COMMONWEALTH OF KENTUCKY
BEFORE THE
KENTUCKY PUBLIC SERVICE COMMISSION

In the Matter of:

Electronic Application of Jackson Purchase Energy Corporation for a Certificate of Public Convenience and Necessity Authorizing the Installation of a New Advanced Metering Infrastructure (AMI) System	))))))	Case No. 2024-00013

VERIFIED APPLICATION

Comes now, Jackson Purchase Energy Corporation ("Jackson Purchase" or the "Company"), pursuant to KRS 278.020, 807 KAR 5:001, and other applicable law, and hereby respectfully requests from the Kentucky Public Service Commission ("Commission") an Order granting Jackson Purchase a Certificate of Public Convenience and Necessity ("CPCN") for approval to install a new Advanced Metering Infrastructure System ("AMI"). In support of this Application, Jackson Purchase respectfully states as follows:

<u>INTRODUCTION</u>

1. Jackson Purchase is a not-for-profit, member-owned, rural electric distribution cooperative organized under KRS Chapter 279. Jackson Purchase is engaged in the business of distributing retail electric power to approximately 30,000 meters for approximately 23,000 members in Ballard, Carlisle, Graves, Livingston, Marshall, and McCracken counties in Kentucky. Jackson Purchase owns approximately 3,000 circuit miles of distribution line in its service territory, and purchases its power requirements from

Big Rivers Electric Corporation pursuant to a Wholesale Power Contract dated October 14, 1977, and subsequent amendments. Jackson Purchase is a "utility" as that term is defined in KRS 278.010(3)(a), and subject to the rates and service jurisdiction of the Commission.

2. Pursuant to 807 KAR 5:001 Section 14(1), Jackson Purchase's mailing address is 6525 US Highway 60 W, Paducah, Kentucky 42001, and its electronic mail address is greg.grissom@jpenergy.com. Jackson Purchase requests that the following individuals be included on the service list:

Greg Grissom, Jackson Purchase's President/CEO

Greg.grissom@jpenergy.com

Travis Spiceland, Jackson Purchase's Vice-President of Engineering

Travis.spiceland@jpenergy.com

L. Allyson Honaker, Counsel for Jackson Purchase

Allyson@hloky.com

Brittany Hayes Koenig, Counsel for Jackson Purchase

brittany@hloky.com

Heather S. Temple, Counsel for Jackson Purchase

Heather@hloky.com

This Application, including the Exhibits attached hereto and incorporated herein, contain fully the facts on which Jackson Purchase's request for relief is based, and an Order from the Commission granting the CPCN is requested, consistent with KRS 278.020 and other applicable law.

3. Pursuant to 807 KAR 5:001 Section 14(2), Jackson Purchase states that it incorporated in Kentucky on June 12, 1937, and attests that it presently is a Kentucky

corporation in good standing.

BACKGROUND

4. Jackson Purchase installed an AMI system, and on March 15, 2021, informed the Commission of its error in not obtaining a CPCN prior to installation. A copy of this letter is attached to this Application as Exhibit 9. The AMI system that was installed was manufactured by Cannon Technologies. This system is becoming obsolete due to the inability of Jackson Purchase to receive monthly billing reads along with continued deterioration of read rates.

5. Jackson Purchase included the new AMI system in its most recent Construction Work Plan (“CWP”) which is on file with the Commission and was approved in PSC Staff Opinion 2023-005.

6. Jackson Purchase anticipates that the installation of the new AMI meters will take approximately two years.

7. Jackson Purchase will begin the installation of the new AMI system with proceeds from its general fund until it becomes necessary to secure new funding to complete the project. Once new funding is necessary, Jackson Purchase will use loan funds obtained from the Rural Utility Service (“RUS”), pending loan approval.

8. Jackson Purchase estimates the cost of the new AMI system will be $6,499,767 and the annual operating expense of the new AIM system will be approximately $30,000 less than existing AIM system. The estimated $30,000 decrease in operating expenses is mainly due to the decrease in manual meter readings.

9. In support of this Application, Jackson Purchase is including several Exhibits, including the testimony of Travis Spiceland, Jackson Purchase’s Vice-President

of Engineering. The Exhibits are as follows:

Exhibit 1 – Background of AMI system, Vendor List, RFP Process and the Vendor Chosen

Exhibit 2 – Information on the Aclara AMI system chosen

Exhibit 3 – Quality Resources RFP Response

Exhibit 4 – Luthan Electric Meter Testing RFP Response

Exhibit 5 – Estimated Pricing Information and Evaluation Matrix

Exhibit 6 – Testimony of Travis Spiceland

Exhibit 7 – Proposed Project Timeline

Exhibit 8 – Summary of Benefits to End-Use Members

Exhibit 9 – Letter to the Commission

10. In accordance with 807 KAR 5:001 Section 15(2)(a), the Application, exhibits and supporting testimony provide the evidence to show that the updated AMI system is required by public convenience or necessity.

11. In accordance with 807 KAR 5:001 Section 15(2)(b), Jackson Purchase states that it has previously filed with the Commission the applicable franchises from the proper public authorities. Additionally, to the extent a local city or municipality requires Jackson Purchase to obtain a construction permit, Jackson Purchase will follow such local regulations and obtain any necessary local permits prior to beginning any work.

12. In accordance with 807 KAR 5:001 Section 15(2)(c), which requires the Company to provide a full description of the proposed location, route, or routes, including a description of the manner in which the facilities will be constructed, and Section 15(2)(d)(1) which requires maps to suitable scale showing the location or route as well as

the location to like facilities owned by others, Jackson Purchase is requesting a deviation of these requirements pursuant to 807 KAR 5:001, Section 22. Based upon the fact this Application is a request for an updated AMI system these requirements are not applicable. Additionally, because the Company's AMI system will only be installed in the area currently served by Jackson Purchase, this project will not compete with any public utilities, corporations, or persons.

13. In accordance with 807 KAR 5:001 Section 15(2)(d)(2), requiring plans and specifications and drawings of the proposed plant, equipment, and facilities Jackson Purchase states that Exhibits 6 and 7 to this Application contain the work specifications for the AMI system, including the number of meters to be installed each year, the estimated length of time the project will take to complete and the type of AMI meters to be installed.

14. In accordance with 807 KAR 5:001 Section 15(2)(e), Jackson Purchase states that it will finance this new construction originally through the use of general funds and then through a loan from RUS, pending loan approval. This project will not materially affect Jackson Purchase's financial condition.

15. In accordance with 807 KAR 5:001 Section 15(2)(f), Jackson Purchase states that in terms of annual operations and maintenance expense, there are no incremental operating costs associated with the new AMI system. Once installed, the new AMI meters will simply be a replacement of the existing AMI system that is becoming obsolete. Therefore, no additional annual operations and maintenance expense will be incurred.

16. Since this Application is only for replacement of the obsolete AMI system, energy efficiency and DSM consideration are not applicable to this proceeding.[1]

---

[1] *In the Matter of Consideration of the New Federal Standards of the Energy Independence and Security Act of 2007,* Case No. 2008-00408, Order, (P.S.C. July 24, 2012).

17. This project will not result in a wasteful duplication of facilities. The Application is only intended to replace the existing AMI system that is becoming obsolete.

18. Jackson Purchase's Board of Directors approved the AMI project and the chosen vendor at its December 2023 Board Meeting.

WHEREFORE, Jackson Purchase respectfully requests that the Commission:

1) Issue a CPCN for replacement and upgrading of its existing AMI system as described herein; and

2) Grant any other relief to which the Company may be entitled.

VERIFICATION

STATE OF KENTUCKY)
) SS:
COUNTY OF MCCRACKEN)

The undersigned, Travis Spiceland being duly sworn, deposes and says that he is the Vice-President of Engineering of Jackson Purchase Energy Corporation, that he has personal knowledge of the matters set forth in the foregoing, and that the information contained therein is true and correct to the best of his knowledge, information and belief.

JACKSON PURCHASE ENERGY CORPORATION

By: ______________________
Travis Spiceland
Vice-President of Engineering
Jackson Purchase Energy Corporation

Subscribed and sworn to before me by Travis Spiceland, Vice-President of Engineering of Jackson Purchase Energy Corporation, on this 26th day of January, 2024.

____
NOTARY PUBLIC

Notary ID#: KYNP55841

My Commission Expires:
8/25/2026

AMY VICK
My Commission Expires 08-25-2026
NOTARY PUBLIC
Notary ID # KYNP55841
STATE AT LARGE, KENTUCKY

Respectfully submitted,

Heather Temple

L. Allyson Honaker
Brittany Hayes Koenig
Heather S. Temple
HONAKER LAW OFFICE, PLLC
1795 Alysheba Way, Suite 6202
Lexington, KY 40509
(859) 368-8803
allyson@hloky.com
brittany@hloky.com
heather@hloky.com

Counsel for Jackson Purchase Energy Corporation.

Exhibit 1

Jackson Purchase Energy Cooperative

AMI Results and Selection

December 12, 2023

STRATEGIC INITIATIVES

1. Be a top safety performer in our industry

2. Upgrade AMI infrastructure

3. Enhance member education and communication

4. Research grid modernization and implement EV strategy

5. Economic Development

EVALUATION MATRIX

Category	Rating Totals (1-3-9)			
	[redacted]	[redacted]	[redacted]	[redacted]
General (Cost, Company Stability, Flexibility)	43	29	33	25
Hardware (Life, Warranty, Capabilities)	35	35	35	37
Reliability/Accuracy	27	27	21	25
Data/Communication (Functionality, Throughput, Applications)	61	65	65	63
Total	**166**	**156**	**154**	**150**

INSTALLED COST

	[redacted]	[redacted]	[redacted]	[redacted]
Meter Replacement (non-instrument)	[redacted]	[redacted]	[redacted]	[redacted]
Meter Replacement and Test (instrument)	[redacted]	[redacted]	[redacted]	[redacted]
Meter Base Changeout (Expected)	[redacted]	[redacted]	[redacted]	[redacted]
Meter Base Changeout (Unexpected)	[redacted]	[redacted]	[redacted]	[redacted]
Meter Testing, Storage, and Disposal	[redacted]	[redacted]	[redacted]	[redacted]
Router Installation by JPEC	[redacted]	[redacted]	[redacted]	[redacted]
Gateways, Routers, Collectors, Modems, Mounting Hardware	[redacted]	[redacted]	[redacted]	[redacted]
Pole Replacements	[redacted]	[redacted]	[redacted]	[redacted]
Meters (Including Modules)	[redacted]	[redacted]	[redacted]	[redacted]
Deployment Costs (Services, Project Management, etc.)	[redacted]	[redacted]	[redacted]	[redacted]
Training	[redacted]	[redacted]	[redacted]	[redacted]
Sales Tax	[redacted]	[redacted]	[redacted]	[redacted]
Shipping	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]
JPEC Labor	[redacted]	[redacted]	[redacted]	[redacted]
Project Credit	[redacted]	[redacted]	[redacted]	[redacted]
Tot[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

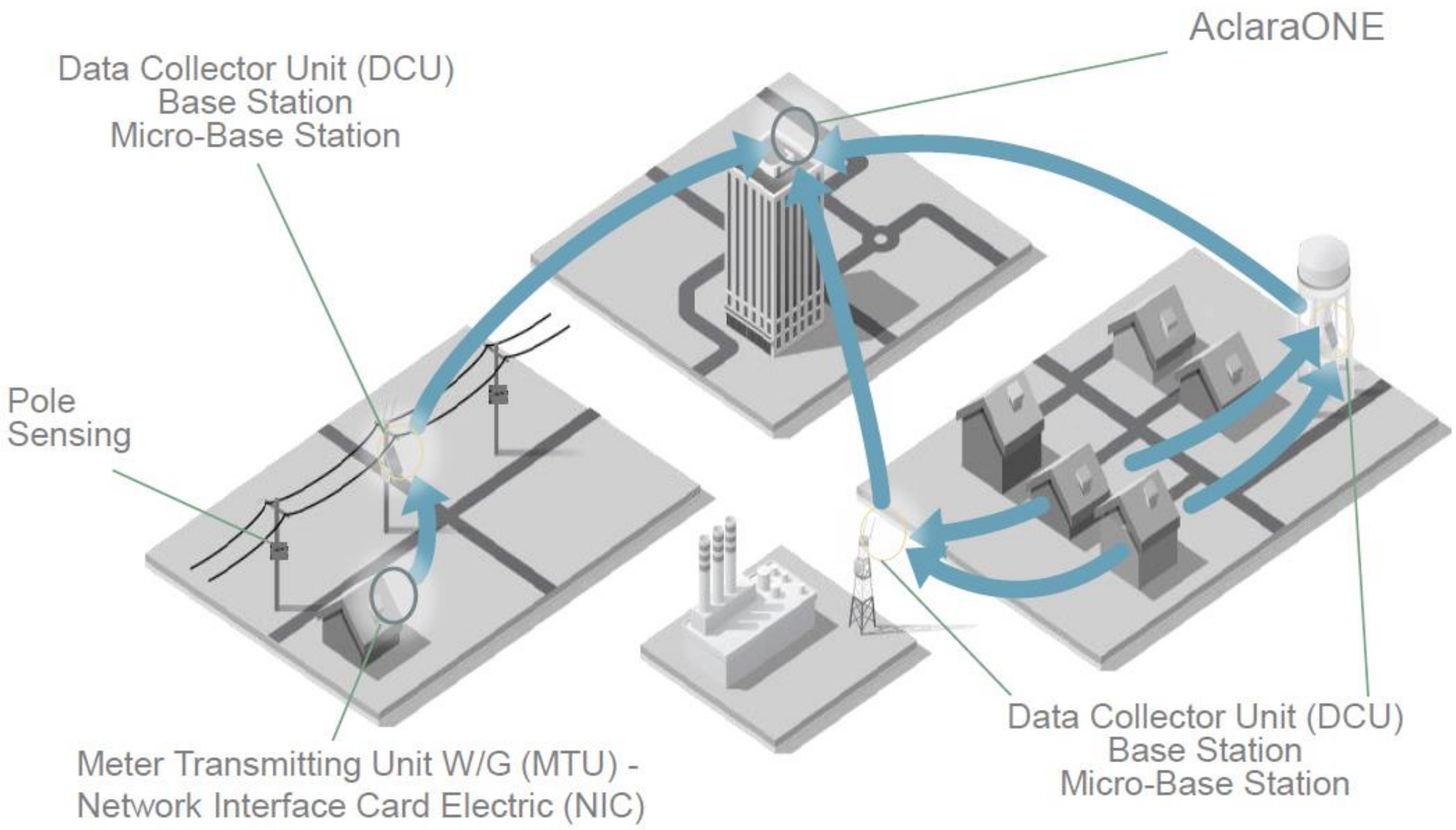
15 YR. COST OF OWNERSHIP

COST ASSUMPTIONS

Assumptions

- Hosted solution
- 5,000 meter replacements in 2024
- 25,000 meter replacements in 2025
- 62 pole replacements
- Quoted pricing (may increase at time of PO issuance)
- Quality Resources
  - Change non-instrument meters
- Luthan Electric Meter Testing
  - Change/test instrument rated meters
  - Complete meter base replacement for meter consolidation
  - Complete end of life testing, storage, and disposal
- Cellular Data
  - $300/month data pool
  - $10/month/device

ACLARA RF SOLUTION



ACLARA CAPABILITIES

- 5/15/30/60 min interval data for commercial and residential meters
- Remote connect/disconnect ability for all 1S and 2S meters
- Distribution automation
- Load control and demand response
- Power quality monitoring
- EV charger communications
- Pole tilt sensors
- Phase detection
- Secure network
- 5-year warranty on all meters and network equipment

PROJECT TIMELINE

Action	Completion Date
RFP Release	3/24/2023
Pre-Proposal Conference Calls	Upon request
RFP Inquiries Deadline	4/14/2023
Proposal Submission Deadline – 2:00 pm CST	5/30/2023
Responses Evaluated	6/5/2023 - 11/10/2023
Notice of Award*	11/15/2023
Contract Negotiations/Contract Execution/Notice to Proceed*	11/16/2023 - 3/29/2024
CPCN Approval by Kentucky Public Service Commission	TBD
Begin Installation of Collectors	Summer 2024
Complete Collector Installations	12/31/2024
Replace approximately 5,000 meters with new RF meters in 2024	12/31/2024
Replace approximately 25,000 meters with new RF meters in 2025	12/31/2025
Desired Project Completion (System Installed, Tested, Functional and Accepted by JPEC)	6/26/2026

*Contingent upon KY PSC approval

QUESTIONS

Questions?

Background

From July 2022 through October 2022, Jackson Purchase Energy Corporation (JPEC) participated in a technology planning study with National Rural Telecommunications Cooperative (NRTC) to develop a 10-year plan and determine our technology needs moving forward. From this study, it was determined that an AMI system upgrade was necessary to meet current and future needs of our members.

In November 2022, a selection team was assembled to begin the AMI search process. The team consisted of the following members:

Samantha Rudolph, Administrative Assistant to Engineering and Operations

Connor Riley, Distribution Engineer

Jason Gipson, Substation Crew Leader

Mark Brueggert, Manager of Information Technology

Jeremy Goodman, Manager of Operations

Meredith Kendall, Vice President of Accounting and Finance

Ward Morgan, Vice President of Operations and Technical Services

Myself, Travis Spiceland, Vice President of Engineering

In December 2022, a kickoff meeting was conducted and formulation of an RFP began. Multiple meetings were conducted with the team to develop the RFP and ensure the appropriate information was requested.

In early March 2023, Ward, Jeremy, Mark, Connor, Jason, and I attended NRECA's TechAdvantage in Nashville TN where we collaborated with multiple AMI vendors, explored products, and began conversations of our intent to upgrade.

In late March 2023, the RFP was released to eight AMI vendors and two meter replacement companies. Once responses were received, the AMI team met to compile answers, data, and figures.

In-person visits were taken to Meade County RECC (Landis+Gyr), Kenergy (Landis+Gyr), and Salt River (Aclara) as well as multiple conference calls to other cooperatives to discuss their systems.

In June 2023, five meetings were conducted as the AMI team evaluated responses and generated a shortlist for onsite presentations. Each of these vendors then showcased their product to the selection team and other staff at our headquarters.

After all AMI solutions were reviewed by the selection team, a recommendation was made to executive management. The final selection, aligning with the team's recommendation, was made to pursue Aclara's offering.

Request for Proposal

Advanced Metering Infrastructure and Services

March 24, 2023

RFP No. 2023-0001

Jackson Purchase Energy Corporation

6525 US Highway 60 W

Paducah, KY 42001

TABLE OF CONTENTS

TABLE OF CONTENTS CONTINUED

1. INTRODUCTION

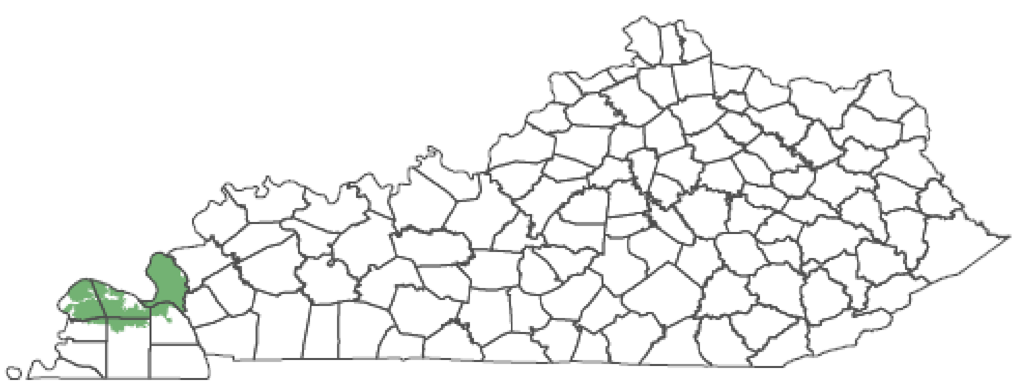
1.1. Project Overview

Jackson Purchase Energy Corporation (JPEC) is issuing this Request for Proposals (RFP) from qualified vendors for the design and installation of an Advanced Metering Infrastructure System (AMI System) utilizing radio frequency (RF) or cellular technologies. The proposed project envisions the qualified vendor(s) will provide services to design and install the AMI System and all other supporting systems, including electric meters and communication infrastructure necessary to provide AMI services to JPEC. Vendors are encouraged to submit proposals for portions or the entire project scope. JPEC plans to manage the installation of new electric meters but invites all parties to submit proposals for meter replacements, testing, and storage. JPEC's desire is to have the system installed, integrated, tested, and accepted by JPEC by December 6, 2024 for pilot, and June 26, 2026 for full installation.

.

1.2. About Jackson Purchase Energy

Jackson Purchase Energy Corporation is a rural electric cooperative serving approximately 30,000 consumer-members, with 1,800 miles of overhead primary conductor and 375 miles of underground primary conductor across six counties in far Western Kentucky. Jackson Purchase Energy Corporation serves six counties in Western Kentucky: Ballard, Carlisle, Graves, Livingston, Marshall, and McCracken.



1.3. Existing Software and Systems

Specific vendors and applications in use at JPEC are listed below. Vendors that can demonstrate or verify proven integration to these existing systems are preferred. JPEC's goal is to ensure secure and reliable system integration and eliminate duplicate entries for any new device or device exchange functions. In addition, preference will be given to vendors with capability for expanded integration such that JPEC users (e.g., Customer Service performing a remote disconnect/ reconnect or billing personnel identifying malfunctioning meters) will be able to do most day-to-day functions through the existing systems described below.

JPEC's existing IT systems are:

1.3.1 Billing/Customer information system – NISC

1.3.2 Telephone System – Cisco

1.3.3 Geographic Information System – ESRI 10.8.1

1.3.4 Engineering Modeling - Milsoft WindMil version 8.7.18.1880

1.3.5 Staking Solution – NISC

1.3.6 Outage Management – NISC

1.3.7 SCADA – Survalent Technologies

1.3.8 SCADA Communications – Fiber

1.4. Projected Schedule

The following timeline is intended to illustrate the anticipated timeline for the RFP and the project. JPEC reserves the right to change activities and dates at its sole discretion.

Action	Completion Date
RFP Release	3/24/2023
Pre-Proposal Conference Calls	Upon request
RFP Inquiries Deadline	4/14/2023
Proposal Submission Deadline – 2:00 pm CST	5/29/2023
Responses Evaluated	6/5/2023 - 7/7/2023
Notice of Award	7/10/2023
Contract Negotiations/Contract Execution/Notice to Proceed	7/17/2023 - 10/13/2023
Pilot Meter Installation	6/28/2024
Desired Project Pilot Installation Complete	8/2/2024
Desired Project Completion (System Installed, Tested, Functional and Accepted by JPEC)	6/26/2026

2. RFP INFORMATION

2.1. General

This RFP is soliciting proposals for the following:

I. Design and installation of an Advanced Metering Infrastructure System (AMI System) utilizing Radio Frequency (RF) or cellular technologies, including all hardware and software.
II. Installation of AMI Meters, end-of-life meter testing and storage of removed meters.

JPEC is soliciting proposals from vendors who provide one or more of the above. Vendors are encouraged to submit proposals for any of these activities for which they are qualified. JPEC may select a single vendor to provide all the above or may choose to select multiple vendors to complete this project. Please consider this as you prepare your proposal(s).

2.2. RFP Goal

This RFP addresses JPEC's interest in acquiring an AMI solution and is structured to capture the requirements and detailed pricing so that JPEC can easily evaluate the responses. Although JPEC understands that some of these requirements may be included or combined in specific functions/applications, JPEC wishes to clearly understand and fairly evaluate the requirements set forth in this RFP. Therefore, bundled pricing should clearly define which functions and modules are included in the bundled price. Vendors are encouraged to offer and include any additional innovative services that will help JPEC improve the efficiency and cost effectiveness of the solutions.

2.3. Inquiries about the RFP

All inquiries and requests for information from prospective vendors concerning this RFP must be submitted in writing to AMI_RFP@jpenergy.com. The subject line of the email should state "*RFP Number 2023-0001 - Advanced Metering Infrastructure Services*". Responses will be written, and copies of the written responses will be issued via email and will be distributed to all prospective vendors. In the event it becomes necessary for JPEC to revise any part of this RFP, an addendum or supplement to this RFP will be provided to all prospective vendors.

2.4. Distribution and Use Restrictions

This RFP shall not be distributed to parties outside the scope of this project. Distribution is allowed to subcontractors bidding on various aspects of the proposal.

2.5. Pre-Proposal Conference Call

Two days have been set aside for individual conference calls with prospective vendors (please refer to the schedule on page 3) to answer questions and clarify information concerning this RFP. All calls will be conducted on the same day and will be 30 minutes in length. Please submit your request for a conference call time to AMI_RFP@jpenergy.com no later than April 14, 2023. The specific time of your conference call and dial-in information will be confirmed with a return email. Please submit your questions in advance via email.

2.6. Contents of Proposals

A complete proposal should be compiled using the following format:

A. Company Information and Experience

Provide company background and history, including the number of years' experience in providing the proposed products/services.

Provide a current organization chart including details for those expected to be involved in selling and servicing the system at JPEC.

Provide the following information for up to three (3) similar sized projects where the specific product or service you are quoting for this RFP has been deployed and is an operating AMI System serving electric utilities within the last two (2) years:

- Brief description of the project.
- Project organization, including use of subcontractors, utility provided services, etc.
- Total number of residential, commercial, and industrial meters in each project.
- Start and finish dates for the contract.
- A description of the specific services provided to the utility, including service level agreements (SLA's) associated with each service.
- Provide relevant references within the utility that are familiar with the work performed. Include name, current phone number and current email address.

In addition to the projects above, provide a list of all customers delivered between 2020 and 2023 including a contact of the person using the system.

Describe the production capacity and location of your manufacturing facilities in support of multiple parallel projects.

State which products quoted in this proposal will meet the (3) requirements below and therefore be classified as "Buy America" certified under the *Build America, Buy America Act* :

- All iron and steel used in the project are produced in the U.S. This means all manufacturing processes, from the initial melting stage through the application of coatings, occurred in the U.S.
- All manufactured products used in the project are produced in the U.S. This means the manufactured product was manufactured in the U.S., and the cost of the components of the manufactured product that are mined, produced, or manufactured in the U.S. is greater than 55 percent of the total cost of all components of the manufactured product.
- All construction materials are manufactured in the U.S. This means that all manufacturing processes for the construction of material occurred in the U.S.

Provide detailed information of any pending or continuing litigation regarding any technology being proposed to JPEC.

Describe any pending, active, or planned merger or acquisition involving your organization.

Provide a copy of your Software License Agreement, or associated document, which you will propose be executed by JPEC outside the negotiated contract.

Provide an Annual Report or a Profit and Loss Statement covering the last 24 months for the vendor(s) proposing to provide products/services. Also include the total investment in research and development related to your electric AMI portfolio for the past five (5) years as well as the electric AMI revenue percentage as compared to the company's overall revenue.

B. AMI System

Include all information requested in Section 3 of this RFP titled "**DESIGN AND INSTALLATION OF AN ADVANCED METERING INFRASTRUCTURE SYSTEM UTILIZING RF TECHNOLOGIES, INCLUDING ALL HARDWARE AND SOFTWARE"**, including the Function/Functionality Checklists.

C. Installation, Testing and Removal of Meters

Include all information requested in Section 4 of this RFP titled **INSTALLATION OF AMI METERS, END OF LIFE METER TESTING AND STORAGE OF REMOVED METERS,** including the Function/Functionality Checklists.

D. Warranty Information

Provide a description of the warranty provided to JPEC for each component and service contained in your proposal. Include the effective dates, the expiration dates, and the extent of the warranty coverage and any limitations of the warranty.

E. Additional Information

Provide additional information important or relevant to the products/services being proposed.

2.7 Submission

JPEC must receive the proposal no later than 2:00 pm CST on May 29, 2023. One (1) original, five (5) hard copies, and one (1) electronic copy of all proposal materials shall be submitted. Sealed proposals shall be clearly marked with "***Request for Proposals - Advanced Metering Infrastructure Services RFP Number 2023-0001***". Proposals shall be submitted as follows:

- Hand delivered or mailed:

  Jackson Purchase Energy Corporation
  ATTN: Meredith Kendall
  6525 US HWY 60 W
  Paducah, KY 42001

- Electronic submissions should be made via a portable storage device or appropriate electronic means. Email submittals will **NOT** be accepted.

3. DESIGN AND INSTALLATION OF AN ADVANCED METERING INFRASTRUCTURE SYSTEM UTILIZING RF TECHNOLOGIES, INCLUDING ALL HARDWARE AND SOFTWARE

The AMI system shall meet the requirements and include the features outlined in this section. Vendors shall document and submit any exceptions (with a recommended alternative) to the technical requirements listed below as part of the proposal.

3.1. SPECIFICATIONS

Proposed products/services must meet the following specifications:

- System is an RF (RF Mesh, Point to Multipoint RF, etc.) or cellular AMI solution with two-way communication.
- Completion of a propagation study using data contained in Exhibit A with the attached electronic files and delivery of a detailed report that includes the following:
    - The quantity and type of equipment required to achieve:
        - 100% Coverage (all deployed meters are active on AMI network)
        - 99.9% delivery of billing determinants every 24 hours.
        - 99% of all meters must report back following an on-demand request.
    - For RF mesh solutions, the system design results in an average of 8 hops, or fewer, per meter, no more than 12 hops per meter and allows each meter's "last gasp" to be delivered to NISC OMS.
    - Installation & maintenance specifications and requirements for collection devices, repeater devices and all equipment mounted on customer premises.
    - Detailed pricing for the above referenced system. See Section 7 for pricing tables. Pricing must include:
        - One-time costs
        - Recurring costs itemized by year (and any other appropriate period) for a period of 10 years (10-year cost of ownership).
        - For System Guarantees/Maintenance Agreements, include initial coverage details and future year's coverage details. Also include the maximum length of a Maintenance Agreement available and the corresponding cost.
        - The cost for disconnect/reconnect switches for 100% of all applicable meters, by meter type.
- Provides integration to NISC iVue, OMS, Mapping and Staking, and MDM.
- Provides integration to Survalent SCADA.
- Capable of supporting distribution automation. Includes the ability to send and receive DNP3 communication to control downline devices.
- During deployment through JPEC acceptance, a single point of contact with 24/7 accessibility will be provided. This contact should be denoted in the proposal.
- Any meter equipped with a disconnect/reconnect switch must be able to display the open/closed status of the switch on the meter display.
- Meters must have the ability to collect and report kWh, kW, kVAR, and voltage. Poly phase meters must additionally have the ability to collect and report Power Factor at peak kW.
- Poly phase meters shall be auto-ranging in voltage (120-480V).

Additionally, proposals should include the following:

- Vendor sample Statement of Work (SOW), Master Service Agreement (MSA), Field Acceptance Test (FAT), and System Acceptance Test (SAT).
- Methodology for deployment, including proposed process maps and deployment schedules for the products/services proposed in order to meet JPEC desired acceptance date of December 6, 2024, for pilot, June 26, 2026, for full installation.
- Any cost associated with the training outlined in Section 6 of this RFP.
- Describe, in detail, cyber security measures/methods intended for use with your proposed AMI solution.
- Methodology of system design including propagation assumptions described in detail and redundancy measures and considerations.
- Any additional required testing equipment with estimated cost.
- List all standard report options through the management portal.
- Include battery backup option with all capable infrastructure equipment. Also include specs on the batteries of all devices that have them (such as routers and collectors) which should include, but not limited to, expected life, replacement process and if notifications are sent when the battery fails.
- Identify any exceptions to JPEC's specifications.
- System Design must be able to run side by side with existing AMI Infrastructure until the existing PLC system is phased out.

3.2 FEATURES AND FUNCTIONALITY CHECKLIST

For tables in this section, respond as follows:
YES Feature/Functionality is part of the product(s) being quoted in this proposal.
NO Feature/Functionality is NOT part of the product(s) being quoted in this proposal.

3.2.1 GENERAL SYSTEM REQUIREMENTS	YES	NO
The AMI System can be deployed using an in-house non-hosted or a hosted model.		
The AMI System can be deployed using Microsoft SQL.		
The AMI System can be deployed using Oracle.		
The AMI System can be used by multiple browsers.		
The AMI System supports the use of mobile devices for in field viewing of system.		
The AMI System can support NISC's pre-pay functionality.		
Currently provides distribution automation functionality.		
The AMI System can provide integration to Jackson Purchase Energy's Survalent SCADA system.		
The AMI System fully supports MultiSpeak 3.		
The AMI System fully supports MultiSpeak 4.		

3.2.2 METERING

A. What is the expected life of the AMI modules? Of the AMI modules and associated meters?

B. How does the installer know a meter is configured and properly communicating with the network?

C. Describe the timeline required for each meter to become a fully integrated into the network and fully capable of meeting performance requirements outlined in this RFP.

D. Describe the number of registers/channels available for data for each meter form.

3.2.3 ALL ELECTRIC METERS	YES	NO
Meter has nonvolatile data storage capable of storing up to 30 days of 15-minute interval data.		
Support for ANSI Reading and Programming Standards C12.18.		
Support for ANSI Reading and Programming Standards C12.19.		
Support for ANSI Reading and Programming Standards C12.22.		
Approval of Underwriters Laboratories (UL).		
Compliant to UL 2735 Standard for Safety, Electric Utility Meters.		
Meter has the ability to be programmed to meter bi-directional energy. The meter has two registers (delivered and received) for this operation and the registers are synced to a clock.		
The meter display has an alphanumeric display and a watt disk emulator that provides both direction and magnitude of energy registration.		
Meter has the ability to report tamper detection including reverse consumption, tilt, and unexpected consumption/diversion.		
Meter has backup battery.		
Meter has optional super capacitor as alternative to the backup battery.		
The meter's voltage reporting/ monitoring capability is guaranteed by the manufacturer to have +/- .5 volts accuracy of applied voltage as compared to a standard verified against NIST.		
The meter is built to function according to ANSI C12.1 Meter Temperature Requirements with a range of -40°F to +185°F.		
Meter has the ability to capture a log of up to 200 events (alerts, diagnostics, cautions, communication and meter operations).		
Meter & Module have documented mfg. lifecycle of at least 10 years.		
Meter has built in functionality to communicate with other equipment to allow member load control. For example, water heater controls, smart thermostats, and EV chargers.		
Meter has current limiting functionality.		
Meter has the ability to detect and report voltage fluctuations and send alarm notifications within 3 minutes.		
The meter's voltage monitoring supports measurements of instantaneous voltage data (line-to-line and line-to-neutral) up to three phases depending on meter form.		

3.2.4 SINGLE PHASE ELECTRIC METERS	YES	NO
Meter Includes safety button/switch for reconnects.		
Meter has ability to collect and report TOU metering measures, Critical Peak, Peak Rebate & Real-Time Usage.		
The meter is capable of rolling demand with the minimal capability to roll 5 into 15-minute demand intervals.		

3.2.5 POLY PHASE ELECTRIC METERS	YES	NO
Meters proposed to meet specification and report KVA with no additional cost.		
Meter has ability to report TOU metering measures, Critical Peak, Peak Rebate & Real-Time Usage.		
The meter is capable of rolling demand with the minimal capability to roll 5 into 15-minute demand intervals.		
Meter has capability of showing instantaneous demand measurement on display.		
Meter can provide kVAR to NISC's MDM.		

3.2.6 NETWORK AND DATA

A. Describe how the available network bandwidth can support applications beyond meter traffic with percentages of network allocation per function.

B. Describe how the system supports communication standards and protocols.

C. Describe the system requirements for FCC licenses and the process for how licenses are registered and administered.

D. For point to multipoint and cellular solutions, list the expected end-to-end communication time for an on-demand meter register read and expected success rate for a command from the headend system.

E. For RF mesh solutions, list the expected end-to-end communication time for an on-demand meter register read and expected success rate for a command from the headend system for the following scenarios:

- 1 meter hop
- 3 meter hop
- 8 meter hop
- 12 meter hop

F. Describe system support of both IPv6 and IPv4 addressing.

G. Describe the process for prioritization of traffic on the network.

H. Describe the network impact and management for configuration changes such as meter programming and firmware updates.

I. Describe backhaul options and requirements for the proposed AMI network.

J. Describe how the solution supports detection of outage events and service restoration notification of network components.

K. Describe the communication equipment's capability to support reprogramming or reconfiguration of network devices over the MTBF and expected service life cycle term.

L. Describe the method for tracking and managing firmware versions.

M. Firmware upgrade: Describe any impact to meter reading, outage reporting, and restoration operations.

N. How does the system push out firmware to devices and how long does it take to complete a firmware update to a NIC?

O. Is the system capable of pushing out meter firmware upgrades? If so, how long does it take to complete the upgrade?

P. How often is the firmware released and does JPEC have the ability to opt out of a firmware release? If JPEC has the option to opt out, please explain the process and any ramifications.

3.2.7 GENERAL NETWORK & METER DATA REQUIREMENTS	YES	NO
AMI System included is capable of capturing all meter errors and events aligned with IEC 61698-9 and can forward these to the integration platform allowing external systems to subscribe to required data in near real-time.		
The AMI System supports measurement of other power quality data including RMS voltage/current, over/under voltage, sag/swell, voltage imbalance, and under frequency alerts.		
The AMI System provides aggregate daily meter reads to the integration bus to provide scheduled Revenue Residential Electric Meter Reads and is capable of providing 15-minute interval data, delivered at minimum every 4 hours.		
The AMI System provides aggregate daily meter reads to the integration bus to provide scheduled commercial electric meter reads and is capable of providing 15-minute interval data, delivered at minimum every 4 hours.		
The AMI System provides aggregate daily meter reads to the integration bus in kWh, KW, kVAR, TOU, KVA, Power Factor and Demand Data.		
Within a selected meter type, Jackson Purchase Energy may desire to utilize different interval durations for endpoints. The AMI solution provides capabilities that allow different groups of meters to be configured at 5, 15 & 30 minute or other intervals.		
The AMI System can perform "Gap-filling" to ensure the maximum number of reads are received from the field to minimize the use of VEE in filling meter data gaps by the MDMS.		
The AMI System provides an on request (real-time) reading service that allows for retrieval of available meter reading data across the entire population of meters, including the most recent data stored. The following data is available on an "On-Request Meter Reading" query: a. Date and time of reading b. Meter number c. Cumulative kWh read d. Voltage e. Power Factor at peak KW (where available on meter) f. KW Demand (must be programmable up to a total of six digits) g. Remote disconnect status		
On-Request (Real Time) Meter Reading – meters respond within 15 seconds.		
System is capable of generating temperature alert.		

3.2.8 APPLICATIONS AND BILLING

- **A.** Can a command from the Headend System (HES) be cancelled?
- **B.** Describe the process for detection of meter tampering along with reporting/alerting, logging, and tracking of tamper events.
- **C.** Describe the system's data management capabilities, collection, storage, presentation.
- **D.** Describe how alarms are logged, stored, presented, and queried.
- **E.** Describe the systems support of on demand requests from the head end and through a typical MultiSpeak command from a third-party vendor.
- **F.** How are configuration details communicated to the network device during the installation process?
- **G.** Describe how meter temperature alarms are triggered, reported, and logged.
- **H.** How are the different data types retrieved from the meter and what polling intervals are available for each data type?
- **I.** How does a client access the AMI applications?
- **J.** How does the system collect unread meter data?
- **K.** How does the system ensure read jobs are complete?
- **L.** How does the system handle messages and traps from the meter?
- **M.** How does the system manage unread meters?
- **N.** How does the system monitor meter programming, firmware versions and statuses?
- **O.** How does the system notify users of failed meter communications?
- **P.** How does the system reprogram meters remotely?
- **Q.** How does the system support outage event detection, and restoration notifications and messaging?
- **R.** How does the system track whether a meter or device is currently available on the network?
- **S.** How does the system support prepaid metering programs (polling, reporting, service disconnect/reconnect, verification)?
- **T.** Describe how time change events are managed by the network (Daylight savings time)
- **U.** How often are the HES applications updated?
- **V.** Describe the field maintenance schedule required for the system.
- **W.** Describe how the system supports remote connect/disconnect for electric meters and meter forms, types supported, integrations supported.
- **X.** Describe how line side voltage is measured, monitored, along with available configurations of alerting and reporting on measured values.
- **Y.** Describe how the system supports grouping including types and classifications.
- **Z.** Describe the process for time stamping of collected meter data points.
- **AA.** Describe the meter attributes that are recorded in the head end and integration into enterprise software solutions for updating and monitoring of life cycle state of devices.
- **BB.** Describe methods used to validate newly installed meters are successfully integrated into the meter communications network.
- **CC.** Describe the systems support of street light management and control including available attributes for monitoring and control.
- **DD.** Describe the systems support of Demand Response and Load Control devices including control types, operating ranges, and capabilities.
- **EE.** Describe how the system supports Distribution Automation.

FF. Please provide a list of devices currently supported by the Distribution Automation solution.

3.2.9 GENERAL BILLING DATA	YES	NO
System has ability to provide billing determinants supporting batch scheduled meter read delivery based on a configurable billing cycle schedule, off-cycle bills, and a final bill process.		
Peak demand reset can be performed to coincide with the billing determinant delivery.		
The AMI System utilizes a web-based utility portal allowing Jackson Purchase Energy to access each included sub-system using a single sign-on methodology integrated to Jackson Purchase Energy's active directory authentication system.		
Service Oriented Architecture (SOA) integration adheres to NERC/CIP security compliance.		
System uses secure file-based integration utilizing file transfer over https, sFTP, SCP, or FTPs.		

3.2.10 AMI SYSTEM FEATURES	YES	NO
The AMI System does not require a network path that traverses infrastructure that is not reliably backed up. For example, hopping through non-battery backed up end devices.		
The AMI System is capable of remote, over-the-air support and firmware upgradeability to system devices without affecting the normal operations of system such as regularly scheduled data retrieval.		
The AMI infrastructure supports optional packaging of the Local Area Network radio and Wide-area Network private, wireless data backhaul in a single enclosure, where the AMI backhaul is also capable of supporting near-real time Distribution Automation applications such as Capacitor bank Control, Reclosers, Fault Detection Isolation and Recovery, etc.		
The AMI System supports the following security attributes: a. Mutual entity authentication of all devices throughout the system. b. Message authentication using AES 128 based CMAC or similar. c. Message confidentiality of the application data using at least AES 128-bit encryption. d. Message confidentiality of the link layer using 3-key Triple DES or similar. e. Limited anonymity by not disclosing the Meter ID over the air. f. Verification of authentic firmware upgrade. g. Symmetric key algorithms with no over-the-air key exchange. h. SSL encryption for backend IP-infrastructure. i. Device keys shall be securely provisioned during manufacturing.		
Capable of integration with security light controls.		
After the AMI infrastructure is installed, meters within the coverage area "plug-and-play" and do not require any processes or additional configuration after being powered on.		
Does the system perform "self-healing" functions?		

3.2.10 AMI SYSTEM FEATURES	YES	NO
The network infrastructure supports two-way communication to multiple types of field device endpoints including electric meters.		
The devices on the network avoid connection redundancy by finding primary and alternate AMI infrastructure devices upon installation.		
The AMI System requires licensed frequencies for operation. If yes, does Jackson Purchase Energy have the option to acquire and own license?		
All device emissions levels are significantly under FCC OET Bulletin 65 guidelines even if device is stuck in transmitting mode.		
Does the system support phase detection?		

3.2.11 OUTAGE NOTIFICATION AND MONITORING

A. Describe how outages integrate with NISC's OMS.
B. Describe meter "last gasp" capabilities during outage events.

3.2.12 OUTAGE NOTIFICATION AND MONITORING REQUIREMENTS	YES	NO
The system will not false alarm on a momentary outage event. Duration for momentary outage is a parameter that Jackson Purchase Energy can set.		
System will provide restoration notice after power has been restored.		
The system provides full integration with NISC's OMS.		
Last gasp performance does not degrade in the case of a large grid outage.		
Restoration performance (i.e. the amount of time that it takes for a restored meter to report restoration) does not degrade in the case of a large grid outage.		
The system detects an outage or power loss on monitored meters. When an outage is detected, the system will: a. Notify a designated Jackson Purchase Energy representative b. Update GIS map with current status c. Update status on a map d. Log outage information in the system		
Jackson Purchase Energy will have the ability to obtain status of meters within the electrical network (ping); response will be received in 15 seconds or less.		
During power restoration the AMI head-end receives and forwards all power up notifications.		
Does the system provide a real time status map?		
The system provides trouble shooting capabilities such as: a. Current Meter route b. Real time trace c. Neighbor listing d. Log outage information in the system		
Polling accuracy of routers and collectors greater than 99%.		

3.2.13 ASSET MONITORING FUNCTIONALITY REQUIREMENTS	YES	NO
The system provides visualization of the wireless communications network during operation.		
System can update meter status on Jackson Purchase Energy's monitoring and mapping screen.		
Head-end system can display meter problems/communication problems.		
Jackson Purchase Energy will have the ability to query each meter from the head-end system for detailed information.		

3.2.14 SECURITY

A. Describe how data is encrypted at rest.
B. Describe how the system enforces role base access control (RBASC).
C. Describe the effect on system performance when encryption is enabled.
D. Describe the system encryption capabilities.
E. Describe the endpoint and communications security strategy.
F. How will the system be hardened to meet security requirements?
G. The system must provide mutual authentications for all devices on the network.
H. Describe how individual customer data will be secured and separated in a hosted environment.
I. Describe the security services framework.
J. How are vulnerabilities communicated and managed?
K. How does the system monitor security events?
L. How is contractors' compliance with company security standards ensured?
M. Describe backup procedures.
N. Describe disaster recovery plan for the hosted system.
O. How is system redundancy achieved across the system?
P. Typically, how many days of data are recommended to be retained in the system?

3.2.15 SECURITY/AUTHENTICATION	YES	NO
Does the system support 2-Factor Authentication?		
Does the system integrate with LDAP authentication?		
Are regular penetration tests performed throughout the network attributes?		
The AMI System supports the following security attributes: a. Mutual entity authentication of all devices throughout the system. b. Message authentication using AES 128 based CMAC or similar. c. Message confidentiality of the application data using at least AES 128-bit encryption. d. Message confidentiality of the link layer using 3-key Triple DES or similar. e. Limited anonymity by not disclosing the Meter ID over the air. f. Verification of authentic firmware upgrade. g. Symmetric key algorithms with no over-the-air key exchange. h. SSL encryption for backend IP-infrastructure. i. Device keys shall be securely provisioned during manufacturing.		

3.2.16 CYBERSECURITY

Preparing and Informing Personnel	YES	NO	N/A
Does your organization protect descriptions of JPEC's Control System Domain (CSD) systems or architecture, unless JPEC releases this information for public consumption?			
Does your organization perform personnel background checks for those personnel that will service JPEC equipment and/or be present at JPEC facilities?			
Does your organization have a means of ensuring that competent security leads are assigned to JPEC's projects?			
Does your organization follow applicable standards and procedures regarding confidentiality and user agreements, including agreements signed by all persons having access to JPEC's Environment?			

Security Contact	YES	NO	N/A
Does your organization have a Control System Security Focal Point in the organization who is responsible and accountable for the following activities? a. Acting as liaison with JPEC, as appropriate, about compliance of its systems with JPEC policies? b. Communicating your organization's point of view on control system security to JPEC's staff. c. Ensuring that tenders to JPEC are aligned and in compliance with both JPEC's and your internal requirements for control system security. d. Communicating deviations from, or other issues not conforming with JPEC's policies.			
Does your organization have a means to provide JPEC with timely information about cyber security vulnerabilities in your supplied systems and services?			

Practices	YES	NO	N/A
Does your organization provide a list of membership and level of membership participation in recognized security standards development working groups or other process control security initiatives (e.g., ICSJWG for PCS Security)?			
Has your organization obtained control security certificates for either your product being offered and/or your services provided (e.g., SSAE16, ISO27001, etc.)?			

System Hardening	YES	NO	N/A
Does your organization practice and maintain a policy of hardening requirements for systems in a distributable hardening guide, which includes at least the following: a. Removal or non-installation of software and functionality that is not required by JPEC, nor for the intended functional purpose of the system, email, office applications, games, USB ports, Bluetooth and Wi-Fi communications, etc. b. Protection of physical and logical access to diagnostic and configuration ports. c. Disabling all unused ports on switches and routers to assist in preventing unauthorized access to the network. d. Proper maintenance processes to maintain the system-hardened state during the system lifetime.			
Does your organization have policies and procedures for security testing and approval and maintenance policies and procedures for 3rd party software integrated into your systems?			
Does your organization have policies and procedures for 3rd party security architecture reviews including security risk assessments?			
For interfaces identified as untrusted, does your organization provide compensating security mechanisms to protect the control system?			
Does your organization document special mechanisms and procedures needed to minimize recognized security weaknesses inherent in communication protocols?			

Protection	YES	NO	N/A
Does your organization support the use of anti-malware software?			
If anti-malware software is not technically possible are other mitigating controls documented and implemented to reduce the risk of infection?			
Does your organization provide JPEC with documented instructions for the proper installation, configuration, and update of anti-virus software?			

Patch Management	YES	NO	N/A
Does your organization provide documentation describing the software patching policy for your systems?			
Does your organization review its patching policy at least annually to address new threats and vulnerabilities?			
Does your organization qualify all relevant software patches and service packs for use on its system during its supported lifetime including security patches that are released by the manufacturer of the operating system and third-party software used on their system?			
Does your organization provide JPEC with documented reasons for not patching if a security patch is considered not relevant for use on your systems?			

Does your organization document the reason and remediation plan for security patches not approved for use on your systems? Does the remediation plan describe how a solution will be provided within 12 months?			
Does your organization maintain a list of software patches and service packs relevant to its system including the approval status of each? Can you provide the list to JPEC?			
Does your organization inform JPEC about approved, not approved, and not relevant software patches that affect its systems within 30 days after release by the manufacturer of the software?			
Does your organization provide tools to audit the current security patch status of your systems and provide a list of missing security patches?			
Does your organization describe the approved patching procedures and configuration instructions for your systems, describing how to perform patching both manually and via a patch management server? a. When using a patch management server, does documentation show how to configure your systems to receive updates? b. For manual patching using portable media, are detailed instructions supplied for how to install patches and how patching status reports will be provided?			
Is your organization's recommended roll-out procedure for software patching and upgrading all parts of your system documented and available for JPEC to review?			

Account Management	YES	NO	N/A
Do your organization's systems provide the capability to support default passwords used for system accounts which can be changed by JPEC?			
Do your organization's systems provide the capability to remove or disable unused default system accounts, such as super-user, guest, and back-door/support accounts?			

Account Management Continued	YES	NO	N/A
Do your organization's systems provide the capability for users to be prompted to change their passwords at most 30 days prior to expiration?			
Do your organization's systems log and report unsuccessful login attempts in a timely manner to an interface specified by JPEC?			
Do your organization's systems provide the capability to set service, auto-login, and operator accounts so they never expire or become disabled automatically?			
Do your organization's network devices provide the capability to enable role-based access features?			
Do your organization's systems provide the capability to support unified account management to centralize security policies and to decentralize execution of the security policies?			
Does your organization have established methods, processes and procedures that generate logs of sufficient detail to create historical audit trails of individual user account access activity for a minimum of 90 days?			

Backup/Restore Process	YES	NO	N/A
Does your organization have a documented backup strategy and architecture for your systems, including but not limited to the following: a. Provisions for regular back-ups at intervals which fulfill the data restore and disaster recovery objectives for the system? b. Provisions to back-up the following types of data: operating system files, applications, including middleware, such as an OPC tunneler, configuration data, database files, log files, electronic logbook, unconventional file types such as network equipment settings, Control Systems controller settings including tuning parameters, set points, alarm levels, etc., field instrumentation parameters and user access directories (e.g., Microsoft Active Directory)? c. Provisions to backup other files identified by your organization which are required to create a complete backup of the systems? d. Instructions on how to make a full backup of your systems.			
Does your organization recommend a procedure for verification of successful system backup?			
Do your organization’s systems provide the capability for JPEC’s control and automation technicians to restore the system?			
Does your organization have procedures for control and management of removable backup media?			

Network Visibility	YES	NO	N/A
Do your organization’s systems provide the capability to monitor system security using at least one of the following methods: Syslog, Windows Management Instrumentation (WMI), or Simple Network Management Protocol (SNMP) traps?			

Audit Log Interfaces	YES	NO	N/A
Do your organization’s systems provide the capability to collect historical data using an open standard communication protocol (e.g., syslog)?			
Do your organization’s systems provide the capability to log all state changes?			

Verifying Operations	YES	NO	N/A
Does your organization have a documented policy and procedure for managing and approving changes to operating conditions that come from remote or advisory set points? Do your organization’s systems support the capability of requiring operator acknowledgement and approval action to verify a new set point or modification of an existing set point, requiring the use of the last approved set point if not acknowledged?			
When operating conditions change due to automated operation (those without human intervention), do your organization’s systems provide the capability to log the event and notify the operator in a timely manner?			

Wireless Connection	YES	NO	N/A
Where wireless devices are appropriate, do your organization's systems provide the capability to use wireless devices that comply with approved international wireless standards (e.g., IEEE, ISA, IEC)?			
Does your organization restrict the use of proprietary and non-standard protocols unless approved by JPEC?			
Are industrial wireless field devices based on ISA 100 or WirelessHART? The use of other techniques shall not be used unless approved by JPEC.			
Are wireless devices and systems, including infrared and non-RF, compliant with approved international standards (e.g., NIST, ANSI, IEEE, IEC, ISO) or with regulatory requirements governing licensing of frequency bands?			
Do your organization's systems provide the control system's capability to configure wireless field instruments similarly to the one used to configure wired field instruments?			
Do your organization's systems provide the capability to view the latest configuration of a wireless field device used for monitoring and control from the control system?			

Remote Access	YES	NO	N/A
If remote access is required, does your organization's system provide the capability for remote access using a secure application and protocol subject to approval by JPEC?			
Does your organization provide detailed instructions for how to install, configure and operate the selected remote access software on your systems?			
Does your organization provide adequate information about proposed methods of data transfer between your systems and other systems and networks to allow JPEC to assess the risk and approve the method of data transfer before it is implemented, and periodically thereafter?			

Deployment Management	YES	NO	N/A
Does your organization conduct a control system security risk assessment at the beginning of commissioning phases?			
Does your organization provide JPEC with documentation describing built and installed equipment connections and configurations (e.g., manufacturing data files, management information, etc.)?			
After completion of commissioning, does your organization remove all temporary user accounts used during system testing and commissioning from all systems?			
During testing and commissioning, does your organization obtain approval from JPEC for the use of troubleshooting tools prior to being used?			
During testing and commissioning, does your organization inform JPEC of any adverse effects that hardware or software troubleshooting tools may have on network performance?			

3.2.17 SYSTEM TESTING AND COMMISSIONING

System Hardening	YES	NO	N/A
During system testing and commissioning, does your organization demonstrate security mechanisms installed in accordance with the approved procedures, including compliance with your hardening guidelines?			
During system testing and commissioning, does your organization verify the following conditions have been successfully completed? a. Software and functionality that is not required for the intended functional purpose of the system; email, office applications, games, USB ports, Bluetooth, and Wi-Fi communication, etc., have been removed or not installed unless approved by JPEC. b. Physical and logical access to diagnostic and configuration ports is protected. c. Unused ports on switches and routers that have been disabled so as to prevent unauthorized access to the network. d. If requested by JPEC, demonstrate maintenance processes that maintain the system hardened state during the system lifetime.			
During system testing and commissioning, does your organization verify that the point of connection to a control system network includes a stateful firewall with documented and maintained firewall rules; or provide JPEC with verification that firewall rules are up to date if JPEC is responsible for maintaining them?			
During system testing and commissioning, does your organization verify that the point of connection within the control system network between wired and wireless networks is firewalled with documented and maintained firewall rules?			
During system testing and commissioning, does your organization verify that the point of connection within the control system network is firewalled with documented and maintained firewall rules?			
During system testing and commissioning, does your organization verify the point of connection within the control system network to a data warehouse is firewalled with documented and maintained firewall rules?			

Protection from Malicious Code	YES	NO	N/A
Prior to system testing and commissioning, does your organization update the document describing the configuration of the virus detection software installed on each component?			
Where the installation of anti-virus software is not technically possible, prior to testing and commissioning, does your organization update the document describing all computers where anti-virus software cannot be installed?			
Prior to testing and commissioning, does your organization update the document describing all the uses of all mitigating features and functions used to reduce the risk of incident?			

Protection from Malicious Code	YES	NO	N/A
Prior to system testing and commissioning, does your organization provide documentation to ensure that the use of correctly installed, configured, and up-to-date anti-virus software has been verified?			

Secure Account Management	YES	NO	N/A
During system testing and commissioning, does your organization demonstrate that invalid login attempts are logged and reported in a timely manner to an interface specified by JPEC?			
During system testing and commissioning, do your organization's systems demonstrate the capability to create unique usernames and passwords?			
Prior to system testing and commissioning, does your organization verify that usernames and passwords approved by JPEC to be shared by your organization's service group are correctly logged and maintained?			
During system testing and commissioning, does your organization demonstrate the capability to create and maintain system accounts (such as an Administrator account)?			
During testing and commissioning, does your organization demonstrate and verify that users are prompted to change their passwords 14-30 days prior to expiration?			
During system testing and commissioning, does your organization demonstrate and verify that workstations located in areas that are normally unattended have the required authentication and have an active automatic locking or disconnection mechanism?			

Backup and Restoration Support	YES	NO	N/A
During system testing and commissioning, does your organization perform a back-up for all systems and verify that the system will be regularly backed-up and that the scheduled intervals fulfill JPEC's data restore and disaster recovery objectives for the system?			
Prior to system testing and commissioning, does your organization provide JPEC with logical and physical infrastructure architecture diagrams in AutoCAD or MS Visio drawing formats, which verify that your organization's systems and components are compliant with the infrastructure architectural requirements described by JPEC?			
During system testing and commissioning, does your organization verify that the Control System Network (CSN or Layer 3) and Distributed Control System (DCS) internal bus (Layer 2) are physically separated in a secure fashion (e.g. dedicated firewall, or router with ACLs, or dual-homed host with blocked routing between interfaces?			

Wireless Connections	YES	NO	N/A
During system testing and commissioning, does your organization verify that JPEC has approved the use of wireless devices as part of a control loop?			
Prior to system testing and commissioning, does your organization verify that its systems architecture documentation describing wireless systems is up to date in its description of the following: a. Data exchange between Layer 1 and wireless instrumentation. b. Data exchange between Layer 2 and Layer 3 through a secure wireless link. c. Bridge connecting the Layer 3 network using a secure wireless link. d. Security mechanisms that prevent an intruder from gaining access to the systems using the wireless system. e. Security mechanism that restricts access by workers with handheld wireless devices. f. Where required, security mechanisms that provide remote management of wireless systems.			
During system testing and commissioning, does your organization verify that its system plan for the use of frequencies in wireless infrastructures, addressing non-interference and co-existence is up-to-date and approved by JPEC?			

Remote Access	YES	NO	N/A
During system testing and commissioning, does your organization demonstrate that if remote access is required it is possible to remotely access its system using one of the allowed connectivity applications which comply with JPEC policy?			
Prior to system testing and commissioning, does your organization verify that all system-to-system connections and user-to-system connections are approved by JPEC in accordance with the required review time?			

4. INSTALLATION OF AMI METERS, END OF LIFE METER TESTING AND STORAGE OF REMOVED METERS

4.1. SPECIFICATIONS

Proposed products/services must meet the following specifications:

- When completing meter exchange, installer shall complete service order, while onsite, through NISC's AppSuite.
- During installation through JPEC's acceptance, a single point of contact with 24/7 accessibility will be provided.
- End of life testing:
  - Test facility and meter testers shall have certification from the Kentucky Public Service Commission.
  - All meter testing data shall be submitted in a CSV file as specified in Exhibit B.
  - All meters shall be tested, and results returned to Jackson Purchase Energy within fourteen (14) days following removal.
  - All meters shall be tested for accuracy and stored for six (6) months; If meter shows an average meter error that is two (2) percent or greater, fast or slow, or if the meter is stuck or dead, the meter should be returned to Jackson Purchase Energy's Paducah Office within 48 hours following testing.

Additionally, proposals should include the following:

- Pricing to replace approximately (400) meter bases to allow consolidation of meter forms. This encompasses replacing all 3S, 4S, 5S, 6S, and 16K bases with 9S bases. See Exhibit A for meter inventory list.
- Methodology for deployment, including proposed process maps and deployment schedules for the products/services proposed in order to meet Jackson Purchase Energy's desired acceptance date of December 6, 2024, for pilot and, June 26, 2026, for full installation.
- Turnkey solutions and third-party installation services should provide information outlining services they can offer related to communications hardware installation, AMI meter installation (see Exhibit B), and end of life testing and 6 months of storage for old meters.
- Identify any exceptions to Jackson Purchase Energy's specifications.

4.2 FEATURES/FUNCTIONALITY CHECKLIST

Respond as follows:

YES Feature/Functionality is part of the product(s) being quoted in this proposal.
NO Feature/Functionality is NOT part of the product(s) being quoted in this proposal.

4.2.1 Meter Installation/ End of Life Testing Requirements	YES	NO
GPS data on installed meter will be provided without additional cost.		
Vendor trains all employees in safety, customer relations, hazardous conditions, and identification of meter tampering.		
Meter jaw tension testing.		

5. MDMS/METER DATA ANALYTICS

JPEC will utilize NISC's MDMS but welcomes vendors to propose data analytics software to assist with engineering functions and system monitoring.

6. TRAINING SERVICES AND SUPPORT

Vendor will provide training to support the deployment and operation of the proposed system as part of the service.
At a minimum, vendor must provide the following training services:

- Two weeks on-site initial training with the option to purchase one additional week of on-site training.
- One week follow-up on-site training upon request.

Training will take place at JPEC's Headquarters in Paducah, KY. Vendor must provide recommended positions intended for training. Vendor should also provide a course listing and associated fees for all available optional off-site, WebEx and user group training.

Minimum topics to be covered during training:

A. **System Introduction**

The course will introduce relevant services, Consumer Web Portal, Hardware, Software and Support System and documentation.

B. **System Installation, Operation, and Maintenance Training**

The course will train selected JPEC maintenance personnel on the installation, operation, and maintenance of the proposed system. At the end of the training the meter maintenance personnel will understand the meter fault error codes, proper installation & maintenance procedures, and operation of software and troubleshoot best practices. IT Staff will understand installation, and maintenance of backend services and operating systems.

C. **Operator Training**

The course will train JPEC's operators how to access and utilize all services. At the end of the training the operators should know how to log into the system, request on demand meter read, request historical data, assist consumers in configuring the prepayment system and use the outage and asset monitoring services.

D. **Maintenance and Operation**

The course will train selected JPEC personnel to configure and change services to support JPEC's meter database and configurations. At the end of the session, JPEC personnel will know how to add, delete, or modify consumer meter information, update meter asset monitoring, and enroll consumers in prepayment systems while also maintaining network infrastructure equipment and update systems.

Support

Vendor must state the hours of operation for support service, a description of services offered, and an overview of the support staff including the number of persons on the team.

7. PRICING AND PROPOSAL REQUIREMENTS

JPEC expects priced proposals that offer complete transparency and exposure of all costs that are associated with the vendors offer. This includes all purchase and implementation costs as well as all annual operating expenses for the expected lifetime of the proposed system. Vendors must submit their priced proposals in an editable (e.g., MS-Excel or Word) format. **Other file types will not be accepted**. The sheets that follow provide a suggested format for the priced proposals. If you need to modify the form or to add additional space, please do so as needed.

You must provide unit prices for each of the items in your offer. These unit prices will be used for internal evaluation and to account for the fact that specific meter and device quantities could vary. In addition, and where applicable, you must clearly define:

- quantity discount volumes and prices,
- minimum quantities required for specific price levels,
- parameters for price escalation/reduction related to future purchases,
- thresholds for data transfer volumes which affect recurring/monthly price levels,
- software development that is custom to **JPEC** and the impact of this development on annual recurring expenses,
- other variables unique to your solution which affect your pricing or the inherent support costs for your system.

JPEC is also interested in knowing if optional cost savings are available with neighboring utilities through joint use of existing AMI system.

7.1 SOFTWARE AND DELIVERY SUPPORT FOR AMI APPLICATIONS (You may use a separate sheet for each of these applications)

Item #	Description	Quantity	Required or Optional	Unit Price
1	License Agreement for Standard Software Application			
2	Additional software licenses, applications, integration, or services required to meet the JPEC specifications			
3	Additional software licenses, applications, integration, or services required to meet the JPEC specifications			
4	Additional software licenses, applications, integration, or services required to meet the JPEC specifications			
5	Fees required to support JPEC through start- up and SAT (including documentation, training, project management, etc.)			
6	Training			
7	Project management			
8	Documentation			
9	Travel costs			
10	Other (if more space is needed for detail, please add to the table.)			
11	Other (if more space is needed for detail, please add to the table.)			
Options				
12	Application 1			
13	Application 2			
Expected by JPEC **In the spaces below please list all items which you expect JPEC to provide in order to meet the specification – e.g., Oracle or SQL licenses, Microsoft Office, etc.**				
14				
15				
18				

7.2 SERVERS/HARDWARE FOR AMI SYSTEM

In the spaces below, please enter the specifications/ requirements and price for each item. The table below allows 2 servers. If more space is needed, expand this table, or create a table similar to the one below. Please be specific and detailed with your response. It is possible that JPEC will purchase all recommended hardware directly from local sources.

Item #	Description	Quantity	Required or Optional	Unit Price
Server # 1				
1				
2				
3				
4				
5				
6				
7				
8				
9				
Server # 2				
10				
11				
12				
13				
14				
15				
16				
17				
Expected to be Supplied by JPEC **In the spaces below please list all items which you expect JPEC to provide in order to meet the specification – e.g., specific network interfaces, etc.**				
18				
19				
20				
21				

7.3 NETWORK INFRASTRUCTURE – INCLUDES LAN AND EQUIPMENT REQUIRED FOR AMI

JPEC expects that the AMI Vendor will select/identify location points for all network infrastructure hardware. If the design does not meet the specified performance parameters, AMI vendor will redesign it at its cost. In the spaces below, provide the details and costs for all hardware and software required to operate your communications infrastructure. This section should include any test apparatus, and separate lists for recommended and required spare parts required to operate your network.

In this table, we expect that an initial system delivery will be quoted as well as an expected cost for the full system roll-out (based on current prices for Network hardware).

Item #	Description	Quantity	Required or Optional	Unit Price	Unit Price to install equipment
Infrastructure for Initial Deployment and System Acceptance Test					
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
Expected Full Deployment Infrastructure to Reach 100% of the JPEC Meter Locations (please include any recommended test equipment and spare parts)					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Expected Full Deployment Infrastructure to Reach 100% of the JPEC Meter Locations (please include any recommended test equipment and spare parts)					
21					
22					
23					
24					
25					
26					
Expected to be Supplied by JPEC **In the spaces below please list all items which you expect JPEC to provide in order to meet the specification – e.g., backhaul communications, frequency licenses, etc.**					

7.4 AMI METERS

Item #	Description	Meter Manufacturer	Unit Price for Meter	Unit Price to install Meter
1	AMI meter for 1Φ (Form 2S CL 200) meter manufacturer 1			
2	AMI meter for 1Φ (Form 2S CL 200) meter manufacturer 2			
3	AMI meter for 1Φ (Form 2S CL 200) meter manufacturer 1 with disconnect			
4	AMI meter for 1Φ (Form 2S CL 200) meter manufacturer 2 with disconnect			
5	AMI meter for 1Φ (Form 2S CL 320) meter manufacturer 1			
6	AMI meter for 1Φ (Form 2S CL 320) meter manufacturer 2			
7	AMI meter for 1Φ (Form 2S CL320) meter manufacturer 1 with disconnect			
8	AMI meter for 1Φ (Form 2S CL320) meter manufacturer 1 with disconnect			
9	AMI meter for 1Φ or 3Φ (Form 9S) meter manufacturer 1			
10	AMI meter for 1Φ or 3Φ (Form 9S) meter manufacturer 2			
11	AMI meter for 3Φ (all self-contained forms and classes for kWh applications) meter manufacturer			
12	AMI meter for 3Φ (all self-contained forms and classes for kWh applications) meter manufacturer			
13	AMI meter for 3Φ (all transformer rated meter forms and classes for kWh applications) meter			
14	AMI meter for 3Φ (all transformer rated meter forms and classes for kWh applications) meter			
15	AMI meter for 3Φ (all transformer rated meter forms and classes for kVARh applications) meter			
16	AMI meter for 3Φ (all transformer rated meter forms and classes for kVARh applications) meter			

7.5 RECURRING AND MISCELLANEOUS COSTS

Please provide details for the recurring and miscellaneous costs associated with the delivery and operation of your system. Expand the table as needed to completely summarize anticipated costs.

Item #	Description	Quantity	Required or Optional	Unit Price
System Installation and Maintenance Tools				
1				
2				
3				
Spare Parts				
4				
5				
6				
Recurring Fees				
7				
8				
9				
Professional Services Fees				
10				
11				
12				
Cost Savings Options				
13				
14				
15				
Expected to be Supplied by JPEC In the spaces below please list all items which you expect JPEC to provide in order to meet the specification.				
16				
17				
18				
19				

8. RFP TERMS AND CONDITIONS

A. RIGHT TO CANCEL PROCUREMENT OR REJECT ALL OFFERS

This RFP in no manner obligates Jackson Purchase Energy to the purchase of any products or services described, implied or which may be proposed until confirmed by a written contract. Progress towards this end is solely at the discretion of Jackson Purchase Energy and may be terminated without penalty or obligations at any time prior to the signing of a contract. Jackson Purchase Energy reserves the right to cancel this RFP at any time, for any reason, and to reject any or all proposals or any parts thereof.

B. VENDOR EXPENSES

Expenses for developing and presenting proposals shall be the entire responsibility of the vendor and shall not be chargeable to Jackson Purchase Energy. All supporting documentation submitted with this proposal will become the property of Jackson Purchase Energy.

C. WITHDRAWALS

Proposals may be withdrawn if requested, in writing, or on the vendor's letterhead signed by an authorized representative and received by Jackson Purchase Energy prior to RFP closing time.

D. COMPLIANCE WITH LAWS

The vendor shall comply with all applicable federal, state, and local laws, statues, rules, regulations, and ordinances.

E. RFP AND PROPOSAL PART OF CONTRACT

This RFP, along with all submitted proposals and materials will become part of the final contract upon which implementation and performance shall be based.

F. ASSURANCES

By submitting a proposal, vendor makes the following assurances:

A. Vendor has read and understands all instructions, requirements, site conditions, and terms and conditions contained herein, including the attachments and Exhibits listed in this RFP.

B. Vendor has the authority and/or responsibility to submit a proposal and to bind the vendor's organization in all phases of this RFP process.

C. The information provided is true and accurate to the best of the vendor's knowledge.

D. Vendor has not and will not discriminate against any employee or subcontractor.

Exhibit A – Meter Forms

Current Meter Inventory

Form	Count	Class 20	Class 100	Class 200	Class 320
1s	193		193		
2s	28,928			27,602	1326
3s	64	64			
4s	100	100			
5s	33	33			
6s	12	12			
9s	342	342			
16s	502			442	60
16k	186			3	183

Consolidated Meter Inventory

Form	Count	Class 20	Class 100	Class 200	Class 320
1s		240			
2s				28,602	1,526
9s	788				
16s				500	100

***See shape files sent with RFP for the following information:**

- Meter locations
- Pole locations
- Transformer locations
- Outdoor light locations
- Existing tower locations
- Substation locations
- Fiber route
- JPEC headquarters location

Exhibit B – Meter Exchange and Testing Requirements

A. Meter Exchange Data Requirements

- Before and after picture of meter exchange.
- Data will be processed through NISC's AppSuite using service orders created by JPEC for each exchange.
- Data processing will require iOS or android devices provided by vendor.

B. End of Life Meter Testing Requirements for Data

*See CSV file

RFP Recipients

<u>AMI Vendors</u>
Aclara/Hubbell
Sensus/Xylem
Eaton
Landis+Gyr
Tantalus
Honeywell
Itron/NRTC
Verizon

<u>Meter Exchange and Testing Vendors</u>
Quality Resources, LLC
Luthan Electric Meter Testing

Exhibit 2

Brownstown Electric Supply Co. & Aclara Technologies LLC

Response to Jackson Purchase Energy Corporation

RFP No. 2023-0001

Advanced Metering Infrastructure and Services

May 29, 2023

May 29, 2023

Jackson Purchase Energy Corporation
6525 US Highway 60 W
Paducah, KY 42001

RE: Proposal in Response to RFP No. 2023-0001

Dear JPEC Team,

On behalf of Brownstown Electric Supply Co. (BESCO) and Aclara Technologies LLC (Aclara), we appreciate the opportunity to respond to Jackson Purchase Energy Corporation (JPEC) Request for Proposal (RFP) for Advanced Metering Infrastructure and Services. This proposal will provide insights into our solutions and offer an approach on not only what our solutions can provide to JPEC, but also how we will work with JPEC to deliver value.

Aclara has deployed AMI systems for utilities large and small, including a number that are similar to JPEC's in size and in integrations. We have provided a short list of references, bolstered by a map showing all US AMI deployments. All of the elements proposed for this system incorporate quality components configured to serve JPEC's current and future needs.

Our extensive experience enabled us to understand the myriad ways AMI can make a difference. Aclara's proposed solution will:

- Provide a system built on future-proof technology
- Monitor system health, from meter operation to voltage optimization and more
- Use AMI to identify outages, theft, tampering, and malfunctioning meters
- Integrate with existing systems such as NISC iVue MDMS modules, OMS, Mapping and Staking, and Survalent SCADA
- Deploy a system that will provide greater efficiency and generate revenue to offset JPEC's total cost of ownership.

We look forward to discussing our proposal in greater details. Should you have any questions, please contact me at lrygiel@hubbell.com or (810) 931-2011.

Sincerely,

Larry Rygiel

Jon Mars

Larry Rygiel
Team Leader, Regional Sales
Mobile: (810) 931-2011
Email: lrygiel@aclara.com

Jon Mars
TSD-Outside Sales
Mobile: (217) 273-3119
Email: jmars@brownstown.com

Contents

List of Figures

List of Tables

The information contained herein is confidential, business sensitive information of Aclara Technologies LLC. It is provided for the sole use of the intended recipients. Any distribution, dissemination, reverse engineering, or copying of this document or the information contained herein is prohibited.

A. Company Information & Experience

Company Background

Since 2018, Aclara has been a division of Hubbell Utility Solutions and a wholly owned subsidiary of Hubbell Incorporated, continuing a legacy of nearly 50 years as a world-class supplier of smart infrastructure solutions (SIS) and services to the utility industry. More than 1,000 utilities around the world rely on Aclara's technology solutions to support their operations. Integrating into publicly traded Hubbell has enhanced Aclara's global distribution capabilities while furnishing increased access to resources for innovative R&D.

Aclara has been providing innovative tools and technology to the utility industry for nearly 50 years, while Hubbell has been in business for more than a century. Aclara helped pioneer the AMI business in 1972 with its Two-Way Automatic Communication System (TWACS), a technology that paved the way for the first fixed network RF AMI system in 1997.

Platts Global Energy Awards

Aclara has been recognized for its vision and end-to-end solution strategy by Navigant Research, won a Global Smart Energy Networks Enabling Technology Leadership Award as well as a North American New Product Innovation Award from Frost & Sullivan, and was named a finalist in three categories of the Platts Global Energy Awards.

2022 WORLD'S MOST ETHICAL COMPANIES® WWW.ETHISPHERE.COM 2-TIME HONOREE

Additionally, in March 2021, Ethisphere named Hubbell, Aclara's parent company, as one of the most ethical companies in the world, for the company's unwavering commitment to business integrity. Ethisphere presented awards to just 135 companies representing 47 industries and spanning 22 countries. Hubbell was recognized again in 2022.

For nearly five decades, Aclara innovations have helped customers navigate an ever-changing landscape of complex change and new opportunities. In that time, Aclara has honed proven processes and delivered best practices that work for utilities across the country and around the world.

Aclara's RF network has been available for more than two decades. In 1997, Aclara installed the first RF AMI network in Canton, OH, using the same RF technology proposed to JPEC. Aclara has built on our technology to offer greater reliability, flexibility, and resiliency while providing utility customers with advanced features that allow for the retention, redundancy, and data recovery. Aclara has provided services to more than 1,200 electric, water and gas utilities worldwide with 1,103 of those utilities in the U.S. Please see Figure 1 below for a depiction of Aclara's more than 500 current AMI clients, which represents all electric, gas, water, and combo deployments.

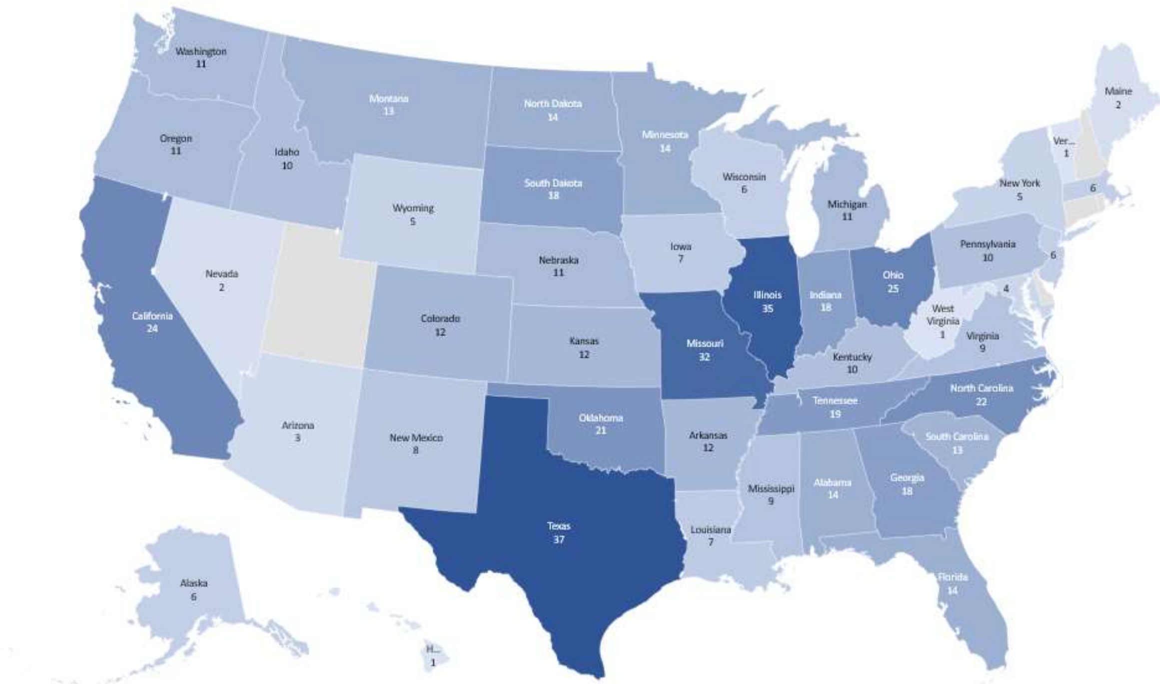


Figure 1: AMI Customer Count per State

Aclara has been providing software solutions to numerous utilities with the same vision as JPEC, which have been completed successfully and operational for decades. With customers like Pedernales Electric Cooperative (355,000 endpoints), People's Electric Cooperative (21,350 endpoints) and Guadalupe Valley Electric Cooperative (90,000 endpoints), as well as many others with multi-hundred thousand endpoints, we have completed more than a thousand deployment projects. Aclara shares JPEC's excitement about this opportunity for improved system management and customer service. We have proposed a solution to create operational efficiencies and significant labor cost reductions, added revenue protection, and billing accuracy.

Aclara partners with our customers to navigate the difficult and uncertain road ahead, providing the right intelligence, solutions, and confidence for the journey. Aclara's years of experience in developing and honing our project implementation approach has proven successful over the past 48 years and allows us to incorporate lessons learned to continually improve it to meet our customer needs. As part of this, Aclara takes the time to understand JPEC's specific project and business needs to develop the approach that works best for JPEC, your end customers, and Aclara.

Organizational Structure

Below in Figure 2 please find the proposed organization chart for JPEC's project. Biographies for key personnel follow; we will be pleased to provide full resumes upon request.

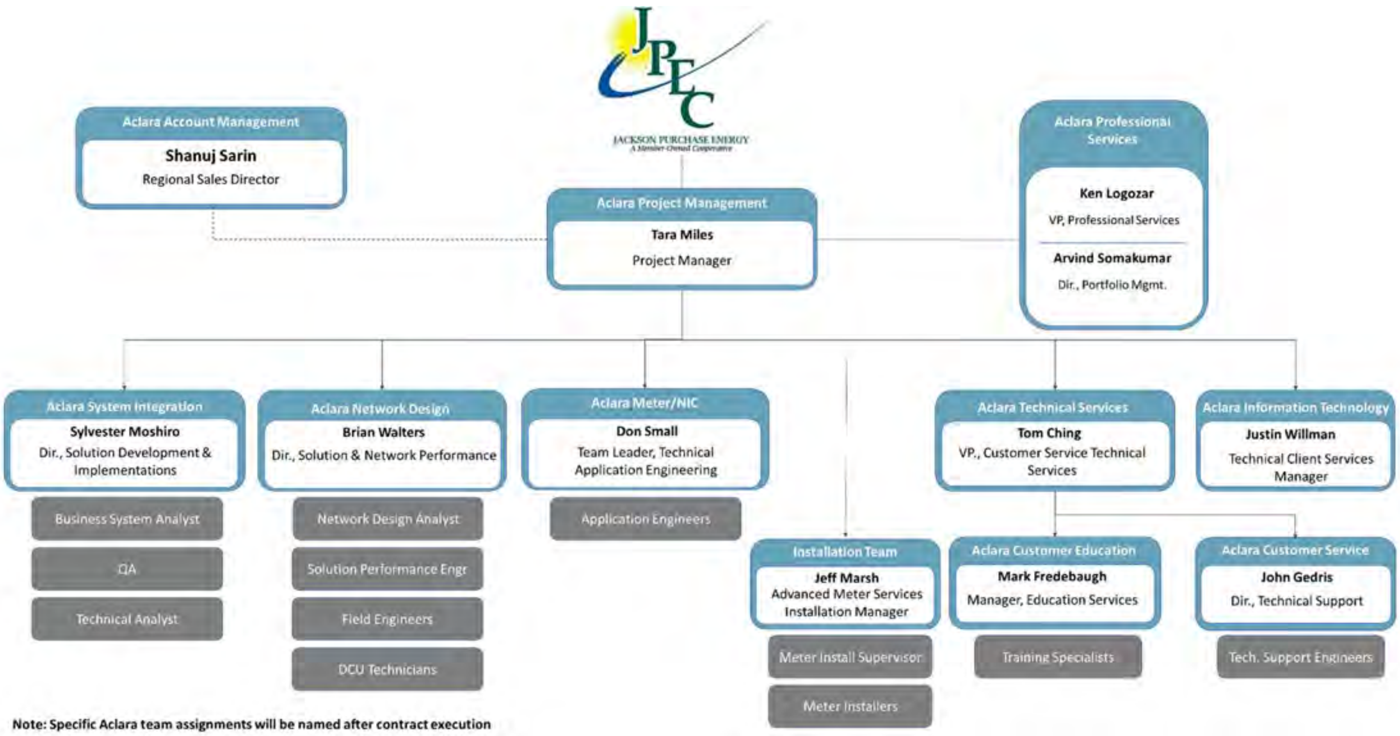


Figure 2: Proposed Organizational Structure

Ken Logozar (Executive Oversight) is an 18-year Aclara veteran and serves as Vice President, Professional Services. He has years of industry experience overseeing installations for millions of endpoints for gas, water, and electric projects. Ken has experience managing a team of experts during the hands-on field service support, including back-office system set-up and initialization, through on-site DCU commissioning. He serves as senior level program oversight and point of escalation during the life cycle of a project.

Arvind Somakumar (Director, Portfolio Management) will provide oversight and guidance to project teams during implementation to ensure best practices are applied to Aclara's AMI electric and combo deployments. He possesses a mix of technical and functional skills and brings a deep understanding of enterprise product implementations and custom-built solutions along with a track record of successful product implementations. Arvind brings over 19 years of industry experience to the team.

Tara Miles (Project Manager) has more than 23 years of experience in the utility industry, upon which she bases her approach to deploying complex hardware and software projects. With extensive knowledge of the Aclara RF product line as well as the practices used to install, operate, and maintain an effective AMI system, she is conscious of each customer's business needs and executes the project to ensure that they are met.

Sylvester Moshiro (Director, Solution Development & Implementation) has 18 years of industry experience. Sylvester is a dynamic leader with experience in multiple areas of information technology delivery including technology consulting, project management, product management, and business development focused on energy and utility companies.

Brian Walters (Director, Solution & Network Performance) has 19 years of experience at Aclara and is currently leading the technical division of the company's Professional Services delivery team. He provides subject matter expertise to design, build, analyze and optimize the networks that support the targeted performance of Aclara products.

Don Small (Team Leader, Technical Application Engineering) is an industry veteran with more than 22 years of experience. He leads a team of application engineers who provide technical support to Aclara sales and deployment efforts. He interfaces with engineering, product management, operations, and sales.

Tom Ching (Vice President, Customer Service Technical Service) has more than 22 years of experience in the service and support industry. Tom has extensive experience in running customer technical teams and creating a customer-centric culture by aligning resources to rapidly meet customer needs.

Justin Willman (Technical Client Services Manager) has over 14 years of industry experience serving as an IT professional. As a Sr. System Administrator, Justin has a solid background in server/network design, support, configuration, set up and troubleshooting. His background includes Active Directory, Azure Active Directory, Group Policy, assigning static TCP/IP addresses, managing DNS/DHCP, and managing group policy.

Mark Fredebaugh (Manager, Education Services) has 16 years of industry experience focused on AMI training. Mark is adept at implementing software needs to match a client's internal business process and standards and has a keen ability to manage multiple training processes and implementations simultaneously. He is accomplished at training individuals and large groups in both web-based and in person settings.

John E. Gedris (Sr. Manager Technical Support) manages a team of specialists, representatives, engineers, and DBAs supporting Aclara's hardware and software products. With more than 21 years of experience in the industry, he brings a solid knowledge base to defining metrics and goals to align with the Customer Support Experience and tracking progress.

Jeff Marsh (Advanced Meter Services, Meter Installation) is an experienced utility service professional with more than 20 years of experience that started as a lineman for a cooperative in central Kentucky. As owner of Advanced Meter Services for nearly 15 years, he has overseen numerous installation projects across the US and provided solutions to complicated meter and communication issues for multiple customers.

Guadalupe Valley Electric Cooperative

Dianna Hill, Manager of CSR
825 E. Sarah DeWitt Drive, Gonzales TX 78629
(830) 857-1200 / dhill@gvec.org

Deployment Duration: Jan 2016 to Oct 2020 (AMI RF)
90,000 electric meters

Guadalupe Valley Electric Cooperative (GVEC) originally deployed Aclara's TWACS AMI system in 2003. With a desire to gain added benefits and functionality including AMI Distribution Automation, GVEC upgrade implemented Aclara's RF AMI system in 2016. As part of the RF project, Aclara provided electric meters with factory integrated NICs, DCUs, AclaraONE headend, integrations, and project management. Meter installation was provided through Aclara Technologies' affiliate Aclara SGS.

Pedernales Electric Cooperative (PEC)

Jim Spaulding, Director, Power, Quality & Development
201 South Avenue F, Johnson City TX 78636
(830) 868-6128 / james.spaulding@peci.com

Deployment Duration: 2020 – ongoing (AMI RF)
355,000 electric meters

Pedernales Electric Cooperative (PEC) is the largest electric cooperative in the USA, delivering electricity to more than 385,000 customers across 8,100 square miles of the Texas Hill Country. Starting in 2020, PEC migrated from Aclara's TWACS network to an Aclara RF network to improve efficiencies and take advantage of modern smart infrastructure options. Phase 1 with 90K endpoints has been completed, and the second phase of +355K endpoints is ongoing. As part of the deployment, Aclara provided electric meters with factory integrated NICs, DCUs, AclaraONE headend, integrations, and project management.

People's Electric Cooperative (PEC)

Billy Huffman, Manager of Transmission and Distribution Services
1600 North County Club Road, Ada, OK 74820
(580) 272-1581 / billy.huffman@peopleselectric.coop

Deployment Duration: 2019 – ongoing
21,350 electric meters

People's Electric Cooperative's (PEC) service territory covers 11 counties in rural southcentral Oklahoma. The large service area extends 43 miles east, 38 miles west, 36 miles north, and 37 miles south. In 2004, PEC implemented Aclara's TWACs system, which was perfectly suited to the cooperative's diverse terrain. In 2019, a hybrid TWACS-RF deployment was installed at PEC, and both systems are currently supported through a unified AclaraONE solution, providing the optimal AMI communication architecture as dictated by the terrain. Aclara provided electric meters with factory integrated NICs, DCUs, AclaraONE headend, integrations, and project management. Additionally, Aclara trained PEC's personnel on endpoint installation; PEC performed mass deployment of all residential and commercial meters using Aclara SGS's proprietary work order management software, ProField.

Aclara does not provide comprehensive customer lists due to confidentiality reasons. Please see Company Background above for information on Aclara's deployment experience.

Manufacturing & Buy America

Aclara's products do not meet the criteria specified by the *Build America, Buy America Act.* Aclara's electric meters and NICs are manufactured under contract by Jabil in Guadalajara, Mexico, which is ISO9001:2015 and ISO14001 certified. Data Collector Units (DCU) are assembled in Solon, OH with internal components that are globally sourced.

All manpower used on this project are US employees. AMI professional services staff are employees of Aclara/Hubbell. The meter installation and testing firm is Advanced Meter Services LLC (AMS), which is based in Cynthiana, KY. Jeff Marsh is the sole owner of Advanced Meter Services (AMS). AMS is a veteran-owned business that has been in continuous operation since 2007. Jeff has been involved in the utility industry since 1990; after serving in the United States Air Force, Jeff began working as a Journeymen-Lineman in a local rural electric cooperative. After earning his Electrical Engineering Degree, Jeff began work in meter services.

Social responsibility is viewed as a key business imperative by Aclara and Hubbell, and we are committed to responsible sourcing throughout our supply chain. Our supply chain activities are managed by a team of professionals who oversee suppliers and vendors, with support from functional managers at each of our business units. Suppliers are expected to follow Hubbell's *Third-Party Code of Business Conduct and Ethics,* which mandates that they conduct business in an ethical, legal, and responsible manner. For additional information on our supply chain governance, please visit our 2023 Sustainability Report online.

Litigation & Organization

There is no pending or continuing litigation regarding any technology that Aclara is proposing to JPEC. There is no pending, active, or planned merger or acquisition involving Aclara.

Agreements

A copy of Aclara's Software License Agreement is included in the Section F Attachments.

Financial Statement

Aclara listens to partners and dedicates resources to research and development that meet the needs and goals of our clients while anticipating future hurdles and advanced functionality.

Aclara has a strong tradition of innovating products with responses directly from customers and understanding the critical processes and products needed to meet their goals in this complex and rapidly growing market. Aclara incorporates regular feedback from both end users and utilities in the Product Roadmap development cycle and regularly partners with utilities to create new applications and products to adapt as the needs of the business change. Aclara does not share investment figures but upon award we would be pleased to discuss product strategies and roadmaps.

Aclara also does not report electric AMI revenue separately from its parent company. Aclara was acquired by Hubbell Incorporated (NYSE: HUBB, Hubbell) on February 2, 2018 and operates under the umbrella of Hubbell Utility Systems. Hubbell is an international manufacturer of electrical and electronic products with a dedicated, international workforce of more than 19,000 employees and agents, and $4.9 billion in revenue in 2022. As a publicly traded company, financial information can be found at https://investor.hubbell.com/. Hubbell's 2022 Annual Report is included in Section F Attachments.

B. AMI System

3.1. SPECIFICATIONS

Proposed products/services must meet the following specifications:

- **System is an RF (RF Mesh, Point to Multipoint RF, etc.) or cellular AMI solution with two-way communication.**

Comply.

RF Network

The Aclara RF AMI solution operates on an FCC-licensed 450-470 MHz frequency owned by the utility. Aclara will assist in obtaining the frequency for both the original and renewal (at 10 years) processes. Communications are two-way and AES 256-bit encrypted. The network utilizes a point-to-multipoint topology and ensures redundancy via signal overlap and secure on-board storage at the endpoint and in collectors. The entire system is configurable to meet the needs of each of our clients both now and in the future. Expansion to include additional smart infrastructure is simple and straightforward, often without the need for additional network hardware.

Aclara's proposed AMI solution employs a two-way point-to-multipoint (P2MP) architecture, where data is directly transmitted from a NIC to a DCU and then to the AclaraONE headend software, as depicted in Figure 3. The data then flows seamlessly to our analytics engine to be analyzed. The backhaul from the DCU network to the headend includes multiple options, such as ethernet, fiber, cellular, etc. For this opportunity, Aclara has used fiber for the backhaul where available and augmented other locations with cellular.

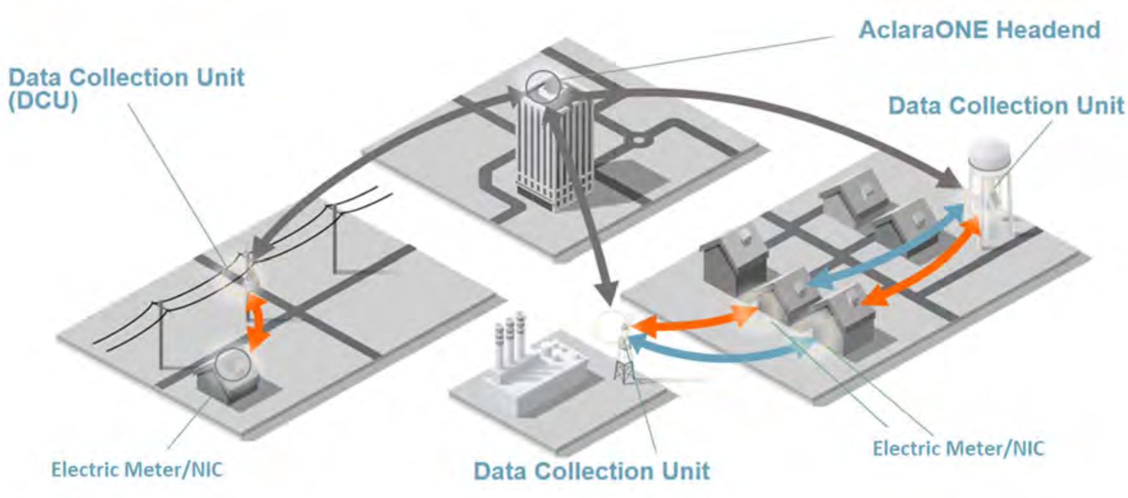


Figure 3: Aclara RF Solution

The Aclara solution offers customizable read intervals to support multiple read schedules to meet VMU's billing and performance requirements. Intervals can be changed from AclaraONE, eliminating the need for field visits.

Tamper alerts, battery health, voltage, load, outages, and overall network health are all monitored and reported by the DCUs and NICs. Electric meters store data in the endpoint which will vary depending upon the configuration of the read interval and meter type. A typical configuration will store more than 45 days of data, to a maximum of 96 days, which is more than enough time to correct any outages. Upon outage restoration, the endpoint automatically communicates the stored data to AclaraONE. Additionally, should the need arise, data can be queried over the air from AclaraONE or manually via a field visit.

The Aclara RF network safeguards against loss of data by providing the following:

Built-In Redundancy: Electric transmissions are collected by all DCUs within range, typically designed for triple redundancy; this redundancy ensures continuous communications and results in a typical read rate of over 99% of all daily reads.

Data Protection: The DCUs self-contained battery recharges an AC line and can operate without charging for several days. If charging is interrupted for an extended period, the DCU will proactively monitor its battery voltage and shut down non-critical services to maintain the ability to collect reads for as long as possible. DCUs also have internal memory to store data in case of a backhaul outage. Readings are stored in non-volatile memory and are maintained even through a complete loss of backup battery power.

Failover Routing: The RF Network provides dynamic failover routing. A failure of one network device does not affect the entire network. The success of the RF Network is due to a conservative design, built-in redundancy, and multiple collection and processing paths to prevent single-point failures from disrupting normal operation. The distribution of collectors throughout the utility service territory provides a high level of redundancy, compared to competitor network designs.

Multiple levels of storage and redundancy: Electric endpoint can store 35 days of readings at its default configuration. Stored readings can be uploaded over the Aclara RF network by a remote command from the headend or collected with the field programming device. This adds another level of redundancy and data protection in the case of a widespread DCU outage, such as a severe weather event.

Some of the advantages of Aclara's private RF network are provided in Figure 4.

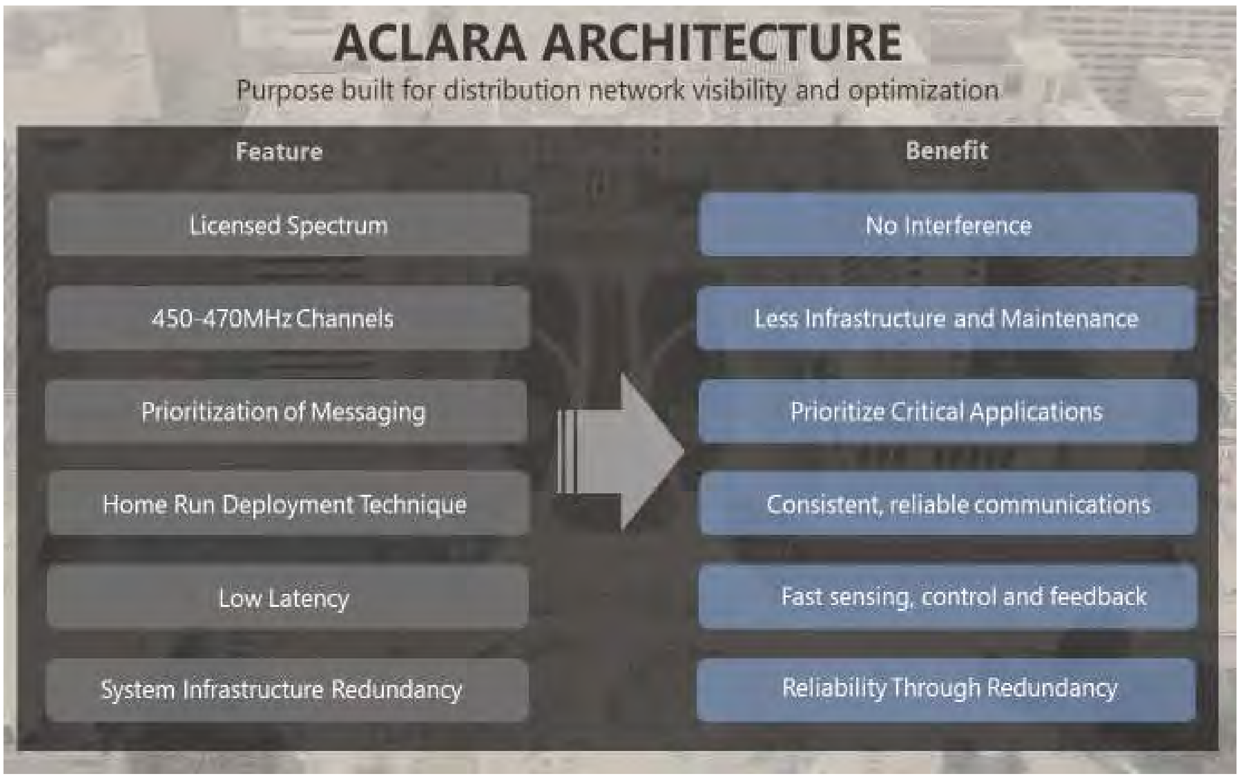


Figure 4: Aclara RF Features and Benefits

Electric Meters and Network Interface Card (NIC)

Aclara electric NICs are factory integrated with Aclara's single-phase and polyphase solid-state, ANSI-certified residential and commercial meters. Our endpoints minimize risk and ensure accurate, reliable, and efficient measurements. In addition to reading meters, the units support demand, load profiling, time-of-use, and net metering for distributed generation.

<table>
<tr><th>Residential</th><th>Commercial</th></tr>
<tr><td>I-210+c w/ or w/out Remote Disconnect</td><td>kV2c</td></tr>
<tr><td>Aclara's most full-featured residential meter, offering demand, load profile, time-of-use (TOU), service switch, and a full complement of communication options.
</td><td>Aclara's flagship meter product offering all required revenue-grade metering functionality and advanced power quality monitoring for polyphase metering.
</td></tr>
</table>

Table 1: Aclara Integrated Electric Meters and NICs

Features and Benefits:

- Outage notification programmable from 5 to 300 seconds from meter notification
- Accesses data directly from ANSI C12.19 tables
- Residential: 5/15/30/60-minute load profile channels transmitted at the end of every interval or buffered and transmitted at longer intervals (e.g., 4 blocks of 15-minute data sent hourly). Up to 8 channels are available; the number of channels and transmission frequency is configurable
- Commercial: 5/15/30/60-minute load profile channels transmitted at the end of every interval or buffered and transmitted at longer intervals (e.g., 4 blocks of 15-minute data sent hourly). Up to 20 channels are available; the number of channels and transmission frequency is configurable
- Large amount of storage (dependent on configuration)

Aclara's I-210+c residential and kV2c commercial meters will deliver a flexible technology solution to cover JPEC's metering needs and provide advanced functionality to meet evolving system needs.

Single-phase and polyphase meters with communications modules can store all measurement data, load profile, and event/alarm data in the meter's flash memory. Measurement data is forwarded to the headend software based on a configurable interval that can be set by JPEC or preconfigured when the meter ships from the factory.

Please see the Aclara NIC, I-210+c and kV2c cutsheets included in the Section E for additional information.

Aclara Data Collector Units (DCUs)

The Aclara RF Data Collection unit (DCU) is multifunctional, supporting electric, water, and gas meters, load control, distribution automation (DA), Smart Infrastructure Solutions (SIS) and other advanced applications. It provides reliable and flexible, two-way communications to support a utility's infrastructure for decades to come.

The DCU is the backbone of an AMI network, communicating with endpoints over individual 450–470 MHz radio frequencies, and to the Aclara RF headend using a network backhaul of choice. The device communicates over cellular, fiber-optic, Ethernet, Wi-Fi, and WiMAX on public or private networks. DCUs can be powered by AC line voltage or solar and include a back-up battery in case of a power failure.

Features and Benefits:

- Tuned to a unique frequency, minimizing external interference from other sources.
- Point-to-multipoint design does not require add-on repeaters or similar devices.
- Small, inexpensive, reliable, and low maintenance (primarily battery replacement every 4 to 5 years)
- Can mount at street level for ease of access, with a remote antenna at height
- Message encryption, passphrase for DCU console access, DCU door access and tamper notifications offer multiple levels of security
- Transmits readings and alarms data from endpoints to the utility and transmits commands from the utility to endpoints
- Detailed diagnostic data for calls, alarms, system redundancy, location, and battery charging current and temperature allows utilities to maintain total control over their system
- Remote firmware upgrades for ease of network management
- Battery backup, power-save mode, and data retention during power outages protect important data and operations
- Flexible mounting option
- Rugged, weatherproof design protects electronic components.

For further details, please see the Aclara RF DCU cutsheet in the Section E.

AclaraONE Software

AclaraONE allows utilities to operate their distribution networks securely, reliably, and efficiently. From meter to cash, network management, distribution operations, sensors, and analytics, AclaraONE delivers the broad set of functionalities utilities require to improve the operation of their infrastructure under a single platform. Equipped with robust, scalable, next-generation AclaraONE smart infrastructure solution software, network operators can react faster and more effectively while improving the technical and economical operation of their distribution network.

AclaraONE is a powerful unified platform that supports both HES and MDM functionality and enables Aclara's communications technology and adds comprehensive solutions to transform business operations, increase efficiencies, reduce costs, and increase customer satisfaction. It is built to provide actionable insights and create situational awareness required to handle growing distribution challenges.

The AclaraONE platform will provide functionality to allow JPEC staff to access and analyze data collected from meters and other devices on the distribution network while maintaining the health of the AMI system. It is a single, unified platform that monitors, optimizes, and improves network operations, and increases customer satisfaction.

AclaraONE's software platform provides a single sign-on experience. The single user experience boosts productivity of Customer Service Representatives (CSR) and utility operators and improves security capabilities while simplifying multi-factor authentication.

AclaraONE supports the complete lifecycle of network and billing management, including advanced consumption-based workflows and analytics, and offers advanced capabilities in five major areas:

1. **Meter-to-cash** software offers a single, centralized enterprise service featuring consumption-based analytics, billing analytics, and a portal with tools for customer service representatives (CSRs).
2. **Installation Services** include comprehensive workflow management, real-time project visibility to monitor safety, accuracy, and quality of the installation.
3. **Network management** functions link securely to critical business systems through a single, centralized headend.
    a. **Collector Installation.** Installation, recognition, and system administration of network collectors (DCUs) for Aclara's RF network.
    b. **Network Messaging.** Filtering, routing, queuing, de-duping, decrypting inbound and outbound traffic for all endpoints. AclaraONE underlying network management system has been performance tested for 12 million endpoints.
    c. **Health-monitoring.** The AclaraONE headend includes a comprehensive set of alarms and software-generated analytic alerts. Alerts and alarms feed a standard time-stamped, prioritized, "events" framework.

d. **Two-Way Communications OTA.** Over-the-air (OTA) communications include authentication, encryption, firmware management, on-demand reads, ping, trace, diagnostics, communications configuration, collection, and interval rates. All communications are timestamped and logged for integration into a complete audit trail of system access.

e. **Network Devices.** The AclaraONE headend communicates with a comprehensive set of devices such as meters, sensors, and controls. Network devices cover core meter-to-cash operations as well as sensors for smart infrastructure solutions.

f. **Systems Integration.** The headend supports inter-operable, industry-standard integration adaptors, as well as standard and customizable file-based options. APIs include interfaces for billing, customer-service and all other utility systems that are commonly served by AMI networks.

4. Distribution operations software provides distribution system awareness that analyzes data throughout the network. This enables advanced smart infrastructure solutions on MUB's network such as distribution automation, load control, and other future capabilities.

5. Analytics in AclaraONE will help extract information from the data that MUB collects from meters and sensors on the distribution networks, which will provide real-time insights, alerting staff to events affecting operations, and enable quick response to identified problems.

Figure 5: AclaraONE

AclaraONE, depicted in Figure 5, is powerful platform that enables Aclara's communications technology and adds comprehensive solutions to transform business operations, increase efficiencies, reduce costs, and increase customer satisfaction. It was built to provide actionable insights and the situational awareness required to handle growing distribution challenges. Highlight include:

1. Installation Services
- Real-time project visibility
- Safety, accuracy, and quality
- Comprehensive workflow management

2. Network Management

3. Meter to Cash
- Billing analytics
- CSR portal and tools
- Consumption analytics
- VEE

4. Distribution Operations

5. Sensors and Analytics
- Load control
- Pressure monitoring
- Leak detection
- Distribution automation

6. Consumer Engagement

- Device Installation
- Network messaging
- Device management and control
- Grid visibility
- Grid optimization
- Fault detection
- Integrates with 3rd party online portal
- Alerts and notifications
- Efficiency programs

The AclaraONE platform will integrate into JPEC's existing architecture. AclaraONE's Integration Hub provides secure, reliable connectivity between the AclaraONE platform and the utility's back-office systems. Aclara can provide integration points using flat file exchange (.csv), or other API type protocols (WebServices, MultiSpeak, etc.). Flat files are commonly used because of their simplicity, audit tracking capabilities, and ease of maintenance.

The AclaraONE analytics engine provides management of important operational and health events, whether these events are generated direct from the hardware devices (e.g., prioritized alarms, commands, notifications) and/or produced by software analysis, e.g., signal strengths, reading performance, device charging levels.

Events bubble up to the AclaraONE dashboard and are presented on filterable lists, readily drilled down into the source details, or proactively provided in outbound notifications. The actionable event-based alerts are the primary visualization of the system health, but list or report views are also strongly supported. Please see Section E for additional information on AclaraONE.

- **Completion of a propagation study using data contained in Exhibit A with the attached electronic files and delivery of a detailed report that includes the following:**
    - The quantity and type of equipment required to achieve:
        - 100% Coverage (all deployed meters are active on AMI network)
        - 99.9% delivery of billing determinants every 24 hours.
        - 99% of all meters must report back following an on-demand request.

Comply.

On the following pages, Aclara has included a propagation model that depicts JPEC's coverage territory and the proposed AMI system. The images show meter density, collector locations, redundancy, and signal strength. Aclara's GIS team used the latest information available in the modeling software and the information provided by JPEC to determine a highly redundant solution that meets the needs and expectations of JPEC while provisioning for the future.

Note that the following is a proposed solution which can be modified further to meet JPEC's needs and will be finalized upon award and official site surveys.

Predicted Redundancy	MTU Coverage %	Overall Coverage %
Single	7.5%	100.0%
Double	13.9%	92.5%
Triple	78.6%	78.6%

Table 2: Predicted Coverage

DCU Site Type	DCU Count
Customer Sites	62
Aclara Proposed	0
Total DCUs	62

Table 3: DCU Count

DCU Site Type	DCU Count	Antenna Height (ft)
Electric Pole	54	25-80
Non-Transmission Pole	1	43
Roof Mount	N/A	N/A
Tank / Tower	NA	N/A
Lattice Tower	7	60-195
Total DCUs	62	

Table 4: DCU Quantity and Install Type

Type	Provided Count	Modeled Count
Meters	30,305	30,305
Customer Assets (Non-Poles)	39	8
Customer Poles	59,875	54

Table 5: Customer Data

Metric	Value
Total Area (SqMi)	645
Avg Endpoint per SqMi	47
Avg. Endpoint per DCU	489
Highest DCU Elevation	668
Lowest DCU Elevation	345

Table 6: Coverage Territory

Type	P/N	Description	Sum of QTY
Antennas	109-9985-SRFN-03	MTG KIT, SRFN ANTENNA, THRU POLE	55
	109-9985-SRFN-06	MTG KIT, SRFN ANTENNA, CROSS ARM	7
Cable Ties	067-0020	CTY,11.5 NYLON, BLACK, UV	744
Coaxial Cables	070-2590H	AVA5-50 COAX CABLE, COR CU, 7/8"	1260
	070-2574	LMR400 COAX CABLE	2800
	070-2575	LMR600 COAX CABLE	1780
DCU2+	501-9985LTV-L-2A2T-EGW	DCU2+, VER, AC, 2 ANT, 2 T-BOARDS, SRFN/STAR	62
DCU2+ Mounting	109-9975-03A	DCU/SRFN, MTG, BND POLE	7
	109-9975-01D	WOODEN POLE DCU MTG KIT	55

Table 7: DCU Mounting Summary

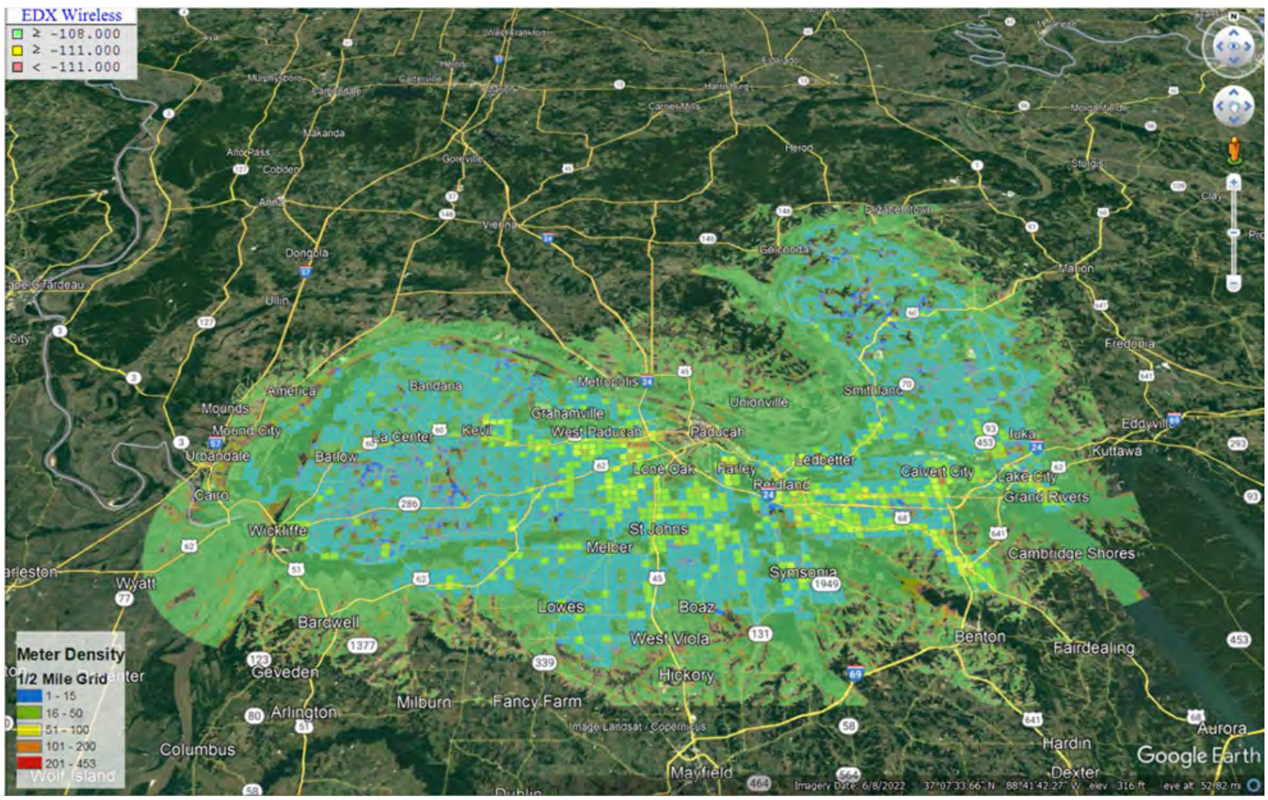


Figure 6: Signal Strength and Meter Density

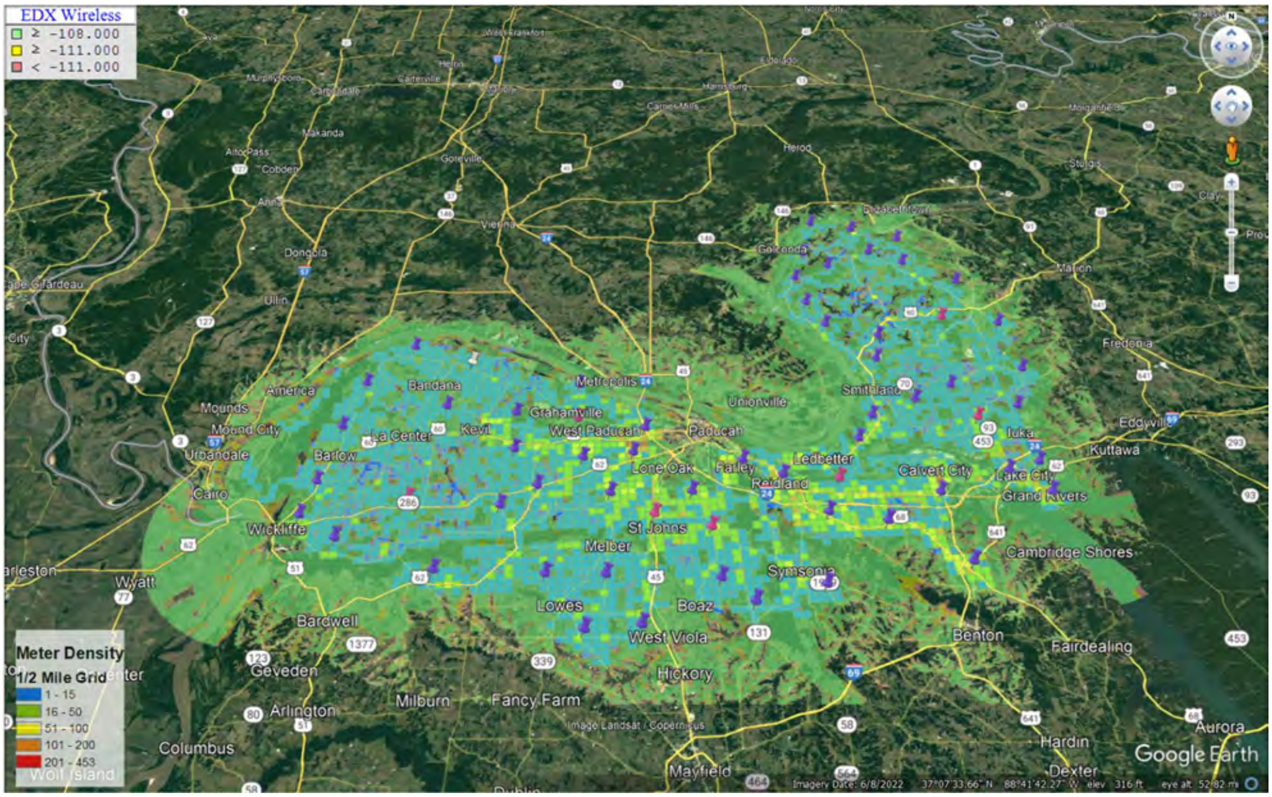


Figure 7: Signal Strength, Meter Density, and DCU Locations

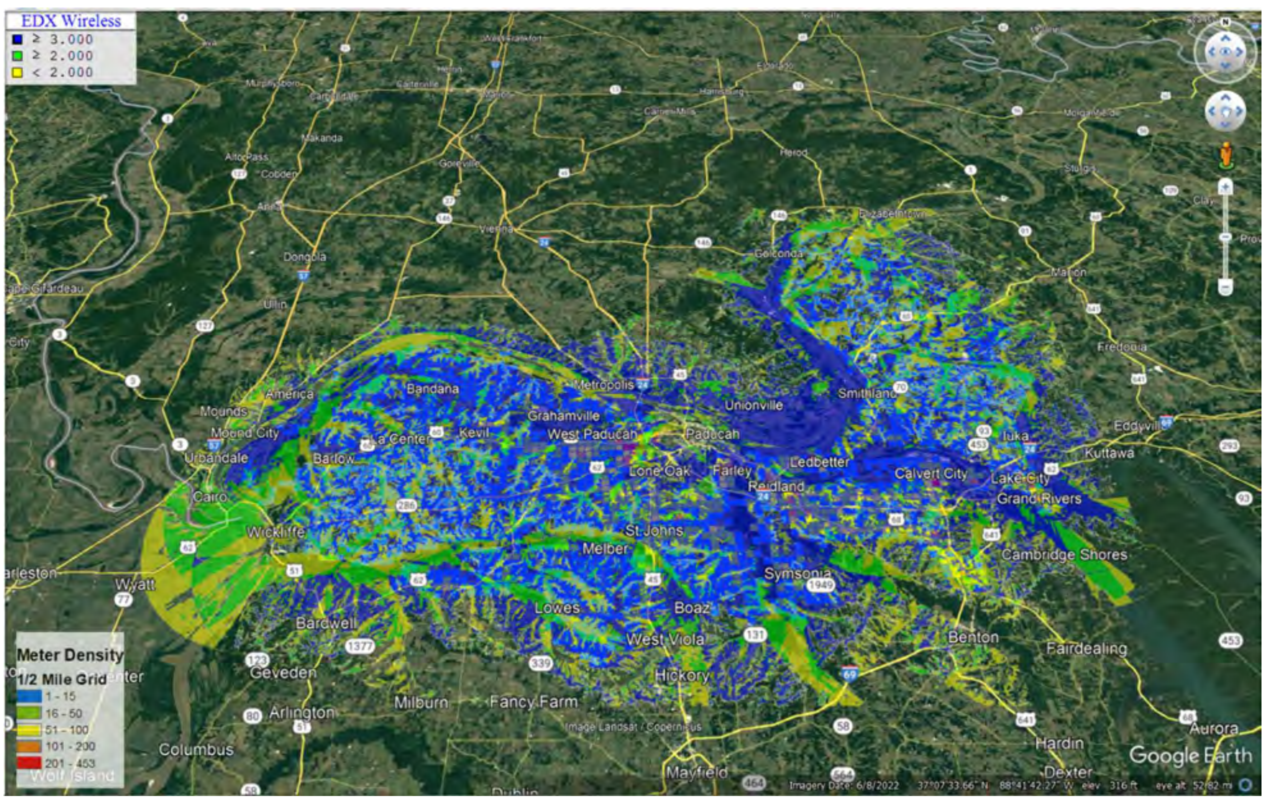


Figure 8: Redundancy and Meter Density

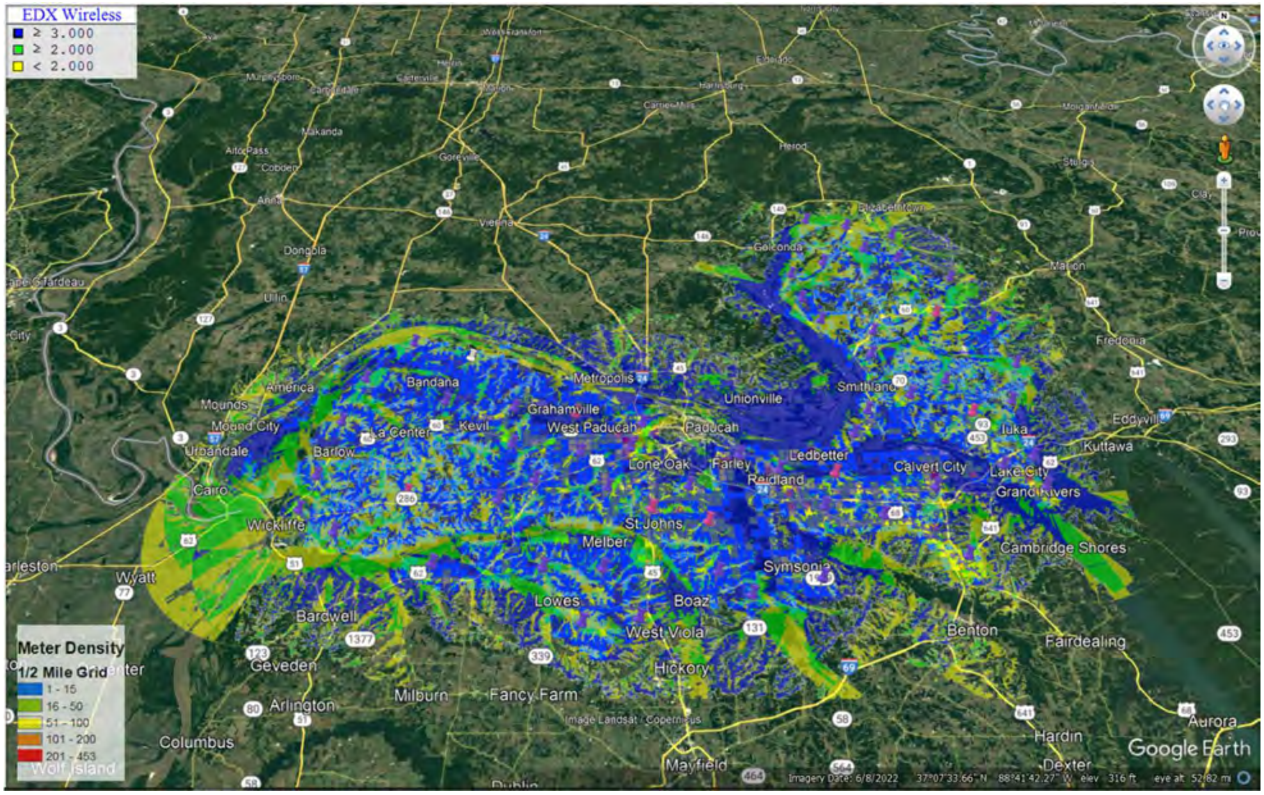


Figure 9: Redundancy, Meter Density, and DCU Locations

Parent Site	Id	Latitude	Longitude	Ant. Height	Type
C1006	C1006	37.07884	-89.0477	30	Customer Pole
C1015	C1015	37.19088	-88.9811	45	Customer Pole
C1072	C1072	37.13773	-89.0316	40	Customer Pole
C1148	C1148	37.04986	-88.8403	40	Customer Pole
C1194	C1194	37.37486	-88.3248	35	Customer Pole
C1267	C1267	37.03921	-88.7597	35	Customer Pole
C1310	C1310	36.88125	-88.575	30	Customer Pole
C1354	C1354	37.03616	-88.575	30	Customer Pole
C1370	C1370	37.13523	-88.7678	50	Customer Pole
C1391	C1391	37.30292	-88.48	25	Customer Pole
C1439	C1439	36.8981	-88.4993	40	Customer Pole
C1446	C1446	36.91255	-88.9123	30	Customer Pole
C1448	C1448	36.90866	-88.7939	35	Customer Pole
C1465	C1465	37.09681	-88.8424	40	Customer Pole
C1532	C1532	36.85847	-88.6925	40	Customer Pole
C1600	C1600	36.85421	-88.7507	35	Customer Pole
C1602	C1602	36.99801	-88.3559	35	Customer Pole
C1643	C1643	36.97514	-88.485	50	Customer Pole

Parent Site	Id	Latitude	Longitude	Ant. Height	Type
C1663	C1663	36.90792	-88.73	45	Customer Pole
C1687	C1687	37.22875	-88.2226	30	Customer Pole
C169	C169	37.40403	-88.4447	30	Customer Pole
C178	C178	37.33097	-88.3264	30	Customer Pole
C1785	C1785	37.02375	-88.2712	45	Customer Pole
C1802	C1802	37.01042	-89.0605	40	Customer Pole
C1804	C1804	37.10579	-88.9272	35	Customer Pole
C1845	C1845	37.10718	-88.2352	60	Customer Pole
C1851	C1851	36.99847	-88.2298	25	Customer Pole
C1886	C1886	37.03431	-88.2328	30	Customer Pole
C1888	C1888	36.90431	-88.6087	40	Customer Pole
C1918	C1918	37.15931	-88.2129	30	Customer Pole
C1921	C1921	37.01829	-88.5308	30	Customer Pole
C1934	C1934	37.17366	-88.394	40	Customer Pole
C1938	C1938	36.98236	-88.8496	40	Customer Pole
C1978	C1978	36.92125	-88.3397	45	Customer Pole
C2077	C2077	37.13532	-88.3093	45	Customer Pole
C2089	C2089	37.39282	-88.3877	40	Customer Pole
C2126	C2126	36.96532	-88.4215	45	Customer Pole
C2134	C2134	36.99671	-88.7272	45	Customer Pole
C2153	C2153	37.20856	-88.385	35	Customer Pole
C2154	C2154	37.22653	-88.4504	45	Customer Pole
C2174	C2174	37.29745	-88.2604	35	Customer Pole
C2268	C2268	37.00569	-88.8101	30	Customer Pole
C2293	C2293	37.09329	-88.4147	40	Customer Pole
C2322	C2322	36.97125	-89.0698	40	Customer Pole
C2360	C2360	37.3244	-88.4322	30	Customer Pole
C2364	C2364	37.11542	-88.3576	40	Customer Pole
C2365	C2365	37.26181	-88.4707	40	Customer Pole
C27	C27	37.3494	-88.3704	35	Customer Pole
C382	C382	37.34727	-88.4634	30	Customer Pole
Pole3	Pole3	37.0633	-88.4362	45	Customer Pole
Pole5	Pole5	36.94625	-89.0248	35	Customer Pole
Pole7	Pole7	36.99844	-88.6354	35	Customer Pole
Pole8	Pole8	37.04556	-88.7016	80	Customer Pole
PolenearMall	PoleMall	37.07676	-88.6875	45	Customer Pole
SHELL	SubShell	37.16895	-88.9044	43	Pole at Substation
Tower1	Tower1	37.01408	-88.4671	95	Lattice Tower
Tower2	Tower2	37.08946	-88.7678	75	Lattice Tower
Tower3	Tower3	36.95842	-88.6156	65	Lattice Tower
Tower4	Tower4	37.09104	-88.288	60	Lattice Tower

Parent Site	Id	Latitude	Longitude	Ant. Height	Type
Tower5	Tower5	37.23771	-88.2948	195	Lattice Tower
Tower6	Tower6	36.9727	-88.6781	100	Lattice Tower
Tower7	Tower7	36.99051	-88.9533	98	Lattice Tower

Table 8: Proposed DCU Locations

- **For RF mesh solutions, the system design results in an average of 8 hops, or fewer, per meter, no more than 12 hops per meter and allows each meter's "last gasp" to be delivered to NISC OMS.**

Comply. Aclara's proposed solution is for a point-to-multipoint network that does not require hops. All "last gasp" messaging will be delivered to the headend/OMS. Aclara's "last gasp" methodology allows for confirmed outage notifications by using an on-board supercapacitor to "wake" the endpoint and check connection multiple times before sending the outage confirmation. This prevents alerts from "momentary outages" and allows utility personnel to focus on the most pertinent tasks. Upon restoration, a similar confirmation process is followed for restoration notifications.

- **Installation & maintenance specifications and requirements for collection devices, repeater devices and all equipment mounted on customer premises.**
  - Detailed pricing for the above referenced system. See Section 7 for pricing tables. Pricing must include:
    - One-time costs
    - Recurring costs itemized by year (and any other appropriate period) for a period of 10 years (10-year cost of ownership).
    - For System Guarantees/Maintenance Agreements, include initial coverage details and future year's coverage details. Also include the maximum length of a Maintenance Agreement available and the corresponding cost.
    - The cost for disconnect/reconnect switches for 100% of all applicable meters, by meter type.

Comply. Please see the Pricing document for the requested information.

- **Provides integration to NISC iVue, OMS, Mapping and Staking, and MDM.**

Comply.

- **Provides integration to Survalent SCADA.**

Comply.

- **Capable of supporting distribution automation. Includes the ability to send and receive DNP3 communication to control downline devices.**

Comply.

- **During deployment through JPEC acceptance, a single point of contact with 24/7 accessibility will be provided. This contact should be denoted in the proposal.**

Comply. Aclara's Professional Services team will work in conjunction with JPEC. The single point of contact will be Tara Miles, Project Manager.

- **Any meter equipped with a disconnect/reconnect switch must be able to display the open/closed status of the switch on the meter display.**

Comply.

- **Meters must have the ability to collect and report kWh, kW, kVAR, and voltage. Poly phase meters must additionally have the ability to collect and report Power Factor at peak kW.**

Comply.

- **Poly phase meters shall be auto-ranging in voltage (120-480V).**

Comply.

Additionally, proposals should include the following:

- **Vendor sample Statement of Work (SOW), Master Service Agreement (MSA), Field Acceptance Test (FAT), and System Acceptance Test (SAT).**

These are included in Section E Additional Information.

- **Methodology for deployment, including proposed process maps and deployment schedules for the products/services proposed in order to meet JPEC desired acceptance date of December 6, 2024, for pilot, June 26, 2026, for full installation.**

Aclara's Professional Services' project approach is one of communication, accountability, and risk assessment. Aclara's extensive experience in delivering AMI solutions greatly reduces risks, while a committed Professional Services team will meet the JPEC's deployment timeframe and ensure ongoing results and satisfaction. Aclara uses a proven methodology to implement the proposed integrated AMI solution. The Aclara methodology of delivery is a phase-based approach, depicted in Figure 10 below, that brings principles from the Project Management Institute (PMI) and Project Management Body of Knowledge (PMBOK) into practice. Aclara will introduce a project direction to the JPEC that blends these principles with years of lessons learned through successful deployments across nearly every client size and demographic within the industry. Aclara's methodology will direct the JPEC through the experience of adopting the newly selected technology and partners into the Commission's operations.

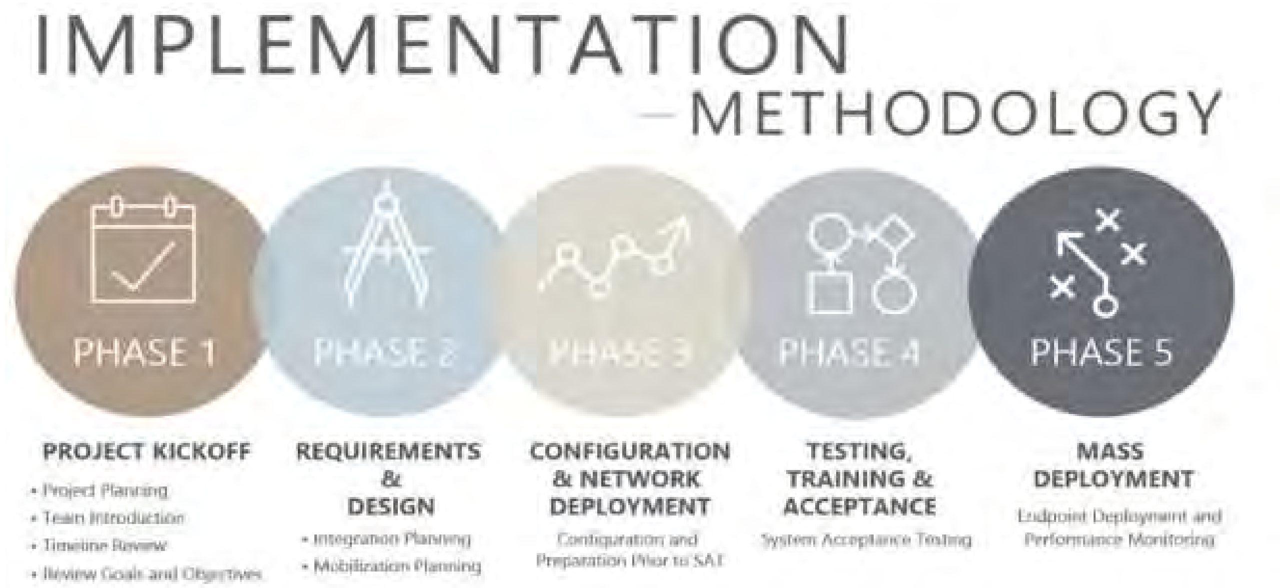


Figure 10: Phased Implementation Approach

It begins with the mutual agreement on solution principles and execution strategy, encompasses technology implementation and acceptance, oversees mass deployment of the solution, and continually grows a partnership through on-going optimization and enhancement within the JPEC's operations. The Aclara methodology is divided into five phases, each of which has delivery has a specific set of defined deliverables and entry and exit criteria.

Phase 1 Project Kick-Off: Objectives, Deliverables

A kickoff meeting will be scheduled for Aclara and the JPEC once "notice to proceed" received. The objective is to identify and introduce the teams and stakeholders, confirm the project scope, define lines of accountability, and develop the communication plan.

Deliverables

- **Project kick-off materials:** Includes project kick-off meeting agenda and materials presented and discussed during the project kick-off meeting
- **Project plan:** Lists the different phases and tasks, important milestones, approximate duration for each task, resource requirements, and projected start and end dates
- **Project communication plan:** Includes project team member roles and responsibilities, contact list, escalation plan, and project logistics

Phase 2 Requirements and Design: Objectives, Deliverables

A series of meetings will be held to confirm the detailed functional, integration, and infrastructure requirements for the system over the next ten days. Third-party vendors representing the JPEC's or Aclara's software products may attend relevant meetings. The definition of all product hardware, software, and software integration requirements are clarified. Parameters are set for system acceptance testing. Product orders are submitted as needed. Field installation plans are created to define the requirements, approach, logistical needs, and schedules. Aclara will complete site surveys and perform additional spectrum analyses to finalize the DCU installation plan. Application to the FCC will be made on behalf of the JPEC, and the process to begin securing permits for DCU sites will begin.

Deliverables

- **Final requirements document:** Lists final requirements agreed to by Aclara and the JPEC necessary to accomplish solution implementation and operability. This includes functional and technical requirements for all input and output interfaces with the Aclara software.
- **Testing document:** Includes all testing scenarios to be discussed or reviewed for system acceptance testing along with timelines and parties responsible for administration.
- **Site surveys:** Describes specific location concerns and logistics needed for each DCU site placement. Aclara may need to help obtain access to some field sites.
- **Network design and propagation study:** Documents locations for DCU installation for optimal system read and functionality performance based upon site surveys. A draft propagation study based on existing asset location was performed and is included in this proposal.
- **Purchase orders:** Finalizes orders for all necessary hardware and software products needed for project.

The formal requirements gathering phase will conclude when the JPEC signs off on the final requirements document, indicating acceptance of the planned scope of work and projected timeline.

Phase 3 Configuration and Network Deployment: Objectives, Deliverables

In this phase, Aclara will complete all tasks to support the MTU deployment and prepare for system user acceptance testing. If the JPEC opts to use the Aclara hosting, the IT environment will be built in this stage and software will be installed.

Software interfaces will be written to interface to the CIS within the JPEC's billing system and configured and enabled for data loading and testing. Validation of the DCU network begins after software interfaces to the CIS are complete.

During this time, Aclara finalizes software integrations and performs unit testing to integrate with the JPEC's environment. Aclara also integrates and configures the field programmers into the JPEC's meter shop environments, as applicable. During this phase, the JPEC will provide sample integration data from the production systems to confirm successful validation and software functionality. Initial system user acceptance testing then begins.

For user acceptance testing, test criteria will be co-developed and include various test cases as needed to ensure a fully qualified system can be accepted prior to a full system deployment. Aclara welcomes and expects the JPEC's participation during the drafting of test plans and test cases.

Aclara will provide full support during lab qualifications, field-based SAT, acceptance testing as well as final system acceptance qualifications. During test periods, an Aclara Project Manager will be overseeing all points of the test plan, leveraging both Aclara BSAs and RF technicians to test software deployment, integrations, and RF network performance, respectively.

Deliverables

- **Final test plan:** Lists test cases to be executed during system acceptance testing and testing logistics

Phase 4 Testing, Training, and Acceptance: Objectives, Deliverables

This phase extends the testing from the previous stage to validate the system's full functionality, from the meter reading and data capturing phases through the billing phase. Training for all software solutions is completed in this period and on-site classes are scheduled for meter professionals so that MTU installations are successful.

Severity Level	Description
1	Requires immediate attention – Service is lost or degraded for all users preventing operation of business
2	Requires priority attention – Service is lost or degraded for single or small number of users, affecting significant business functionality
3	Requires attention – Users are able to continue business operations, but a problem or issue has been identified that affects operation of business
4	There is a problem or issue that does not affect operation of business

Table 9: Issue Priorities

Final acceptance then begins. Any remaining issues are categorized into severity level 1 or 2. Please see Table 9 above for descriptions of these severity levels. The Aclara team is onsite as needed to resolve the any issues.

Deliverables:

- **Training materials**: Training and post-training material are distributed
- **Signed Certificate of Acceptance**

This phase is concluded when the JPEC signs a Certificate of Acceptance, agreeing that user acceptance training has been completed.

Phase 5 Mass Deployment: Objectives, Deliverables

After acceptance testing is complete, Aclara helps the JPEC cutover the software solutions so data begins flowing between the Aclara applications and the Cit's production environment. Endpoint installations begin once the application cutover is complete.

Additionally, during this phase, the JPEC will be introduced to Aclara customer technical support operations to receive technical support as needed. Technical department full-time staff are available to our clients via 1-800-892-9008, through the Aclara web portal, or by email at support@aclara.com.

- **Any cost associated with the training outlined in Section 6 of this RFP.**

Comply. Please see the Pricing document for this information.

- **Describe, in detail, cyber security measures/methods intended for use with your proposed AMI solution.**

Aclara's proposed solution provides data security across all levels of its system, as depicted in Figure 11 below.

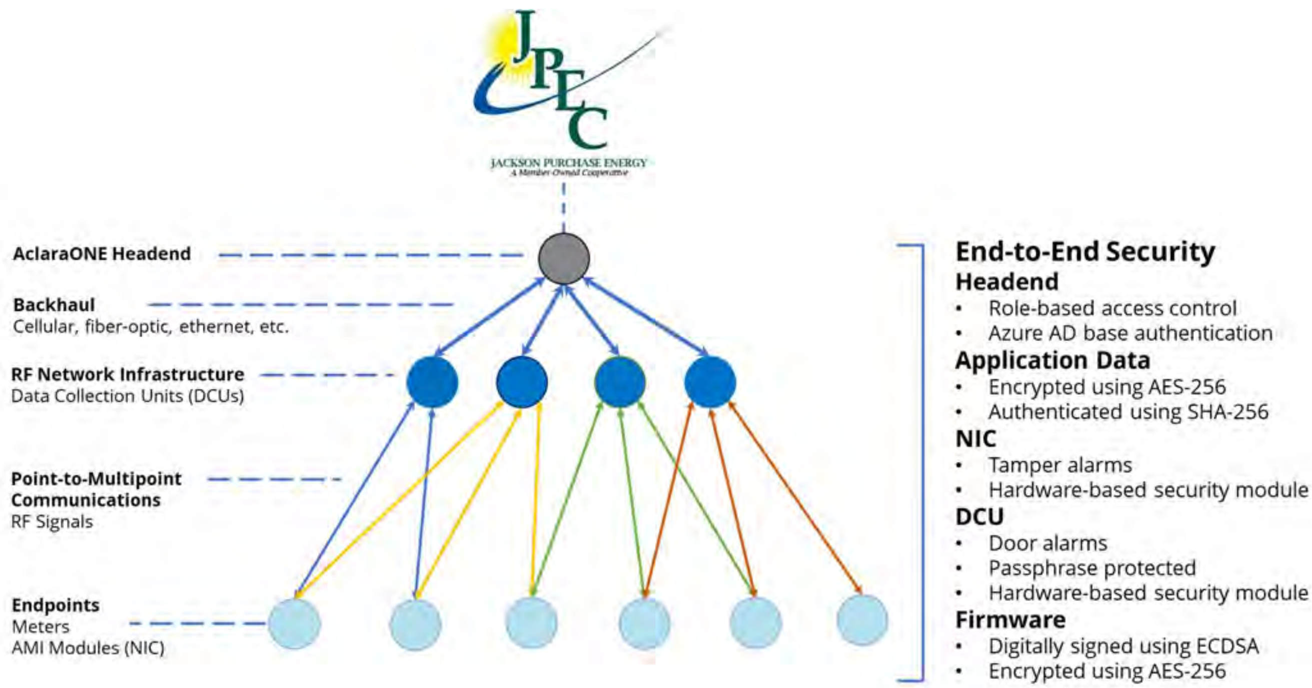


Figure 11: Security Overview

Aclara's network provides for bi-directional AES-256 encryption, along with a standards-based high-security authentication using a high-strength SHA-256 hashed-based message authentication code (HMAC) authentication algorithm with relay protection. Each Aclara communication module uses a unique per device encryption key. The key is generated from a hardware random number generator (RNG) output and protected with multiple physical security protections. This method of encryption and hashed-authentication is well-suited for security, battery-preservation, and network performance.

All application data sent to or received from each endpoint is authenticated (proving its integrity) and AES-256 encrypted (keeping it confidential). If any legitimate traffic is captured and replayed to the device again (e.g., attacker sends command to close RCD switch again), the replayed traffic will be automatically detected and dropped. Each endpoint has a unique key that is protected inside of a specialized security chip. This unique key is used to establish a secured session end-to-end between each end point and AclaraONE.

Please see responses to Section 3.2.14 SECURITY, 3.2.15 SECURITY/AUTHENTICATION, and 3.2.16 CYBERSECURITY for detailed information on Aclara's security practices.

- **Methodology of system design including propagation assumptions described in detail and redundancy measures and considerations.**

Please see response in Section 3.1. SPECIFICATIONS for this information.

- **Any additional required testing equipment with estimated cost.**

Not applicable

- **List all standard report options through the management portal.**

AclaraONE Event List and Event Trends serve as a flexible and effective ad hoc reporting tool. Queries can be constructed and manipulated in real time as well as saved for future use.

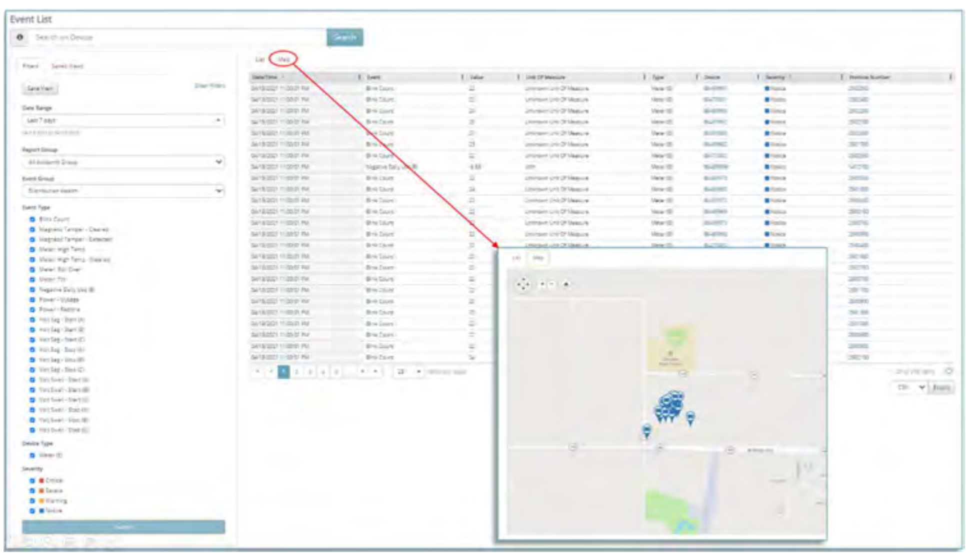


Figure 12: Event List – Ad Hoc Reporting

AclaraONE also offers several standard reports which can be scheduled, allowing results to be exported as flat files for further analysis.

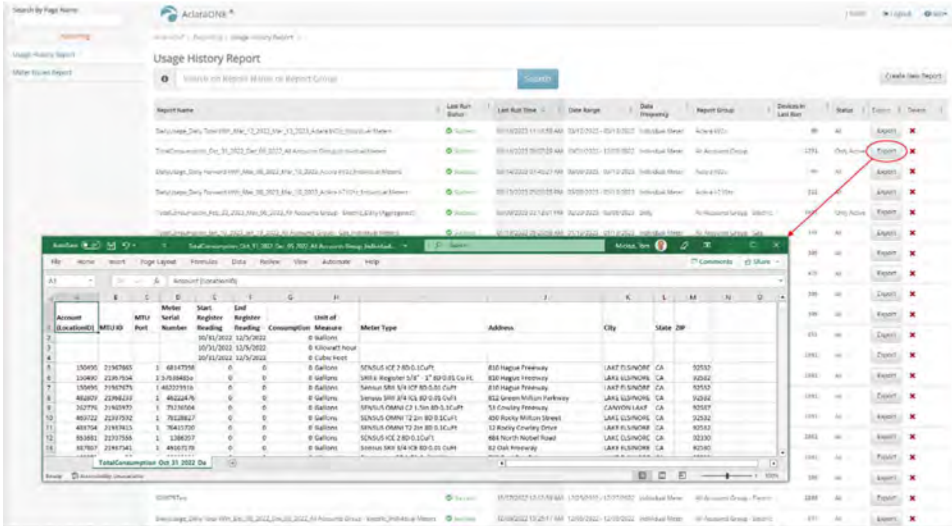


Figure 13: Usage History Report – Export

- **Include battery backup option with all capable infrastructure equipment. Also include specs on the batteries of all devices that have them (such as routers and collectors) which should include, but not limited to, expected life, replacement process and if notifications are sent when the battery fails.**

Aclara's DCU's self-contained battery recharges via a solar panel or an AC line and can operate without charging for several days. If charging is interrupted for an extended period, the DCU will proactively monitor its battery voltage and shut down non-critical services to maintain the ability to collect reads for as long as possible. DCUs also have internal memory to store data in case of a backhaul outage. Readings are stored in non-volatile memory and are maintained even through a complete loss of backup battery power. Once power or backhaul is restored, all stored readings will automatically begin transmitting to AclaraONE.

Aclara DCUs require very little maintenance, but Aclara recommends preventative maintenance in the form of DCU health checks and battery changeout to be performed every five years.

- **Identify any exceptions to JPEC's specifications.**

None.

- **System Design must be able to run side by side with existing AMI Infrastructure until the existing PLC system is phased out.**

Comply.

3.2 FEATURES AND FUNCTIONALITY CHECKLIST

For tables in this section, respond as follows:
YES Feature/Functionality is part of the product(s) being quoted in this proposal.
NO Feature/Functionality is NOT part of the product(s) being quoted in this proposal.

3.2.1 GENERAL SYSTEM REQUIREMENTS	YES	NO
The AMI System can be deployed using an in-house non-hosted or a hosted model.	YES	
The AMI System can be deployed using Microsoft SQL.	YES	
The AMI System can be deployed using Oracle.	YES	
The AMI System can be used by multiple browsers.	YES	
The AMI System supports the use of mobile devices for in field viewing of system.	YES	
The AMI System can support NISC's pre-pay functionality.	YES	
Currently provides distribution automation functionality.	YES	
The AMI System can provide integration to Jackson Purchase Energy's Survalent SCADA system.	YES	
The AMI System fully supports MultiSpeak 3.	YES	
The AMI System fully supports MultiSpeak 4.	YES	

3.2.2 METERING

A. What is the expected life of the AMI modules? Of the AMI modules and associated meters?

The proposed Aclara meter platform designs have followed all Aclara metering product development "Best Practices" with a strong focus on high reliability and strict design reviews to ensure the product meets all design requirements. The design team and sourcing supply chain worked closely with circuit board manufacturers to ensure the use of industrial grade components that are designed with higher performance characteristics across a broader environmental range than consumer grade components. Components used in the meters are considered long life components in accordance with Aclara component specifications. Given the historical in-service experience with previous Aclara meter product designs, using this proven product development process, Aclara believes that the meters are high quality, robustly designed products that can achieve a 20- year operating life.

B. How does the installer know a meter is configured and properly communicating with the network?

Upon installation, endpoints (meter and NIC) power up and self-test, and then the NIC mutually authenticates (X.509) with the AclaraONE headend. Users add the meter information to the CIS, which then communicates this information to AclaraONE where the association between account and authenticated endpoint is made.

C. Describe the timeline required for each meter to become a fully integrated into the network and fully capable of meeting performance requirements outlined in this RFP.

Please see response to item B, above for sequence. Timing for an endpoint to register over the Aclara RF network with the headend typically is less than a minute once it is installed in a utility's distribution network. AclaraONE users will then be able to execute two-way commands for that endpoint. For an endpoint to appear in the AclaraONE MDM, associations between an endpoint's serial number and customer account number must be sent from the Customer Information System (CIS). Depending on the CIS account update cycle, this may take up to a day or longer.

D. Describe the number of registers/channels available for data for each meter form.

Aclara meters can store several days of readings, depending on the configuration and meter type. Please see Table 10, Table 11 and Table 12 below for details.

Num Chan	Interval Length (minutes)					
	1	5	10	15	30	60
1	29.2	146	292	438	876	1,752
2	14.7	73.7	147.3	221	442	884
3	11	55	110	165	330	660
4	8	40	80	120	240	480
5	6.8	34	68	102	204	408
6	5.5	27.7	55.3	83	166	332
7	4.9	24.3	48.7	73	146	292
8	4.2	21	42	63	126	252

Table 10: kV2c Data Storage with R Switch

Num Chan	Interval Length (minutes)					
	1	5	10	15	30	60
1	43.8	219.0	438.0	657.0	1,314.0	2,628.0
2	22.1	110.3	220.7	331.0	662.0	1,324.0
3	16.5	82.7	165.3	248.0	496.0	992.0
4	12.1	60.3	120.7	181.0	362.0	724.0
5	10.2	51.0	102.0	153.0	306.0	612.0
6	8.3	41.3	82.7	124.0	148.0	496.0
7	7.3	36.7	73.3	110.0	220.0	440.0
8	6.3	31.7	63.3	95.0	190.0	380.0
9	5.7	28.7	57.3	86.0	172.0	344.0
10	5.1	25.3	50.7	76.0	152.0	304.0
11	4.7	23.7	47.3	71.0	142.0	284.0
12	4.3	21.3	42.7	64.0	128.0	256.0
13	4.0	20.0	40.0	60.0	120.0	240.0
14	3.7	18.3	36.7	55.0	110.0	220.0
15	3.5	17.3	34.7	52.0	104.0	208.0
16	3.2	16.0	32.0	48.0	96.0	192.0
17	3.1	15.3	30.7	46.0	92.0	184.0
18	2.9	14.3	28.7	43.0	86.0	172.0
19	2.7	13.7	27.3	41.0	82.0	164.0
20	2.6	13.0	26.0	39.0	78.0	156.0

Table 11: kV2c(+) with Optional X Switch

Int (min)	Number of Channels							
	1	2	3	4	5	6	7	8
1	25.5	12.8	9.6	7	5.9	4.8	4.3	3.7
2	50.9	25.6	19.2	14	11.9	9.6	8.5	7.3
3	76.4	38.4	28.8	21	17.8	14.4	12.8	11
4	101.9	51.2	38.4	28	23.7	19.2	17.1	14.7
5	127.3	64	48	35	29.7	24	21.3	18.3
6	152.8	76.8	57.6	42	35.6	28.8	25.6	22
10	254.7	128	96	70	59.3	48	42.7	36.7
12	305.6	153.6	115.2	84	71.2	57.6	51.2	44
15	382	192	144	105	89	72	64	55
20	118.7	96	85.3	73.3	118.7	96	85.3	73.3
30	764	384	288	210	178	144	128	110
60	1,528	768	576	420	356	288	256	220

Table 12: I210+c Data Storage

Aclara meters support four TOU periods and seasons and three daily rates plus holiday, along with two or five billing and demand measures per period, depending on the meter type.

3.2.3 ALL ELECTRIC METERS	**YES**	**NO**
Meter has nonvolatile data storage capable of storing up to 30 days of 15-minute interval data.	YES	
Support for ANSI Reading and Programming Standards C12.18.	YES	
Support for ANSI Reading and Programming Standards C12.19.	YES	
Support for ANSI Reading and Programming Standards C12.22.	YES	
Approval of Underwriters Laboratories (UL).	YES	
Compliant to UL 2735 Standard for Safety, Electric Utility Meters.	YES	
Meter has the ability to be programmed to meter bi-directional energy. The meter has two registers (delivered and received) for this operation and the registers are synced to a clock.	YES	

3.2.3 ALL ELECTRIC METERS	YES	NO
The meter display has an alphanumeric display and a watt disk emulator that provides both direction and magnitude of energy registration.	YES	
Meter has the ability to report tamper detection including reverse consumption, tilt, and unexpected consumption/diversion.	YES	
Meter has backup battery.	Not req'd	
Aclara's meters are battery-free. During an outage, our RF module (located within the meter) will send up to 6 outage messages over a 20-minute period, thus providing a "confirmed" outage message. Upon restoration of power, the meter will sync its time with network. The meter continuously syncs time to ensure the most accurate billing and advanced diagnostic capabilities.		
Meter has optional super capacitor as alternative to the backup battery.	N/A, included	
Aclara's backup power source is a super capacitor in the NIC that comes standard; it is not offered as an alternative for the meter.		
The meter's voltage reporting/ monitoring capability is guaranteed by the manufacturer to have +/- .5 volts accuracy of applied voltage as compared to a standard verified against NIST.	YES	
The meter is built to function according to ANSI C12.1 Meter Temperature Requirements with a range of -40°F to +185°F.	YES	
Meter has the ability to capture a log of up to 200 events (alerts, diagnostics, cautions, communication and meter operations).	YES	
Meter & Module have documented mfg. lifecycle of at least 10 years.	YES	
Meter has built in functionality to communicate with other equipment to allow member load control. For example, water heater controls, smart thermostats, and EV chargers.	YES	
Meter has current limiting functionality.	YES	
Meter has the ability to detect and report voltage fluctuations and send alarm notifications within 3 minutes.	YES	
The meter's voltage monitoring supports measurements of instantaneous voltage data (line-to-line and line-to-neutral) up to three phases depending on meter form.	YES	

3.2.4 SINGLE PHASE ELECTRIC METERS	YES	NO
Meter Includes safety button/switch for reconnects.		NO
For safety reasons, Aclara made the conscious decision not to include a consumer operated switch. Reconnects are controlled remotely over the air. Alternatively, meters can be manually reconnected using an optical probe and the Meter Mate software suite.		

3.2.4 SINGLE PHASE ELECTRIC METERS	YES	NO
Meter has ability to collect and report TOU metering measures, Critical Peak, Peak Rebate & Real-Time Usage.	YES	
The meter is capable of rolling demand with the minimal capability to roll 5 into 15-minute demand intervals.	YES	

3.2.5 POLY PHASE ELECTRIC METERS	YES	NO
Meters proposed to meet specification and report KVA with no additional cost.	YES	
Meter has ability to report TOU metering measures, Critical Peak, Peak Rebate & Real-Time Usage.	YES	
The meter is capable of rolling demand with the minimal capability to roll 5 into 15-minute demand intervals.	YES	
Meter has capability of showing instantaneous demand measurement on display.	YES	
Meter can provide kVAR to NISC's MDM.	YES	

3.2.6 NETWORK AND DATA

A. Describe how the available network bandwidth can support applications beyond meter traffic with percentages of network allocation per function.

Aclara's network design prioritizes traffic and staggers endpoint transmissions for both meter traffic as well as that for other applications to ensure the system never operates at near capacity. This, along with the built-in redundancy, leaves adequate bandwidth to handle alerts, remote closures, and other priority traffic. Bandwidth per data collector primarily is determined by the number of transceiver circuit boards installed; each has one downlink and eight uplink channels over which different types of traffic can be apportioned to set Quality of Service (QoS) levels accordingly when configuring the collectors.

B. Describe how the system supports communication standards and protocols.

Aclara accommodated any standard-based communication protocol to network devices, including DNP3 IP, DNP3 Serial, Modbus, IEC 6870-5-101, IEC 6870-5-104, IEC 61850, PGE-2179, and Proview.

C. Describe the system requirements for FCC licenses and the process for how licenses are registered and administered.

Aclara's RF AMI network uses private FCC-licensed radio channels in the 450–470 MHz band for communications between the endpoints and the collection network. Aclara will assist JPEC in obtaining frequency licenses from the FCC. Ownership of the license will always reside with JPEC and is valid for 10 years, which is renewable. Aclara tracks licenses and will receive a renewal notification at the same time as JPEC. Aclara verifies renewal notification has been received and then coordinates with JPEC to submit renewal paperwork. FCC application fees have been included in the price proposal, and it typically takes four weeks to obtain the licenses.

D. For point to multipoint and cellular solutions, list the expected end-to-end communication time for an on-demand meter register read and expected success rate for a command from the headend system.

On-demand reads typically take 30 seconds or less. Aclara RF's typical Read Success Rate (RSR) is 98.5% for on-demand reads.

E. For RF mesh solutions, list the expected end-to-end communication time for an on-demand meter register read and expected success rate for a command from the headend system for the following scenarios:

- **1 meter hop**
- **3 meter hop**
- **8 meter hop**
- **12 meter hop**

Not applicable to Aclara's solution. Point-to-multipoint system. Each endpoint directly connects to DCUs.

F. Describe system support of both IPv6 and IPv4 addressing.

Aclara's solution supports these communication standards, along with SNMPv3, DNP3, IEC 61850, IEC 61968-9, C12.18, C12.19, RS-232, RS-485, Local Optical/RS-232", FCC Part 15, FCC Part 90, IC RSS-119, LTE, GSM/EDGE, UMTS/HSPA

G. Describe the process for prioritization of traffic on the network.

The Aclara RF Network provides a configurable approach for users to prioritize traffic flows through the network. Traffic classes are used to manage the priority and reliability of a message across the network. An important message can be assigned to a high value traffic class to cause it to move quickly and reliably through the network.

H. Describe the network impact and management for configuration changes such as meter programming and firmware updates.

The data transfer for firmware downloads is 18 transmissions of 68 bytes over a 1.8 second window followed by 18.2 seconds idle. This is then repeated nine times in each three-minute window sending a total of 11,016 bytes in every three-minute window. This will repeat until the full firmware image is sent three times. This process will normally take four to five hours to complete. This averages out to about 6 bytes per second (48 bps) over the full download, which is a small data throughput. Typically, less time is required for over-the-air meter and module configuration changes (via XML file).

I. Describe backhaul options and requirements for the proposed AMI network.

DCUs communicate to the AclaraONE headend over the utility's chosen backhaul, which can include ethernet, cellular, fiber, or other IP-based network.

J. Describe how the solution supports detection of outage events and service restoration notification of network components.

Aclara meters will log an event with a date/time stamp of when the meter identifies a sustained outage. Additionally, the Aclara RF meters will log an event with a date/time stamp of when the meter power was restored. The outage and restoration events with date/time stamps can be reported to the AclaraONE headend system and provided to an integrated OMS.

AclaraONE collects outage and restoration-related notifications (including timestamps) captured and sent by each meter to the headend. Users can assign severities and visualize these notifications on the AclaraONE Events Summary Dashboard.

When a sustained outage is detected, the Aclara RF system will transmit a last gasp notification with typically a 95% success rate for large scale outages. This stands in contrast to mesh technologies, where the outage notification rate can range between 30%-60% success due to the network collapsing and meters being unable to communicate the last gasp notification to the network backhaul. The Aclara RF solution with its single hop, point to multipoint solution will transmit up to 6 last gasp messages to the headend over a 20-minute interval.

K. Describe the communication equipment's capability to support reprogramming or reconfiguration of network devices over the MTBF and expected service life cycle term.

OTA firmware updates do not create outages or system degradations. Firmware updates specific to each meter or module type are uploaded to the AclaraONE File Directory. These can then be downloaded as desired from AclaraONE Manage Downloads by type and selected subsets of meters or modules to the NIC. Downloads are held in memory and applied accordingly. AclaraONE Endpoint Configuration is used similarly for importing and applying desired configuration changes.

L. Describe the method for tracking and managing firmware versions.

Aclara's headend system keeps an audit trail of the firmware upgrades process down to the individual device level. All firmware downloads on the Aclara RF Network are ECDSA digitally signed, encrypted, and authenticated. If any of these checks fail, the firmware download must be restarted. Remote verification of success or failure is provided by the system. The device will continue to run the original firmware if the upgrade was not successful.

M. Firmware upgrade: Describe any impact to meter reading, outage reporting, and restoration operations.

Firmware updates do not create outages or system degradations.

N. How does the system push out firmware to devices and how long does it take to complete a firmware update to a NIC?

Firmware upgrades are performed over-the-air via AclaraONE. Firmware is downloaded to the device and held until commanded to install, allowing JPEC the flexibility to schedule rolling updates, group updates, or individual updates across the network. Once installed, new firmware is verified and goes live. Should verification fail, automatic rollback to the previous operational firmware version occurs. Please also refer to response for item H. above.

O. Is the system capable of pushing out meter firmware upgrades? If so, how long does it take to complete the upgrade?

Yes, please refer to the responses for items H. and N., above.

P. How often is the firmware released and does JPEC have the ability to opt out of a firmware release? If JPEC has the option to opt out, please explain the process and any ramifications.

Aclara normally offers two updates or patches per year as system functionality is expanded. Full SaaS application (headend and analytics on SaaS) updates are automatic, and utilities are not able to opt out. Our proposal has the headend on-prem and analytics in the cloud. You are not required to update the headend, but the cloud application will be updated automatically. New features may not be available until the headend is updated.

3.2.7 GENERAL NETWORK & METER DATA REQUIREMENTS	YES	NO
AMI System included is capable of capturing all meter errors and events aligned with IEC 61698-9 and can forward these to the integration platform allowing external systems to subscribe to required data in near real-time.	YES	
The AMI System supports measurement of other power quality data including RMS voltage/current, over/under voltage, sag/swell, voltage imbalance, and under frequency alerts.	YES	
The AMI System provides aggregate daily meter reads to the integration bus to provide scheduled Revenue Residential Electric Meter Reads and is capable of providing 15-minute interval data, delivered at minimum every 4 hours.	YES	
The AMI System provides aggregate daily meter reads to the integration bus to provide scheduled commercial electric meter reads and is capable of providing 15-minute interval data, delivered at minimum every 4 hours.	YES	
The AMI System provides aggregate daily meter reads to the integration bus in kWh, KW, kVAR, TOU, KVA, Power Factor and Demand Data.	YES	
Within a selected meter type, Jackson Purchase Energy may desire to utilize different interval durations for endpoints. The AMI solution provides capabilities that allow different groups of meters to be configured at 5, 15 & 30 minute or other intervals.	YES	
The AMI System can perform "Gap-filling" to ensure the maximum number of reads are received from the field to minimize the use of VEE in filling meter data gaps by the MDMS.	YES	

3.2.7 GENERAL NETWORK & METER DATA REQUIREMENTS	YES	NO
The AMI System provides an on request (real-time) reading service that allows for retrieval of available meter reading data across the entire population of meters, including the most recent data stored. The following data is available on an "On-Request Meter Reading" query: a. Date and time of reading b. Meter number c. Cumulative kWh read d. Voltage e. Power Factor at peak KW (where available on meter) f. KW Demand (must be programmable up to a total of six digits) g. Remote disconnect status	YES	
On-Request (Real Time) Meter Reading – meters respond within 15 seconds.	YES	
Meters will respond within 15 seconds after receiving the command.		
System is capable of generating temperature alert.	YES	

3.2.8 APPLICATIONS AND BILLING

A. Can a command from the Headend System (HES) be cancelled?

Yes.

B. Describe the process for detection of meter tampering along with reporting/alerting, logging, and tracking of tamper events.

Aclara meters provide the capability to detect and minimize loss through tamper detection. When an event occurs, the meter will log and notify the AclaraONE headend software. Tamper events are also logged in the meter with a date time stamp. Aclara meters can detect meter inversion, magnetic tamper, and current imbalance, and meters provide optical port lockout due to unauthorized use.

Meter inversion tamper (meter inversion tamper is activated by a power down followed by a power-up with reverse current flow for two or more minutes.) • Service error (firmware 6.0 only) • Current imbalance (firmware 6.0 only) • Magnetic tamper (firmware 6.0 only)

C. Describe the system's data management capabilities, collection, storage, presentation.

AclaraONE is a powerful unified platform that supports both headend and data analytics functionality and enables Aclara's communications technology and adds comprehensive solutions to transform business operations, increase efficiencies, reduce costs, and increase customer satisfaction. It is built to provide actionable insights and create situational awareness required to handle growing distribution challenges.

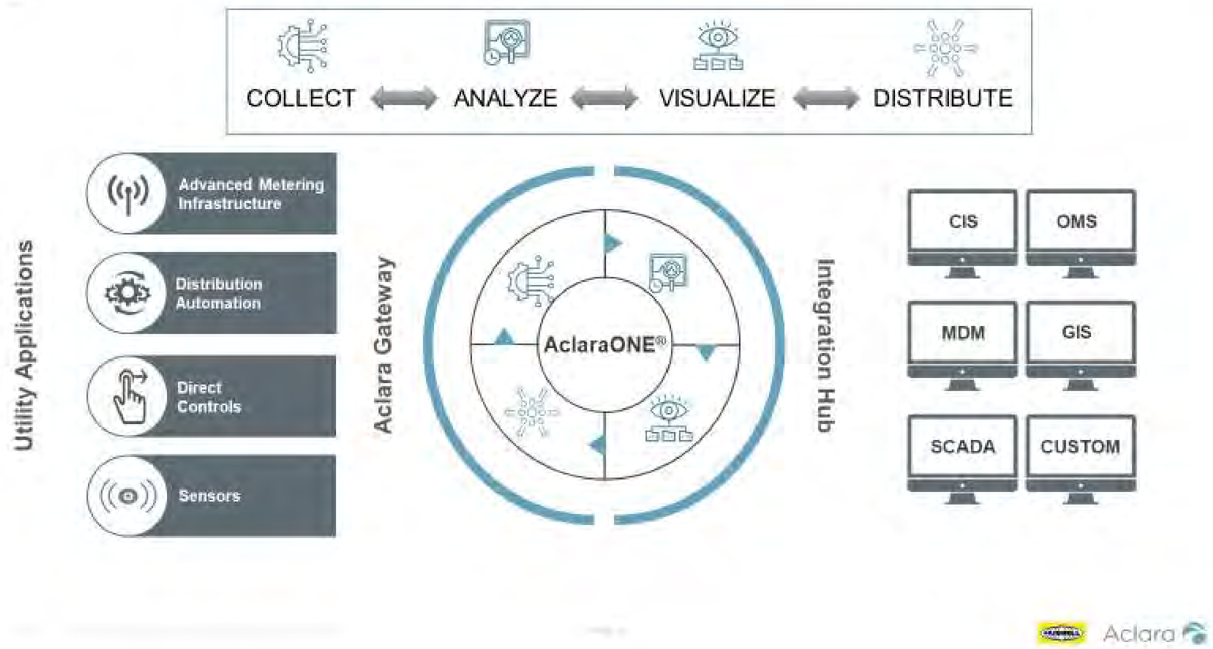


Figure 14: System Overview

The AclaraONE analytics package provides management of important operational and health events, whether these events are generated direct from the hardware devices (e.g., prioritized alarms, commands, notifications) and/or produced by software analysis, e.g., signal strengths, reading performance, device charging levels.

Within the analytics functionality, using a single sign, events bubble up to the AclaraONE dashboard and are presented on filterable lists, readily drilled down into the source details, or proactively provided in outbound notifications. The actionable event-based alerts are the primary visualization of the system health, but list or report views are also strongly supported. Core components include:

Integrated Cloud-based Solution

- Easily handles electric, water, and gas commodity data (or any combination) through the AclaraONE solution
- Incorporates secure data storage and sophisticated analytics
- Provides an advanced library of interfaces to integrate with all utility systems including billing, customer service, outage management, load management, and distribution engineering
- Offers a comprehensive suite of interoperable, industry-standard integration adaptors, as well as standard and customizable file-based options

Validation, Estimation, and Editing

Integral to the AclaraONE MDM is a powerful VEE engine that ensures utility business applications including billing determinant calculations, load research and forecasting, and distribution analysis employ complete, thorough, and accurate interval data. VEE allows you to:

- Configure parameters and VEE rules specifically for each meter group or collection
- Associate meters with jurisdictions, meter types, meter functions, occupancy status, district conservation schedules, or customer types
- Define collections as specifically or as broadly as necessary to tailor the VEE parameters to specific meter segments

Consumption-based Analytics

The AclaraONE solution offers a core set of consumption-based advanced analytics which allow utilities to:

- Proactively identify trends and anomalies in individual, group, and aggregated trends
- View data at the granular (5, 15, 60 minutes, etc.) as well as aggregated (daily, weekly, monthly) levels
- Identify zones, groups, and individual customers with consumption issues and act to address theft and unbilled consumption
- Pinpoint irregular consumption patterns and events proactively
- Provide advanced data visualization through charting, dashboard panels, and drilldowns for aggregated, historical, and trend views of individual meters, customers, and rules-based groups

Actionable Intelligence and Notifications

AclaraONE provides the power of configurable thresholds, prioritization-levels, and rules-based groupings to generate alerts and events that can:

- Identify consumption issues including excess consumption and irregular consumption patterns relative to seasonal, historical, or peer-based comparisons
- Generate notifications and actions for employees through the AclaraONE dashboard, email, SMS text, and work order management interfaces

Aclara's analytics includes a map-based dashboard. An example screenshot is provided in Figure 15 on the following page for System Health. Functionality can be integrated with other vendor analytic tools (i.e., NISC, SEDC, Oracle CIS, etc.).

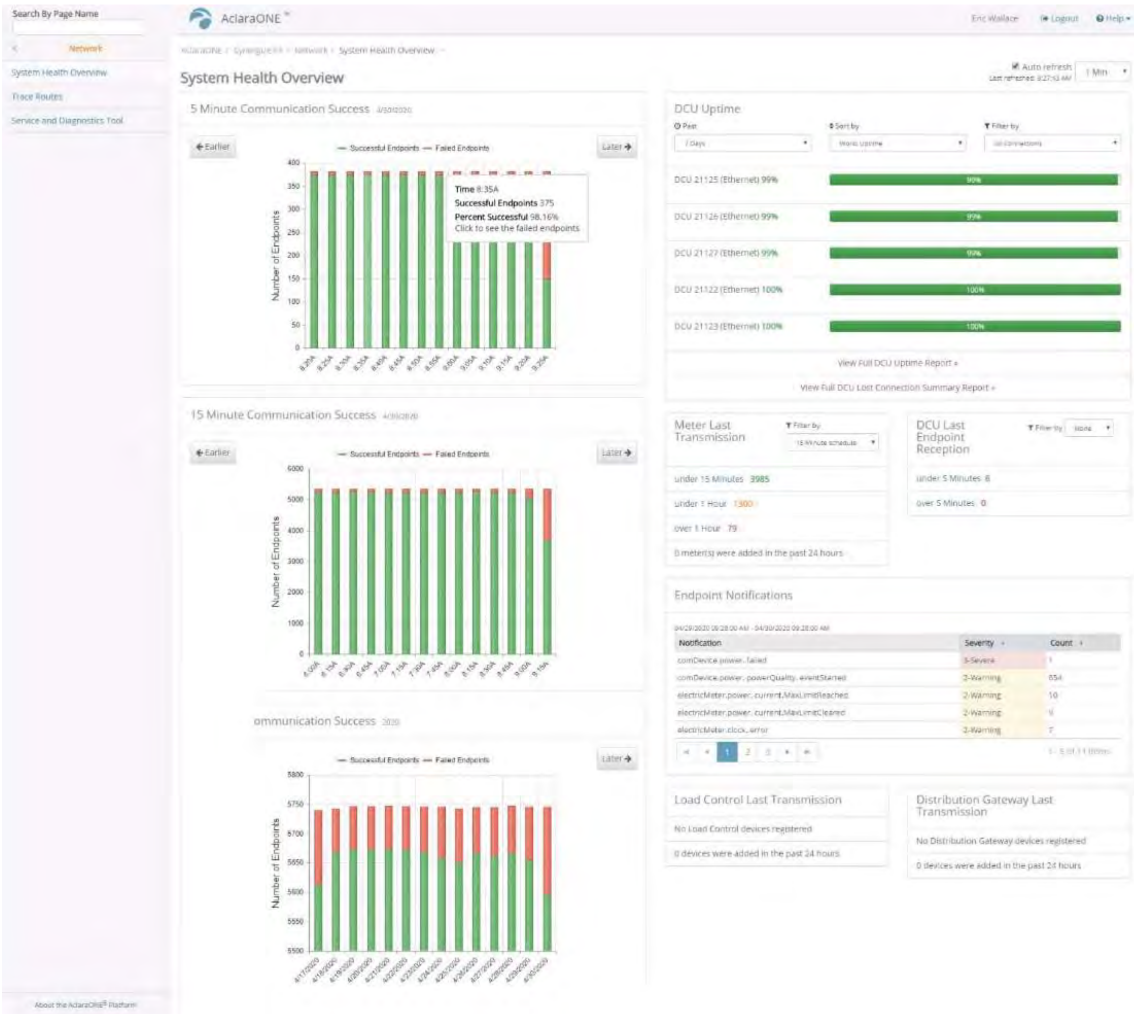


Figure 15: System Health

For JPEC's project, an on-premise installation of the AclaraONE headend is being proposed, with analytics in the cloud. In this scenario, onsite users can navigate the AclaraONE menu and move seamlessly between the headend and the cloud.

A fully hosted solution for both the headend and analytics is also being proposed. This Software as a Service (SaaS) solution provides the benefits of added security, data backup, and disaster recovery. Advantages to JPEC include not having hardware costs or needing additional IT personnel. Aclara will establish an Azure subscription dedicated to the JPEC solution and provide product support and server monitoring for peak performance. There will be no shared infrastructure, system services, applications, or other technologies between JPEC and other AclaraONE clients.

D. Describe how alarms are logged, stored, presented, and queried.

The Aclara RF Network provides alarms for a number of tamper and anomaly events, which are presented to authorized users only, which include but are not limited to zero-consumption reports, theft, last gasp, etc.

Aclara DCUs provide detailed diagnostic data for calls, alarms, system redundancy, location, and battery charging current, and temperature, allowing utilities to maintain total control over their system.

Aclara meters transmits alarms immediately and continues to transmit the alarm during scheduled intervals until the alarm is resolved. The alarms are consolidated and filterable by location, priority, and subject matter to ensure users are focused on actionable information and do not experience alarm fatigue.

See AclaraONE Events Alarms and Report Views in Section F Attachments for additional information.

E. Describe the systems support of on demand requests from the head end and through a typical MultiSpeak command from a third-party vendor.

AclaraONE supports on-demand requests. On-demand requests can be made for individual endpoints, groups of meters, or all meters. The response time for on-demand requests will vary based on the extent of the request but are typically completed within 30 seconds for individual electric meters. AclaraONE also supports MultiSpeak integration with third-party vendors such as Customer Information Systems (CISs) and Prepaid systems for calls to perform on-request meter reads and remote connect/disconnect operations.

F. How are configuration details communicated to the network device during the installation process?

DCUs are configured at the time of installation with the designated TCP/IP address, as required, to ensure a secure connection into the utility's network. Aclara installs and tests DCUs to receive the first wake-up transmissions from endpoints; the headend automatically recognizes and installs the system with any DCUs programmed to connect to the headend. Users can program many DCU behaviors including alternative connection IP addresses. All DCU programmable settings can be specified during DCU installation or uploaded from the headend during each DCU connection.

G. Describe how meter temperature alarms are triggered, reported, and logged.

Aclara meters and communications NIC module include a High Temperature Alert with programmable threshold. Temperature can be measured and shared over the communications network to AclaraONE.

H. How are the different data types retrieved from the meter and what polling intervals are available for each data type?

Aclara RF uses a bubble-up rather than a polled architecture. Load profile data at user-specified intervals (e.g., 5, 15, 30, 60 minutes) automatically is sent at user-specified frequencies (e.g., 5, 15, 30, 60 minutes). For example, 15-minute load profile data can be sent at the end of every 15-minute period or aggregated and sent every 60 minutes to save on backhaul connection charges. Higher-priority traffic such as outage, tamper, and temperature alerts can be sent immediately or opportunistically during the next normally scheduled load profile transmission.

I. How does a client access the AMI applications?

The Aclara software platform is browser-based. Multiple authenticated and authorized users can access the system using a standard web-browser.

J. How does the system collect unread meter data?

AclaraONE can request missing data from the meter at a configurable frequency throughout the day. Both the residential and commercial meter NICs maintain a minimum of 35 days of interval data, depending on the configuration.

K. How does the system ensure read jobs are complete?

All communications are timestamped and logged for integration into a complete audit trail of system access.

L. How does the system handle messages and traps from the meter?

The meter logs all relevant activity based on its meter program. The NIC passes along these notifications to the AclaraONE headend for disposition. Additionally, the NIC can be configured to bring back a variety of meter measurements in its automatic Daily Shift and Demand Reset messages as well as on-request responses to the headend.

M. How does the system manage unread meters?

AclaraONE provides the ability to check and display unread meter counts.

Read Rate (e.g., daily, interval) Notifications are received from the NIC by the AclaraONE head-end. Certain Notifications also are ingested by the AclaraONE MDM which may generate Read Rate Events with various Severities based on user-definable thresholds (e.g., 0-10% for Critical, 40-60% for Warning). These events may appear on the Event Summary Display map and ad hoc reports can be created in the Event List and Event Trends screens. For immediate feedback, an On Request Read can be performed in the Meter Activity screen.

N. How does the system monitor meter programming, firmware versions and statuses?

AclaraONE manages firmware versions across the deployment. User intervention is required to perform a remote upgrade or resolve mismatches.

O. How does the system notify users of failed meter communications?

The AclaraONE Communication History tab on the Metering Details screen shows, for any given endpoint, recent statistics for transmissions to any data collectors within range which may be helpful in discovering and troubleshooting network issues.

P. How does the system reprogram meters remotely?

AclaraONE can update the meter and NIC configuration over the air. To update the meter configuration/program, Aclara MeterMate software is used; the MeterMate program is exported to an XML format that can then be sent to a specific meter/group of meters for over the air updates. All metrology, load profile, TOU, and event parameters are configurable with MeterMate programs and can be configured remotely over the air using the AclaraONE headend software. Please see the Attachments section for additional information on MeterMate.

Q. How does the system support outage event detection, and restoration notifications and messaging?

The meter can be configured to differentiate between momentary vs. sustained outages (from a few seconds to 5 minutes). When momentary and sustained outages occur, the meter will log an event to the meter event log and share the events to the AclaraONE headend. When a sustained outage is detected, the communications module will go into an outage mode and send up to six last gasp messages to the headend system over a 20 minute period.

R. How does the system track whether a meter or device is currently available on the network?

For immediate feedback on any given endpoint, an On Request Read can be performed in the Meter Activity screen.

S. How does the system support prepaid metering programs (polling, reporting, service disconnect/reconnect, verification)?

AclaraONE supports energy pre-payment by providing appropriate billing determinants to third-party prepay systems via standard integrations (MultiSpeak). These integrations also allow third-party prepay systems to directly issue AclaraONE connect and disconnect commands to appropriate meters.

T. Describe how time change events are managed by the network (Daylight savings time)

The headend links to the NIST time source through its operating system. The DCU network is refreshed with time information up to six times per day. The DCU then controls the time synchronization to the endpoint. Every DCU can be configured to send one or more time-sync messages over the RF link to endpoints on a regular or randomized schedule. Endpoints are guaranteed to be synchronized within one minute of each other across the entire deployment. Typically, the synchronization is much closer than one minute. With the typical daily time syncs, we expect less than .5 second drift before correction. Daylight Saving Time is automatically adjusted.

U. How often are the HES applications updated?

Aclara releases software updates that provide product improvements and resolution of known issues.

V. Describe the field maintenance schedule required for the system.

Aclara recommends maintenance on DCUs every five years, which includes exchanging the battery.

W. Describe how the system supports remote connect/disconnect for electric meters and meter forms, types supported, integrations supported.

An integrated disconnect switch is optional in Aclara meters and can be opened or closed from AclaraONE via the RF network. The meter must be configured to allow remote disconnect. The user interface allows the operator to select one or more meters, based on JPEC-specified parameters such as geographic area, user profile, etc. The size of the group is not limited. AclaraONE supports remote disconnect/reconnect with the open/closed status of the switch indicated by a message on the meter display. It also supports load limiting for an electric meter/customer or a batch of electric meters/customers via the user interface. Disconnected meters can be dynamically assigned to a Reporting Group and standard consumption reports issued.

X. Describe how line side voltage is measured, monitored, along with available configurations of alerting and reporting on measured values.

Voltage measurement and monitoring is accessible via the AclaraONE headend system and can be presented in a tabular form. The Aclara RF system has the capability to measure phase angle and loads for load balancing, generate reports for groups of meter showing the phase and phase angle each meter is connected to, and provide visualization of network loads by phase angle with a phase angle precision of < 1°.

Y. Describe how the system supports grouping including types and classifications.

Grouping capabilities (i.e., collection of meters, customers, devices) can be configured using rules-based logic or static list import. Groupings of alarm events and devices are also configurable by the utility.

Z. Describe the process for time stamping of collected meter data points.

The Event Log softswitch allows the meter to track the most recent 500 events. Date and time stamps are included on logged events for demand/load profile or TOU meters.

AA. Describe the meter attributes that are recorded in the head end and integration into enterprise software solutions for updating and monitoring of life cycle state of devices.

Based on how they are programmed using the MeterMate tool, Aclara meters can record a wide range of measurements and alerts in the Event Log. Nearly all such events can be sent by the NIC to the AclaraONE headend, where they are logged and appear as Notifications. The desired set of Notifications can be ingested into the AclaraONE MDM for analytical processing which may then create Events either directly or based on calculations and/or meeting certain conditions (e.g., threshold levels corresponding to various severities).

BB. Describe methods used to validate newly installed meters are successfully integrated into the meter communications network.

At installation, the NIC registers with the network using X.509 mutual authentication. LCD can display diagnostics. When the NIC registers with the network, the DCU will synchronize the meter clock to the network clock and registers with the AclaraONE headend.

CC. Describe the systems support of street light management and control including available attributes for monitoring and control.

AclaraONE provides the foundation to adopt new and changing use cases and functionalities to allow utility staff the ability to access and analyze data collected from endpoints on the distribution network while optimizing processes and insights from m the AMI technology. The AclaraONE headend supports the installation and management of network devices including FNG data collectors, intelligent load control, streetlight control and dimming support, distribution automation with Intelligent Electronic Devices (IEDs) integrated with Edge Gateway, EV charging for detection and TOU rate management, and Behind-the-Meter (BTM) renewable energy assets, as depicted in Figure 16.

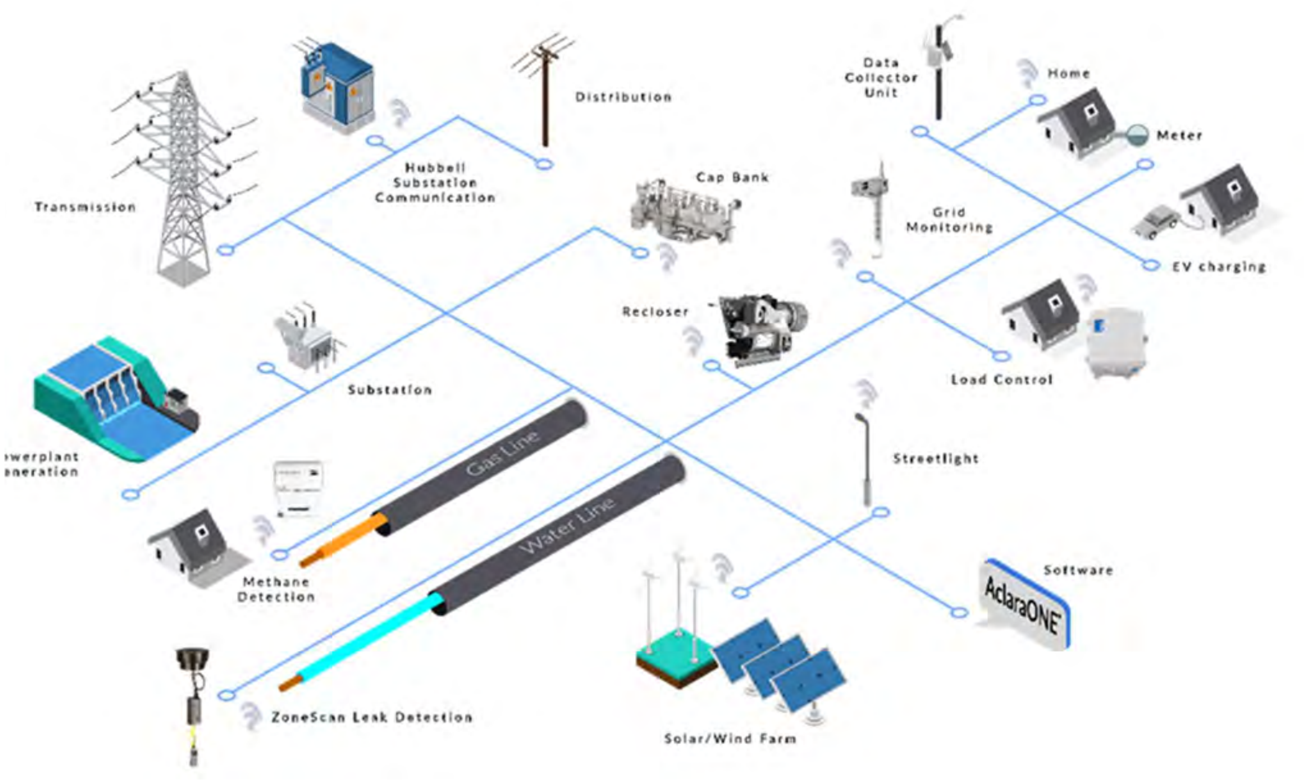


Figure 16: AclaraONE Additional Use Cases

DD. Describe the systems support of Demand Response and Load Control devices including control types, operating ranges, and capabilities.

The I-210+c meter provides capability for demand, load profile, and TOU recording, along with a number of other power quality and demand response related functions. Configurable to support various metering quantities, this meter supports delivered (+), received (-), and net metering for distributed generation.

With the addition of the fully rated 200-amp service switch, the meter is capable of pre-payment metering without all the historical cost associated with card readers or other legacy pre-payment technology. When working in conjunction with a demand response program, the meter provides load limiting and emergency conservation modes. The meter can be remotely configured and is firmware upgradeable.

EE. Describe how the system supports Distribution Automation.

Aclara has a long history of monitoring and controlling distribution automation devices through Distribution Management and SCADA integrations such as GE, Alstom, ABB, Ellipse, OSI, Survalent, ACS, Telvent, and Schneider. The Aclara Edge gateway is the newest product offering for supporting DA communications traffic through the Aclara RF network. The gateway is a stand-alone communications module that enables Intelligent Electronic Devices (IEDs) to interface via serial or ethernet connections. IEDs that support DNP3 communications protocol are compatible with the gateway. This includes IEDs such as the controllers for reclosers, capacitor banks, voltage regulators, and load tap changers (LTC).

FF. Please provide a list of devices currently supported by the Distribution Automation solution.

Aclara has customers at various stages of implementation for distribution automation (DA) devices. In each of these, the Aclara Edge Gateway is used to make the connection between a third-party SCADA software provider and targeted IEDs at the utility. Aclara has also successfully validated the Aclara Edge Gateway performance on the Aclara RF network with Hubbell / Beckwith M6280A and M-6283A capacitor controllers, SEL-651R recloser controller, SEL-351R recloser controllers, Hubbell / Beckwith M-7679 recloser controller, and SEL-2431 voltage regulator controllers.

3.2.9 GENERAL BILLING DATA	YES	NO
System has ability to provide billing determinants supporting batch scheduled meter read delivery based on a configurable billing cycle schedule, off-cycle bills, and a final bill process.	YES	
Peak demand reset can be performed to coincide with the billing determinant delivery.	YES	

3.2.9 GENERAL BILLING DATA	YES	NO
The AMI System utilizes a web-based utility portal allowing Jackson Purchase Energy to access each included sub-system using a single sign-on methodology integrated to Jackson Purchase Energy's active directory authentication system.	YES	
Service Oriented Architecture (SOA) integration adheres to NERC/CIP security compliance.	YES	
System uses secure file-based integration utilizing file transfer over https, sFTP, SCP, or FTPs.	YES	

3.2.10 AMI SYSTEM FEATURES	YES	NO
The AMI System does not require a network path that traverses infrastructure that is not reliably backed up. For example, hopping through non-battery backed up end devices.	YES	
The AMI System is capable of remote, over-the-air support and firmware upgradeability to system devices without affecting the normal operations of system such as regularly scheduled data retrieval.	YES	
The AMI infrastructure supports optional packaging of the Local Area Network radio and Wide-area Network private, wireless data backhaul in a single enclosure, where the AMI backhaul is also capable of supporting near-real time Distribution Automation applications such as Capacitor bank Control, Reclosers, Fault Detection Isolation and Recovery, etc.	YES	
The AMI System supports the following security attributes: a. Mutual entity authentication of all devices throughout the system. b. Message authentication using AES 128 based CMAC or similar. c. Message confidentiality of the application data using at least AES 128-bit encryption. d. Message confidentiality of the link layer using 3-key Triple DES or similar. e. Limited anonymity by not disclosing the Meter ID over the air. f. Verification of authentic firmware upgrade. g. Symmetric key algorithms with no over-the-air key exchange. h. SSL encryption for backend IP-infrastructure. i. Device keys shall be securely provisioned during manufacturing.	YES	
Capable of integration with security light controls.	YES	
After the AMI infrastructure is installed, meters within the coverage area "plug-and-play" and do not require any processes or additional configuration after being powered on.	YES	
Does the system perform "self-healing" functions?	YES	
The network infrastructure supports two-way communication to multiple types of field device endpoints including electric meters.	YES	
The devices on the network avoid connection redundancy by finding primary and alternate AMI infrastructure devices upon installation.	YES	

3.2.10 AMI SYSTEM FEATURES	YES	NO
The AMI System requires licensed frequencies for operation. If yes, does Jackson Purchase Energy have the option to acquire and own license?	YES	
Aclara RF operates on an FCC licensed 450-470 MHz RF band. Aclara will assist JPEC in obtaining the license through the FCC. The FCC grants a 10-year license, which then will need to be renewed every 10 years with Aclara's assistance.		
All device emissions levels are significantly under FCC OET Bulletin 65 guidelines even if device is stuck in transmitting mode.	YES	
Does the system support phase detection?	YES	

3.2.11 OUTAGE NOTIFICATION AND MONITORING

A. Describe how outages integrate with NISC's OMS.

As described in more detail below, AclaraONE forwards last gasp messages to an integrated OMS.

B. Describe meter "last gasp" capabilities during outage events.

Aclara's meters can be configured to differentiate between momentary vs. sustained outages. When momentary and sustained outages occur, the meter will log an event to the meter event log and share the events to the AclaraONE headend. When a sustained outage is detected, the communications module will go into an outage mode and send up to last gasp messages to the headend system over a 20-minute period.

Aclara's last gasp message protocol eliminates "false positives" from a momentary outage (a "blink") or where a meter seems to have lost power due to a failed communication but actually has power. As outages occur, Aclara endpoints transmit last gasp messages from up to six times over a 20-minute period, so a high number of outage messages (over 95%) creates accurate outage analysis. Restoration messages use the same buffer timer to prevent reporting momentary outages and clogging the network with unnecessary traffic. AclaraONE can also forward these messages to an integrated OMS for further outage reporting.

3.2.12 OUTAGE NOTIFICATION AND MONITORING REQUIREMENTS	YES	NO
The system will not false alarm on a momentary outage event. Duration for momentary outage is a parameter that Jackson Purchase Energy can set.	YES	
System will provide restoration notice after power has been restored.	YES	
The system provides full integration with NISC's OMS.	YES	
Last gasp performance does not degrade in the case of a large grid outage.	YES	
Restoration performance (i.e. the amount of time that it takes for a restored meter to report restoration) does not degrade in the case of a large grid outage.	YES	

3.2.12 OUTAGE NOTIFICATION AND MONITORING REQUIREMENTS	YES	NO
The system detects an outage or power loss on monitored meters. When an outage is detected, the system will: a. Notify a designated Jackson Purchase Energy representative b. Update GIS map with current status c. Update status on a map d. Log outage information in the system	YES	
Jackson Purchase Energy will have the ability to obtain status of meters within the electrical network (ping); response will be received in 15 seconds or less.	YES	
During power restoration the AMI head-end receives and forwards all power up notifications.	YES	
Does the system provide a real time status map?	YES	
The system provides trouble shooting capabilities such as: a. Current Meter route b. Real time trace c. Neighbor listing d. Log outage information in the system	YES	
Polling accuracy of routers and collectors greater than 99%.	YES	

3.2.13 ASSET MONITORING FUNCTIONALITY REQUIREMENTS	YES	NO
The system provides visualization of the wireless communications network during operation.	YES	
System can update meter status on Jackson Purchase Energy's monitoring and mapping screen.	YES	
Head-end system can display meter problems/communication problems.	YES	
Jackson Purchase Energy will have the ability to query each meter from the head-end system for detailed information.	YES	

3.2.14 SECURITY

Aclara has provided our company's **Security and Privacy Controls Attestation** document in Section E Additional Information in support of the answers in this section.

A. Describe how data is encrypted at rest.

All customer data is encrypted with AES-256 in transit and at rest.

B. Describe how the system enforces role base access control (RBASC).

The AclaraONE headend supports role-based Least-level Privilege access. The installation establishes an initial credential with an administrative role. This credential is given to an administrator who can subsequently manage other users and their roles. All API interfaces are over encrypted transport and authenticated either with user credentials (for UI supporting APIs) or system to system credentials. Authorization for user and system identities is provided via AclaraONE standard resource security management which includes a set of roles for typical customer use cases with Azure AD group management. Every resource in the head end leverages this role-based authorization mechanism for access privileges.

The Aclara software solution can be fully integrated with the utility's LDAP/AD environments to support RBAC (role-based access and control). AclaraONE utilizes Azure Active Directory for authentication. The AclaraONE portal requires Delegated Permissions from the utility's global administrator, so that the AclaraONE Portal can interact with the utility's Azure Active Directory. Azure Active Directory supports password hash synchronization of users on-premise AD password without the additional infrastructure of a federated environment. Aclara recommends establishing strong password requirements and Multi-Factor Authentication for all users. The application enforces roles and access parameters natively within the software administration panels. There are no shared user accounts by default.

C. Describe the effect on system performance when encryption is enabled.

Data encryption is always enabled.

D. Describe the system encryption capabilities.

All data transmissions are encrypted (TLS) using trusted certificates from a CA. Azure provided transparent data encryption is leveraged (AES 256 encryption algorithm). Linux based data storage uses DM-Crypt based encryption with keys stored in Azure Key Vault.

E. Describe the endpoint and communications security strategy.

Aclara's proposed solution provides data security across all levels of its system. Aclara's network provides for bi-directional AES-256 encryption, along with a standards-based high-security authentication using a high-strength SHA-256 hashed-based message authentication code (HMAC) authentication algorithm with relay protection. Each Aclara communication module uses a unique per device encryption key. The key is generated from a hardware random number generator (RNG) output and protected with multiple physical security protections. This method of encryption and hashed-authentication is well-suited for security, battery-preservation, and network performance.

All application data sent to or received from each endpoint is authenticated (proving its integrity) and AES-256 encrypted (keeping it confidential). If any legitimate traffic is captured and replayed to the device again (e.g., attacker sends command to close RCD switch again), the replayed traffic will be automatically detected and dropped. Each endpoint has a unique key that is protected inside of a specialized security chip. This unique key is used to establish a secured session end-to-end between each end point and AclaraONE.

F. How will the system be hardened to meet security requirements?

Aclara's systems are hardened based on guidelines founded in industry best practices that include, but are not limited to, disable and/or remove default accounts and configurations, remove unnecessary system services, disable unneeded network listeners, install antivirus software and configure for frequent signature updates, enforce the use of strong passwords, implement access control lists for vulnerable executable and registry keys, enforce the use of strong ciphers and explicitly disable weak ciphers.

G. The system must provide mutual authentications for all devices on the network.

The Aclara RF Network provides support for uniquely tracking and authorizing all devices on the network. Each endpoint has a unique key that is protected inside of a specialized security chip. This unique key is used to establish a secured session end-to-end between each endpoint and AclaraONE. All mains powered network devices (DCU, electric endpoint) are issued a unique X.509v3 certificate that is cryptographically bound to the device's unique key. AclaraONE is also issued a unique X.509v3 certificate that is cryptographically bound to its unique key. These certificates and the corresponding keys are used to prove the identity of each device, providing mutual authentication, during the Datagram Transport Layer Security v1.2 (RFC 6347) handshake. A unique session and security keys are used for each device.

H. Describe how individual customer data will be secured and separated in a hosted environment.

JPEC's data is segregated and protected from other customers' data and access at the hosting facility. JPEC will have their own set of servers that do not share connections with other clients

I. Describe the security services framework.

Aclara's information security policy and program are modeled on NIST SP 800-53 and SOC 2 Type 2.

J. How are vulnerabilities communicated and managed?

Aclara uses a risk-based approach to evaluate critical hardware and software supply-chain vendors. We use WhiteSource, a third-party service, to manage risk due to vulnerabilities contained in third-party content incorporated into our product. This gives Aclara the opportunity to address known issues, as appropriate, based on our own internal risk assessment. Additionally, Aclara uses Mend to scan for security and vulnerabilities and validations.

Aclara has an established process for communicating with customers. If a potential IT security incident is identified, it must be communicated immediately to Hubbell's CISO or Security Team. The CISO is authorized to declare an information security incident. Reports of IT security incidents will be forwarded to the Aclara Security Incident Response Team (SIRT). The SIRT follows industry best practices in determining what actions should be taken depending upon the nature of the security incident and will determine whether incidents should be handled within the purview of the facility, department, or location or by SIRT members. In some cases, the SIRT may escalate the incident to law enforcement, corporate counsel, human resources, or other appropriate corporate officers for action.

K. How does the system monitor security events?

Customer facing environments are protected by 24/7/365 monitoring by a third party security operations center as well as Aclara IS security staff.

L. How is contractors' compliance with company security standards ensured?

During project kick-off meetings, Aclara and JPEC will confirm that the solution complies with required security standards.

M. Describe backup procedures.

JPEC will be responsible for backup of on-premise elements. Aclara cloud components are automatically backed up multiple times per day. Hosted headend backups are performed daily. Azure native backups are used.

N. Describe disaster recovery plan for the hosted system.

As described below, Aclara's SaaS solution with built-in redundance provides disaster recovery by copying data synchronously three times to a datacenter in a second Azure region.

O. How is system redundancy achieved across the system?

Aclara's SaaS solution is built on highly reliable Azure services with built-in redundancy. For example, data in Azure SQL or Azure Storage is always replicated three times in the primary region. In addition to local redundancy, we use geo-redundant storage to copy data synchronously three times to a datacenter in a second Azure region.

P. Typically, how many days of data are recommended to be retained in the system?

25 months

3.2.15 SECURITY/AUTHENTICATION	YES	NO
Does the system support 2-Factor Authentication?	YES	
Does the system integrate with LDAP authentication?	YES	
Are regular penetration tests performed throughout the network attributes?	YES	

3.2.15 SECURITY/AUTHENTICATION	YES	NO
The AMI System supports the following security attributes: a. Mutual entity authentication of all devices throughout the system. b. Message authentication using AES 128 based CMAC or similar. c. Message confidentiality of the application data using at least AES 128-bit encryption. d. Message confidentiality of the link layer using 3-key Triple DES or similar. e. Limited anonymity by not disclosing the Meter ID over the air. f. Verification of authentic firmware upgrade. g. Symmetric key algorithms with no over-the-air key exchange. h. SSL encryption for backend IP-infrastructure. i. Device keys shall be securely provisioned during manufacturing.	YES	

3.2.16 CYBERSECURITY

Preparing and Informing Personnel	YES	NO	N/A
Does your organization protect descriptions of JPEC's Control System Domain (CSD) systems or architecture, unless JPEC releases this information for public consumption?	YES		
Does your organization perform personnel background checks for those personnel that will service JPEC equipment and/or be present at JPEC facilities?	YES		
Does your organization have a means of ensuring that competent security leads are assigned to JPEC's projects?	YES		
Does your organization follow applicable standards and procedures regarding confidentiality and user agreements, including agreements signed by all persons having access to JPEC's Environment?	YES		

Security Contact	YES	NO	N/A
Does your organization have a Control System Security Focal Point in the organization who is responsible and accountable for the following activities? a. Acting as liaison with JPEC, as appropriate, about compliance of its systems with JPEC policies? b. Communicating your organization's point of view on control system security to JPEC's staff. c. Ensuring that tenders to JPEC are aligned and in compliance with both JPEC's and your internal requirements for control system security. d. Communicating deviations from, or other issues not conforming with JPEC's policies.	YES		
Does your organization have a means to provide JPEC with timely information about cyber security vulnerabilities in your supplied systems and services?	YES		

Practices	YES	NO	N/A
Does your organization provide a list of membership and level of membership participation in recognized security standards development working groups or other process control security initiatives (e.g., ICSJWG for PCS Security)?	YES		
Has your organization obtained control security certificates for either your product being offered and/or your services provided (e.g., SSAE16, ISO27001, etc.)?	YES		
SSAE18 SOC 2 Type 2 for SaaS, ISO 27001 for electric meters			

System Hardening	YES	NO	N/A
Does your organization practice and maintain a policy of hardening requirements for systems in a distributable hardening guide, which includes at least the following: a. Removal or non-installation of software and functionality that is not required by JPEC, nor for the intended functional purpose of the system, email, office applications, games, USB ports, Bluetooth and Wi-Fi communications, etc. b. Protection of physical and logical access to diagnostic and configuration ports. c. Disabling all unused ports on switches and routers to assist in preventing unauthorized access to the network. d. Proper maintenance processes to maintain the system-hardened state during the system lifetime.	YES		
Does your organization have policies and procedures for security testing and approval and maintenance policies and procedures for 3rd party software integrated into your systems?			N/A
Does your organization have policies and procedures for 3rd party security architecture reviews including security risk assessments?			N/A
For interfaces identified as untrusted, does your organization provide compensating security mechanisms to protect the control system?	YES		
Does your organization document special mechanisms and procedures needed to minimize recognized security weaknesses inherent in communication protocols?	YES		

Protection	YES	NO	N/A
Does your organization support the use of anti-malware software?	YES		
If anti-malware software is not technically possible are other mitigating controls documented and implemented to reduce the risk of infection?			N/A
Does your organization provide JPEC with documented instructions for the proper installation, configuration, and update of anti-virus software?			N/A

Patch Management	YES	NO	N/A
Does your organization provide documentation describing the software patching policy for your systems?	YES		
Does your organization review its patching policy at least annually to address new threats and vulnerabilities?	YES		
Does your organization qualify all relevant software patches and service packs for use on its system during its supported lifetime including security patches that are released by the manufacturer of the operating system and third-party software used on their system?	YES		
Does your organization provide JPEC with documented reasons for not patching if a security patch is considered not relevant for use on your systems?			N/A
Does your organization document the reason and remediation plan for security patches not approved for use on your systems? Does the remediation plan describe how a solution will be provided within 12 months?			N/A
Does your organization maintain a list of software patches and service packs relevant to its system including the approval status of each? Can you provide the list to JPEC?	YES		
Does your organization inform JPEC about approved, not approved, and not relevant software patches that affect its systems within 30 days after release by the manufacturer of the software?	YES		
Does your organization provide tools to audit the current security patch status of your systems and provide a list of missing security patches?	YES		
Does your organization describe the approved patching procedures and configuration instructions for your systems, describing how to perform patching both manually and via a patch management server? a. When using a patch management server, does documentation show how to configure your systems to receive updates? b. For manual patching using portable media, are detailed instructions supplied for how to install patches and how patching status reports will be provided?			N/A
Is your organization's recommended roll-out procedure for software patching and upgrading all parts of your system documented and available for JPEC to review?	YES		

Account Management	YES	NO	N/A
Do your organization's systems provide the capability to support default passwords used for system accounts which can be changed by JPEC?		NO	
Do your organization's systems provide the capability to remove or disable unused default system accounts, such as super-user, guest, and back-door/support accounts?	YES		

Account Management Continued	YES	NO	N/A
Do your organization's systems provide the capability for users to be prompted to change their passwords at most 30 days prior to expiration?	YES		
Do your organization's systems log and report unsuccessful login attempts in a timely manner to an interface specified by JPEC?	YES		
Do your organization's systems provide the capability to set service, auto-login, and operator accounts so they never expire or become disabled automatically?		NO	
Do your organization's network devices provide the capability to enable role-based access features?	YES		
Do your organization's systems provide the capability to support unified account management to centralize security policies and to decentralize execution of the security policies?	YES		
Does your organization have established methods, processes and procedures that generate logs of sufficient detail to create historical audit trails of individual user account access activity for a minimum of 90 days?	YES		

Backup/Restore Process	YES	NO	N/A
Does your organization have a documented backup strategy and architecture for your systems, including but not limited to the following: a. Provisions for regular back-ups at intervals which fulfill the data restore and disaster recovery objectives for the system? b. Provisions to back-up the following types of data: operating system files, applications, including middleware, such as an OPC tunneler, configuration data, database files, log files, electronic logbook, unconventional file types such as network equipment settings, Control Systems controller settings including tuning parameters, set points, alarm levels, etc., field instrumentation parameters and user access directories (e.g., Microsoft Active Directory)? c. Provisions to backup other files identified by your organization which are required to create a complete backup of the systems? d. Instructions on how to make a full backup of your systems.	YES		
Does your organization recommend a procedure for verification of successful system backup?	YES		
Do your organization's systems provide the capability for JPEC's control and automation technicians to restore the system?			N/A
Does your organization have procedures for control and management of removable backup media?	YES		

Network Visibility	YES	NO	N/A
Do your organization's systems provide the capability to monitor system security using at least one of the following methods: Syslog, Windows Management Instrumentation (WMI), or Simple Network Management Protocol (SNMP) traps?	YES		

Audit Log Interfaces	YES	NO	N/A
Do your organization's systems provide the capability to collect historical data using an open standard communication protocol (e.g., syslog)?		NO	
AclaraONE does not support platform audit logging currently. It does offer basic audit trails for parts of the system.			
Do your organization's systems provide the capability to log all state changes?		NO	
Aclara does not currently log all state changes across all AclaraONE components at the application level. Only certain updates are logged that originate from external interfaces such as device status changes or configuration changes for the device. Every message sent from AclaraONE to network or received by AclaraONE from the network is stored in a transaction log.			

Verifying Operations	YES	NO	N/A
Does your organization have a documented policy and procedure for managing and approving changes to operating conditions that come from remote or advisory set points? Do your organization's systems support the capability of requiring operator acknowledgement and approval action to verify a new set point or modification of an existing set point, requiring the use of the last approved set point if not acknowledged?		NO	
Aclara's system does not currently provide for systematic approval of head-end changes. This functionality would be managed as part of a change management process outside of our software system.			
When operating conditions change due to automated operation (those without human intervention), do your organization's systems provide the capability to log the event and notify the operator in a timely manner?	YES		

Wireless Connection	YES	NO	N/A
Where wireless devices are appropriate, do your organization's systems provide the capability to use wireless devices that comply with approved international wireless standards (e.g., IEEE, ISA, IEC)?	YES		
Does your organization restrict the use of proprietary and non-standard protocols unless approved by JPEC?	YES		
Are industrial wireless field devices based on ISA 100 or WirelessHART? The use of other techniques shall not be used unless approved by JPEC.	YES		

Wireless Connection	YES	NO	N/A
Are wireless devices and systems, including infrared and non-RF, compliant with approved international standards (e.g., NIST, ANSI, IEEE, IEC, ISO) or with regulatory requirements governing licensing of frequency bands?	YES		
Do your organization's systems provide the control system's capability to configure wireless field instruments similarly to the one used to configure wired field instruments?	YES		
Do your organization's systems provide the capability to view the latest configuration of a wireless field device used for monitoring and control from the control system?	YES		

Remote Access	YES	NO	N/A
If remote access is required, does your organization's system provide the capability for remote access using a secure application and protocol subject to approval by JPEC?	YES		
Does your organization provide detailed instructions for how to install, configure and operate the selected remote access software on your systems?	YES		
Does your organization provide adequate information about proposed methods of data transfer between your systems and other systems and networks to allow JPEC to assess the risk and approve the method of data transfer before it is implemented, and periodically thereafter?	YES		

Deployment Management	YES	NO	N/A
Does your organization conduct a control system security risk assessment at the beginning of commissioning phases?	YES		
Does your organization provide JPEC with documentation describing built and installed equipment connections and configurations (e.g., manufacturing data files, management information, etc.)?	YES		
After completion of commissioning, does your organization remove all temporary user accounts used during system testing and commissioning from all systems?	YES		
During testing and commissioning, does your organization obtain approval from JPEC for the use of troubleshooting tools prior to being used?	YES		
During testing and commissioning, does your organization inform JPEC of any adverse effects that hardware or software troubleshooting tools may have on network performance?	YES		

3.2.17 SYSTEM TESTING AND COMMISSIONING

System Hardening	YES	NO	N/A
During system testing and commissioning, does your organization demonstrate security mechanisms installed in accordance with the approved procedures, including compliance with your hardening guidelines?	YES		

System Hardening	YES	NO	N/A
During system testing and commissioning, does your organization verify the following conditions have been successfully completed? a. Software and functionality that is not required for the intended functional purpose of the system; email, office applications, games, USB ports, Bluetooth, and Wi-Fi communication, etc., have been removed or not installed unless approved by JPEC. b. Physical and logical access to diagnostic and configuration ports is protected. c. Unused ports on switches and routers that have been disabled so as to prevent unauthorized access to the network. d. If requested by JPEC, demonstrate maintenance processes that maintain the system hardened state during the system lifetime.	YES		
During system testing and commissioning, does your organization verify that the point of connection to a control system network includes a stateful firewall with documented and maintained firewall rules; or provide JPEC with verification that firewall rules are up to date if JPEC is responsible for maintaining them?	YES		
JPEC will be responsible for managing the firewall on the on-premise version			
During system testing and commissioning, does your organization verify that the point of connection within the control system network between wired and wireless networks is firewalled with documented and maintained firewall rules?	YES		
During system testing and commissioning, does your organization verify that the point of connection within the control system network is firewalled with documented and maintained firewall rules?	YES		
During system testing and commissioning, does your organization verify the point of connection within the control system network to a data warehouse is firewalled with documented and maintained firewall rules?	YES		

Protection from Malicious Code	YES	NO	N/A
Prior to system testing and commissioning, does your organization update the document describing the configuration of the virus detection software installed on each component?			N/A
Where the installation of anti-virus software is not technically possible, prior to testing and commissioning, does your organization update the document describing all computers where anti-virus software cannot be installed?			N/A
Prior to testing and commissioning, does your organization update the document describing all the uses of all mitigating features and functions used to reduce the risk of incident?			N/A
Prior to system testing and commissioning, does your organization provide documentation to ensure that the use of correctly installed, configured, and up-to-date anti-virus software has been verified?	YES		

Secure Account Management	YES	NO	N/A
During system testing and commissioning, does your organization demonstrate that invalid login attempts are logged and reported in a timely manner to an interface specified by JPEC?	YES		
During system testing and commissioning, do your organization's systems demonstrate the capability to create unique usernames and passwords?	YES		
Prior to system testing and commissioning, does your organization verify that usernames and passwords approved by JPEC to be shared by your organization's service group are correctly logged and maintained?	YES		
During system testing and commissioning, does your organization demonstrate the capability to create and maintain system accounts (such as an Administrator account)?	YES		
During testing and commissioning, does your organization demonstrate and verify that users are prompted to change their passwords 14-30 days prior to expiration?	YES		
Password requirements will be discussed with VEC during pre-deployment planning.			
During system testing and commissioning, does your organization demonstrate and verify that workstations located in areas that are normally unattended have the required authentication and have an active automatic locking or disconnection mechanism?			N/A

Backup and Restoration Support	YES	NO	N/A
During system testing and commissioning, does your organization perform a back-up for all systems and verify that the system will be regularly backed-up and that the scheduled intervals fulfill JPEC's data restore and disaster recovery objectives for the system?	YES		
Prior to system testing and commissioning, does your organization provide JPEC with logical and physical infrastructure architecture diagrams in AutoCAD or MS Visio drawing formats, which verify that your organization's systems and components are compliant with the infrastructure architectural requirements described by JPEC?	YES		
During planning, JPEC and Aclara will work together to ensure the system meets JPEC's infrastructure architectural requirements.			
During system testing and commissioning, does your organization verify that the Control System Network (CSN or Layer 3) and Distributed Control System (DCS) internal bus (Layer 2) are physically separated in a secure fashion (e.g. dedicated firewall, or router with ACLs, or dual-homed host with blocked routing between interfaces?	YES		
The Aclara DCU is configured to establish a connection only with the configured headend system and will reject all other connection attempts.			

Wireless Connections	YES	NO	N/A
During system testing and commissioning, does your organization verify that JPEC has approved the use of wireless devices as part of a control loop?	YES		
Prior to system testing and commissioning, does your organization verify that its systems architecture documentation describing wireless systems is up to date in its description of the following: a. Data exchange between Layer 1 and wireless instrumentation. b. Data exchange between Layer 2 and Layer 3 through a secure wireless link. c. Bridge connecting the Layer 3 network using a secure wireless link. d. Security mechanisms that prevent an intruder from gaining access to the systems using the wireless system. e. Security mechanism that restricts access by workers with handheld wireless devices. f. Where required, security mechanisms that provide remote management of wireless systems.	YES		
During system testing and commissioning, does your organization verify that its system plan for the use of frequencies in wireless infrastructures, addressing non-interference and co-existence is up-to-date and approved by JPEC?	YES		
The Aclara RF Network system uses private, licensed radio channels for communications between the endpoints and the collection network. Any intentional or unintentional interference on utility licensed channels is considered a violation of FCC rules, and there is a clear and direct path for resolution of such issues. While we have only had to enforce these rules a few times in the history of our company, it is reassuring to know that we can provide a solution for our customers that will not only work today, but well into the future. Security and integrity are incorporated in our systems by design, not as an afterthought.			

Remote Access	YES	NO	N/A
During system testing and commissioning, does your organization demonstrate that if remote access is required it is possible to remotely access its system using one of the allowed connectivity applications which comply with JPEC policy?	YES		
Prior to system testing and commissioning, does your organization verify that all system-to-system connections and user-to-system connections are approved by JPEC in accordance with the required review time?	YES		

C. Installation, Testing and Removal of Meters

4.1. SPECIFICATIONS

Proposed products/services must meet the following specifications:

- **When completing meter exchange, installer shall complete service order, while onsite, through NISC's AppSuite.**

AMS plans on using its work order management system but is open to discussing using JPEC's NISC's AppSuite. AMS has assumed that work orders will be provided in read sequence order.

- **During installation through JPEC's acceptance, a single point of contact with 24/7 accessibility will be provided.**

Comply.

- **End of life testing:**

  - **Test facility and meter testers shall have certification from the Kentucky Public Service Commission.**

  Comply

  - **All meter testing data shall be submitted in a CSV file as specified in Exhibit B.**

  Comply

  - **All meters shall be tested, and results returned to Jackson Purchase Energy within fourteen (14) days following removal.**

  Comply

  - **All meters shall be tested for accuracy and stored for six (6) months; If meter shows an average meter error that is two (2) percent or greater, fast or slow, or if the meter is stuck or dead, the meter should be returned to Jackson Purchase Energy's Paducah Office within 48 hours following testing.**

  Comply

Additionally, proposals should include the following:

- **Pricing to replace approximately (400) meter bases to allow consolidation of meter forms. This encompasses replacing all 3S, 4S, 5S, 6S, and 16K bases with 9S bases. See Exhibit A for meter inventory list.**

Comply

- **Methodology for deployment, including proposed process maps and deployment schedules for the products/services proposed in order to meet Jackson Purchase Energy's desired acceptance date of December 6, 2024, for pilot and, June 26,**

2026, for full installation.

Comply. AMS's schedule assumes meter delivery will be timely.

- **Turnkey solutions and third-party installation services should provide information outlining services they can offer related to communications hardware installation, AMI meter installation (see Exhibit B), and end of life testing and 6 months of storage for old meters.**

AMS provides the following services:

- Collection of old meter pic; new meter pic; GPS location; time stamp of exchange; service voltage; if the service is overhead/underground; if the meter is mounted on the structure, pole, pedestal, or transformer; what is serviced such as house, apartment, garage, well, etc.; extra comments can be recorded if needed.
- Use of AMS's own program for exchanges.
- Coordination with the utility to develop an export file to be sent periodically as needed for integration into our program.
- Development of a correctly formatted import file for integration into NISC.
- Availability of all work will in the correct format for uploading into NISC by noon the next day.

JPEC will also have access to AMS's program so that the utility can track inventory, installations, comments, and CNCs, as well as view all images and technician locations. Multiple JPEC employees can access the system.

The end-of-life testing includes common test information requirements; AMS will meet these requirements.

- **Identify any exceptions to Jackson Purchase Energy's specifications.**

Not applicable.

4.2 FEATURES/FUNCTIONALITY CHECKLIST

Respond as follows:

YES Feature/Functionality is part of the product(s) being quoted in this proposal.

NO Feature/Functionality is NOT part of the product(s) being quoted in this proposal.

4.2.1 Meter Installation/ End of Life Testing Requirements	YES	NO
GPS data on installed meter will be provided without additional cost.	YES	
Vendor trains all employees in safety, customer relations, hazardous conditions, and identification of meter tampering.	YES	
Meter jaw tension testing.	YES	

D. Warranty Information

Aclara has included warranty documents in our legal response.

E. Additional Information

Technical attachments:

- Aclara Electric Meter NIC
- Electric I-210+c Residential Meter
- Electric kV2c Commercial and Industrial Meter
- Aclara RF Data Collection Unit
- AclaraONE Software InfoSheet
- Sample Statement of Work (SOW)
- Sample Field Acceptance Test (FAT)
- Sample System Acceptance Test (SAT)
- AclaraONE Events Alarms and Report Views
- Security and Privacy Controls Attestation

F. Attachments

Pricing attachments:

- Itemized Pricing – Hosted Solution
- Itemized Pricing – On Premise Solution

Legal attachments:

- Summary
- Sample Master Service Agreement (MSA)
- Software License Agreement
- Warranty

Other attachments:

- Hubbell Annual Report

Aclara Pricing to Brownstown for Jackson Purchase Energy (KY)
Aclara RF System - Software-as-a-Service (SaaS)

Quote #

Date: 10/15/2023

HARDWARE

Item	Description	Part Number	Qty	Unit Price	Extended Price	Notes
1.0	NETWORK					
1.01	DCU-II+, RF, 1-ch Tx, 8-ch Rx, T-Board, AC, Verizon LTE - Enhanced Base Station, includes 5-year warranty		13	[redacted]		(7,8,9)
1.02	DCU-II+, RF, 1-ch Tx, 8-ch Rx, T-Board, AC, Verizon LTE, includes 5-year warranty	501-9985LTA-L-2A2T-EGW	37	[redacted]		(7,8,9)
1.03	DCU-II+, RF, 1-ch Tx, 8-ch Rx, T-Board, AC, Ethernet , includes 5-year warranty	501-9985ETH-L-2A2T-EGW	12	[redacted]		(7,8,9)
1.04	DCU Mounting Hardware, DCU II+ Mounting Kit, Pole Mount, Thru-Bolt	109-9975-01D	54	[redacted]		(7,8,9,10)
1.05	DCU Mounting Hardware, DCU II+ Mounting Kit, Pole Mount, Thru-Bolt, DCU II+ Antenna	109-9985-SRFN-03	54	[redacted]		(7,8,9,10)
1.06	DCU Mounting Hardware, DCU II+ Mounting Kit, Pole Mount, Banded, Spare Parts 20' LMR-400 cable w/ N-type male connectors	070-2570-20	108	[redacted]		(7,8,9,10)
1.07	DCU Mounting Hardware, DCU II+ Tower Mounting Kit, Banded	109-9975-03A	8	[redacted]		(7,8,9,10)
1.08	DCU Mounting Hardware, DCU II+ Tower Mounting Kit, Banded, DCU II+ Antenna	109-9985-SRFN-06	8	[redacted]		(7,8,9,10)
1.09	DCU Mounting Hardware, DCU II+ Tower Mounting Kit, DCU II+ Stock Cable for Tower Mount (150 feet)	070-2590H	16	[redacted]		(7,8,9,10)
1.10	DCU Accessories - E-5008 CTV Barrel lock key (includes cover)	057-0078	16	[redacted]		
Item	Description	Part Number	Qty	Unit Price	Extended Price	Notes
2.0	ELECTRIC RF ENDPOINTS					
2.01	Aclara i210+c 1S CL100 120V w/ RD RF Electric Residential Meter, including integrated Aclara Module, TQEVRXK FJU, includes 5-year warranty	Y84900-10	240	[redacted]		(12,13)
2.02	Aclara i210+c 2S CL200 240V w/ RD RF Electric Residential Meter, including integrated Aclara Module, TQEVRXK FJU, includes 5-year warranty	Y84900-20	28,602	[redacted]		(12,13)
2.03	Aclara i210+c 2S CL320 240V w/ RD RF Electric Residential Meter, including integrated Aclara Module, TQEVRXK FJU, includes 5-year warranty	Y84900-26	1,526	[redacted]		(12,13,15)
2.04	Optional - Aclara i210+c 2S CL320 240V w/o RD RF Electric Residential Meter, including integrated Aclara Module, TQEVRXK, includes 5-year warranty	Y84900-25	1,526	[redacted]		(12,13)
2.05	Aclara i210+c 3S CL20 240V w/o RD RF Electric Residential Meter, including integrated Aclara Module, TQEVRXK, includes 5-year warranty	Y84900-30	64	[redacted]		(12,13)
2.06	Aclara i210+c 4S CL20 240V w/o RD RF Electric Residential Meter, including integrated Aclara Module, TQEVRXK, includes 5-year warranty	Y84900-35	100	[redacted]		(12,13)
2.07	Aclara KV2c 9S CL20 120-480V, Gen 5, RF Electric Commercial Meter, including integrated Aclara Module, TQEVRXK, includes 5-year warranty	Y82900-225	393	[redacted]		(12,13)
2.08	Aclara KV2c 9S (for 16K) CL20 120-480V, Gen 5, RF Electric Commercial Meter, including integrated Aclara Module, TQEVRXK, excludes adapter, includes 5-year warranty	Y82900-225	186	[redacted]		(12,14)
2.09	Aclara KV2c 36S CL20 120-480V, Gen 5, RF Electric Commercial Meter, including integrated Aclara Module, TQEVRXK, includes 5-year warranty	Y82900-252	12	[redacted]		(12,14)
2.10	Aclara KV2c 45S CL20 120-480V, Gen 5, RF Electric Commercial Meter, including integrated Aclara Module, TQEVRXK, includes 5-year warranty	Y82900-255	33	[redacted]		(12,14)
2.11	Aclara KV2c 16S CL200 120-480V, Gen 5, RF Electric Commercial Meter, including integrated Aclara Module, TQEVRXK, includes 5-year warranty	Y82900-240	500	[redacted]		(12,14)
2.12	Aclara KV2c 16S CL320 120-480V, Gen 5, RF Electric Commercial Meter, including integrated Aclara Module, TQEVRXK, includes 5-year warranty	Y82900-245	100	[redacted]		(12,14)
			HARDWARE TOTAL:	[redacted]		

SOFTWARE

Item	Description	Part Number	Qty	Unit Price	Extended Price	Notes
3.0	SOFTWARE ANNUAL FEES					

3.01	Software as a Service (SaaS) AclaraONE Software ASP Fee	SW-3010A-E-RF SW-3022A	30,305	[redacted]		(19,21)
			ANNUAL SOFTWARE TOTAL:	[redacted]		

PROFESSIONAL SERVICES

Item	Description	Part Number	Qty	Unit Price	Extended Price	Notes
4.0	PROFESSIONAL SERVICES - NETWORK					
4.01	Aclara Professional Services - RF network Analysis, RF network deployment and performance monitoring, AclaraONE setup, AclaraONE integrations and project management.	504-0535	1	[redacted]	[redacted]	(11,16,17,18)
		PROFESSIONAL SERVICES TOTAL:		[redacted]	[redacted]	

TRAINING

Item	Description	Part Number	Qty	Unit Price	Extended Price	Notes
5.0	TRAINING					
5.01	Training - RF Electric - RF electric system overview and AO training	504-4001	1	[redacted]	[redacted]	
5.02	Training - DCU Installation, Maintenance & Troubleshooting	504-0005	1	[redacted]	[redacted]	
5.03	Training - RF Electric 2-day Netwrok Installtion & System Administration	504-0534	1	[redacted]	[redacted]	
		TRAINING TOTAL:		[redacted]	[redacted]	

INSTALLATION

Item	Description	Part Number	Qty	Unit Price	Extended Price	Notes
6.0	HARDWARE INSTALLATION					
6.01	Installation Services - AMI meter for 1Φ (Form 2S CL 200) meter manufacturer 1		240	[redacted]	[redacted]	
6.02	Installation Services - AMI meter for 1Φ (Form 2S CL 200) meter manufacturer 1 with disconnect		28,602	[redacted]	[redacted]	
6.03	Installation Services - AMI meter for 1Φ (Form 2S CL 320) meter manufacturer 1		1,526	[redacted]	[redacted]	
6.04	Installation Services - AMI meter for 1Φ or 3Φ (Form 9S) meter manufacturer 1		780	[redacted]	[redacted]	
6.05	Installation Services - AMI meter for 3Φ (all self-contained forms and classes for kWh applications) meter manufacturer		600	[redacted]	[redacted]	
6.06	Installation Services - Warehouse (Testing/ Storage) unit price per test		31,748	[redacted]	[redacted]	
6.07	Installation Services - Replacement of 3S, 4S, 5S, 6S, and 16K bases with 9S		395	[redacted]	[redacted]	
6.08	Installation Services - WOMs Set up		1	[redacted]	[redacted]	
6.09	Installation Services - Project management		1	[redacted]	[redacted]	
6.10	Installation Services - Old meter disposal		1	[redacted]	[redacted]	
6.11	Installation Services - Warehouse- Old meter storage monthly (6 month duration after final meter pull)		18	[redacted]	[redacted]	
6.12	Optional - Installation Services - ct site yearly testing (Optional)		1,300	[redacted]	[redacted]	
		INSTALLATION TOTAL:		[redacted]	[redacted]	

Subtotal:	[redacted]	
Material Handling & Freight:	[redacted]	
Project Credit:	[redacted]	
Grand Total:	[redacted]	(1,2,3,4,5,6)

OPTIONAL SELECTIONS

Item	Description	Part Number	Qty	Unit Price	Extended Price	Notes
7.0	OPTIONAL SELECTIONS					
7.01	Cellular Backhaul Data Plan (Per DCU per year for access to the Aclara Wireless Network for SRFN. Fee includes support, private APN, VPN and 1GB cellular data plan.)	NS-AWN-1GBY-E-RF	50	[redacted]	[redacted]	(21,22)
7.02	Optional Battery for timekeeping during a power outage - Price adder for i210+c and KV2c meter	As Needed	As Needed	[redacted]	[redacted]	
7.03	K2-Switch for I-210+c meter	As Needed	As Needed	[redacted]	[redacted]	
7.04	K-Switch for kV2c meter	As Needed	As Needed	[redacted]	[redacted]	
7.05	Cover mounted demand reset for I-210+c	As Needed	As Needed	[redacted]	[redacted]	
7.06	Aclara Edge Gateway Device	Y84110-1	1	[redacted]	[redacted]	
7.07	AclaraONE Distribution Automation Hosted ASP	SW-4010A	1	[redacted]	[redacted]	(20,22)
7.08	AclaraONE Distribution Automation Configuration and SCADA Integration Fee		1	[redacted]	[redacted]	(20)
7.09	Intelligent Load Control (ILC) - 240V, 30-Amp/5-Amp, Configurable CLP	Y99850-401	1	[redacted]	[redacted]	
7.10	AclaraONE Load Control Hosted ASP (per endpoint price)	SW-4015A	1	[redacted]	[redacted]	(20,22)
7.11	AclaraONE Load Control Configuration Fee		1	[redacted]	[redacted]	(20)
7.12	Aclara Level 2 EVSE - 240V, Charging Load: 3.8-19.2Kw		1	[redacted]	[redacted]	

PRICING ASSUMPTIONS

General Note: This Proposal/Quotation is based upon the terms and conditions set forth in the Aclara Standard Terms and Conditions of Sales for Equipment and Certain Services that are available on Aclara's website at:

http://www.aclara.com/terms-and-conditions/

Any conflicting or additional terms and conditions contained in any resulting purchase order are hereby rejected unless agreed to in writing by Aclara.

GENERAL

1 Pricing to Jackson Purchase remains in effect for a period of 90-days from the date above.

2 Pricing is confidential, proprietary, and governed by the confidentiality requirements of the terms and conditions.

3 The itemized pricing shown is based on quantities and schedules proposed herein; any changes may result in a pricing adjustment. Stand-alone pricing for each line item may be provided upon request.

4 Total extended price shown excludes any applicable Sales Tax.

5 In the event of unusual and significant fluctuation in commodities, freight, and/or logistics, Aclara reserves the right to adjust pricing with 30 days' notice.

6 Due to current high fluctuations in commodities, freight, services, and logistics, the prices quoted may be adjusted periodically in accordance with an agreed upon change policy to be incorporated into final contract terms. Commodity prices, services, and logistics costs will be tracked using the appropriate indexes and industry references and any price adjustments will be accompanied with supporting documentation.

NETWORK

7 Total extended price shown excludes DCU mounting structures (e.g. poles, installation of poles) and site acquisition costs.

8 DCU installations and configurations may be a mixture of various mounting styles. Current estimates show 62 DCU's, but a detailed propagation study and site survey is needed to finalize the quantities and types. Pricing Adjustments will be required to accommodate changes in DCU type/counts (i.e. pole height parameters changing), mounting types, and installation types.

9 Pricing and arrangements for non-standard installations will be handled individually. Typical standard installation rate (pole and roof mount) is 3 to 5 units per day.

10 DCU mounting kits include standard cabling (Pole – 2x20', Tower 2x150'), additional cabling to be priced upon mounting requirements.

11 Add $1,000.00 for 1-day Bucket Truck Rental if needed for access.

ENDPOINTS

12 Endpoint prices are subject to change on individual Features, Forms, Classes, Softswitches & Quantities

13 Residential Meter Softswitches that are included in above quote: i210+c

- T - Time of Use (TOU)
- Q - Power Quality Recording (Min, Avg, Max Voltage)
- E - Event Logging Recording (up to 200 events)
- V - Voltage Sag / Swell Monitor and Recording
- R - Basic LP Recording, 4 Channel
- F - Emergency Curtailment
- J - Demand Limit
- U - Prepayment
- X - Expanded Recording

14 Commercial Meter Softswitches that are included in above quote: KV2c

- T - Time of Use
- Q - Power Quality
- E - Event Logging (500 events)
- V - Sag and Swell Monitoring
- R - Basic Recording (8Channels)
- X - Expanded Recording (20 Channels)

15 Aclara is anticipating availability of the i210+c 2S CL320 RD meters hardware in mid-2023. No schedule may be committed until final product release is completed

PROFESSIONAL SERVICES

16 Reasonable travel and expenses will be billed as incurred.

17 Professional Service Pricing Assumptions:

1. 30,305 RF Electric endpoints
2. 62 DCUs (55 electric poles and 7 non-transmission poles)
3. Single Hosted Production AclaraONE environment
4. System Acceptance Testing with the following integration
    a. CIS Account Import - Meter Life cycle updates (MultiSpeak or flat files)
    b. Billing and interval export (flat files)
    c. GIS integration
    d. Milsoft EA integration (Multispeak)
    e. OMS Integrations – Outage and restoration notifications (Multispeak)
5. Utility's CIS (and other) vendor resources are available to support the integration requirements discussions and any work on the CIS side to enable the interfaces. Standard inbound and outbound integrations are assumed. Standard bill export and/or interval data export is flat-file format
6. Meter to cash validation duration is 10 days from start to complete.
7. Aclara's professional services includes project management support during the initial deployment stage through to SAT and 24 months during full system deployment.
8. Mass deployment will commence immediately after System Acceptance Testing is signed off.
9. Aclara Professional Services pricing could be subject to change if Aclara Professional Services are requested to remain on the project for an extended timeframe.
10. System Owner to survey all the DCU sites and share information, including pictures with Aclara. Aclara will Finalize the network design during the initial project phase, prior to SAT.
11. Aclara assumes DCU sites will have existing AC Power or be powered by solar. If an AC DCU is required, Aclara assumes the site has existing AC, Utility is responsible for running an AC extension line to a Utility-supplied disconnect switch with a 6-ft flexible conduit pigtail at
12. System Owner will provide an earth grounding point at sites selected for DCU installations.
13. Site acquisition not included. Utility is responsible for all site preparations prior to DCU installation, including but not limited to lease agreements, pole costs, pole planting logistics costs, engineering surveys/drawings, traffic management, permits, new site construction, any
14. System Owner is responsible to install and commission the DCU. Aclara will provide installation training and will be available onsite for a period of one week during the initial deployment phase to oversee the installation and perform quality checks.
15. Scope of work does not include any custom reports or customizations

16. Hardware delivery plan is not confirmed – dates are assumed
17. FCC license fee is included.
18. Professional services' travel expenses are not included in the quote. All project related travel expenses will be charged to the client as incurred at cost . The client will be notified in advance if travel is required, and an estimate of the expenses involved will be provided on request

18 The pricing above does not include the following:

1. Any DBE, MBE, WBE, FBE, VBE requirements, costs, pricing – such as, but not limited to, civil engineers, permitting/pole planting, customer outreach, call center, staff resourcing, landscape/urban planning/arborist, installation labor, large meter plumbers, excavation/concrete,
2. Third party contractor DCU installation, site acquisition fees, lease agreements, pole costs, pole planting logistics costs, engineering surveys/drawings, traffic management, permitting, new site construction.

SOFTWARE

19 AclaraONE configuration based on total system size of (30,305 total endpoints) endpoints. Final AclaraONE configuration will be determined by working in conjunction with IT staff at the beginning of each contract year and pricing adjusted accordingly for that year.

20 If optional software is selected, a Software License Agreement amendment will be required.

ANNUAL FEES

21 Assumed Cellular Provider is Verizon, alternate Cellular Providers can be discussed, but may impact pricing.

22 Subject to 3% annual escalation starting in year 5.

Response to Jackson Purchase Energy Corporation
Request for Proposal

Brownstown Electric Supply Co. Inc. (“Brownstown”) will be the Prime Contractor for the equipment requirements in response to the Request for Proposal for an Advanced Metering Infrastructure and Services issued by **Jackson Purchase Energy Corporation** (the “JPEC”). **Aclara Technologies LLC** (“Aclara”) will sell its Aclara RF Electric equipment to Brownstown for resale to the JPEC per the terms of the current Non-Exclusive Distributorship Agreement between Brownstown and Aclara. Aclara will also enter a Software Deliverables and Services Agreement directly with JPEC for its AclaraONE® software solution.

The following documents are anticipated to form the basis of any contract:

- **Aclara Standard Terms and Conditions of Sale for Equipment and/or Certain Services**

- **Agreement for Software Deliverables and Services** which shall contain the terms and conditions under which Aclara licenses its proprietary AclaraONE® software solution for this Project; and

- **A Statement of Work** which shall describe any professional services which Acara will provide in connection with the deployment (To Be Developed); and

- **Aclara Equipment Warranties** document shall describe the warranty associated with the various components of the Aclara® RF Electric Network System.

Aclara proposes that these standard Aclara contract documents form the basis of any negotiations between the parties and agrees to negotiate the terms of each agreement in good faith with the JPEC and Brownstown.

Terms and Conditions

Standard Terms and Conditions of Sale for Equipment and/or Certain Services

1. Seller (as used herein shall mean “Aclara Technologies LLC”, “Aclara Meters LLC”, “Aclara Meters S.L.”, “Aclara Meters UK LTD.”, “Aclara Meters Chile SpA”, “Aclara India Private Limited”, “Aclara Smart Grid Solutions, LLC”, “Aclara Belgium”, or “Aclara Philippines”). Customer as used herein shall mean INSERT CUSTOMER. Aclara agrees to sell and deliver to Customer either direct or through a distributor, the parts, materials, supplies, and other goods (“Equipment”), Software and/or Services described in the Master Agreement and accompanying Exhibits (“Master Agreement”) to which these Terms and Conditions are attached. The Master Agreement and Attachments and/or Exhibits are governed by these Terms and Conditions. Customer Licensing of any Software and the providing of any Maintenance Services shall be performed in accordance with the Exhibit C – Agreement for Software Deliverables and Services. Customer may issue one or more purchase orders under this Master Agreement. Any such issuance shall be deemed an acceptance of these Terms and Conditions; any different or additional terms, whether incorporated in Customer’s Purchase Order or otherwise, are hereby specifically rejected. Regardless of any language that may appear on Customer’s Purchase Order including Provisions that may be construed as saying that Seller’s acceptance and/or fulfillment of the Purchase Order shall serve as an acceptance of the terms of the Purchase Order, no deviation from the Terms and Conditions contained herein shall be enforceable against Seller unless contained in a separate amendment to these standard Terms and Conditions executed by authorized officers of Seller and Customer which specifically sets forth the terms contained herein that are to be amended and the specific amendment. The Master Agreement, including these Terms and Conditions, and Customer’s acceptance constitute the “Agreement”.

2. PRICE.
As payment for the Equipment and/or Services, Customer shall pay the price(s) and within the times as set forth in the Exhibit B.

3. SHIPMENTS.
Shipment of the Equipment and performance of the Services shall be in accordance with the schedule set forth, or referenced, in the Exhibit B.

4. CHANGES.
Customer may request, in writing, changes in the scope of the Agreement. Such changes shall be effected, only upon Seller’s concurrence with such request. If any such change causes an increase or decrease in the cost of or the time required for performance hereunder, an equitable adjustment shall be made in the price and/or delivery schedule.

5. FORCE MAJEURE.

Seller shall not be liable for delays in shipment or delivery of any items sold hereunder, or loss or damage thereto, when due to acts of God, acts of Customer, acts of civil or military authority, governmental restrictions or embargoes, war, riot, fires, strikes, flood, epidemics, quarantine, restrictions, default or delay by supplier, breakdown in manufacturing facilities, machinery or equipment, delays in transportation or difficulties in obtaining necessary materials, labor or manufacturing facilities due to such causes, or any other cause beyond Seller's reasonable control.

6. INSPECTIONS.

Any Equipment may, at the option of the Customer, be subject to inspection by Customer at its cost at Seller's or Seller's contract manufacturer's factory in accordance with Seller's normal inspection system during normal business hours. All inspections by Customer shall be performed in such manner as not to delay performance by Seller. Customer must provide Seller with a minimum of forty-eight (48) hours prior written notice of such inspections.

7. PACKAGING.

All material and equipment to be furnished by Seller shall be packed, crated, or otherwise suitably protected to withstand shipment to its destination. Each package, crate, or container shall be marked with the name of the consignee, shipping destination, and purchase order number. Complete packing lists shall be supplied showing contents and identity of each package.

8. TITLE, SHIPPING, AND RISK OF LOSS.

8.1 For shipments that do not involve export, including shipments from one European Union ("EU") country to another EU country, Seller shall deliver Equipment to Customer FCA Seller's facility or warehouse (Incoterms 2010). For export shipments, Seller shall deliver Equipment to Customer FCA Port of Export (Incoterms 2010). Customer shall pay all delivery costs and charges or pay Seller's standard material, handling, and freight charges. Partial deliveries are permitted. Seller may deliver Equipment in advance of the delivery schedule. Delivery times are approximate and are dependent upon prompt receipt by Seller of all information necessary to proceed with the work without interruption. If the Equipment delivered does not correspond in quantity, type or price to those itemized in the shipping invoice or documentation, Customer shall so notify Seller within ten (10) days after receipt.

8.2 For shipments that do not involve export, title to Equipment shall pass to Customer upon delivery in accordance with Section 8.1. For export shipments from a Seller facility or warehouse outside the U.S., title shall pass to Customer upon delivery in accordance with Section 8.1. For shipments from the U.S. to another country, title shall pass to Customer immediately after each item departs from the territorial land, seas and overlying airspace of the U.S. The 1982 United Nations Convention of the law of the Sea shall apply to determine the U.S. territorial seas. For all other shipments, title to Equipment shall pass to Customer the earlier of (i) the port of export immediately after Equipment have been cleared for export or (ii) immediately after each item departs from the territorial land, seas and overlying airspace of the sending country. When Customer arranges the export or intercommunity shipment, Customer will provide Seller evidence of exportation or intercommunity shipment acceptable to the relevant tax and custom authorities. Notwithstanding the foregoing, Seller grants only a license, and does not pass title, for any software provided by Seller under this Agreement, and title to any leased equipment remains with Seller.

8.3 Risk of loss shall pass to Customer upon delivery pursuant to **Section 8.1**, except that for export shipments from the U.S., risk of loss shall transfer to Customer upon title passage.

8.4 If any Equipment to be delivered under this Agreement or if any Customer equipment repaired at Seller's facilities cannot be shipped to or received by Customer when ready due to any cause attributable to Customer or its other contractors, Seller may ship the Equipment to a storage facility, including storage at the place of manufacture or repair, or to an agreed freight forwarder. If Seller places the Equipment into storage, the following apply: (i) title and risk of loss immediately pass to Customer, if they have not already passed, and delivery shall be deemed to have occurred; (ii) any amounts otherwise payable to Seller upon delivery or shipment shall be due; (iii) all expenses and charges incurred by Seller related to the storage shall be payable by Customer upon submission of Seller's invoices; and (iv) when conditions permit and upon payment of all amounts due, Seller shall make the Equipment and repaired equipment available to Customer for delivery.

8.5 If repair Services are to be performed on Customer's equipment at Seller's facility, Customer shall be responsible for, and shall retain risk of loss of, such equipment at all times, except that Seller shall be responsible for damage to the equipment while at Seller's facility to the extent such damage is caused by Seller's negligence.

8.6 Seller grants only a license, and does not pass title, for any software or any other Confidential Information provided by Seller under this Agreement, and title to any leased equipment remains with Seller

9. SUBSTITUTION.

Seller shall have the right to substitute an item of Equipment for an item specified in the Quotation provided that such substituted item is, in fact, functionally equivalent to the specified item. In the event of any such substitution, Seller shall give Customer prompt written notice of its intention to make a substitution which notice shall set forth the reason(s) for such substitution and shall contain a statement that the substituted item is functionally equivalent to the specified item.

10. WARRANTY

10.1 Seller warrants its products in accordance with Aclara Equipment Warranties in Exhibit D.

10.2 Installation Services. Seller warrants that all workmanship that it provides in connection with the Installation Services under this Agreement shall conform to the drawings, submittals, and specifications as to kind, quality, function and characteristic of workmanship specified in the Statement of Work and shall be free from any fault or defect for a period of ninety (90) days after the Installation Service is performed (the "**Warranty Period**"). For the avoidance of doubt, the warranty provided under this Section 10.2 is strictly limited to the Installation Services provided pursuant to the Agreement and does not apply with respect to the hardware installed, its accuracy, functionality, its means of communication with Buyer, or any software associated with the installed hardware.

11. ASSIGNMENT.

Customer shall not assign its right, title, or interest herein, or any part thereof, to any person without the prior written consent of Seller. Such consent shall not be unreasonably withheld.

12. SUCCESSORS AND ASSIGNS.

The Agreement, subject to the provisions hereof, shall inure to the benefit of and be binding upon the respective successors and assigns of the parties hereto.

13. CONFIDENTIAL AND PROPRIETARY DATA (SELLER).

To the extent Seller furnishes confidential and proprietary information of Seller (hereinafter referred to collectively as, the "Confidential Information) to Customer under this Agreement, Seller and Customer agree as follows:

13.1 Confidential Information includes, without limitation, (i) non-public information and/or private business information developed, collected or created by Seller or at Seller's expense or direction or non-public information and/or private business information developed, collected or created by a third party and lawfully in the possession of Seller; (ii) trade secret information including technical or non-technical data, formulae, patterns, compilations, client lists, business plans, programs, devices, methods, techniques, drawings, diagrams or processes, data, databases, software, specifications, in any form or format that (1) are not generally known in the trade or business of Seller, (2) have direct or indirect, tangible or intangible, actual or potential value, (3) are not readily ascertainable from publicly available information, and (4) are the subject of reasonable protection measures taken by Seller.

13.2. Except as provided in **Sections 13.4** and **13.5**, Customer shall not, without the prior written consent of the Seller: (i) disclose or reveal any of Seller's Confidential Information to any third party; (ii) use any of the Confidential Information other than pursuant to and in accordance with performing this Agreement; (iii) copy, reverse engineer or disassemble any products, technology, software, database, operating system or tangible objects that utilize, embody or contain any portion of the Confidential Information; or (iv) use Seller's Confidential Information for its own or any third party's independent economic gain. The period of confidentiality shall be indefinite with respect to Seller's Confidential Information.

13.3. Customer shall apply security measures no less stringent than the measures that Customer applies to its own like information, but not less than a reasonable degree of care, to prevent the unauthorized disclosure and use of the Confidential Information.

13.4. Customer may disclose Confidential Information received from Seller in the following circumstances: (i) disclosure to third parties to the extent that the Confidential Information is required to be disclosed pursuant to a court order or as otherwise required by law, provided that Customer promptly notifies Seller upon learning of such requirement prior to disclosure and has given Seller a reasonable opportunity to contest or limit the scope of such required disclosure (including but not limited to making an application for a protective order); (ii) disclosure to nominated third parties under written authority from Seller of the Confidential Information; and (iii) disclosure to those within its organization having a need to know.

13.5. The provisions of this **Section 13** shall not apply to information which: (i) at the time of disclosure to Customer, is generally available to the public or thereafter, without any fault of the Customer becomes generally available to the public by publication or otherwise, or which becomes general knowledge; or (ii) was lawfully in the possession of the Customer prior to its disclosure by Seller; or (iii) was independently made known without restriction to the Customer by a third party having a bona fide right to disclose such information; or (iv) was developed by the Customer independently from the Confidential Information disclosed to it by Seller.

13.6. A breach by Customer of any of the covenants of this **Section 13** will cause Seller to suffer loss which will not be adequately compensated for by damages, and in addition to damages in respect of any breach of this **Section 13**, Seller shall be entitled to seek equitable remedies (including, without limitation, injunctive relief) in case of a breach or to prevent a breach of this **Section 13**.

14. CONFIDENTIAL AND PROPRIETARY DATA (CUSTOMER).

14.1. All information of Customer that Customer considers proprietary and furnishes to Seller in connection with Seller's performance hereunder will be clearly marked as proprietary by Customer (hereinafter "Customer Proprietary Data"). Customer information not so marked shall not be considered to be proprietary to Customer. Customer hereby grants to Seller authority to use Customer Proprietary Data only for the purposes of this Agreement. Seller agrees to keep such Customer Proprietary Data confidential, to use it only for work necessary to the performance of the Agreement, and not to sell, transfer, disclose, or otherwise make available any of such data to others. Seller may disclose or otherwise make available such Customer Proprietary Data, with Customer's consent, to a third party with whom Seller contracts for work necessary to the performance of this Agreement, provided that said third party agrees to be bound by the limitations on use and disclosure contained herein.

14.2. Notwithstanding the foregoing, Customer Proprietary Data shall not include material which:

(i) at the time of disclosure is in the public domain or which, after disclosure, becomes part of the public domain by publication or otherwise; or (ii) is information which Seller can show was in its possession at the time of disclosure and was not acquired directly or indirectly from Customer; or (iii) is information which was received by Seller from a third entity having legal right to transmit the same. All information pertaining to supply/usage/load profiles shall be recognized by Seller as proprietary information.

15. TERMINATION FOR CAUSE.

15.1. Customer may terminate this Agreement upon delivery to Seller of a written notice of termination. Such notice of termination shall be given to Seller at least ten (10) days prior to the effective date of such termination. Such notice of termination may be given for any one of the following reasons: (1) If Seller shall become insolvent, commit any act of bankruptcy, make a general assignment for the benefit of creditors, or becomes the subject of any proceeding commenced under any statute or law for the relief of debtors; or (2) if a receiver, trustee or liquidator of any property or income of Seller is appointed; or (3) if Seller: (a) defaults in any material manner in the performance of Seller's obligations under any of the terms, provisions, conditions or covenants contained in this Agreement and (b) further fails within thirty (30) days (or as otherwise mutually agreed) after written notice thereof from Customer to take reasonable steps to remedy such default. Customer shall be permitted to pursue any and all rights and remedies available hereunder or at law or in equity without terminating this Agreement for cause. In the event of termination for cause by Customer, Seller shall be paid only the portion of the compensation related to Equipment delivered, Services performed or Software licensed prior to the effective date of termination. Seller shall also be subject to any claim Customer may have against Seller under other provisions of this Agreement, or as a matter of law.

15.2. Seller may also terminate this Agreement upon delivery to Customer of a written notice of termination. Such notice of termination shall be given to Customer at least ten (10) days prior to the effective date of such termination. Such notice of termination may be given for any one of the following reasons: (1) If Customer shall become insolvent, commit any act of bankruptcy, make a general assignment for the benefit of creditors, or becomes the subject of any proceeding commenced under any statute or law for the relief of debtors; or (2) if a receiver, trustee or liquidator of any property or income of Customer is appointed; or (3) if Customer: (a) defaults in any material manner in the performance of Customer's obligations under any of the terms, provisions, conditions or covenants contained in this Agreement and (b) further fails within thirty (30) days (or as otherwise mutually agreed) after written notice thereof from Seller to take reasonable steps to remedy such default.

Customer shall also be subject to any claim Seller may have against Customer under other provisions of this Agreement, or as a matter of law.

16. TERMINATION FOR CONVENIENCE.

Customer reserves the right, at any time, to terminate this Agreement, or any portion of the

Services, for its sole convenience. Any such termination shall be effected by delivery of a written notice of termination to Seller specifying the extent to which the Agreement and related work have been terminated and the date upon which the termination shall be effective. The date of the effective date of termination shall be no earlier than thirty (30) days from the receipt of the notice of termination by Seller. Upon receipt of such notice, Seller shall in good faith and using all commercially reasonable efforts, stop all work hereunder, and shall promptly take steps to cancel existing orders, contracts and subcontracts relating to the Purchase Order.

In the event of such termination, Seller shall be entitled to receive: (1) the price due Seller for the work performed, the Equipment delivered, the Software licensed and the Services performed; (2) the price for Equipment manufactured but not delivered prior to the effective date of termination; (3) all costs reasonably incurred by Seller prior to the effective date of termination including, but not limited to, labor, materials and overhead not covered under (1) or (2) above; (4) the reasonable cost of termination reasonably incurred by Seller in accordance with Customer's termination notice which costs shall include the reasonable cost incurred by Seller in preparing any termination settlement proposal; and (5) Fifteen percent (15%) of the amounts payable under (3) and (4) above.

No costs incurred after the effective date of the notice of termination shall be treated as a reimbursable cost unless it relates to performing the portion of the work not terminated, or taking measures reasonably required to comply with Customer's notice of termination in a prudent and business-like manner.

17. NON-DISCRIMINATION.

During the performance of this Agreement, the Seller agrees as follows: Seller will comply with all applicable provisions of and, if required, furnish all information and reports required by Section 503 of the Rehabilitation act of 1973, as amended, the Vietnam Era Veterans' Readjustment Assistance Act of 1974 (38 U.S.C. 4212), as amended, the Americans with Disabilities Act ("ADA") including the ADA Amendments Act, the Federal Executive Order No. 11246, as amended, the regulations at 41 CFR part 60, "Office of the Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor" and of the rules, regulations, and relevant orders of the Secretary of Labor. Such acts, amendments, rules, regulations and orders are incorporated herein by reference.

18. INDEPENDENT CONTRACTOR.

Seller agrees to perform the work in connection with this Agreement as an Independent Contractor and not as a subcontractor, agent or employee of Customer, its parent, subsidiaries or affiliates, or their respective officers, directors, agents or employees.

19. INDEMNIFICATION.

For the purpose of this **Section 19** only, "Customer Parties" shall mean Customer, its directors, officers, agents and employees, contractors and subcontractors (other than Seller), assignees, subsidiaries and affiliates, and each of them; “Seller Parties” shall mean Seller, its directors, officers, agents and employees, contractors and subcontractors at any tier, and the subcontractor’s directors, officers, agents and employees, and each of them; and “Claims” shall mean claims, demands, suits or causes of action. The Parties obligations under this **Section 19** shall not be limited to their respective insurance coverage.

19.1 General Indemnity.

A. Seller shall indemnify Customer Parties for any and all loss or liability, including the costs of settlements, judgments, damages and direct expense including reasonable attorney’s fees, costs and expenses arising from Claims, whether based on statute or regulation or on theories of contract, tort, strict liability, or otherwise, which are brought against one or more Customer Parties by or on behalf of persons other than Customer Parties involving injuries or damages to persons or tangible personal or real property arising from or in any manner relating to negligent acts or omissions of Seller Parties under this Agreement provided that: (1) Customer promptly notifies Seller in writing of such Claims; (2) Customer fully cooperates with Seller in assisting in the defense or settlement of such Claims; and (3) Seller has the sole right to conduct the defense of such Claims or to settle such Claims. Seller shall defend at its own expense, with counsel of its choosing, but reasonably acceptable to Customer, any suit or action brought against Customer Parties based upon such Claims. Further, provided that Customer promptly notifies Seller in writing of any alleged violations described below, Seller shall also indemnify Customer Parties for any and all loss or liability for fines, fees or penalties for violations of any statutes, regulations, rules, ordinances, codes or standards applicable to the work arising from or relating to acts or omissions of Seller Parties. Seller’s obligations under this **Section 19.1.A** shall be reduced to the extent that and shall not extend to: (a) claims that arise out of, pertain to, or relate to the negligence or willful misconduct of Buyer Parties, other servants, or other independent contractors who are responsible to them; (b) defects in design furnished by Buyer Parties, other servants, or other independent contractors who are responsible to them; (c) to the extent claims do not arise out of the scope of the Work of Seller or (d) claims of damage to real property or improvements or thereon or injuries as a result of the Seller’s performance of the work, unless there is evidence that injury or damage to property was caused directly by Seller’s performance of the work.

B. Customer shall indemnify Seller Parties for any and all loss or liability, including the costs of settlements, judgments, damages and direct expense including reasonable attorney’s fees, costs and expenses from Claims, at law or in equity, whether based on statute or regulation or on theories of contract, tort, strict liability, or otherwise, which are brought by or on behalf of persons other than Seller Parties for injuries or damages to persons or property arising from or in any manner relating to acts or omissions of Customer Parties under this Agreement provided that: (1) Seller promptly notifies Customer in writing of such Claims; (2) Seller fully cooperates with Customer in assisting in the defense or settlement of such Claims; and (3) Customer has the sole right to conduct the defense of such Claims or to settle such Claims. Customer shall defend at its own expense, with counsel of its choosing, but reasonably acceptable to Seller, any suit or action brought against Seller Parties based upon such Claims. Further, provided that Seller promptly notifies Customer in writing of any alleged violations described below, Customer shall also indemnify Seller Parties for any and all loss or liability for fines, fees or penalties for violations of any statutes, regulations, rules, ordinances, codes or standards applicable to the work arising from or relating to acts or omissions of Customer Parties. Customer's obligations under this **Section 19.1.B** shall be reduced to the extent of the negligence, gross negligence or willful misconduct of Seller Parties.

19.2 Intellectual Property Indemnity.

A. Seller shall defend and indemnify Customer against any claim by a non-affiliated third party Claims alleging that Equipment or Services furnished under this Agreement infringe a patent in effect in the U.S., an EU member state or the country of the site (provided there is a corresponding patent issued by the U.S. or an EU member state), or any copyright or trademark registered in the country of in which the premises where Equipment is used or Services are performed, not including Seller's premises from which it performs Services provided that (1) in the case of Software licensed, it is the latest released version of the Software licensed; (2) Customer promptly, and in any event, within ten (10) days of becoming aware of the Claims, notifies Seller in writing of such Claims; (3) Customer makes no admission of liability and does not take any position adverse to Seller; (4) Customer provides Seller with full disclosure and fully cooperates with Seller in assisting in the defense or settlement of such Claims and (5) Seller has the sole right to conduct the defense of such Claims or to settle such Claims.

B. In addition, in the event any such Equipment sold, Software licensed or Services furnished hereunder are held in such suit to be infringing or misappropriating or their use by Customer is enjoined or limited in any manner, or Seller believes that such holding or enjoining is likely, Seller shall at its sole option and expense: (1) procure for Customer the right to continue use of such Equipment or Software licensed, or (2) replace or modify the same with an equivalent non-infringing product with functionality substantially similar to the product it is replacing, or (3) failing (1) or (2), take back infringing Equipment, Software licensed, or Services and refund the price received by Seller attributable to the infringing Equipment, Software licensed or Services. Notwithstanding the foregoing, Seller shall not be liable for any Claims based upon (a) the combination or use of the Equipment or Software with any other equipment or software not supplied or authorized by Seller, or (b) Customer's possession or use of any altered version of the Equipment or Software unless such alteration has been performed or expressly authorized by Seller, or (c) failure of Customer to implement any update provided by Seller that would have prevented the Claims, or (d) Equipment or Services made or performed to Customer's specifications.

C. Section 19.2 states Seller's exclusive liability for intellectual property infringement by Equipment, Software and Services.

D. Each party shall retain ownership of all Confidential Information and intellectual property it had prior to the Agreement. All new intellectual property conceived or created by Seller in the performance of this Agreement, whether alone or with any contribution from Customer, shall be owned exclusively by Seller. Customer agrees to deliver assignment documentation as necessary to achieve that result.

20. CHANGES.

A. Changes Proposed by Customer

1. In the event that Customer determines that it desires to modify the Statement of Work (including but not limited to, changes in quantities of installations) or scheduling or delaying of any Statement of Work then in force, Customer may issue a change proposal ("Change Request") to Seller, referencing the applicable Statement of Work, and documenting the changes in work scope or scheduling it proposes.
2. Upon receipt of a Change Request, Seller will promptly (but in no event later than ten (10) business days, unless otherwise agreed by the Parties) prepare and return an impact analysis ("Impact Analysis") to Customer, which shall include the financial and schedule impact of the Change Request on the Statement of Work.
3. Upon receipt of the Impact Analysis, Customer shall promptly (but in no event later than 5 business days, unless otherwise agreed by the Parties) review and respond to Seller in writing accepting, rejecting or seeking to modify the terms of the Impact Analysis. Seller shall not be required to implement the Change Request or start any work affected by the Change Request unless and until the Parties have reached agreement and have caused a binding change order referencing the applicable Statement of Work ("Change Order") to be executed on their behalf by their duly authorized representatives.

B. Changes Proposed by Seller

1. Seller may submit a Change Request to Customer that outlines the proposed changes in the Statement of Work, cost and/or schedule required if:

    i. Seller determines in good faith that the scope of work on a given Statement of Work is different than could have been reasonably determined by Seller at the time of executing the SOW;

    ii. the existing Statement of Work is impacted by unforeseen changes in circumstances or factors ("External Factors") that are not caused by Seller and that impact the Statement of Work. As used herein, such External Factors include, but are not limited to, new prevailing wage rate laws, collective bargaining, or any other such External Factors that impact hourly wage rates or directly impacts costs; or

    iii. Customer delays the project commencement date.

2. Upon receipt of a Change Request from Seller, Customer shall promptly (but in no event later than 10 business days, unless otherwise agreed by the Parties) review

and respond to Seller in writing accepting, rejecting or seeking to modify the terms of the Change Request.

3. If the Change Request affects only a discrete and separable portion of the Statement of Work as originally conceived (the "Affected Portion"), Seller shall continue to perform work on the remainder of the Statement of Work not affected by the Change Request (the "Unaffected Portion"). Seller shall not, however, be obliged to continue working on the Affected Portion of such Statement of Work (or if the entire SOW is affected, on the entire SOW) unless and until the Parties have reached agreement and have caused a binding Change Order referencing the applicable Statement of Work to be executed on their behalf by their duly authorized representatives.

C. Whether originally proposed by Seller or by Customer, each fully executed Change Order shall be deemed to be part of the Statement of Work that it references.

21. SUSPENSION OR DELAY

A. In the event that (i) **Error! Reference source not found.** suspends Seller's provision of Services under this Agreement or under any SOW by written notice; or (ii) Seller's provision of Services under this Agreement or under any Statement of Work is hindered, delayed or suspended due to any failure of performance, or other action or omission by **Error! Reference source not found.** and/or its personnel, vendors or subcontractors, the Parties agree that **Error! Reference source not found.** shall compensate Seller for any cost directly related to and actually incurred by Seller for: (i) productivity losses, (ii) idle employee costs, (iii) efficiency losses, (iv) increased supervisory costs, (v) direct project support cost (including vehicle leasing costs, and warehouse leasing costs), (vi) documented and direct project demobilization), and (vii) any increased costs that are documented and directly associated with the unanticipated disposition of Seller personnel and equipment; provided that Seller shall use commercially reasonable efforts in good faith to mitigate any such costs during the period of such hindrance, delay or suspension, consistent with maintaining the capacity to resume work once the period of such hindrance, delay or suspension is over. Additionally, in such event the schedule for performance of such Services as set forth in the Statement of Work shall be extended accordingly and Seller shall have the right to an adjustment in its pricing if such delay or suspension results in an increase in its cost of performance.

B. In the event that the hindrance, delay or suspension persists for more than ten (10) calendar days, the Parties agree that Customer shall also compensate Seller as required for the costs of redeployment of Seller personnel to other projects if Seller reasonably believes that such redeployment should be effected to mitigate costs.

C. In the event Seller claims entitlement to reimbursement of costs and increased overhead due to hindrance, delay or suspension under this Section 21, Seller shall submit an invoice therefor, together with any supporting documents, and Customer will pay such invoice in the normal payment cycle agreed to by the Parties.

22. PUBLICITY.

Neither party shall, without the express written consent of the other party, disclose any information or make any news release, advertisement, or public communication regarding this Agreement. Notwithstanding the foregoing, nothing herein shall prevent either party from making such public disclosures as it, in its sole judgment, may deem appropriate to satisfy such party's (or such party's parent's) obligations under any applicable law or requirement of any stock exchange.

23. INSURANCE.

In the event that Seller's obligations hereunder require or contemplate performance of Services by Seller's employees, or persons under contract to Seller, to be done on Customer's property, or property of the Customer's customers, Seller agrees that all such work shall be done as an independent contractor and that the persons doing such work shall not be considered employees of the Customer. Further, in such event, Seller shall maintain:

23.1. General Liability insurance on a one million dollar ($1,000,000), per occurrence basis; and

23.2. Statutory workers compensation insurance. Customer shall be provided for as an additional insured or loss payee as its interest may appear on the policy referred to in **Section 23.1** above.

24. LIMITATION OF LIABILITY.

Notwithstanding anything contained herein to the contrary, the total aggregate liability of Seller to the Customer for all liability arising out of or in connection with the performance by Seller of its obligations under this Agreement shall be limited to the aggregate sum of payments made by Customer to Seller under this Agreement. **IN NO CASE SHALL EITHER PARTY BE LIABLE TO THE OTHER PARTY FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, PUNITIVE, OR SPECIAL DAMAGES OR FOR THE LOSS OF BENEFIT, PROFIT, REVENUE, OR DATA, EVEN IF THE PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.**

25. TAXES AND PAYMENT.

Seller shall be responsible for all corporate taxes measured by net income due to performance of or payment for work under this Agreement ("Seller Taxes"). Customer shall be responsible for all taxes, duties, fees, or other charges of any nature (including, but not limited to, consumption, gross receipts, import, property, sales, stamp, turnover, use, or value-added taxes, and all items of withholding, deficiency, penalty, addition to tax, interest, or assessment related thereto, imposed by any governmental authority on Customer or Seller or its subcontractors) in relation to the Agreement or the performance of or payment for work under the Agreement other than Seller Taxes ("Customer Taxes"). The price does not include the amount of any Customer Taxes. If Customer deducts or withholds Customer Taxes, Customer shall pay additional amounts so that Seller receives the full Price without reduction for Customer Taxes. Customer shall provide to Seller, within one month of payment, official receipts from the applicable governmental authority for deducted or withheld taxes.

26. INVOICING AND PAYMENT.

26.1. Seller will invoice Customer for the Equipment and Services as follows based upon the prices set forth in the Agreement: (1) For Equipment. Seller will invoice Customer for the Equipment purchased hereunder upon Delivery (as defined below); (2) For Software, Seller will invoice Buyer for the Software license purchased hereunder upon contract signing; and (3)Unless governed by a separate written agreement executed by the parties, any professional, support and/or maintenance services provided by Seller will be invoiced as such Services are provided.

26.2. Payment of all such invoices shall be due and payable thirty (30) days from receipt thereof.

26.3. Any amounts not paid when due shall bear interest at the lesser of 1 ½% per month or the highest amount permitted by law until paid.

26.4. “Delivery” means, (i) in the case of Equipment purchased hereunder, the loading of the equipment on the means of transport of the carrier selected by Seller pursuant to **Section 8** above; and (ii) in the case of Services provided hereunder, the periodic performance of such Services as described herein.

27. SEVERABILITY.

In case any one or more of the provisions contained in this Agreement should be invalid, illegal or unenforceable in any respect, the remaining portions of this Agreement shall continue to be binding and enforceable.

28. GOVERNING LAW AND DISPUTE RESOLUTION.

28.1 This Agreement shall be governed by and construed in accordance with the laws of (i) the federal court in St. Paul, Minnesota if Customer’s place of business is in the U.S.; or (ii) England if the Customer’s place of business is outside the U.S., in either case without giving effect to any choice of law rules that would cause the application of laws of any other jurisdiction (the “Governing Law”). If the Agreement includes the sale of Equipment and the Customer is outside the Seller’s country, the United Nations Convention on Contracts for the International Sale of Goods shall apply.

28.2 All disputes arising in connection with this Agreement, including any question regarding its existence or validity shall be resolved in accordance with this **Section 28**. If a dispute is not resolved by negotiations, either party may, by giving written notice, refer the dispute to a meeting of appropriate higher management, to be held within twenty (20) business days after the giving of notice. If the dispute is not resolved within thirty (30) business days after the giving of notice, or such later date as may be mutually agreed, either party may commence arbitration or court proceedings, depending upon the location of the Customer, in accordance with the following: (a) if the Customer’s pertinent place of business is in the U.S., legal action shall be commenced in federal court with jurisdiction applicable to, or state court located in, either St. Louis County, Missouri or the location of Customer's principal place of business; or (b) if the Customer's pertinent place of business is outside the U.S., the dispute shall be submitted to and finally resolved by arbitration under the Rules of Arbitration of the International Chamber of Commerce ("ICC"). The number of arbitrators shall be one, selected in accordance with the ICC rules, unless the amount in dispute exceeds the equivalent of U.S. $5,000,000, in which event it shall be three. When three arbitrators are involved, each party shall appoint one arbitrator, and those two shall appoint the third within thirty (30) days, who shall be the Chairman. The seat, or legal place, of arbitration, shall be London, England. The arbitration shall be conducted in English. In reaching their decision, the arbitrators shall give full force and effect to the intent of the parties as expressed in the Agreement, and if a solution is not found in the Agreement, shall apply the governing law of the Agreement. The decision of the arbitrator(s) shall be final and binding upon both parties, and neither party shall seek recourse to a law court or other authority to appeal for revisions of the decision.

28.3 Notwithstanding the foregoing, each party shall have the right at any time, at its option and where legally available, to immediately commence an action or proceeding in a court of competent jurisdiction, subject to the terms of this Agreement, to seek a restraining order, injunction, or similar order to enforce the confidentiality provisions set forth in **Sections 13 and 14** and/or the nuclear use restrictions set forth in **Section 31.1**, or to seek interim or conservatory measures. Monetary damages shall only be available in accordance with **Section 28.2**.

29. NOTICES.

Any notices required under this Agreement shall be in writing, in the English language, and shall for all purposes be deemed to be fully given and received if sent by registered or certified mail, postage prepaid, to the respective parties at the addresses set forth on face hereof. Such addresses are subject to change by the respective parties upon written notice as herein provided.

30. SURVIVABILITY.

Notwithstanding the expiration or termination of this Agreement, the following Sections shall survive according to their terms: 10, Warranty; 13, Proprietary Data (Seller); 14, Proprietary Data (Customer); 28, Governing Law and Dispute Resolution; 29, Notices.

31. GENERAL CLAUSES.

31.1 Equipment and Services sold by Seller are not intended for use in connection with any nuclear facility or activity, and Customer warrants that it shall not use or permit others to use Equipment or Services for such purposes, without the advance written consent of Seller. If, in breach of this, any such use occurs, Seller (and its parent, affiliates, suppliers and subcontractors) disclaims all liability for any nuclear or other damage, injury or contamination, and, in addition to any other rights of Seller, Customer shall indemnify and hold Seller (and its parent, affiliates, suppliers and subcontractors) harmless against all such liability. Consent of Seller to any such use, if any, will be conditioned upon additional terms and conditions that Seller determines to be acceptable for protection against nuclear liability.

31.2 Customer shall notify Seller immediately upon any change in ownership of more than fifty percent (50%) of Customer's voting rights or of any controlling interest in Customer. If Customer fails to do so or Seller objects to the change, Seller may (A) terminate the Agreement, (B) require Customer to provide adequate assurance of performance (including but not limited to payment), and/or (C) put in place special controls regarding Seller's Confidential Information.

30. COMPLIANCE WITH LAWS, CODES AND STANDARDS

30.1 Seller shall comply with laws applicable to the manufacture of Equipment and its performance of Services. Customer shall comply with laws applicable to the application, operation, use and disposal of the Equipment and Services.

30.2 Seller's obligations are conditioned upon Customer's compliance with all U.S. and other applicable trade control laws and regulations. Customer shall not trans-ship, re-export, divert or direct products other than in and to the ultimate country of destination declared by Customer and specified as the country of ultimate destination on Seller's invoice.

30.3 Notwithstanding any other provision, Customer shall timely obtain, effectuate and maintain in force any required permit, license, exemption, filing, registration and other authorization, including, but not limited to, building and environmental permits, import licenses, environmental impact assessments, and foreign exchange authorizations, required for the lawful performance of Services at the Site or fulfillment of Customer's obligations, except that Seller shall obtain any license or registration necessary for Seller to generally conduct business and visas or work permits, if any, necessary for Seller's personnel. Customer shall provide reasonable assistance to Seller in obtaining such visas and work permits.

31. US GOVERNMENT CONTRACTS.

31.1 This **Section 31** applies only if the Agreement is for the direct or indirect sale to any agency of the U.S. government and/or is funded in whole or in part by any agency of the U.S. government.

31.2 Customer agrees that all Equipment and Services provided by Seller meet the definition of "commercial-off-the-shelf" ("COTS") or "commercial item" as those terms are defined in Federal Acquisition Regulation ("FAR") 2.101. To the extent the Buy American Act, Trade Agreements Act, or other domestic preference requirements are applicable to this Agreement, the country of origin of the Equipment is unknown unless otherwise specifically stated by Seller in this Agreement. Customer agrees any Services offered by Seller are exempt from the Service Contract Act of 1965 (FAR 52.222-41). Customer represents and agrees that this Agreement is not funded in whole or in part by American Recovery Reinvestment Act funds unless otherwise specifically stated in the Agreement. The version of any applicable FAR clause listed in this **Section 31** shall be the one in effect on the effective date of this Agreement.

31.3 If Customer is an agency of the U.S. Government, then as permitted by FAR 12.302, Customer agrees that all paragraphs of FAR 52.212-4 (except those listed in 12.302(b)) are replaced with these Terms and Conditions. Customer further agrees the subparagraphs of FAR 52.212-5 apply only to the extent applicable for sale of COTS and/or commercial items and as appropriate for the Price.

31.4 If Customer is procuring the Equipment or Services as a contractor, or subcontractor at any tier, on behalf of any agency of the U.S. Government, then Customer agrees that FAR 52.212-5(e) or 52.244-6 (whichever is applicable) applies only to the extent applicable for sale of COTS and/or commercial items and as appropriate for the Price.

32. Software License Agreement.

The purchase of any Software shall be governed in accordance with: (i) the license terms accompanying the Software file at the time it is downloaded or installed; or (ii) if no license terms accompany the Software file, a separate Software License Agreement that has been executed by Seller and Customer and that is in effect for the product(s) at the time of the purchase.

33. TERMS OF AGREEMENT: ORDER OF PRECEDENCE.

The parties intend for these express standard Terms and Conditions contained in this Agreement (including any Schedules and Exhibits thereto) and in any Purchase Order that are consistent with these standard Terms and Conditions to exclusively govern and control each of the parties' respective rights and obligations regarding the manufacture, purchase and sale of Equipment and Service. Notwithstanding the foregoing, if any terms and conditions contained in a Purchase Order conflict with any terms and conditions contained in this Agreement, the applicable standard term or condition herein will prevail, and such contrary or different terms will have no force or effect. Except for such contrary terms, the terms and conditions of all Purchase Orders are incorporated by reference into this Agreement for all applicable purposes hereunder. Without limitation of anything contained in this **Section 33**, any additional, contrary or different terms contained in any confirmation or any of Seller's invoices or other communications, and any other attempt to modify, supersede, supplement or otherwise alter this Agreement, are deemed rejected by Customer and will not modify this Agreement or be binding on the parties unless such terms have been fully approved in a signed writing by authorized representatives of both parties.

34. ENTIRE AGREEMENT.

The Agreement contains the entire agreement and all representations between the parties relating to the subject matter hereof, and supersede all prior or contemporaneous understandings, agreements, negotiations, representations and warranties, and communications, both written and oral. Notwithstanding anything herein to the contrary, if a written contract signed by both parties is in existence covering the sale of the Equipment, Services or Software licensed covered hereby, the terms and conditions of said contract shall prevail to the extent they are inconsistent with these Terms and Conditions.

© 2021 Aclara Technologies LLC
All Rights Reserved.

AGREEMENT FOR SOFTWARE DELIVERABLES AND SERVICES

This Agreement for Software Deliverables and Services (“Agreement”) is made this ________ day of ______, 20____, (“**Effective Date**”) by and between Aclara Technologies LLC, **a limited liability company** of the State of Ohio with offices at 77 Westport Plaza, Suite 500, St. Louis, Missouri 63146 ("Provider"), and [CUSTOMER], a [STATE OF ORGANIZATION] [ENTITY TYPE] with offices located at [ADDRESS] ("**Customer**")

WHEREAS, Provider provides certain software-as-a-service offerings, professional services and deliverables to its customers**;**

WHEREAS, Customer desires to access certain software-as-a-service offerings, professional services and/or deliverables described herein, and Provider desires to provide Customer access to such offerings, subject to the terms and conditions set forth in this Agreement**.**

IN CONSIDERATION OF the following terms and conditions, and other valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Provider agrees to perform the Services and provide the Deliverables for Customer pursuant to the terms of this Agreement.

ARTICLE 1. DEFINITIONS

Certain terms used in this Agreement are defined in this Article 1. Other terms used in this Agreement are defined where they are used and have the meanings there indicated. Unless otherwise specifically defined, those terms, acronyms and phrases in this Agreement that are utilized in the IT services industry or other pertinent business context shall be interpreted in accordance with their generally understood meaning in such industry or business context. The word "and" shall mean "and" as well as "or," unless otherwise specified.

1.1 “Acceptance Criteria” shall mean, with respect to a Deliverable, a mutually agreed upon statement defining the criteria for acceptance of that Deliverable. With respect to Services, Acceptance Criteria shall mean a statement defining the criteria for acceptance of that Service.

1.2 “Access Credentials” means any username, identification number, password, license or security key, security token, PIN, or other security code, method, technology, or device used, alone or in combination, to verify an individual's identity and authorization to access and use the Services.

1.3 "Aclara Materials" means the Services, Specifications, Documentation, and Aclara Systems and any and all other information, data, documents, materials, works, and other content, devices, methods, processes, hardware, software, and other technologies and inventions, including any deliverables, technical or functional descriptions, requirements, plans, or reports, that are provided or used by Aclara or any subcontractor in connection with the Services or otherwise comprise or relate to the Services or Aclara Systems. For the avoidance of doubt, Aclara Materials include Resultant Data and any information, data, algorithms or other content derived from Aclara's monitoring of Customer's access to or use of the Services.

1.4 “Aclara Systems” means the information technology infrastructure used by or on behalf of Aclara in performing the Services, including all computers, software, hardware, databases, electronic systems (including database management systems), and networks, whether operated directly by Aclara or through the use of third-party services

1.5 “Affiliate(s)” means, with respect to any entity, any other entity that owns, directly (or indirectly through one or more intermediaries) controls or is controlled by, or is under common control with, such entity.

1.6 “Agreement” shall consist of this document (including attachments, schedules and addendums to the Agreement) and any SOW and Purchase Order issued under the Agreement**.**

1.7 "**Authorized User**" means Customer's employees, consultants, contractors, and agents (a) who are authorized by Customer to access and use the Services under the rights granted to Customer pursuant to this Agreement; and (b) for whom access to the Services has been purchased hereunder.

1.8 “Claims” means any claim, action, cause of action, demand, lawsuit, whether at law, in equity, or otherwise brought by a third party.

1.9 “Cloud Services” shall mean software services comprised of a software licensing model in which access to the software and its updates/maintenance are provided on a subscription basis.

1.10 “Confidential Information” includes, without limitation, (a) non-public information and/or private business information developed, collected or created by Party (b) a Party’s Proprietary Information and (c) trade secret information including technical or non-technical data, formulae, patterns, compilations, client lists, business plans, programs, devices, methods, techniques, drawings, diagrams or processes, data, databases, software, specifications, in any form or format that (i) are not generally known in the trade or business of a Party, (ii) have direct or indirect, tangible or intangible, actual or potential value, (iii) are not readily ascertainable from publicly available information, and (iv) are the subject of reasonable protection measures taken by Party.

1.11“Customer Data” means information, data, and other content, in any form or medium, that is collected, downloaded, or otherwise received, directly or indirectly from Customer by or through the Services.

1.12 “Customer Systems” means the Customer's information technology infrastructure, including computers, software, hardware, databases, electronic systems (including database management systems), and networks, whether operated directly by Customer or through the use of third-party services, other than Aclara provided services.

1.13 “Deliverable” shall mean the Software Deliverable, hardware, products, and other tangible goods and materials, including data, delivered to Customer under this Agreement or any SOW.

1.14 “Designated Equipment” shall mean the computer equipment of Customer in which Aclara loads the Software or the Customer’s back-up computer equipment and such additional equipment as Customer may from time to time designate in writing, which such back-up equipment and such additional equipment shall meet Aclara’s applicable specifications **.**

1.15 “Disaster Recovery Plan” means the establishment of the processes necessary to enable the recovery of vital data, software, systems, and networks following a natural or human-induced disaster or equipment failure.

1.16 “Documentation” means the user manuals and supporting documentation in electronic form containing copyrighted material and other Proprietary Information of Aclara provided with the Deliverable or Services under this Agreement.

1.17 “Fix” shall mean changes intended to correct feature/function deficiencies and/or system vulnerabilities.

1.18 “Harmful Code” means any software, hardware, or other technology, device, or means, including any virus, worm, malware, or other malicious computer code, the purpose or effect of which is to (a) permit unauthorized access to, or to destroy, disrupt, disable, distort, or otherwise harm or impede in any manner any (i) computer, software, firmware, hardware, system, or network; or (ii) any application or function of any of the foregoing or the security, integrity, confidentiality, or use of any data Processed thereby; or (b) prevent Customer or any Authorized User from accessing or using the Software Services or Aclara Systems as intended by this Agreement. Harmful Code does not include any Aclara disabling device.

1.19 “Hosting Services” shall mean any Software Services (whether performed by Aclara or through a third party) that involve hosting data, software, or services external to Customer.

1.20 “Intellectual Property Right” shall mean, on a worldwide basis, any and all: (a) rights associated with works of authorship, including copyrights, moral rights and mask-works; (b) trademarks, service marks, trade names, trade dress, symbols, logos, designs, and other source identifiers; (c) trade secret rights; (d) patents, designs, algorithms and other industrial property rights; (e) other intellectual and industrial property rights of every kind and nature, however designated, whether arising by operation of law, contract, license or otherwise; and (f) registrations, initial applications, renewals, extensions, continuations, divisions or re-issues thereof, now or hereafter in force (including any rights in any of the foregoing.

1.21 “Issue” means a problem with the Software Services, identified by the Customer, which requires a response by Aclara to resolve.

1.22 “Licensing Parameters” means Central Processing Units (CPUs), Processors (including Sockets and/or Cores), Seats, Interfaces and End Points connected to the system (Meters, LCTs, CSTs, DSIs, etc.) and Utilities as set forth on Attachment A

1.23 “Losses” shall mean all losses, liabilities, damages and claims, and all related costs and expenses (including reasonable legal fees and disbursements and costs of investigation, litigation, settlement, judgment, interest and penalties).

1.24 “Object Code” means the instructions or statements comprising the Software expressed in machine-readable language, being the machine level representations that actually cause the computer to execute instructions and operations.

1.25 “Patch” shall mean a version of the Software that provides an Error Correction to address an urgent need that is outside the schedule of regularly released Software Revisions or Software Versions.

1.26 “Personal Identifying Information” or “PII” shall mean Customer Data which contains any name or number that may be used, alone or in conjunction with any other information, to identify a specific person, including any (1) name, social security number, date of birth, official State or government issued driver's license or identification number, alien registration number, government passport number, employer or taxpayer identification number; (2) unique biometric data, such as fingerprint, voice print, retina, iris image, or other unique physical representation; (3) unique electronic identification number, address, or routing code;

1.27 “Private Label Site” the private label versions of the Software the Provider hosts and maintains**.**

1.28 “Project” shall mean the Services and/or Deliverables as set forth in an individual SOW.

1.29 "Proprietary Information” shall mean any data, documentation, methods, processes, materials, and all other information that is owned by either Party or an Affiliate thereof.

1.30 “Purchase Order” shall mean the document issued on behalf of Customer authorizing the commencement of Services or the delivery of Deliverables.

1.31 “Representatives” means, with respect to a party, that party's and its Affiliates' employees, officers, directors, consultants, agents, independent contractors, service providers, subcontractors, and legal advisors.

1.32“Resultant Data” means data and information related to Customer's use of the Services that is used by Aclara in an aggregate and anonymized manner, including to compile statistical and performance information related to the provision and operation of the Services.

1.33 “Security Incident” means one or more unwanted or unexpected information security events that could possibly compromise the security of information and weaken or impair business operations.

1.34 “Severity Level” means a designation of the effect of an Issue on the Customer’s use of the System as set forth in Exhibit C, Maintenance and Support Services.

1.35 “Services” shall mean any software implementation and testing, software maintenance and support, Cloud Services or Hosting Services, and other information technology services provided to Customer under this Agreement, and any SOW or Purchase Order referencing this Agreement.

1.36 “Software” means the software described on Attachment A as “Aclara Software”.

1.37 “**Software Deliverable**” shall mean Software loaded on the Designated Equipment and delivered to Customer under this Agreement or any SOW.

1.38 “Software Services” shall mean either Hosting Services or Cloud Services.

1.39 “Statement of Work (“SOW”)” shall mean an attachment to this Agreement, substantially in the form of Exhibit A hereof, that states, with respect to each Project: A detailed description of the Services and Deliverables; work schedule (including the due dates related to the applicable Deliverables and Services, and any milestone dates); specifications, performance standards and functional requirements; documentation, and; fees and payment schedule. In the event of a conflict between an SOW and the provisions of this Agreement, the Agreement shall take precedence.

1.40 “**Supplemental Services**” shall mean the services set forth on Exhibit C-3 hereto, and offered at the prices set forth on Exhibit C-3 hereto.

1.41 “System Incident” a Security Incident with the potential of causing irreparable or significant damage, corruption or loss (compromise) of Confidential Information.

1.42 “Third Party Deliverable” means the Deliverable described on the Attachment A as “Third Party Software—Included in this Agreement.

1.43 “**Third-Party Materials**" means materials and information, in any form or medium, including any software, documents, data, content, specifications, products, equipment, or components of or relating to the Services that are not proprietary to Aclara

1.44 “Vulnerability” shall mean a weakness in a product that could allow an attacker to compromise the integrity, availability, or confidentiality of that product.

ARTICLE 2. THE SERVICES AND DELIVERABLES

2.1 Services and Deliverables Description.

The Services and Deliverables to be provided hereunder shall be set forth in individual SOWs which shall incorporate the terms and conditions of this Agreement. Each such SOW shall detail the nature of the Services and Deliverables, which may be further defined by attachments. Aclara will provide the Services and Deliverables which are designated in the SOW, within the timeframe set forth therein.

2.2 Software Deliverables.

For Software Deliverables furnished by Aclara to Customer, the following provisions shall apply:

(a) Grant of License

(i) Aclara hereby grants to the Customer a non-exclusive, royalty-free, worldwide, non-transferable license and perpetual (subject to termination as set forth herein) Object Code license to use the Software Deliverable on the Designated Equipment solely in connection with Customer's use of the System and only for the purposes set forth in Section 2.2 (a)(ii) copy the Software.

(ii) Notwithstanding any other provision in this Agreement to the contrary, and for no additional or incremental license fees and only for internal business purposes, the Customer may: (a) make a reasonable number of copies of the software Deliverable for back-up or archival purposes or (b) operate the Software Deliverable on the Designated Equipment for testing the Software Deliverable.

(iii) Third Party Deliverables are sublicensed by Aclara to Customer pursuant to sublicensing agreements with the respective third parties identified on Attachment A.

(b) Restrictions on Use

(i) Parameters. Customer use of the Software Deliverable is restricted to the Licensing Parameters. Use of the Software Deliverable outside the Licensing Parameters is subject to the express written consent of Aclara and the payment of all required additional Fees.

(ii) Alterations. Customer's use of the Software Deliverable is limited in that Customer is prohibited from altering, attempting to reverse engineer, attempting to decompile, or creating or attempting to create a derivative work from the Software Deliverable.

(iii) Compliance with Laws. Customer's use of the Software Deliverable is limited in that it must use the Software Deliverable and the Documentation in accordance with all applicable laws and regulations of the United States and the States, Country and localities in which the Software Deliverable and Documentation is used.

(iv) Use on Designated Equipment. Customer's use of the Software Deliverable is restricted to use on the Designated Equipment. Should Customer desire to transfer the operation of the Software Deliverable to a computer other than the Designated Equipment, Customer shall notify Aclara upon such transfer. Such computer must meet the specifications of the Designated Equipment. Upon such notification, such computer shall become the Designated Equipment. Under no circumstances may the Licensed Software be used for production purposes on other than the Designated Equipment.

(v) Temporary Use. Without notice to Aclara, Customer may temporarily transfer the operation of the Software Deliverable to a backup computer if the Designated Equipment is inoperative due to malfunction, or during the performance of preventive maintenance, engineering changes or changes in features or model until the Designated Equipment is restored to operative status and processing of the data already entered into the back-up computer is completed.

2.3 Software Services.

(a) Access and Use.

(i) Hosting Services. Subject to and conditioned on Customer's compliance with the terms and conditions of this Agreement, Aclara hereby grants Customer a non-exclusive, non-transferable right to access and use the Hosting Services during the Term, solely for its own internal business purposes in accordance with the terms and conditions herein. Aclara shall provide to Customer the Access Credentials within a reasonable time following the Effective Date.

(ii) Cloud Services. Subject to and conditioned on Customer's compliance with the terms and conditions of this Agreement, Aclara will provide functionality on Aclara Systems to enable Customer to access the Cloud Services and triggers that provide access to the Software used to collect Customer Data. Aclara hereby grants Customer a non-exclusive, non-transferable right to access and use the Cloud Services during the Term, solely for its own internal business purposes in accordance with the terms and conditions herein. Aclara shall provide to Customer the Access Credentials within a reasonable time following the Effective Date.

(b) Service and System Control. Except as otherwise expressly provided in this Agreement, as between the parties:

(i) Aclara has and will retain sole control over the operation, provision, maintenance, and management of the Aclara Materials; and

(ii) Customer has and will retain sole control over the operation, maintenance, and management of, and all access to and use of, the Customer Systems, and sole responsibility for all access to and use of the Aclara Materials by any Person by or through the Customer Systems or any other means controlled by Customer, including any: (i) information, instructions, or materials provided by any of them to the Services or Aclara; (ii) results obtained from any use of the Services or Aclara Materials; and (iii) conclusions, decisions, or actions based on such use.

(c) Use Restrictions. Customer shall not, and shall not permit any other person to, access or use the Services or Aclara Materials except as expressly permitted by this Agreement and, in the case of Third-Party Deliverables, the applicable third-party license agreement. For purposes of clarity and without limiting the generality of the foregoing, Customer shall not, except as this Agreement expressly permits:

(i) copy, modify, or create derivative works or improvements of the Software Services or Aclara Materials;

(ii) rent, lease, lend, sell, sublicense, assign, distribute, publish, transfer, or otherwise make available any Software Services or Aclara Materials to any person, including on or in connection with the internet or any time-sharing, service bureau, software as a service, cloud, or other technology or service;

(iii) reverse engineer, disassemble, decompile, decode, adapt, or otherwise attempt to derive or gain access to the source code of the Software Services or Aclara Materials, in whole or in part;

(iv) bypass or breach any security device or protection used by the Software Services or Aclara Materials or access or use the Software Services or Aclara Materials other than by valid Access Credentials;

(v) input, upload, transmit, or otherwise provide to or through the Software Services or Aclara Systems, any information or materials that are unlawful or injurious, or contain, transmit, or activate any Harmful Code;

(vi) damage, destroy, disrupt, disable, impair, interfere with, or otherwise impede or harm in any manner the Software Services, Aclara Systems, or Aclara's provision of services to any third party, in whole or in part;

(vii) remove, delete, alter, or obscure any trademarks, Specifications, Documentation, EULA, warranties, or disclaimers, or any copyright, trademark, patent, or other intellectual property or proprietary rights notices from any Software Services or Aclara Materials, including any copy thereof;

(viii) access or use the Software Services or Aclara Materials in any manner or for any purpose that infringes, misappropriates, or otherwise violates any Intellectual Property Right or other right of any third party (including by any unauthorized access to, misappropriation, use, alteration, destruction, or disclosure of the data of any other Aclara customer), or that violates any applicable Law;

(ix) access or use the Software Services or Aclara Materials for purposes of competitive analysis of the Software Services or Aclara Materials, the development, provision, or use of a competing software service or product or any other purpose that is to Aclara's detriment or commercial disadvantage; or

(x) otherwise access or use the Software Services or Aclara Materials beyond the scope of the authorization granted under this Section 2.3.

(d) <u>Customer Obligations.</u>

(i) <u>Customer Systems and Cooperation</u>. Customer shall at all times during the Term: (a) set up, maintain, and operate in good repair and in accordance with the Specifications all Customer Systems on or through which the Software Services are accessed or used; (b) provide Aclara Personnel with such access to Customer's premises and Customer Systems as is necessary for Aclara to perform the Software Services in accordance with the Availability Requirement and Specifications; and (c) provide all cooperation and assistance as Aclara may reasonably request to enable Aclara to exercise its rights and perform its obligations under and in connection with this Agreement.

(ii) <u>Effect of Customer Failure or Delay</u>. Aclara is not responsible or liable for any delay or failure of performance caused in whole or in part by Customer's delay in performing, or failure to perform, any of its obligations under this Agreement (each, a "**Customer Failure**").

(iii) Corrective Action and Notice. If Customer becomes aware of any actual or threatened activity prohibited by Section 2.3(c) Customer shall, and shall cause its Authorized Users to, immediately: (a) take all reasonable and lawful measures within their respective control that are necessary to stop the activity or threatened activity and to mitigate its effects (including, where applicable, by discontinuing and preventing any unauthorized access to the Software Services and Aclara Materials and permanently erasing from their systems and destroying any data to which any of them have gained unauthorized access); and (b) notify Aclara of any such actual or threatened activity.

(iv) (**Applicable for Profield® Software Solution**) Prior to commissioning the Software Services, Customer shall supply a list of the names of all users who are authorized to use the Software Services. Customer shall keep the list current at all times and promptly inform Aclara of any change in Customer End Users. Customer will strictly enforce each Customer End User's user identification and password controls, to ensure that Customer End User's identity is not used to access the Software Services by any other person.

2.4 Documentation.

Subject to the terms and conditions set forth herein, Aclara hereby grants to Customer, and Customer accepts, a fully paid, non-exclusive, non-transferable, license to use the Documentation during the Term of this Agreement and solely in connection with its use of the Software Deliverable or Software Services.

2.5 Maintenance and Support Services.

For Hosting and Cloud Services furnished by Aclara to Customer, Aclara shall provide service level standards, as set forth in Exhibit C-1, Software Services Schedule. For Software Deliverable furnished by Aclara to Customer, Aclara shall provide maintenance and support services as set forth in Exhibit C-2. For Supplemental Services furnished by Aclara to Customer, Aclara shall provide such services in accordance with Exhibit C-3.

2.6 Changes.

(a) Aclara reserves the right, in its sole discretion, to make any changes to the Services and Aclara Materials that it deems necessary or useful to (i) maintain or enhance the quality or delivery of Aclara's services to its customers; (ii) the competitive strength of or market for Aclara's services; (iii) the Services' cost efficiency or performance; or (iv) to comply with applicable Law.

(b) Without limiting the foregoing, either party may, at any time during the Term, request in writing changes to the Services. The parties shall evaluate and, if agreed, implement all such requested changes in accordance with the change procedure set forth in the SOW. In the event of a change, the Parties will use commercially reasonable efforts to negotiate and execute a "Change Order" to the Statement of Work setting forth all necessary updates. Each Change Order shall include, as applicable, changes to the Services, Deliverables, Work Schedule, fees or other material terms of the Statement of Work, and, upon execution thereof, Aclara waives any claim resulting from the Change for additional compensation or change to the Work Schedule except as set forth in the Change Order, including, without limitation, claims related to lost productivity and lost efficiency. No claim for additional compensation or an adjustment to the Work Schedule shall be allowed unless the same was authorized by a written Change Order executed by an authorized representative of both parties in advance of the performance of the applicable Services or Deliverables.

2.7 Reservation of Rights.

Nothing in this Agreement grants any right, title, or interest in or to (including any license under) any Intellectual Property Rights in or relating to, the Services, Aclara Materials, or Third-Party Materials, whether expressly, by implication, estoppel, or otherwise. All right, title, and interest in and to the Services, the Aclara Materials, and the Third-Party Materials are and will remain with Aclara and the respective rights holders in the Third-Party Materials.

ARTICLE 3. TERM

3.1 Initial Term.
The initial term of this Agreement commences as of the Effective Date and, unless terminated earlier pursuant any of the Agreement's express provisions, will continue in effect for a period of five (5) years from such date (the "Initial Term").

3.2 Renewal Term.
This Agreement will automatically renew for successive twelve 12 month periods unless earlier terminated pursuant to this Agreement's express provisions or either party gives the other party written notice of non-renewal at least 60 days prior to the expiration of the then-current term (each a "Renewal Term" and, collectively, together with the Initial Term, the "Term").

ARTICLE 4. PAYMENT

4.1 Billing Rate.
4.1.1. The Fees for the Deliverables and Services provided hereunder shall be set forth in Exhibit B, Fees. Aclara will invoice Customer for the Deliverables and Services as follows: (a) for Software Deliverables, Aclara will invoice Customer upon contract execution; (b) for implementation Services, Aclara will invoice Customer as set forth in the SOW; and (c) for Cloud Services/Hosting Services, Aclara will invoice Customer the Annual Service Provider (ASP) Fees annually in advanced and shall not be subject to adjustment during the Initial Term. Thereafter, during any subsequent Renewal Term, upon receipt of a 30 day notice, the ASP Fee shall be subject to adjustment not to exceed five percent (5%) at the commencement of each Renewal Term.

4.1.2. Support Fees for Software Deliverables. The charge for the service level selected by the Customer shall be at the annual Fee as identified in Exhibit C-2 during the Initial Term of this Agreement. The annual Fee shall not be subject to adjustment during the Initial Term. Thereafter, during any subsequent Renewal Term, upon receipt of a 30 day notice, the Fee shall be subject to adjustment not to exceed five percent (5%) at the commencement of each Renewal Term.

4.1.3. Partial Services. Aclara reserves the right to invoice the Customer for any partial month services which may result from the Effective Date or date of termination of this Agreement, at a prorated charge.

4.1.4. Reinstatement Fee. In the event that Customer terminates or elects not to renew this Agreement and subsequently wishes to reinstate it, in addition to paying Aclara’s then current fees and charges, Customer shall also pay Aclara, a reinstatement charge. The reinstatement charge shall include a lump sum equal to the total fees and charges which would have been paid for the period of lapse had the lapse not occurred: provided, however that if the lapse period is three (3) years or longer, Aclara shall have the option at its sole discretion to refuse to reinstate said Agreement.

4.2 <u>Due Dates for Payment</u>.
Payments for all invoices shall be due and payable thirty (30) days from the date of receipt . Any amounts not paid when due shall bear interest at the lesser of one and one half percent (1 ½%) per month or the highest permitted by law until paid. In the event that annually Fees remain unpaid for more than thirty(30) days after becoming due for payment, Aclara shall be entitled to withdraw the Maintenance or Software Services.

4.3 <u>Taxes</u>.
Aclara shall be responsible for all corporate taxes measured by net income due to performance of, provision of or payment for Services or Deliverables under this Agreement ("Aclara Taxes"). Customer shall be responsible for all taxes, duties, fees, or other charges of any nature (including, but not limited to, consumption, gross receipts, import, property, sales, stamp, turnover, use, or value-added taxes, and all items of withholding, deficiency, penalty, addition to tax, interest, or assessment related thereto, imposed by any governmental authority on Customer or Aclara or its subcontractors) in relation to the Agreement or the performance of , provision of or payment for Services or Deliverables under the Agreement other than Aclara Taxes ("Customer Taxes"). The price does not include the amount of any Customer Taxes. If Customer deducts or withholds Customer Taxes, Customer shall pay additional amounts so that Aclara receives the full Price without reduction for Customer Taxes. Customer shall provide to Aclara, within one month of payment, official receipts from the applicable governmental authority for deducted or withheld taxes.

ARTICLE 5. TIME FOR PERFORMANCE

5.1 <u>Delivery</u>.
(a) Aclara shall use commercially reasonable efforts to deliver the Deliverables and provide the Services within the times set forth on Exhibit A. Purchaser understands and agrees that the ability of Aclara to make such deliveries and provide such Service within such times is dependent upon the timely issuance of Purchase Orders (if required) and timely performance of Customer's Obligations. Customer agrees that it will use commercially reasonable efforts to cause Customer's personnel to perform their respective obligations in a timely fashion and to cooperate with Aclara in scheduling their respective Services.

(b) Except as specified in an SOW or Purchase Order, Deliverables shall be FCA Aclara's facility, and pursuant to the delivery schedule, if any, set out in said SOW or Purchase Order.

5.2 <u>Project Schedule</u>.
The schedule for the Deliverables and Services (the "Project Schedule") shall be determined on a project by project basis as more particularly described in the applicable SOWs. The Project Schedule shall begin and end as specified on such SOWs, which shall list the Deliverables and Services involved, the schedule for delivery and performance, any milestone dates, and the deadline for the completion of all such activities.

5.3 <u>Acceptance</u>.
Acceptance of the Deliverables and Services shall be in accordance with Acceptance Criteria set forth in the SOW.

ARTICLE 6. SECURITY

6.1 <u>Secure Environment</u>.
For hosting services and cloud services Aclara will implement and maintain secure systems and environment according to the following terms: (a) utilize only datacenters that are certified as SSAE 18

SOC 2 compliant, with actively-managed multi-layered security and redundant power systems; (b) maintain firewall protection; (c) maintain antivirus software with automated monitoring; (d) encrypt all PII data at rest and in transit; (e) perform monthly vulnerability scanning; and (f) perform annual security penetration testing.

6.2. **<u>Disaster Recovery</u>**.
Aclara shall maintain appropriate backups of all Customer data. Aclara shall maintain Disaster Recovery plans and exercise Disaster Recovery plans on an annual basis for the cloud services provided. For hosting services, Aclara shall, at Customer's request and expense, offer Disaster Recovery services and exercise Disaster Recovery plans on an annual basis for Customer.

6.3. **<u>Incident Response</u>**.
In the event of an Aclara, or subcontractor, System Incident, Aclara shall: (a) promptly, but in no event more than 48 hours of becoming aware of the incident, notify Customer; (b) then provide Customer with a written report within the subsequent 48 hours detailing the scope of the incident and the measures taken to by Aclara to respond to the incident; and (c) use best efforts to remedy the incident and prevent any further or recurrent incidents at Aclara's expense in accordance with applicable privacy laws, regulations, and standards.

6.4. **<u>Vulnerability Remediation</u>**.
Aclara shall take full responsibility for the comprehensive remediation of security vulnerabilities found in Aclara's hosting services and cloud services that could reasonably result in a System Incident.

6.5 **<u>Customer Control and Responsibility</u>**.
Customer has and will retain sole responsibility for: (a) all Customer Data, including its content and use; (b) all information, instructions, and materials provided by or on behalf of Customer or any Authorized User in connection with the Services; (c) Customer's information technology infrastructure, including computers, software, databases, electronic systems (including database management systems), and networks, whether operated directly by Customer or through the use of third-party services ("**Customer Systems**"); (d) the security and use of Customer's and its Authorized Users' Access Credentials; and (e) all access to and use of the Services and Aclara Materials directly or indirectly by or through the Customer Systems or its or its Authorized Users' Access Credentials, with or without Customer's knowledge or consent, including all results obtained from, and all conclusions, decisions, and actions based on, such access or use.

6.6 **<u>Access and Security</u>.**
Customer shall employ all physical, administrative, and technical controls, screening, and security procedures and other safeguards necessary to: (a) securely administer the distribution and use of all Access Credentials and protect against any unauthorized access to or use of the Services; and (b) control the content and use of Customer Data, including the uploading or other provision of Customer Data for processing by the Services.

6.7 **<u>Harmful Code</u>.**
Aclara represents, warrants and covenants that: (a) Aclara will use its best efforts to ensure that no Harmful Code is introduced into the software, Customer Data or other Deliverables, or any systems used to perform the Services, and Aclara will not insert into any software any code which would have the effect of disabling or otherwise shutting down all or a portion of such software or damaging any Customer Data, systems or functionality.

ARTICLE 7. TERMINATION

7.1 Termination.

(a) Aclara may terminate this Agreement at any time upon delivery thirty (30) days prior written notice to Customer.

(b) either party may terminate this Agreement, effective upon delivery of at least ten (10) days prior written notice to the other party, (i) if the other party materially breaches this Agreement, and (ii) further fails within thirty (30) days (or within such longer period as may be otherwise mutually agreed) after the non-breaching party provides the breaching Party with written notice of such breach; and

(c) either party may terminate this Agreement, effective immediately upon written notice to the other party, if the other party: (i) becomes insolvent or is generally unable to pay, or fails to pay, its debts as they become due; (ii) files or has filed against it, a petition for voluntary or involuntary bankruptcy or otherwise becomes subject, voluntarily or involuntarily, to any proceeding under any domestic or foreign bankruptcy or insolvency law; (iii) makes or seeks to make a general assignment for the benefit of its creditors; or (iv) applies for or has appointed a receiver, trustee, custodian, or similar agent appointed by order of any court of competent jurisdiction to take charge of or sell any material portion of its property or business.

7.2 Effects of Termination

Upon any expiration or termination of this Agreement, except as expressly otherwise provided in this Agreement:

(a) all rights, licenses, consents, and authorizations granted by either party to the other hereunder will immediately terminate;

(b) Aclara shall cease all use of any Customer Data or Customer's Confidential Information and at the request of the Customer within a commercially reasonable time (i) return to Customer, or at Customer's written request destroy, all documents and tangible materials containing, reflecting, incorporating, or based on Customer Data or Customer's Confidential Information; and (ii) permanently erase all Customer Data and Customer's Confidential Information from all systems Aclara directly or indirectly controls, provided however, Aclara that may retain copies of such information that is stored in Aclara's archive or back-up systems or as required by applicable law or Aclara's document retention policy;

(c) Customer shall immediately cease all use of any Services or Aclara Materials and (i) promptly return to Aclara, or at Aclara's written request destroy, all documents and tangible materials containing, reflecting, incorporating, or based on any Aclara Materials or Aclara's Confidential Information and (ii) permanently erase all Aclara Materials and Aclara's Confidential Information from all systems Customer directly or indirectly controls; provided that Customer may retain copies of such information that is stored in Customer's archive or back-up systems or as required by applicable law or Customer's document retention policy ; and (iii) certify to Aclara in a signed written instrument that it has complied with the requirements of this Section 7.2(c);

(d) Aclara may disable all Customer and Authorized User access to the Aclara Materials;

(e) if either Party terminates this Agreement pursuant to Section 7.1(a), Aclara shall be paid all Fees related to Deliverables provided and Services performed prior to the effective date of termination.

ARTICLE 8. CONFIDENTIALITY

8.1 Confidentiality.
From time to time during the Term of this Agreement, either Party (as the "Disclosing Party") may disclose or make available to the other Party (as the "Receiving Party"), Confidential Information of Disclosing Party that, if disclosed in writing or other tangible form is clearly labeled as "confidential," or if disclosed orally, is identified as confidential when disclosed and within thirty (30) days thereafter, is summarized in writing and confirmed as Confidential Information. The Parties shall hold all Confidential Information of the other Party confidential, and shall not use or disclose it to others (except as is necessary to perform its obligations under the Contract and with the prior written consent of the disclosing Party). The Receiving Party shall maintain security measures designed to: (i) protect the security and confidentiality of the Confidential Information of the Disclosing Party; (ii) protect against any anticipated threats or hazards to the security or integrity of such Confidential Information; and (iii) protect against unauthorized access to or use of such Confidential Information; provided, however, that Confidential Information does not include any information that: (a) is or becomes generally available to the public other than as a result of Receiving Party's breach of this Section 8.

8.2 Exclusions.
Confidential Information does not include information that: (a) was rightfully known to the Receiving Party without restriction on use or disclosure prior to such information's being disclosed or made available to the Receiving Party in connection with this Agreement; (b) was or becomes generally known by the public other than by the Receiving Party's or any of its Representatives' noncompliance with this Agreement; (c) was or is received by the Receiving Party on a non-confidential basis from a third party that to the Receiving Party's reasonable knowledge was not or is not, at the time of such receipt, under any obligation to maintain its confidentiality; or (d) was or is independently developed by the Receiving Party without reference to or use of any Confidential Information.

8.3 Compelled Disclosure.
If the Receiving Party or any of its Representatives is compelled by applicable Law to disclose any Confidential Information then, to the extent permitted by applicable Law, the Receiving Party shall: (a) promptly, and prior to such disclosure, notify the Disclosing Party in writing of such requirement so that the Disclosing Party can seek a protective order or other remedy or waive its rights under Section 8.1; and (b) provide reasonable assistance to the Disclosing Party, at the Disclosing Party's sole cost and expense, in opposing such disclosure or seeking a protective order or other limitations on disclosure. If the Disclosing Party waives compliance or, after providing the notice and assistance required under this Section 8.3, the Receiving Party remains required by law to disclose any Confidential Information, the Receiving Party shall disclose only that portion of the Confidential Information that, on the advice of the Receiving Party's legal counsel, the Receiving Party is legally required to disclose and, on the Disclosing Party's request, shall use commercially reasonable efforts to obtain assurances from the applicable court or other presiding authority that such Confidential Information will be afforded confidential treatment.

8.4. In the event of a breach of this Section 8, the breaching party shall indemnify the non-breaching party for any Losses associated with the breach of this Section 8.

ARTICLE 9. INDEMNITY

For the purpose of this **Section 9** only, "Customer Parties" shall mean Customer, its directors, officers, agents and employees, contractors and subcontractors (other than Seller), assignees, subsidiaries and affiliates, and each of them; "Aclara Parties" shall mean Aclara, its directors, officers, agents and employees, contractors and subcontractors at any tier, and the subcontractor's directors, officers, agents and employees, and each of them. The Parties obligations under this **Section 9** shall not be limited to their respective insurance coverage.

9.1 <u>General Indemnity for Deliverables and Services</u>.

(a) Aclara shall indemnify Customer Parties for Losses arising from Claims, whether based on statute or regulation or on theories of contract, tort, strict liability, or otherwise, which are brought against one or more Customer Parties involving injuries or damages to persons or property arising from: (a) the negligent acts or omissions of Aclara Parties in connection with the delivery of Deliverables or performance of Services; or (b) Losses resulting from any incident involving the supply, access or maintenance of data or the networks and systems that store, process or transmit such data under this Agreement provided that: (i) Customer promptly notifies Aclara in writing of such Claims; (ii) Customer fully cooperates with Aclara in assisting in the defense or settlement of such Claims; and (iii) Aclara has the sole right to conduct the defense of such Claims or to settle such Claims. Aclara shall defend at its own expense, with counsel of its choosing, but reasonably acceptable to Customer, any suit or action brought against Customer Parties based upon such Claims. Further, provided that Customer promptly notifies Aclara in writing of any alleged violations described below, Aclara shall also indemnify Customer Parties for any and all loss or liability for fines, fees or penalties for violations of any statutes, regulations, rules, ordinances, codes or standards applicable to the work arising from or relating to acts or omissions of Aclara Parties. Aclara's obligations under this **Section 9.1 (a)** shall be reduced to the extent of the negligence, gross negligence or willful misconduct of Customer Parties.

(b) Customer shall indemnify Aclara Parties for Losses from Claims for injuries or damages to persons or property arising from or in any manner relating to acts or omissions of Customer Parties under this Agreement provided that: (i) Aclara promptly notifies Customer in writing of such Claims; (ii) Aclara fully cooperates with Customer in assisting in the defense or settlement of such Claims; and (iii) Customer has the sole right to conduct the defense of such Claims or to settle such Claims. Customer shall defend at its own expense, with counsel of its choosing, but reasonably acceptable to Aclara, any suit or action brought against Aclara Parties based upon such Claims. Further, provided that Aclara promptly notifies Customer in writing of any alleged violations described below, Customer shall also indemnify Aclara Parties for any and all loss or liability for fines, fees or penalties for violations of any statutes, regulations, rules, ordinances, codes or standards applicable to the work arising from or relating to acts or omissions of Customer Parties. Customer's obligations under this **Section 9.1 (b)** shall be reduced to the extent of the negligence, gross negligence or willful misconduct of Aclara Parties.

9.2 <u>Intellectual Property Indemnity</u>

(a) Aclara shall defend and indemnify Customer against any Claims alleging that Deliverables or Services furnished under this Agreement infringe a patent in effect in the U.S., an EU member state or the country of the site (provided there is a corresponding patent issued by the U.S. or an EU member state), or any copyright or trademark registered in the country of in which the premises where Deliverables are used or Services are performed, not including Aclara's premises from which it performs Services provided that (i) in the case of software Deliverables, it is the latest released version of the software; (ii) Customer promptly, and in any event, within ten (10) days of becoming aware of the Claims, notifies Aclara in writing of such Claims; (iii) Customer makes no admission of liability and does not take any position adverse to Aclara; (iv) Customer provides Aclara with full disclosure and fully cooperates with Aclara in assisting in the defense or settlement of such Claims and (v) Aclara has the sole right to conduct the defense of such Claims or to settle such Claims .

(b) Notwithstanding the foregoing, if any software or other Deliverable provided by Aclara under the terms of this Agreement becomes, or in Aclara's reasonable opinion is likely to become, the subject of any infringement or misappropriation claim or proceeding, then Aclara shall, at its sole option and expense shall either: (i) obtain for Customer the right and license to continue to use the software or other Deliverable in the manner permitted under this Agreement; or (ii) replace or modify the same with an equivalent non-infringing product with functionality substantially similar to the product it is replacing; or

(iii) failing (i) or (ii), take back infringing Deliverable or Services and refund the price received by Aclara attributable to the infringing Deliverable or Services. Notwithstanding the foregoing, Aclara shall not be liable for any Claims based upon (1) the combination or use of Deliverables or Services with any other equipment or software not supplied or authorized by Aclara, or (2) Customer's possession or use of any altered version of the Deliverable or Services unless such alteration has been performed or expressly authorized by Aclara, or (3) failure of Customer to implement any update provided by Aclara that would have prevented the Claims, or (4) Deliverables or Services made or performed to Customer's specifications.

ARTICLE 10. REPRESENTATIONS AND WARRANTIES

10.1 **Mutual Representations and Warranties.** Each party represents and warrants to the other party that:

(a) it is duly organized, validly existing, and in good standing as a corporation or other entity under the Laws of the jurisdiction of its incorporation or other organization;

(b) it has the full right, power, and authority to enter into and perform its obligations and grant the rights, licenses, consents, and authorizations it grants or is required to grant under this Agreement;

(c) the execution of this Agreement by its representative whose signature is set forth at the end of this Agreement has been duly authorized by all necessary corporate or organizational action of such party; and

(d) when executed and delivered by both parties, this Agreement will constitute the legal, valid, and binding obligation of such party, enforceable against such party in accordance with its terms.

10.2 **Additional Aclara Representations, Warranties, and Covenants**. Aclara represents, warrants, and covenants to Customer that Aclara will perform the Services using personnel of required skill, experience, and qualifications and in a professional and workmanlike manner in accordance with generally recognized industry standards for similar services and will devote adequate resources to meet its obligations under this Agreement.

10.3. **THE EXPRESS WARRANTIES SET FORTH IN THIS AGREEMENT ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED INCLUDING WITHOUT LIMITATION ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE**.

ARTICLE 11. INSURANCE

11.1 **Minimum Insurance Coverages**.
In the event that Aclara's obligations hereunder require or contemplate performance of Services by Aclara's employees, or persons under contract to Aclara, to be done on Customer's property, or property of the Customer's customers, Aclara agrees that all such work shall be done as an independent contractor and that the persons doing such work shall not be considered employees of the Customer. Further, in such event, Aclara shall maintain:

(a) General Liability insurance on a one million dollar ($1,000,000), per occurrence basis; and

(b) Statutory workers compensation insurance.

(c) Cyber Risk Liability and Technology Errors and Omissions Insurance. Aclara shall maintain cyber risk liability and technology errors and omissions insurance with a combined aggregate limit of not less than $5,000,000.00. Such insurance shall cover errors, omissions or negligent acts in the delivery of Services under this Agreement. Such cyber risk liability insurance shall include coverage of claims and losses with respect to network risks (such as data breaches, unauthorized access/use, ID theft, invasion of privacy, damage/loss/theft of data, degradation, downtime).

(d)Customer shall be provided for as an additional insured or loss payee as its interest may appear on the policy referred to in **Section 11.1(a)** above.

ARTICLE 12. LIMITATION OF LIABILITY

12.1 IN NO EVENT SHALL EITHER PARTY BE LIABLE FOR ANY PUNITIVE, EXEMPLARY, INCIDENTAL, INDIRECT, SPECIAL OR CONSEQUENTIAL DAMAGES OR FOR THE LOSS OF PROFIT, REVENUE, OR DATA OF THE OTHER PARTY ARISING UNDER OR IN CONNECTION WITH THIS AGREEMENT, WHETHER BASED UPON CONTRACT, TORT, BREACH OF WARRANTY OR ANY OTHER LEGAL OR EQUITABLE GROUNDS, EVEN IF SUCH PARTY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

12.2 Each Party's total liability to the other Party in connection with this Agreement, whether in contract or in tort, shall be limited to the aggregate sum of payments made by Customer to Aclara under an applicable SOW or Purchase Order.

ARTICLE 13. FORCE MAJEURE

It is understood that, at times, unavoidable delays result from causes which may reasonably be presumed to be beyond the control of Aclara, or Customer such as: Acts of providence, floods, fortuitous events, unavoidable accidents, riots, strikes, and lock outs. Should the progress of the Services or Deliverables be or seem to be delayed at any time for such causes, the party claiming force majeure shall notify the counterparty in writing of the occurrence, in order that a record of same may be made. For force majeure events declared by Aclara, a corresponding extension of time for the completion of the Services or Deliverables shall be allowed by Customer. Aclara and Customer shall in good faith use such effort as is reasonable under all the circumstances known to it at the time to remove or remedy the cause(s) and mitigate the damage associated with a force majeure event.

ARTICLE 14. AUDIT RIGHTS

14.1 **<u>Audit Rights General</u>**.
Customer and its representatives shall have the right to audit activities which are performed under this Agreement on a time and material basis. Aclara will provide access to Aclara personnel, and to data and records, for the purpose of performing audits and inspections to verify the accuracy of Aclara's charges and invoices for Services provided on a time and material basis. Aclara will provide to such auditors and representatives such assistance, as they reasonably require. Aclara will cooperate fully with Customer or Customer's designees in connection with audit functions. If Customer performs such audits via an independent audit firm, Customer will take reasonable steps to ensure that the audit firm will protect the confidentiality of Aclara's Proprietary Information.

(a) If an audit uncovers any overcharge, Aclara shall immediately refund such overcharge (net of any undercharges uncovered by the audit).

(b) Aclara shall maintain and provide access upon request to records, documents and other information required to meet Customer's audit rights under this Agreement until the later of: (i) 3 years after expiration or termination of this Agreement; or (ii) all pending matters relating to this Agreement (e.g., disputes) are closed.

(c) In addition, Aclara shall use commercially reasonably efforts to assist Customer with respect to ensuring that all subcontractors and vendors adhere to and comply with the same requirements herein.

14.2. Aclara shall provide within thirty (30) days of receipt and at no additional cost to Customer, a copy of a SSAE 18 SOC 2 – Type II report of Aclara's measures with respect to electronic data for Hosting and Cloud Services which has been audited by an independent CPA or similarly qualified third party.

ARTICLE 15. GENERAL CLAUSES

15.1 Relationship of the Parties.
Aclara is performing under the Agreement as an independent contractor. Aclara has the sole right and obligation to supervise, control, manage, and direct all work associated with the Deliverables and Services to be performed by all individuals and entities it assigns to perform work under this Agreement, which includes, but is not limited to, its employees, its contractors, and its subcontractors' employees, and Aclara agrees that none of these persons or entities are employees or should be considered employees of Customer. As to these persons or entities Aclara assigns to perform work under this Agreement, Aclara will be solely responsible for: (a) the acts and omissions of all such persons and entities, (b) payment of compensation to such persons and entities, and (c) any injury to such persons in the course of their employment.

15.2 Publicity.
Neither Party may announce or release any information regarding this Agreement or its relationship with the other Party without the other Party's express prior written approval (which may be withheld in the other party's sole discretion). Neither Party shall use any trade name, trademark, service mark or any other information which identifies the other Party or any of the other Party's Affiliates in such Party's sales, marketing and publicity activities, including postings to the Internet, interviews with representatives of any written publication, television station or network, or radio station or network without the other Party's express prior written approval. Notwithstanding the foregoing, nothing in this Agreement shall prevent either Party from making such public disclosures as it, in its sole judgment, may deem appropriate to satisfy such Party's (or such Party's Parent's) disclosure obligations under any applicable law or requirement of any stock exchange.

15.3 Non-Solicitation/No-Hire.
Neither party shall solicit or hire, in any capacity whatsoever, any of the other party's employees involved in this SOW during the term of this SOW and for a period of six (6) months from the expiration/termination hereof, without the express written consent of the other party; provided, however, that nothing shall prevent general solicitations by either party not specifically directed at the other party's employees and any hiring as result of such general solicitations.

15.4 Assignment.
Neither Party may assign its rights or obligations under this Agreement without the prior written consent of the other Party, provided however, that Aclara may assign this Agreement to an Affiliate, or to an entity acquiring all or substantially all of the assets of Aclara if the acquiring entity is an Affiliate, or, by operation of law, to an entity into which Aclara is merged if the surviving entity is an Affiliate, in each

such case without prior approval of the other Party. In any such event, Aclara shall provide the other Party with prompt written notice of such assignment. As used herein, "Affiliate" means a company which either owns or controls Aclara or which Aclara owns or controls directly or indirectly, or is under common control directly or indirectly with Aclara through a common parent company.

ARTICLE 16. GOVERNING LAW AND DISPUTE RESOLUTION

16.1 Governing Law.
This Agreement shall be governed by and construed in accordance with the laws of the State of Missouri, USA.

16.2 Dispute Resolution.
All disputes arising in connection with this Agreement, including any question regarding its existence or validity shall be resolved in accordance with this **Section 16**. If a dispute is not resolved by negotiations, either party may, by giving written notice, refer the dispute to a meeting of appropriate higher management, to be held within twenty (20) business days after the giving of notice. If the dispute is not resolved within thirty (30) business days after the giving of notice, or such later date as may be mutually agreed, either party may commence arbitration or court proceedings. In the event that the parties choose arbitration, the decision of the arbitrator(s) shall be final and binding upon both parties, and neither party shall seek recourse to a law court or other authority to appeal for revisions of the decision.

16.3 Notwithstanding the foregoing, each party shall have the right at any time, at its option and where legally available, to immediately commence an action or proceeding in a court of competent jurisdiction, subject to the terms of this Agreement, to seek a restraining order, injunction, or similar order to enforce the confidentiality provisions set forth in **Article 8**. Monetary damages shall only be available in accordance with **Article 12**.

ARTICLE 17. NOTICES

All notices, requests and demands, other than routine communications under this Agreement, will be in writing and will be deemed to have been duly given when delivered, or when transmitted by confirmed facsimile (with a copy provided by another means specified in this **Article 17**), or one (1) business day after being given to an overnight courier with a reliable system for tracking delivery, or three (3) business days after the day of mailing, when mailed by U.S. mail, registered or certified mail, return receipt requested, postage prepaid, and addressed as follows:

In the case of Aclara:

Aclara Technologies LLC
Attn: Legal
77 Westport Plaza Drive
Suite 500
St. Louis, MO 63146

With a copy (which shall not constitute Notice) to:

Hubbell Incorporated
Attn: General Counsel
40 Waterview Drive
Shelton, CT 06484

In the case of Customer:

INSERT CUSTOMER INFORMATION

With a copy (which shall not constitute Notice) to:

Either Party may from time to time change the individual(s) to receive notices under this paragraph and its address for notification purposes by giving the other prior written notice of the new individual(s) and address and the date upon which the change will become effective.

ARTICLE 18. COMPLIANCE WITH LAWS, CODES, AND STANDARDS

18.1 Aclara shall comply with laws applicable to the manufacture of Deliverable and its performance of Services. Customer shall comply with laws applicable to the application, operation, use and disposal of the Deliverables and Services.

18.2 Aclara's obligations are conditioned upon Customer's compliance with all U.S. and other applicable trade control laws and regulations. Customer shall not trans-ship, re-export, divert or direct products other than in and to the ultimate country of destination declared by Customer and specified as the country of ultimate destination on Aclara's invoice.

18.3 Notwithstanding any other provision, Customer shall timely obtain, effectuate and maintain in force any required permit, license, exemption, filing, registration and other authorization, including, but not limited to, building and environmental permits, import licenses, environmental impact assessments, and foreign exchange authorizations, required for the lawful performance of Services at the Customer's site or fulfillment of Customer's obligations, except that Aclara shall obtain any license or registration necessary for Aclara to generally conduct business and visas or work permits, if any, necessary for Aclara's personnel. Customer shall provide reasonable assistance to Aclara in obtaining such visas and work permits.

ARTICLE 19. HEADINGS

The headings used in this Agreement are intended for convenience only. They are not a part of the written understanding between the Parties, and they shall not affect the construction and interpretation of this Agreement.

ARTICLE 20. COUNTERPARTS

This Agreement may be executed in two or more counterparts, each of which shall be considered an original hereof but all of which together shall constitute one agreement.

ARTICLE 21. SEVERABILITY

If any term or provision of this Agreement is invalid, illegal, or unenforceable in any jurisdiction, such invalidity, illegality, or unenforceability shall not affect any other term or provision of this Agreement or invalidate or render unenforceable such term or provision in any other jurisdiction. Upon such determination that any term or other provision is invalid, illegal, or unenforceable, the parties hereto shall negotiate in good faith to modify this Agreement so as to effect the original intent of the parties as closely as possible in a mutually acceptable manner in order that the transactions contemplated hereby be consummated as originally contemplated to the greatest extent possible.

ARTICLE 22. RESERVATION OF RIGHTS

A delay or failure in enforcing any right or remedy afforded hereunder shall not prejudice or operate to waive that right or remedy or any other right or remedy, whether of a similar or different character.

ARTICLE 23. AMENDMENT AND MODIFICATION;WAIVER

No amendment to or modification of this Agreement is effective unless it is in writing identified as an amendment to this Agreement and signed by an authorized representative of each Party. No waiver by any Party of any of the provisions hereof shall be effective unless explicitly set forth in writing and signed by the party so waiving. Except as otherwise set forth in this Agreement, no failure to exercise, or delay in exercising, any rights, remedy, power, or privilege arising from this Agreement will operate or be construed as a waiver thereof; nor shall any single or partial exercise of any right, remedy, power, or privilege hereunder preclude any other or further exercise thereof or the exercise of any other right, remedy, power, or privilege.

ARTICLE 24. SURVIVAL

The provisions set forth in the following sections, and any other right or obligation of the parties in this Agreement that, by its nature, should survive termination or expiration of this Agreement, will survive any expiration or termination of this Agreement: Section 2.2(b) Section 2.3(c), Section 7.2, Article 8, Article 9, Article 10, Article 12, Article 15 and Article 24.

ARTICLE 25. ENTIRE AGREEMENT

The Agreement contains the entire agreement and all representations between the parties relating to the subject matter hereof, and supersede all prior or contemporaneous understandings, agreements, negotiations, representations and warranties, and communications, both written and oral.

IN WITNESS WHEREOF, the Parties hereto have caused this Agreement to be executed as of the date first above written.

Aclara Technologies LLC		**CUSTOMER**
Signed:	____________________________	Signed: ____________________________
Name:	____________________________	Name: ____________________________
Title:	____________________________	Title: ____________________________

ATTACHMENT A-
SOFTWARE

EXHIBIT A

Statement of Work

EXHIBIT B

FEES

LEVEL OF MAINTENANCE SERVICES SELECTED

Customer: ____

Address: ____

---

1. **Billing frequency is annually in advance.**
2. ☐ **If a Purchase Order number is required on Aclara invoices, please check here.**
   A. Selected Maintenance Level (check one) (Annual First Term Price shown):

   ☐ Base @ 20% $__________________

   ☐ Premier @ 30% $__________________

3. **Customer Designated Contact Information:**

Designated Renewal Contact Information
Name ______________________________
Title______________________________
Address______________________________
Address______________________________
Telephone______________________________
Fax______________________________
Cellular Phone______________________________
Email Address______________________________

Designated Contact Information
Name ______________________________
Title______________________________
Address______________________________
Address______________________________
Telephone______________________________
Fax______________________________
Cellular Phone______________________________
Email Address______________________________

Designated Contact Information
Name ______________________________
Title______________________________
Address______________________________
Address______________________________
Telephone______________________________
Fax______________________________
Cellular Phone______________________________
Email Address______________________________

Designated Contact Information
Name ______________________________
Title______________________________
Address______________________________
Address______________________________
Telephone______________________________
Fax______________________________
Cellular Phone______________________________
Email Address______________________________

EXHIBIT C-1
Software Services Schedule
(Not Applicable to Profield® Software Solution)

1. Definitions. For the purpose of this Exhibit, the following definitions shall apply:

A. **"Aclara Holidays"** means New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, the day after Thanksgiving, Christmas Eve, Christmas Day and New Year's Eve.

B. **"Additional Services"** means services offered by Aclara for improvements and/or enhancements to the Customer's System that are not covered by this Agreement, but may be offered and provided at the rates set forth on Schedule 2 hereto.

C. **"Classroom Training"** means training offered by Aclara at its facility.

D. **"Customer Portal"** means an electronic gateway to a secure entry point via Aclara's website at www.Aclara.com that allows Aclara customers to log in to an area where they can view and download information or request assistance regarding Issues with the System.

E. **"Customer Site Training"** means Aclara providing its training at the Customer's facility at the then current terms and pricing published on the Aclara Customer Portal. The training may be customized to meet the Customer's needs.

F. **"E-Learning"** means on-line training offered by Aclara via the Internet.

G. **"Issue"** means a problem with the System identified by the Customer, which requires a response by Aclara to resolve.

H. **"Maintenance Services"** means activities to investigate, resolve Issues and correct product bugs arising from the use of the Software in a manner consistent with the published specifications and functional requirements defined during implementation.

I. **"Patch"** means a version of the Software that provides an Error Correction to address an urgent need that is outside the schedule of regularly released Software Revisions or Software Versions.

J. **"Renewal Term"** means each of one or more consecutive twelve (12) month periods following the Initial twelve (12) month Term of this Agreement.

K. **"Severity Level"** means a designation of the effect of an Issue on the Customer's use of the System. The Severity of an Issue is initially defined by the Customer and confirmed by Aclara. Until the Issue has been resolved, the Severity Level may be raised or lowered based on Aclara analysis of impact to business. The four Severity Levels are:

Severity Level	Description
1	**Requires immediate attention– Critical production functionality is not available or a large number of users cannot access the system. Causes a major business impact where service is lost or degraded and no workaround is available, therefore preventing operation of the business.**

Severity Level	Description
2	**Requires priority attention - Some important production functionality is not available, or a small number of users cannot access the system. Causes significant business impact where service is lost or degraded and no workaround is available, however the business can continue to operate in a limited fashion.**
3	**Requires attention –There is a problem or inconvenience. Causes a business impact where there is minimal loss of service and a workaround is available such that the system can continue to operate fully and users are able to continue business operations.**
4	**There is a problem or issue with no loss of service and no business impact.**

L. **"Software Revision"** means an update to the released version of the Software code which consists of minor enhancements to existing features and code corrections. Software Revisions are provided and included as a part of this Agreement.

M. **"Target Response"** refers to the period of time between a Customer's initial contact with Aclara to report an issue (by phone, email or through the Customer Portal, thereby creating a ticket which has been assigned a number for tracking purposes) and Aclara's initial contact back to Customer to begin investigation of the reported Issue.

N. **"Training Services"** means all training provided by Aclara to the Customer, including but not limited to Classroom Training, E-Learning Training and Customer-Site Training.

2. Scope

A. **Maintenance Services Provided.** Aclara shall provide Maintenance Services at the Premier level as designated in Schedule 1, Level of Maintenance Services Selected. The following are included as part of this Agreement:

   1. **Aclara Software Revisions and Patches.** Aclara shall provide Software Revisions and Patches to the Customer as they become available. In support of such Software Revisions and Patches, Aclara shall provide updated user technical documentation reflecting the Software Revisions and Patches as soon as reasonably practicable after the Software Revisions and Patches have been released. Updated user technical documentation that corrects Errors or other minor discrepancies will be provided to Customers when available.

B. Response to Issues. Aclara will provide verbal or written responses to Issues identified by the Customer in an expeditious manner. Such responses shall be provided in accordance with the Target Response Times as defined in Schedule 1, Level of Maintenance Services.

C. **Service Limitations.** The following limitations apply to Maintenance Services under this Agreement.

   1. During Renewal Term, certain follow-up training is provided as outlined in Schedule 1, Levels of Maintenance Services. Additional training is available and may be purchased. Please contact Aclara Customer Support at 1-800-892-9008 for training requirements and fees.

2. Maintenance Services do not include any problem arising from the use of components manufactured or authorized by anyone other than Aclara as an interface or peripheral to the Software.

3. Maintenance Services do not include changes in workflow, practices, procedures, or processes that differ from the Software approved specifications.

3. Hosting

A. Aclara will host the ACLARA RF Server Sites in a secure, 24/7 environment according to the terms established below and the terms of the Maintenance Agreement to which this Exhibit D is attached.

B. Aclara will use commercially reasonable efforts to provide a high level of site uptime. It is our goal to provide at least 98% uptime. This means a total of no more than approximately 15 hours of unscheduled down time within a month. This goal excludes scheduled maintenance and upgrades, failure caused by the Internet or Licensee software, events of force majeure, or downtime caused by any other factor beyond Aclara's reasonable control.

C. Aclara will refund up to a percentage (see table below) of the total Hosting Fee for the month if up time performance, with the exclusions noted above, is not met based upon the following table. This table applies to the prime time period only. Downtime is defined as the site being unavailable for customer or staff use.

Average Uptime for the Month	Refund of monthly fee
97% or better	0%
95% – 96.99%	5%
Below 95%	10 %

D. Aclara will use commercially reasonable efforts to prevent more than 1 hour of continuous down time during prime time (defined as 8AM to 12 AM EST) every day; and to prevent more than 6 hours of continuous down time during non-prime time (defined as the hours between 12:01 AM to 7:59 AM (EST), with the same exclusions as noted above.

E. Generally, Aclara performs all scheduled system maintenance and upgrades during non-prime time or off-peak hours. Aclara will provide Licensee with as much advanced notice of scheduled downtime as reasonably possible.

F. During any period of downtime of the Private Label Site(s) or any components of more than 30 minutes in duration, Aclara will provide notice to users by posting a web page that indicates that the site is temporarily unavailable due to routine maintenance and to please come back later.

G. Aclara will provide e-mail notice to appropriate Licensee staff if there will be more than thirty (30) minutes down time of the Private Label Site(s) or any components. Notice will include at least a brief description of the reason for the down time and an estimate of the time when Licensee can expect the site to be up and available.

H. Aclara will provide Licensee access to a client portal that will be used to report issues and review maintenance and upgrade schedule. Licensee agrees to make good faith efforts to notify Aclara in advance whenever unusually heavy traffic is expected because of promotions or other factors.

I. Aclara will use commercially reasonable efforts to respond within thirty (30) minutes during prime time hours or within six (6) hours during non-prime time hours to any issue categorized as Severity 1 (as defined herein) that is posted by Licensee through the reporting tool.

J. Aclara will store customer data on mirrored drives and arrange for daily backup daily all customer data, with backup tapes moved to offsite storage regularly.

K. Aclara will use commercially reasonable efforts to ensure that all hardware (including servers, routers, and other related equipment) on which the applications are deployed are attached to backup power systems sufficient to maintain the site's availability for so long as any power outage could reasonably be expected to occur, based on the experience of Aclara at its deployment location.

L. Aclara agrees to maintain firewall protection and redundant, high speed Internet connections for the Private Label Site(s).

2. <u>Maintenance and Support</u>

A. <u>Standard Maintenance Services</u>

Maintenance includes all new versions, error corrections, enhancements and improvements to the Program functionality licensed to Licensee, as the same are released to Aclara's Licensees generally. Aclara will provide updates to the application in accordance with the standard release cycle and will provide release notes to Licensees in advance of the release. At Licensee's request, Aclara will provide technical assistance in identifying and resolving issues with the Program's failure to conform to its specifications.

B. <u>Ongoing Support Services</u>

1) In the event that the Licensee sends invalid data to Aclara in the data integration, Aclara will notify the Licensee and the Licensee will adjust their data transfer process to correct the issue.

2)<u>Ongoing Release Testing</u>

a. Aclara Service Level Agreement (SLA) applies to the production environment only. SLA on the test environment can be provided at an additional cost.

LEVELS OF MAINTENANCE SERVICES

Technical Support: *Technical Support is available during the hours of 6:30am- 6:00pm Monday-Friday US Central Time, excluding Aclara Holidays and weekends, toll-free at 800-892-9008.*	
24x7 Technical Support: *Technical Support is available between the business hours of 6:30am to 6pm US Central Time by accessing the Aclara Customer Portal (or Toll-free at 800-892-9008, if access to the Customer Portal is not readily available to Customer). On-call technical support is available after 6pm and before 6:30am Central Time 24-hours a day/7 days a week/365 days a year, including Aclara Holidays and weekends. Such after hours support is provided for Severity 1 and 2 issues only. Non Severity 1 or 2 items will be addressed during the standard business hours of 6:30am-6:00pm US Central Time.*	**X**
Target Response Time – Severity 1: *Requires immediate attention– Critical production functionality is not available or a large number of users cannot access the system. Causes a major business impact where service is lost or degraded and no workaround is available, therefore preventing operation of the business.*	**<2 hours**
Target Response Time – Severity 2: *Requires priority attention - Some important production functionality is not available, or a small number of users cannot access the system. Causes significant business impact where service is lost or degraded and no workaround is available, however the business can continue to operate in a limited fashion.*	**<4 hours**
Target Response Time – Severity 3: *Requires attention –There is a problem or inconvenience. Causes a business impact where there is minimal loss of service and a workaround is available such that the system can continue to operate fully and users are able to continue business operations.*	**<6 hours**
Target Response Time – Severity 4: *There is a problem or issue with no loss of service and no business impact.*	**<1 business day**
Access to Aclara Customer Portal (www.aclara.com): *Customer will receive individual user names/passwords to the Aclara Customer Portal, as well as have access to Issue Management Reports for each case generated by Customer.*	**X**
Follow-up Aclara Classroom Training. *Training is available at Aclara's facilities as listed on the Aclara Customer Portal. The maximum number of Customer's employees attending any Classroom Training session is three (3).*	**No Maximum Number of Classes**
Aclara Web based E-Learning classes. *Certain E-Learning classes are available as listed on the Aclara Customer Portal to an unlimited number of Customer employees per course at the prices listed on the Aclara Customer Portal.*	**No Cost**

Exhibit C-2
Software Deliverable Support Services Schedule

2. **Definitions.** For the purposes of this Exhibit, the following definitions shall apply:

O. **"Aclara Holidays"** means New Year's Day, Dr. Martin Luther King Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, the day after Thanksgiving, Christmas Eve, Christmas Day and New Year's Eve.

P. **"Aclara Technology System" (or "System")** means the system comprised of, in part 1) the Hardware purchased from Aclara by Customer, and 2) the Software licensed by Aclara to Customer under the terms of the Software License Agreement.

Q. **"Additional Services"** means services offered by Aclara for improvements and/or enhancements to the Customer's System that are not covered by this Agreement, but may be offered and provided at the rates set forth on Schedule 2 hereto.

R. **"Classroom Training"** means training offered by Aclara at its facility.

S. **"Customer Portal"** means an electronic gateway to a secure entry point via Aclara's website at www.Aclara.com that allows Aclara customers to log in to an area where they can view and download information or request assistance regarding Issues with the System.

T. **"On-Site Maintenance Services"** means Aclara providing Maintenance Services at the Customer's facility at the then current rates stated in Schedule 2, Time and Material Rates, attached hereto.

U. **"Custom Enhancement"** means any improvement, modification or addition that, when made or added to the Software or Third Party Licensed Software, changes its utility, efficiency, functional capability or application. Custom Enhancements are not included as part of this Agreement**.**

V. **"Customer Site Training"** means Aclara providing its training at the Customer's facility at the then current terms and pricing published on the Aclara Customer Portal. The training may be customized to meet the Customer's needs.

W. **"Delivery"** means, in the case of Software provided hereunder (and as applicable), (i) the remote installation of the Software by Aclara on the Customer-provided Designated Equipment; or (ii) delivery of the Designated Equipment provided by Aclara on which the Software is installed; or (iii) the loading of the software to an FTP site for Customer's availability to download. "Delivery" means, in the case of Services provided hereunder, the periodic performance of such Services as described herein.

X. **"Error"** means any failure of Software to conform in all material respects to the requirements of this Agreement or Aclara's published specifications. Any nonconformity resulting from Customer's misuse, improper use, alteration or damage of the Software, the combination of the Software with any hardware or software not supplied by or authorized by Aclara, or any other condition beyond the control of Aclara, shall not be considered an Error.

Y. **"Error Correction"** means either a modification or addition that, when made or added to the Software, brings the Software into material conformity with the published specifications, or a procedure or routine that, when observed in the regular operation of the Software, avoids the practical adverse effect of such nonconformity.

Z. "E-Learning" means on-line training offered by Aclara via the Internet.

AA. **"Hardware"** means the equipment supplied by Aclara which may include the Substation Communication Equipment (SCE), Remote Communications Equipment (RCE), Test Equipment, Meter Transmission Unit (MTU), Data Collection Unit (DCU) and MTU programmer.

BB. **"Issue"** means a problem with the System identified by the Customer, which requires a response by Aclara to resolve.

CC. **"Maintenance Services"** means activities to investigate, resolve Issues and correct product bugs arising from the use of the Software in a manner consistent with the published specifications and functional requirements defined during implementation.

DD. **"Patch"** means a version of the Software that provides an Error Correction to address an urgent need that is outside the schedule of regularly released Software Revisions or Software Versions.

EE. **"Renewal Term"** means each of one or more consecutive twelve (12) month periods following the Initial twelve (12) month Term of this Agreement.

FF. **"Severity Level"** means a designation of the effect of an Issue on the Customer's use of the System. The Severity of an Issue is initially defined by the Customer and confirmed by Aclara. Until the Issue has been resolved, the Severity Level may be raised or lowered based on Aclara analysis of impact to business. The four Severity Levels are:

Severity Level	Description
1	**Requires immediate attention– Critical production functionality is not available or a large number of users cannot access the system. Causes a major business impact where service is lost or degraded and no workaround is available, therefore preventing operation of the business.**
2	**Requires priority attention - Some important production functionality is not available, or a small number of users cannot access the system. Causes significant business impact where service is lost or degraded and no workaround is available, however the business can continue to operate in a limited fashion.**
3	**Requires attention –There is a problem or inconvenience. Causes a business impact where there is minimal loss of service and a workaround is available such that the system can continue to operate fully and users are able to continue business operations.**
4	**There is a problem or issue with no loss of service and no business impact.**

GG. **"Software Version"** means the base or core version of the Software that contains significant new features and significant fixes and is available to the Customer. Software Versions may occur as the Software architecture changes or as new technologies are developed. Software Versions are not provided or included as part of this Agreement.

HH. **"Software Revision"** means an update to the released version of the Software code which consists of minor enhancements to existing features and code corrections. Software Revisions are provided and included as a part of this Agreement.

II. **"<u>Target Response</u>"** refers to the period of time between a Customer's initial contact with Aclara to report an issue (by phone, email or through the Customer Portal, thereby creating a ticket which has been assigned a number for tracking purposes) and Aclara's initial contact back to Customer to begin investigation of the reported Issue.

JJ. **"<u>Third Party Licensed Software</u>"** shall have the meaning as it is defined in Attachment A.

KK. **"<u>Training Services</u>"** means all training provided by Aclara to the Customer, including but not limited to Classroom Training, E-Learning Training and Customer-Site Training.

2. <u>Scope</u>

D. **<u>Software Maintenance</u>.** The Software maintained under this Schedule shall be the Software set forth in Attachment A as a Software Deliverable. Any additional Software Deliverables for which a license is obtained by the Customer from Aclara shall be governed by this Schedule and the pricing for Maintenance Services adjusted accordingly.

E. **<u>Levels of Maintenance Services</u>.** Two (2) Levels of Maintenance are available to Customer under this Agreement. Each level is identified and described in Schedule 1, Levels of Maintenance Services attached hereto and made a part hereof. Customer may, at its option, change the Level of Maintenance for any subsequent Renewal Term, provided Customer gives Aclara written notice of the requested change no less than thirty (30) days prior to the end of the Initial Term or then current Renewal Term**.**

F. **<u>Maintenance Services Provided</u>.** Aclara shall provide Maintenance Services at the level selected by the Customer as designated in Schedule 1, Level of Maintenance Services Selected. The following are included as part of this Agreement:

1. **<u>Aclara Software Revisions and Patches</u>.** Aclara shall provide Software Revisions and Patches to the Customer as they become available. In support of such Software Revisions and Patches, Aclara shall provide updated user technical documentation reflecting the Software Revisions and Patches as soon as reasonably practicable after the Software Revisions and Patches have been released. Updated user technical documentation that corrects Errors or other minor discrepancies will be provided to Customers when available.
2. **<u>Third Party Software Revisions</u>.** At the option of Aclara, periodic Software Revisions of the Third Party Licensed Software will be provided by Aclara without further charge provided the following conditions are met: (i) the Software Revision corrects a malfunction in the Third Party Software that affects the operation of the Software; and (ii) the Software Revision has, in the opinion of Aclara, corrected malfunctions identified in the Aclara Technology System and has not created any additional malfunctions; and (iii) the Software Revision is available to Aclara. Customer is responsible for obtaining and installing the Software Revision if the Third Party Software was not licensed to Customer by or through Aclara. Software Revisions to Third Party Licensed Software provided by Aclara are specifically limited to the Third Party Software identified and set forth in the Software License Agreement. Any associated Hardware or Hardware modifications required to support revisions of Third Party Software are not included under the terms of this Agreement.

G. **<u>Response to Issues</u>.** Aclara will provide verbal or written responses to Issues identified by the Customer in an expeditious manner. Such responses shall be provided in accordance with the Target Response Times as defined in Schedule 1, Level of Maintenance Services.

H. **<u>Service Limitations</u>.** The following limitations apply to Maintenance Services under this Agreement.

1. New Software Versions are not included as a part of this Agreement. Such Software Versions will be offered to Customer for additional fees and costs.

2. Services requested by Customer for assistance with installation or implementation of Software Revisions and Patches are not included in this Agreement, but are offered to the Customer on a time and materials basis at the rates stated in Schedule 2 hereto.

3. System administration, database maintenance and recovery, server malfunctions, database backup processes, management and training services, master station computer equipment repair are not included as part of this Agreement.

4. Maintenance services shall be limited to the latest Software Revision within the last two (2) years in accordance with Section 3.E below. All code changes, Enhancements or fixes will be incorporated into the latest Software Revision or a future Software Revision. Aclara has no obligation to make code changes, Enhancements or fixes to previous Software Revisions.

5. Maintenance Services do not include costs incurred by Aclara while investigating problems that are the result of Customer's negligence, misuse, or unauthorized application, alteration, or modification of the Software, Hardware, or interfaces to the equipment configuration, which shall be invoiced to Customer on a time-and-material basis at Aclara's then current published rates. The current rates are set forth on Schedule B hereto.

6. Services offered outside of Maintenance Services as noted in Schedule C-3, Supplemental Services attached hereto are not included in this Agreement. Such additional services are available and may be provided upon Customer's request at the fixed price established on Schedule C, and if no fixed price is established, in accordance with the terms and rates provided in Schedule B hereto.

7. During Renewal Term, certain follow-up training is provided as outlined in Schedule 1, Levels of Maintenance Services. Additional training is available and may be purchased. Please contact Aclara Customer Support at 1-800-892-9008 for training requirements and fees.

8. Aclara shall consider and evaluate the development of Custom Enhancements for the specific use of Customer and shall respond to Customer's requests for Custom Enhancements or other additional services pertaining to the Software. Such Custom Enhancements or additional services shall be subject to a separate charge in accordance with Aclara's then in effect rates. The current rates are listed on Schedule 2 hereto.

9. Maintenance Services do not include any problem arising from the use of components manufactured or authorized by anyone other than Aclara as an interface or peripheral to the Software.

10. Maintenance Services do not include any problem resulting from the combination of the Software with such other programming or equipment unless such combination has been approved by Aclara.

11. Maintenance Services do not include any problem caused by changes to other software (including releases and patches), interfaces or systems connected to the Software

including but not limited to changes of operating systems database servers, web servers, and communications software.

12. Maintenance Services do not include changes in workflow, practices, procedures, or processes that differ from the Software approved specifications.

13. Customer specific testing and reimplementation of Custom Enhancements are not part of this Agreement.

Customer will be responsible to pay Aclara for time or other resources provided by Aclara to diagnose or attempt to correct any of the items set forth above in this Section 2.F., at Aclara's then current time and material rates. If Aclara incurs expense in servicing claims which are later shown to result from any of the above activities, Customer shall pay Aclara the costs associated with the performance of such service. Aclara's time and material rates are attached hereto as Schedule 2. Aclara, in its sole discretion, may change these rates from time to time with thirty (30) days advance notice to Customer.

3. Customer Responsibilities

A. Backups. Customer shall maintain a current backup copy of all Software and databases. Customer shall perform regular daily backups of its data, and weekly backups of its entire system maintained under this Agreement.

B. Notification of Issues

During the hours between 6:30 a.m. and 6:00 p.m. Central Time on Monday through Friday, excluding Aclara Holidays:

1. Customer shall provide Aclara with timely notification of any new System issues by one of three methods:

   b. By entering the problem on the Aclara Customer Portal (See Note 1 below);

   c. Contacting Aclara Customer Support at **1-800-892-9008;** or

   d. Emailing the problem to **support@aclara.com**

   Note 1: Customer's utilization of the Aclara Customer Portal is the preferred method for Issue notifications.

2. Premier Level. Selection of the Premier level of services provides technical support for Severity 1 and 2 issues, 24 hours per day; seven (7) days per week; 365 days per year. All Severity 1 and 2 notifications submitted between the hours of 6:00 p.m. and 6:30 a.m. Central Time (Monday through Friday, Weekends and Aclara Holidays) must be submitted through the Aclara Customer Portal. If Customer cannot readily access the Aclara Customer Portal, Customer may contact Aclara at the "800" number listed above. Premier Level Customers will receive priority treatment over Base Level Customer when resources are allocated to competing, same-priority issues.

3. Base Level. Selection of the Base level of services ensures tickets will be processed on the next business day within the normal business hours (6:00 p.m. and 6:30 a.m. Central Time) noted on Schedule 1, Levels of Maintenance Service. If an emergency arises, Aclara does offer support for

Issues arising during other than normal business hours at the Time and Material Rates set forth in Schedule B hereto.

C. Technical Staff. Customer shall be responsible for maintaining sufficient suitably trained technical staff to operate and maintain the System on a day-to-day basis, including backing up the Software and report handling. Aclara training for designated contacts shall be made available to Customer.

D. Support for Problem Investigation. Customer shall support all reasonable requests by Aclara as may be required in problem investigation and resolution. For troubleshooting purposes, Aclara may need remote system access to Customer's system.

E. Maintain Current Software Revision. Customer shall install new revisions of defined Software in the production environment within two (2) years of receipt of the Software Revision. Customer shall maintain the required version of the Third Party Licensed Software, if applicable, specified by Aclara for each released Software Revision provided. Aclara Error Corrections will be provided on Aclara's latest release of the Software Revision.

F. Additional Requirements. Customer is responsible for procuring, installing and maintaining all equipment, telephone lines, communications interfaces, and other hardware necessary to operate the Software and obtain Maintenance Services from Aclara.

G. Designation of Point of Contact. Customer shall assign an individual or individuals to serve as the designated contact(s) for all communication with Aclara during Issue investigation and resolution.

H. Discovery of Errors. Upon discovery of an Error, Customer agrees, if requested by Aclara, to submit to Aclara a listing of output and any other data that Aclara may require in order to reproduce the Error and the operating conditions under which the Error occurred or was discovered.

I. Test Environment. If Customer elects to purchase a test environment, Customer should maintain a test copy of the Program and a separate test data base (other than Customer's production database) and shall test all new Software Revisions, Patches, Custom Enhancements, hotfixes and Error Corrections before integrating them into system productions.

J. Technical Infrastructure Management. Customer shall manage hardware, software, network, storage, database, and peripheral devices for optimal operating performance and availability as required by end users.

K. Proactive Monitoring. Unless Customer elects to purchase the Supplemental Service "AMI Advanced System Monitoring Service" set forth in Exhibit C-3, Customer shall regularly monitor the hardware, software and infrastructure that support the Software application. Customer shall define system (OS/Oracle) level event logging, notification and escalation procedures, and detect and react to events. Customer shall regularly monitor event logs, server logs, and other debug information generated by the application to proactively identify problems.

L. Acceptance. On or before ten (10) business days after Aclara's release of a new Custom Enhancement, hotfix or Error Correction that Aclara issues in response to an Error Report, Customer shall test and notify Aclara if there are any problems that need further resolution, or if Customer accepts the solution, Customer shall send such notification to Aclara's e-mail support address. If Aclara receives neither a request for further assistance nor an acceptance of the solution, the solution will be deemed accepted by Customer, and Aclara will have no further obligation to maintain the Software in its earlier form or version. Problems arising from the aforementioned items requiring further resolution will be included as part of this Agreement.

M. Routine System Management. Customer shall monitor the system logs and database and perform routine system and database management to ensure proper system operation.

SCHEDULE 1
LEVELS OF MAINTENANCE SERVICES

	Base	*Premier*
Technical Support: *Technical Support is available during the hours of 6:30am- 6:00pm Monday-Friday US Central Time, excluding Aclara Holidays and weekends, toll-free at 800-892-9008.*	**X**	
24x7 Technical Support: *Technical Support is available between the business hours of 6:30am to 6pm US Central Time by accessing the Aclara Customer Portal (or Toll-free at 800-892-9008, if access to the Customer Portal is not readily available to Customer). On-call technical support is available after 6pm and before 6:30am Central Time 24-hours a day/7 days a week/365 days a year, including Aclara Holidays and weekends. Such after hours support is provided for Severity 1 and 2 issues only. Non Severity 1 or 2 items will be addressed during the standard business hours of 6:30am-6:00pm US Central Time.*		**X**
Target Response Time – Severity 1: *Requires immediate attention– Critical production functionality is not available or a large number of users cannot access the system. Causes a major business impact where service is lost or degraded and no workaround is available, therefore preventing operation of the business.*	**<4 hours**	**<2 hours**
Target Response Time – Severity 2: *Requires priority attention - Some important production functionality is not available, or a small number of users cannot access the system. Causes significant business impact where service is lost or degraded and no workaround is available, however the business can continue to operate in a limited fashion.*	**<1 day**	**<4 hours**
Target Response Time – Severity 3: *Requires attention –There is a problem or inconvenience. Causes a business impact where there is minimal loss of service and a workaround is available such that the system can continue to operate fully and users are able to continue business operations.*	**<2 days**	**<6 hours**
Target Response Time – Severity 4: *There is a problem or issue with no loss of service and no business impact.*	**<3 business days**	**<1 business day**
Access to Aclara Customer Portal (www.aclara.com): *Customer will receive individual usernames/passwords to the Aclara Customer Portal, as well as have access to Issue Management Reports for each case generated by Customer.*	**X**	**X**
Follow-up Aclara Classroom Training. *Training is available at Aclara's facilities as listed on the Aclara Customer Portal. The maximum number of Customer's employees attending any Classroom Training session is three (3).*	**Aclara List Price**	**No Maximum Number of Classes**
Aclara Web based E-Learning classes. *Certain E-Learning classes are available as listed on the Aclara Customer Portal to an unlimited number of Customer employees per course at the prices listed on the Aclara Customer Portal.*	**Aclara List Price**	**No Cost**

SCHEDULE 2

TIME AND MATERIAL RATES

Additional Services may be provided at the Customer's request in accordance with the following Time and Material Rates (hereinafter referred to as "Rates"[1]).

Rates:

1. The following Rate categories have been defined for Aclara technical staff:

Professional Services Staff	Hourly Rate	Off-hours hourly rate
Sr. Technical Advisor	[redacted]	
Program Manager		
Product Manager		
Project Manager		
Field Supervisor		
Sr. Systems Engineer/Sr. QA		
Sr. Business Analyst		
DBA/Application Consultant		
Systems Engineer/QA/UI		

3. Rate Adjustments.

The above hourly rates are in U.S. Dollars and are subject to annual adjustment up to five percent (5%).

4. Service Charges.

A. Services will be charged at the applicable Rates as follows:

2) Standard Hourly Rates will apply to all service hours expended that do not exceed eight (8) consecutive hours during Aclara's normal business hours of 6:30 a.m. - 6:00 p.m. Central Time, Monday through Friday, excluding Aclara Holidays.

3) Off-Hours Hourly Rates will apply to all service-hours expended beyond eight (8) consecutive hours during Aclara's normal business hours of 6:30 a.m. – 6:00 p.m. Central Time, Monday through Friday excluding Aclara Holidays.

B. If Aclara is requested to travel to the Customer's site to provide Services, the costs and expenses associated with such travel will be borne by Customer and invoiced as set forth below.

---

[1]Rates exclude any applicable taxes and the like.

1) Travel Expenses: Unless otherwise mutually agreed, Aclara's travel expenses for On-Site Services shall include, but are not limited to airfare, lodging, meals, automobile rental, fuel, parking and associated administration fees, and will be charged to Customer on an actual basis.

2) Portal to Portal Invoices: Travel time for On-Site Maintenance Services will be invoiced to Customer on a portal-to-portal basis at Aclara's On-Call Hourly Rates.

4. <u>Pre-Purchased Support Hours</u>

A. Pre-purchased software support hours are a block of hours intended to cover Software issues that are not covered under this Agreement, thereby allowing the Customer added flexibility to utilize Aclara's services without generating a Change Order. Should Customer request services which are not included in this Agreement and desire to utilize the pre-purchased hours, Aclara shall provide the Customer with an estimated number of hours required to resolve such request. The Customer may then advise Aclara either to stop working, sign and fund a Change Order, or use the pre-purchased support hours to resolve the request. Aclara reserves the right to decline the Customer's request, depending on the nature of the request.

B. Pre-purchased support hours may be purchased at any time during the term of this Agreement. Pre-purchased support hours expire upon termination of this Agreement or within one year after purchase (regardless of use), whichever occurs first.

C. Pre-purchased software support hours are offered in the following increments and volume discounts:

40 hours	Hourly Rates listed in Section 1 above.
80 hours	5% discount
120 hours	10% discount

Exhibit C-3

Supplemental Services

1. AMI System Monitoring Service

A. **Tiered Annual Fees:**

Tier 1 (Less than 1,000 endpoints) [redacted]
Tier 2 (1,001 to 10,000 endpoints) [redacted]
Tier 3 (10,001 to 25,000 endpoints) [redacted]
Tier 4 (25,001 to 50,000 endpoints) [redacted]
Tier 5 (50,001 to 100,000 endpoints) [redacted]
Tier 6 (Greater than100,000 endpoints) Please contact Aclara for pricing

B. Aclara's AMI System Monitoring service is designed to monitor end to end data transfer from meter/MTU's to and from DCU's to the head-end software, and provide health status of your AMI system to minimize system downtime. Aclara will deliver a weekly diagnostic report that will identify issues which could affect the successful operation of your Aclara AMI system. The major components of the system that will be analyzed include:

- Head-end software
- Data Collector Units (DCU)
- Meter Transmitting Units (MTU)
- Field programmers

C. Aclara's proactive approach is to look for any condition out of the ordinary and will result in an immediate issue of a troubleshooting ticket and/or field work order based on the nature and severity of the condition. Example diagnostics include:

- Battery voltage loss
- Reading reception loss
- File processing errors

D. Customers will be notified about the issues found, the recommended steps to solve the problem, and the path for any required escalation. Aclara will provide:

- A snapshot of the AMI system's health
- Generation of incident tickets, investigation and if needed, scheduling of work orders
- Notification that the issue has been resolved and confirmation that the STAR system is operating within established normal parameters

E. The AMI System Monitoring Service requires that Aclara be allowed the following access and functionality:

- Install the required tracking scripts on Customer's head-end system
- Necessary data must be allowed to be passed from Customer's head-end system to Aclara for analysis
- Aclara must have reliable remote connectivity to Customer's System

2. AMI Advanced System Monitoring Service

A. **Annual Fee:**

- Pricing available upon request

B. Aclara's AMI Advanced System Monitoring service is a near real-time interactive tool designed to monitor end to end data transfer from meter/MTU's to and from DCU's to the head-end software, and provide health status of your AMI system to minimize system downtime. Aclara will enable an interactive dashboard you can access at any time both for viewing summary reports and drilling down into specific details, and also deliver a weekly summary report. Additionally, Aclara will schedule and execute a monthly review call with designated Customer resources to review the state and performance of the network since the last review.

C. The major components of the system that will be analyzed include:
- Head-end software
- Data Collector Units
- Meter Transmitting Units
- Field programmers

D. Not only will the interactive tool and access be made available, but Aclara will proactively monitor your network looking for any condition out of the ordinary. Such conditions will result in an immediate issue of a troubleshooting ticket and/or field work order based on the nature and severity of the condition. Example diagnostics include:
- Battery voltage loss
- Reading reception loss
- File processing errors

E. Customers will be notified about the issues found, recommended steps to solve the problem, and the path for any required escalation. Aclara will provide:
- A snapshot of the AMI system's health
- Generation of incident tickets, investigation and if needed, scheduling of work orders
- Notification that the issue has been resolved and confirmation that the STAR system is operating within established normal parameters

F. The AMI Advanced System Monitoring Service requires that Aclara be allowed the following access and functionality:
- Install the required tracking scripts on Customer's head-end system
- Necessary data must be allowed to be passed from Customer's head-end system to Aclara for analysis
- Aclara must have reliable remote connectivity to Customer's System
- Identified Customer resources and regularly scheduled monthly review session

3. AMI DCU Maintenance Service

A. Tiered Annual Fees:

Tier	DCU (Low End)	DCU (High End)	Price / DCU
Tier 1	1	15	$ [redacted]
Tier 2	16	30	$
Tier 3	31	50	$
Tier 4	50	1000	Call for Pricing

In addition to the above unit prices, Customer shall also be responsible for any associated rental equipment and delivery costs to access the DCU.

B. Aclara's AMI DCU Maintenance service is designed to provide for the on-site repair of any DCU that fails under normal operation after expiration of the standard DCU Warranty. The Service covers all electronics including the Aclara provided WAN module and solar cell, but excludes the mounting frame, mounting hardware, and battery.

C. The Service does not include maintenance or repairs attributable to the unauthorized attempt by Customer or any unauthorized person other than an authorized Aclara representative to repair or maintain a DCU. Maintenance or repairs resulting from casualty, catastrophe, extreme weather conditions or natural disaster (including lightening damage), accident, vandalism, civil unrest, war, misuse, neglect or negligence of Customer, or causes external to the DCU such as, but not limited to, failed or faulty electrical power, communication failure resulting from cell or other WAN network service interruption or any causes other than ordinary use. Maintenance or repairs to attachments or to any other devices not originally a part of the DCU and added without the prior written approval of Aclara. Repairs resulting from unauthorized changes, modifications or alterations of or to the DCU are not covered under this Agreement.

D. Upon notification from Customer of DCU failure, Aclara will diagnose the DCU. If a failure occurs to a DCU covered under the Agreement, the unit will be repaired or replaced, at Aclara's option, at no additional cost to Customer. If the Customer has entered into a System Monitoring agreement with Aclara, Aclara will normally identify the problem as part of its System Monitoring and will take the necessary steps to resolve the problem. The Customer is responsible for arranging access to DCU sites before Aclara can take action.

E. Customer's electing the Aclara AMI DCU Maintenance Service must purchase the service for all DCUs in the AMI network; Aclara AMI DCU Maintenance Service may not be purchased on an individual, case-by-case basis.

4. AMI DCU Preventative Maintenance Service

A. <u>Tiered Annual Fees</u>:

- Tier 1 (Less than 15 DCUs) $[redacted] per DCU per year
- Tier 2 (16 to 30 DCUs)[redacted] per DCU per year
- Tier 3 (31 to 50 DCUs) [redacted] per DCU per year
- Tier 4 (Greater than 50 DCUs) Please contact Aclara for pricing

In addition to the above unit prices, Customer shall also be responsible for any associated rental equipment and delivery costs to access the DCU either during a covered repair or a preventative visit.

B. Aclara's AMI DCU Preventative Maintenance service is designed to provide for the on-site repair of any DCU that fails under normal operation after expiration of the standard DCU Warranty, as well as provide periodic on-site maintenance and inspection of all DCUs in a covered deployment (at 5 year intervals from installation).

C. The service covers all electronics including the Aclara provided WAN module and solar cell, but excludes the mounting frame, mounting hardware and battery – excepting the periodic preventative inspection as listed below.

D. Beyond break/fix as above, this Service encompasses the following preventative maintenance service:

1. At year 5 after installation (and again at year 10 if the coverage is maintained uninterrupted) Aclara will visit all DCUs and perform the following service at each DCU:

   - Document and confirm each DCU's configuration
   - Replace the DCU backup battery
   - Inspect and replace where needed: antennas, antenna cables, and solar panels
   - Inspect mounting hardware: replace as needed (hardware costs are not covered, will be charged on a time and materials basis)
   - Clean and adjust chassis and solar panel
   - Install all outstanding DCU firmware updates and patches
   - Confirm proper DCU functionality after maintenance is completed

   Issues beyond the above maintenance items will be escalated to the Utility and Aclara Support for proper resolution

E. The Service does not include maintenance or repairs attributable to the unauthorized attempt by Customer or any unauthorized person other than an authorized Aclara representative to repair or maintain a DCU. Maintenance or repairs resulting from casualty, catastrophe, extreme weather conditions or natural disaster (including lightening damage), accident, vandalism, civil unrest, war, misuse, neglect or negligence of Customer, or causes external to the DCU such as, but not limited to, failed or faulty electrical power, communication failure resulting from cell or other WAN network service interruption or any causes other than ordinary use. Maintenance or repairs to attachments or to any other devices not originally a part of the DCU and added without the prior written approval of Aclara. Repairs resulting from unauthorized changes, modifications or alterations of or to the DCU are not covered under this Agreement.

F. Customer's electing the Aclara AMI DCU Preventative Maintenance Service must purchase the service for all DCUs purchased by Customer; Aclara AMI DCU Preventative Maintenance Service may not be purchased on an individual, case-by-case basis and must be maintained uninterrupted from year 2 after DCU installation to be eligible for the 5 year and 10 year inspections.

Aclara® RF Warranties

1. Aclara® RF DCU Warranty. Aclara warrants to the original Purchaser of an Aclara RF Data Collection Unit ("DCU") that the DCU shall be free from defects in material and workmanship for a period of one (1) year from the date of original product shipment("Warranty Period").

   Any DCU manufactured by Aclara that, within the Warranty Period, fails as a result of a defect in material or workmanship, will be repaired or replaced, at the option of Aclara, without charge to the Purchaser. Aclara shall either: (1) Provide a return authorization to the Purchaser to return the defective DCU for repair; or (2) Perform on-site repair of the defective DCU, provided Purchaser pays all reasonable Aclara travel expenses. Aclara will be responsible for cost inbound and outbound freight when using shipping method of Aclara's choice. Purchaser must provide reasonable access to the DCUs and shall be responsible for additional costs incurred should Aclara be prevented access at the scheduled time.

   Aclara warrants replacement DCUs for the longer of: (i) the remaining term of the Warranty Period applicable to the DCU repaired or replaced, or (ii) ninety (90) days from the date the repaired DCU or its replacement is returned to Purchaser.

2. Aclara® RF Electric Equipment. Aclara warrants to the original Purchaser of the RF Electric Equipment that the RF Electric Equipment shall be free from defects in material and workmanship for a period of one (1) year from first use or eighteen (18) months from date of original product shipment. ("Warranty Period").

   Any RF Electric Equipment manufactured by Aclara that, within the Warranty Period, fails as a result of a defect in material or workmanship, upon confirmation that the RF Electric Equipment has suffered a failure, will be repaired or replaced, at the option of Aclara, without charge to the Purchaser. Warranty repair, replacement or re-performance by Aclara shall not extend or renew the applicable Warranty Period.

3. Aclara® Electric Meter Warranty. Aclara warrants to the original Purchaser of an Aclara Electric Meter ("Electric Meter") that the Electric Meter warrants that the Electric Meter shall be free from defects in material and workmanship for a period of one (1) year from first use or eighteen (18) months from date of original product shipment ("Warranty Period").

   Any Electric Meter manufactured by Aclara that, within the Warranty Period, fails as a result of a defect in material or workmanship, will be repaired or replaced, at the option of Aclara, without charge to the Purchaser. If despite Aclara's reasonable efforts, a non-conforming Electric Meter cannot be repaired or replaced, Aclara shall refund or credit monies paid by the Purchaser for such non-conforming Electric Meter. Warranty repair, replacement or re-performance by Aclara shall not extend or renew the applicable Warranty Period. Purchaser shall obtain Aclara's agreement on the specifications of any tests it plans to conduct to determine whether a non-conformance exists.

4. Software. All of the products set forth herein include software which is proprietary to Aclara and which is protected by United States Copyright Laws with which the Purchaser must comply. Purchaser has the right to utilize the software in the product with the product, but Purchaser may not disassemble, decompile, or modify the software. The software is confidential and the property of Aclara and shall not be disclosed to others.

5. Return Material Authorization Process. The return of defective products under a warranty claim must be returned in accordance with Aclara's Return Material Authorization (RMA) Process. Please refer to the latest process document posted to the Aclara customer portal at: https://aclaratech.force.com/login

6. Warranty Claim. The warranty remedies set forth herein shall be contingent upon: (1) Purchaser providing written notice of a warranty claim to Aclara within the applicable warranty period; and (2) Purchaser returning the defective product to Aclara within sixty (60) days of removal and in accordance with the RMA Process.

7. Exceptions to Warranties. The following apply to all warranties offered to Purchaser by Aclara and set forth herein.
   a. All costs associated with the removal and/or reinstallation and transportation of a defective product back to Aclara shall be the responsibility of the Purchaser.
   b. The warranties set forth herein do not cover repairs or replacements required as a result of misuse, mishandling, improper storage, accident, modification, improper operation, installation errors, meter failures, theft, vandalism, acts of god or repair by unauthorized personnel.
   c. Aclara reserves the right to supply factory refurbished equipment, new equipment, or a newer model that provides equivalent or better performance.
   d. Third Party Equipment. Aclara does not provide warranty repair or replacement services for equipment not manufactured by Aclara.

8. **NO IMPLIED WARRANTIES**. THE WARRANTIES CONTAINED HEREIN ARE IN LIEU OF ALL WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES FOR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE LIABILITY OF ACLARA SHALL BE LIMITED TO REPAIR OR REPLACEMENT OF ANY DEFECTIVE PRODUCT. IN NO EVENT SHALL ACLARA BE LIABLE FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO SPECIAL, DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL, OR PUNITIVE DAMAGES, RESULTING FROM PRODUCT INSTALLATION, USE, REMOVAL OR REINSTALLATION. THE REMEDIES SET FORTH HEREIN ARE EXCLUSIVE, AND IN NO EVENT SHALL THE LIABILITY OF ACLARA EXCEED THE PRICE OF THE PRODUCT ON WHICH SUCH LIABILITY IS BASED. THE LIMITATION OF REMEDIES SET FORTH HEREIN IS IN RECOGNITION OF THE DIFFICULTIES OF PROOF OF LOSS AND THE INCONVENIENCE AND NON-FEASIBILITY OF OTHERWISE MEASURING DAMAGES AND OBTAINING AN ADEQUATE REMEDY. THE WARRANTIES CONTAINED HEREIN MAY NOT BE ALTERED, AMENDED, OR MODIFIED, EXCEPT BY A WRITTEN INSTRUMENT SIGNED BY AN AUTHORIZED REPRESENTATIVE OF ACLARA.

Electric Meter Network Interface Card

With Aclara RF™ for Residential and Commercial Meters

Aclara RF™ Network Interface Cards (NIC's) for single-phase and poly-phase, solid-state, ANSI-certified residential and commercial meters minimize risk and ensure accurate, reliable and efficient measurements.

Aclara RF Network Interface Cards provide superior measurement performance, affordability, accuracy and reliability. In addition to reading meters, the units support demand, load profiling, time-of-use, and net metering for distributed generation.

Aclara RF NIC's are a critical component of the Aclara RF network solution, which offers unequalled performance and expandability while providing reliable, flexible two-way communications for electric meters and other smart-infrastructure devices on distribution networks.

FEATURES AND BENEFITS

- Operates on Aclara's low cost Aclara RF point-to-multipoint FCC licensed 450-470 MHz network, reducing the risk of interference by other radio systems providing reliable communications with low channel noise, no competition for airwaves and greater penetration through building structures than higher frequency unlicensed solutions providing improved range and deterministic latency.
- Supports secure encrypted remote over-the-air configuration and firmware updates of the meter and NIC modules from the utility using the AclaraONE® headend software, reducing the need for in-field configuration and expensive truck rolls.
- Outage or restoration confirmation timer reduces false reporting and provides accurate outage and restoration messaging.
- Provides up to six "last gasp" outage messages across 20 minutes from any affected meter to identify where outages exist.
- Offers an outage event buffer to reduce the number of false momentary alarms.
- Accesses data directly from ANSI C12.19 tables.
- Supports integrated connect/disconnect functionality for residential meter.
- Employs NIST-standard, approved Advanced Encryption Standard 256-bit encryption (AES-256) for communications with the headend.
- Utilizing Datagram Transport Layer Security (DTLS) protocol, uses X.509 digital certificate-based client and server authentication.
- Uses the IEC 61968-9 standard (Application Integration at Electric Utilities) to transact CIM-based messages.
- Applies an extended set of IEC-61968-9 Distribution Management commands from the headend to the endpoints.

CONVERT DATA TO INFORMATION

Data transmitted to the utility is turned into actionable information by Aclara's AclaraONE® software, a full-featured headend that provides a single user-friendly interface for control and command.

Out-of-the-box functions in AclaraONE® are on-demand reads, outage and restoration reporting, connect/disconnect, firmware downloads, alarms and validation, estimation and editing capability. Aclara offers additional value-added modules for loss analysis, transformer analysis, voltage analysis, meter exchange, power billing, fault detection and localization and more.

Aclara

Electric Meter Network Interface Card

With Aclara RF™ for Residential and Commercial Meters

METER NETWORK INTERFACE CARD SPECIFICATIONS

Meter compatibility	Aclara I-210+, I-210+c, and kV2c smart meter platforms
Data speed	9.6 kbps per RF channel
Load profile data	5-minute, 15-minute, 30-minute, Hourly
Daily Shift Read	Daily consumption read
Transmission Read Rate	I-210+: 15-minute reads every 15 minutes, 4 channels I-210+c: 5-minute reads every 5 minutes, 8 channels kV2c: 5-minute reads every 5 minutes, 8 channels
On-demand read response rate	< 30 seconds
Messaging standard	IEC 61968-9 CIM
Transmitter power	1W (30dBm) per transmitter channel
Receiver Sensitivity	-105 dBm for 10^{-6} BER per receiver channel
Security Standards	AES-256 encryption with X.509 certificate authentication, DTLS v1.2 and NEMA SG-AMI 1, FIPS 197, FIPS 186-4, FIPS 108-4, SP800-90A
Outage/restoration event confirmation timer	Programmable from 5 to 300 seconds from meter notification
Last-gasp outage capability	Up to 6 outage notification messages during a 20-minute period
Alarms/Event notification	High temperature, tamper, outage, restoration, and more
On-request commands (if supported by meter)	Connect/disconnect, demand read, demand reset, historical recovery

Visit us at Aclara.com, phone 800 297 2728 or contact us at info@aclara.com and follow us on Twitter @AclaraSolutions.

©2020 Aclara. All Rights Reserved.

Residential Metering

I-210+c

Precision & Reliability with Flexibility

KEY FEATURES

- Advanced metering solution
- Industry-proven
- Cost efficient
- Adaptable to fit complex needs
- Robust design and testing
- Bi-directional demand meter
- Diverse integrated AMI options
- 20+ years expected meter life

Aclara's I-210+c residential meter continues the tradition to bring innovative technology solutions to cover all your metering requirements. From basic energy-only metering to highly flexible sensor solutions, this flagship meter provides all functionality required to meet utilities' evolving needs.

This advanced, powerful, and easy-to-use meter will deliver the real-time instrumentation, power quality monitoring, and easy access to critical information you require - right at the edge of your network - to gain visibility and improve service. The I-210+c will help you achieve higher operational effectiveness, improved network efficiency, and reduced energy costs.

Visit us at aclara.com

Aclara

I-210+c

ADVANCED CONFIGURATION

- Configurable options for specific data needs and complex rate requirements
- Optional advanced functions available when shipped or field installed, such as:
  - Include reactive power measurement for power factor rate applications
  - Install power quality and event logging for specific case investigations.
- Remote disconnect to improve operational efficiency and adds options like:
  - Demand side management
  - Remote prepayment systems
  - Controlled outage restoration
- Tamper detection tools that shows:
  - Errors
  - Wiring changes
  - Tampering
  - Billing issues

RELIABILITY

- Over 130 years of experience designing and building high-quality, accurate, and reliable meters
- Accelerated life testing assures reliability over the life of the meter
- Industry leading software suite, MeterMate™, eases configuration effort and increases diagnostic details for lower operational costs

COMMUNICATIONS

- Broad advanced metering infrastructure (AMI) options including:
  - Radio frequency point-to-multipoint
  - Power line communications
  - Cellular communications
  - Radio frequency mesh (RF mesh)
- Rigorous validation of AMI integration to ensure reliability and control cost of ownership

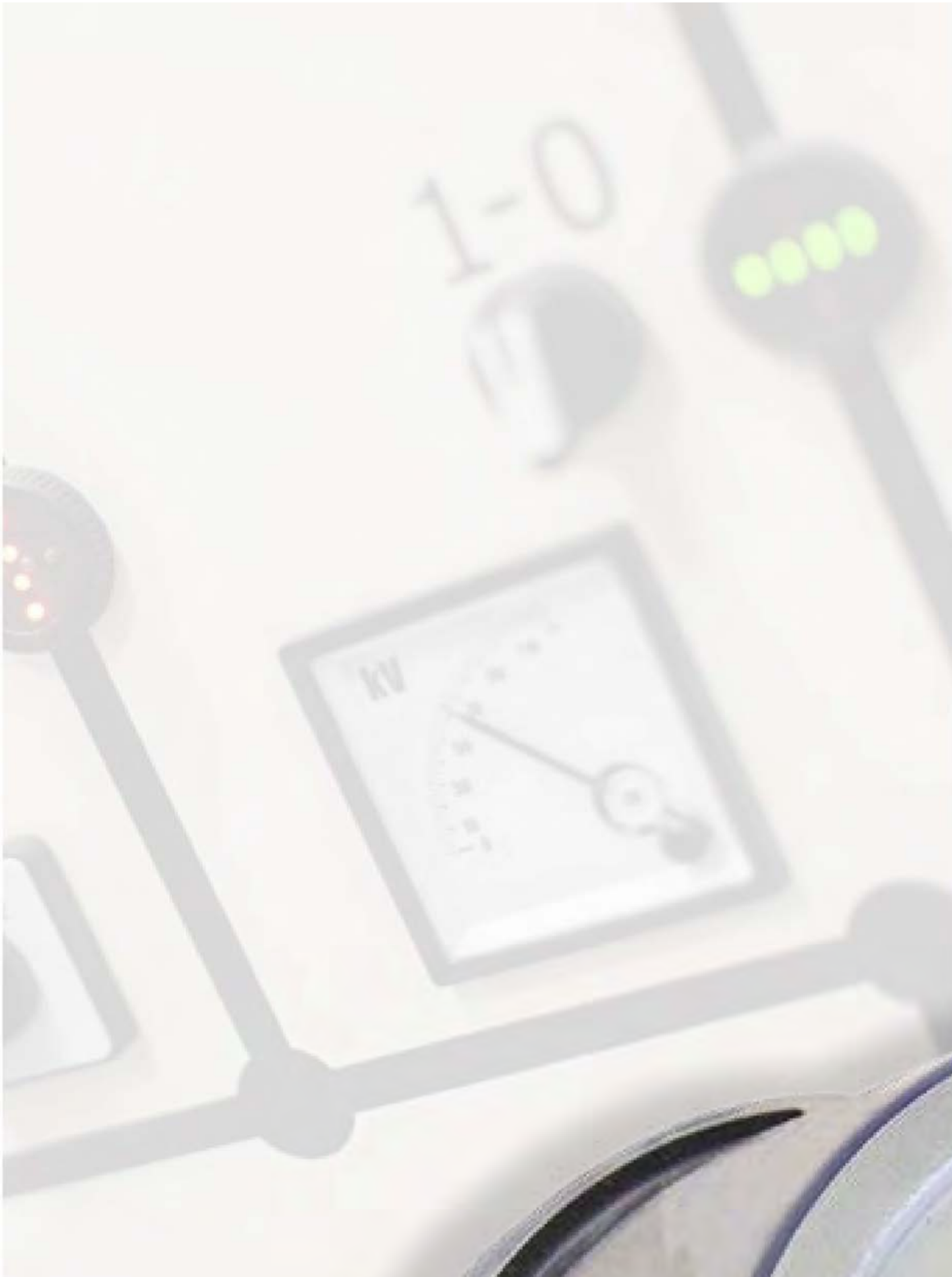
Specifications

Available Forms	CL20: 3S, 3CS, 4S CL100: 1S (RD Available) CL200: 2S, 12S, 25S (RD Available) CL320: 2S, 12S, 25S
Display	Supports 6 characters Up to 75 displayable items Modes: Normal, Alternate, Test 3 Character Display Label
Accuracy	Exceeds +/- 0.5% certified class accuracy Typically within +/- 0.2%
Voltage	120V, 240V
Frequency	50Hz, 60Hz
Temperature	-40°C to 85°C <95% relative humidity
Standards	ANSI C12.1 ANSI C12.10 ANSI C 12.19 ANSI C12.20 ANSI C37.90.1 UL2735 FCC Class B

Aclara.

Learn More
Visit us at Aclara.com, phone 800 297 2728 or contact us at info@aclara.com.

© 2020 Aclara. All Rights Reserved



Aclara kV2c™ Electric Smart Meter

Commercial and Industrial

Aclara metering products have over 100 years' heritage of providing reliable and robust metering solutions to utility companies and their customers. That tradition of excellence continues with the fifth generation of kV2c.

Aclara kV2c™ Electric Smart Meter

Commercial and Industrial

Aclara's fifth generation kV2c™ meter is designed for revenue class metering in commercial and industrial applications. This new generation of meter moves beyond revenue metering to real time instrumentation, true power quality monitoring and real cost of service measurements. Whether you are metering the simplest energy rate or collecting critical quality of service and load analysis information on a polyphase or a singlephase circuit, there is a kV2c meter configuration to meet your needs.

ELECTRICITY METER FOR ALL YOUR FUTURE NEEDS

The Aclara kV2c meter family is one of the most widely accepted ANSI® commercial and industrial meters with over 2 million units deployed in the field since its introduction. The robust revenue-grade meter design is based on Aclara's cutting edge technology that provides high accuracy and reliability. This fifth generation kV2c has eight times the processing power and three times the memory of previous models. This allows for future upgrades and new applications without having to replace the meter.

KEY BENEFITS

- Reliable and accurate cash register for utilities
- Revenue assurance using diagnostic and event tools
- Low maintenance and high accuracy over the life of the meter
- Strong overvoltage capabilities – Twice the operating voltage to absorb the system events of the grid
- Adaptive and versatile meter with bidirectional and four quadrant measurements
- Smart metering functions such as Time of Use, demand metering and reactive measurement
- Advanced power quality monitoring
- Robust meter security and standards compliance
- Polyphase Remote Disconnect is available for unique utility applications

RELIABILITY

- Over 130 years of experience designing and building electricity meters
- Robust revenue-grade watt-hour and demand meter with advanced recording options
- Based on Aclara's high-quality technology, providing 0.2% accuracy and reliability
- Highly Accelerated Life Testing assures the reliability of the meter over the life of the meter
- Provide utilities with tools to lower operational cost and provide accurate metering solutions

SMART CONFIGURATION

- Customize advanced metering options to suit customer needs and complex rate requirements.
- Versatile programming softswitches allowing the selection of advanced functionality such as expanded recording features, harmonic analysis, time of use, load profile, and power quality measures.
- Options available to provide totalization capability and pulse outputs.
- Tamper detection tools and installation verification capabilities to automatically catch errors, wiring changes, tampering, and billing issues.

SOLUTIONS FOR THE MOST DEMANDING APPLICATIONS

Aclara's most advanced electricity metering product, the kV2c, delivers world class capability for revenue metering and protection, power quality and cost of service measurements..

RELIABLE METERING

In this dynamic time of regulatory scrutiny and customer engagement, you can rest assured by the product and the company behind the product. We have ANSI and ISO certified labs to ensure that our product design and manufacturing processes yield a robust and reliable product.

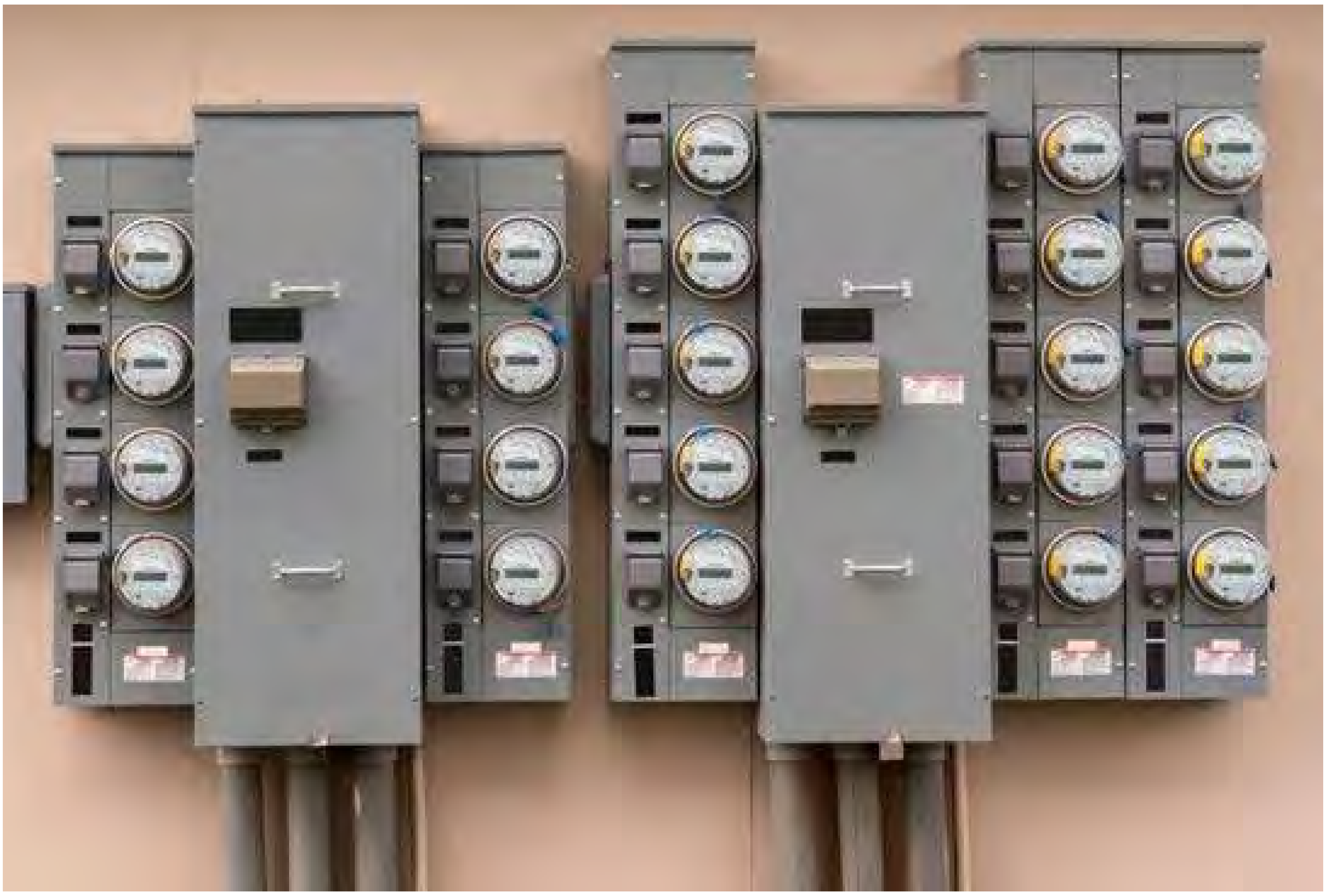
Our testing procedures go well beyond the ANSI and IEC requirements for which we design to, including some of the most aggressive internal standards. We include world-class Radio Frequency (RF) communications expertise to ensure that our meter products are hardened to withstand even the harshest of RF environments without sacrificing the quality or integrity of the metrology or the communications technology

ACCURATE & DEPENDABLE

With an accuracy class of 0.2%, the Aclara kV2c meter provides outstanding capabilities for accuracy. With Aclara's Highly Accelerated Life Testing we are replicating the normal wear and tear that would normally be experienced over the usable lifetime of the product in a shorter amount of time.

INTEGRITY OF SUPPLY

Having a partner that can provide assurance in supply is critical when a utility begins a mass deployment of meters. Aclara's process focus and rigor around supply chain excellence minimizes the risk to the utility, giving them confidence to manage installation crews and provide accurate scheduling to customers. Aclara dual sources all components and in many instances from different countries. This reduces our risk of parts obsolescence impacting our meters as well it helps us in the case of a catastrophic event.



TECHNICAL SPECIFICATIONS

Available Forms	CL20: 3S, 4S, 9S, 36S, 45S
	CL100: 16S (With Remote Disconnect only)
	CL200: 1S, 2S, 12S, 16S, 25S
	CL320: 2S, 12S, 16S
Accuracy	Exceeds +/- 0.2% Certified Class Accuracy Typical Watt Loss: 0.8W @ 120V / 1.7W @ 480V
Voltage	120 to 480 Volts Auto-ranging
Current	Class 20, 100, 200, and 320
Frequency	50 or 60 Hz
Temperature	-40^{o}C to 85^{o}C
Relative Humidity	<95%
Weight	2.5 to 3.9 lbs.
Dimensions	6 ½" Wide by 8 ¼" Deep
Display	Supports 6 Characters Up to 75 displayed items Modes: Normal, Alternate, Test and Site Genie (Diagnostics) 3 Character Display Label Phase Voltage Indicators
KYZ Option Boards	Simple I/O – 2 form C outputs, 1 form A output & 1 RTP Multiple I/O – 2 form C outputs, 6 form A outputs, 4 pulse inputs & 1 RTP
Standards	ANSI C12.1, C12.10, C12.16, C12.18. C12.19, C12.20 FCC Class B emissions UL2735*

METROLOGY AND DATA CAPACITY

- 5 Accumulators
- 10 Coincident Demands
- Demand (Block, Rolling or Thermal)
- 20 Channels of Load Profile Data (1,5,15,30 or 60-minute intervals)
- 384kB of Load Profile Storage (Days recorded depends on number of channels, i.e. 5 channels of 15 minutes = 306 Days)
- Energy Data (Wh, VArh & VAh)
- Instrumentation Data (Voltage, Current, Temperature and Frequency)
- Time of Use (4 periods & 4 seasons, 3 daily rates plus holiday, 5 billing and demand measures per period)
- Comprehensive Event Logging
- Remote Configuration and Firmware updates over the air

*No UL2735 Certification for 16S CL100 with Remote Disconnect

Visit us at Aclara.com, phone 800 297 2728 or contact us at info@aclara.com and follow us on Twitter @AclaraSolutions.

©2020 Aclara. All Rights Reserved.

Aclara RF™ Data Collection Unit

A single advanced RF communications network for electric, water, and gas utilities.

The Aclara RF Data Collection Unit's (DCU2+) advanced design meets all the needs of electric, water, and gas utilities looking for an advanced communication backbone. The DCU2+ is multi-functional supporting Advanced Metering Infrastructure (AMI) applications for electric, water, and gas, load control, distribution automation (DA), Smart Infrastructure Solutions (SIS) and other advanced applications. Designed to operate on a single network for all advanced measurement, sensor monitoring, and control, the DCU2+ can support utilities' system infrastructure for decades to come.

Available in AC mains powered or stand-alone solar operation, the DCU2+ can be quickly and easily mounted on wood or steel poles, water towers, building rooftops, and communication towers. The DCU2+ does not require additional field configuration tools, and provides the flexibility and range to minimize network infrastructure and your total cost of operation.

OVERVIEW

The Aclara RF architecture employs a two-way point-to-multipoint (P2MP) communication, where data is directly transmitted from an edge device (meter, sensor, distribution automation/SCADA radio) to a DCU2+, and then to the head-end (software). This architecture delivers key distribution operation advantages:

FEATURES AND BENEFITS

- **Redundant Network –** The Aclara RF P2MP network designs are designed with redundancy, providing multiple data paths to the AclaraONE® head-end system, ensuring reliable and secure delivery of data between the field network devices and back-office applications.
- **Licensed Frequency 450MHz-470MHz –** Aclara's RF communication is over a low-cost 450MHz-470MHz licensed frequency providing reliable communications with low channel noise, no competition for airwaves and greater penetration through building structures than higher frequency unlicensed solutions.
- **Message priority –** Aclara's architecture ensures critical grid events (i.e. outage, load control, DA/SCADA, tamper alarms) are prioritized over day-to-day functionality (i.e., billing reads) as needed.
- **Dedicated channels –** Aclara's architecture provides the ability to configure and dedicate separate frequencies to specific applications (e.g., electric, water, gas AMI, DA, load control, leak detection, pressure monitoring, methane detection, etc
- **Low Latency** – The Aclara P2MP network provides low deterministic latency with near real-time distribution visibility and control, which is not possible with other architectures utilizing non-deterministic hopping.
- **Over-the-air firmware** – updates and configuration – the DCU2+ supports secure encrypted over-the-air firmware updates and device configuration from the utility AclaraONE head-end software eliminating the need for in-field configuration and expensive truck rolls.

WHY THE DCU2+

- **Designed to protect your investment for future expansion with a low total cost of ownership** - As your needs evolve or expand, additional applications to the existing coverage area such as meter, DA, load control, lighting, leak detection, pressure monitoring, methane detection, etc. can be added to the network without the need to add additional network infrastructure.
- **Provides for a variety of high-speed IP backhaul options -** such as Cellular, Ethernet or Fiber between the DCU2+ and AclaraONE software. The DCU2+ also supports an optional failover backhaul configuration for mission-critical applications such as DA, to switch from a primary wired/wireless backhaul to a secondary wired/wireless failover backhaul and back to the primary once it becomes available again.
- **Redundant network -** Ensures reliable communications to all endpoints without the added expense of network repeaters.
- **Quick and easy to install -** without the need for field configuration and flexibility for a variety of field installation options to poles, lattice towers, water towers, and other assets.

Aclara RF™ Data Collection Unit

A single advanced RF communications network for electric, water, and gas utilities.

ACLARA RF DATA COLLECTION UNIT SPECIFICATIONS

Model	Aclara Data Collection Unit (DCU2+)
Size	22"H x 14"W x 8.25"D
Main Enclosure	316 Stainless Steel, NEMA 3R
Internal PCB Enclosure	Polycarbonate, NEMA 4X
Operating Power	120VAC +/- 20%, 0.7A
Operating Temperature	-40ºC to +70ºC
Operating Humidity	0% to 95% non-condensing
Vibration Rating	Seismic Zone 4
Wind Rating	120 mph
Backhaul Options	Cellular (AT&T, Verizon, Rogers, Bell Canada), Ethernet, Fiber
Back up Battery*	12V, 42Ah, Lead-Acid
Weight	72 lbs (36.6 pounds for DCU and 35.4 lbs for the battery)
Mounting Options	Wood pole mount, steel pole mount, lattice tower mount, water tower mount, roof top mount
Approvals	FCC Part 15, FCC Part 90, IC RSS-119
Options:	
Solar Operation	100W panel(s)
Failover Backhaul	Wired (Ethernet/Fiber) to Wireless (cellular)
	Wireless (Cellular) to Wired (Ethernet/Fiber)

*Backup Battery provides multi-day operation during AC power outage periods or limited sunlight when solar powered.

Contact your Aclara solution expert to explore how the Aclara RF Data Collection Units can deliver the communication infrastructure to improve reliability, reduce losses, improve quality and reduce cost.

Visit us at Aclara.com, phone 800 297 2728 or contact us at info@aclara.com and follow us on Twitter

2020 Aclara © All Rights Reserved.

AclaraONE Software Solutions

One Network for Everyone

To be ready for anything, you need a partner with a wide range of solutions; but not just any solutions. You need that will stay effective for years to come.

Unlock, analyze and apply critical meter and device data with the AclaraONE™ (One Network for Everyone™) platform. With a single, customizable interface for utility personnel, AclaraONE allows you to manage distribution infrastructure, integrate key business processes, optimize operations, improve reliability and position your utility for future success.

OVERVIEW

AclaraONE is a powerful platform that enables Aclara's communications technology and adds comprehensive solutions to transform business operations, increase efficiencies, reduce costs and increase customer satisfaction. Built to provide actionable insights and the situational awareness required to handle growing distribution challenges,

AclaraONE allows gas, water, and electric utilities to securely, reliably, and efficiently operate their distribution networks.From meter to cash, network management, distribution operations, sensors, analytics, and consumer engagement, AclaraONE delivers the broad set of functionalities utilities require to monitor, optimize and improve the operation of their infrastructures under a single platform. Equipped with robust, scalable, next-generation AclaraONE smart infrastructure solution (SIS) software, network operators can react faster and more effectively while improving the technical and economical operation of their distribution grids.

BENEFITS

- **Meter-to-cash** software offers a single, centralized enterprise service featuring consumption-based analytics, billing analytics and a portal and tools for customer service representatives.

- **Network management** functions link securely to critical business systems through a single, centralized head end for gas, water and electric devices on Aclara's RF, powerline communications and cellular networks.

- **Distribution operations** software provides distribution automation capabilities that rapidly shed load during peak periods, pinpoint outages on low-voltage power lines using analysis of meter data, and analyze data from smart grid sensors to detect and locate faults, classify various line disturbances, and monitor power quality across all three phases of medium-voltage distribution networks.

- **Analytics** in AclaraONE allow utilities to extract information from the data they collect from meters and sensors on their distribution networks, providing real-time insights, alerting utilities to events affecting operations and enabling quick response to identified problems.

AclaraONE Software Solutions

One Network for Everyone

FEATURES

The AclaraONE platform offer you the software you need to manage distribution operations, sensors, and analytics.

Distribution Operations

- The AclaraONE™ platform offers you the insights and confidence to safely monitor, manage, and control distribution grid assets in the most challenging of circumstances.
- Innovative load control operates the grid at optimum efficiency, and rapidly manages and sheds load during peak periods.
- Distribution automation solutions help you deliver these outcomes by providing standards-based (i.e. DNP3) communications and control to both intelligent electronic devices and older analog devices.
- The Aclara Grid Monitoring platform detects faults and integrates with data historians as well as SCADA, OMS, or DMS systems.

Sensors and Analytics

Our robust, solutions analyze data collected from sensors on your existing gas and water networks and deliver targeted, actionable insights that help you improve operations and maximize customer benefits.

- The Aclara ZoneScan solution collects data from sensors monitoring points located throughout the water distribution system and correlates it at your office, providing visual identification of probable leak locations.
- Non-revenue water loss, conservation and customer service challenges are solved with Aclara's suite of software and water analytics.
- Sanitary sewer overflow (SSO) solution alerts utilities to any potential or actual sanitary sewer overflow, which can send contaminated water onto streets or into lakes, rivers or streams.
- Pressure Monitoring actively monitors your distribution networks, collecting detailed, accurate and actionable data on water and gas pressures.

Consumer Engagement

The AclaraONE platform offers data-driven tools that will propel your consumer engagement programs for success. Integration with these tools helps utilities engage customers online, on their tablets, or through their mobile devices.

Network Management

AclaraONE performs network management and securely links to critical business systems via a single, centralized head end for gas, water, and electric devices on our RF, power line communications, and cellular networks.

- Installs, recognizes, and administers electric, gas, and water devices and their pairings with Aclara communication modules through a common, easy-to-use interface and user experience.
- Supports secure roles-based access, including single-sign-on, user authentication, and integration with Microsoft Active Directory®.
- Provides over 100 health-alarms and software-generated analytics alerts.

Meter-to-Cash

AclaraONE™ meter-to-cash software provides a single, centralized enterprise service that delivers billing data accuracy. The AclaraONE MDM system supports end-to-end data validation, estimation, and editing (VEE), integrated reads, and billing determinant delivery, providing customer service and network management employees with the tools they need to deliver efficient service.

Visit us at Aclara.com, phone 800 297 2728 or contact us at info@aclara.com.

©2018 Aclara. All Rights Reserved.

SAMPLE Statement of Work (SOW)

Upon notification of selection, Aclara Technologies LLC (Aclara) will work with the UTILITY ("Client") to draft a formal Statement of Work (SOW) for this Project that includes a milestone payment table with the agreed-upon project scope. This sample SOW outlines Aclara's approach for completing deliverables related to typical requirements of an AMI Implementation Project.

Scope of Work

The scope of work for UTILITY's Project includes the professional services (project management, coordination, training, and system acceptance testing).

The new solution will support various uses of the components and applications defined in Attachment 1, Section 1.1. More detailed requirements will be developed during the Requirements Gathering task of the Project, but will remain consistent with Attachment 1, unless mutually agreed by the Client and Aclara.

This Scope of Work addresses the implementation services required by the Project. It is mutually understood that business requirements, resources, and dates may change subject to the applicable terms of this Scope of Work and that any such material change requested by the Client or as a result of the Client's inability to provide agreed upon resources and perform its other responsibilities set forth herein or the result of Client errors or omissions may result in a Change Order.

It is understood by Aclara and the Client that any material changes to scope will be addressed through a formal change order process. Material changes are those which specifically will impact budget, scope, timeline, and/or resources.

1. Project Approach

The Aclara Services Team ("Aclara Team") assigned to this project will complete the Aclara tasks described herein and will perform work for the Client for the duration of the Project at designated Client facilities and from remote locations.

The scope of the services engagement for this SOW is set forth in the attached Attachment 1, hereto. Attachment 1 also includes certain Responsibilities and Assumptions that are the responsibility of the Client. In addition to the tasks specified in Attachment 1 hereto, the Client will provide appropriate Project resources, including but not limited to, data, information, and appropriate and cooperative personnel, to facilitate the performance of the Services. The Client shall designate a Project Manager to work with the Aclara Team to facilitate the provision of the Services. Once this SOW is executed, Aclara and the Client will assign resources to the Project. The Aclara Team will work on the Project and provide support as specified by the SOW.

2. Assumptions and Responsibilities

Project Assumptions and Responsibilities are set forth in Attachment 1. Should the Client fail to fulfill those that are applicable to the Client, the estimated level of effort, timeline, and scope may be subject to change.

3. Scope Estimates

Aclara will support the Client by providing a team to complete the SOW defined in Attachment 1.

Aclara's estimate of the level of effort is based on the following:

- Information provided by the Client to Aclara
- Aclara's understanding of the project scope, based on Client information

Should the information provided by the Client be inaccurate or should Aclara gain additional information during the Project, the work required may be out of scope and the pricing and schedule may be impacted. If so, additional work will be addressed as a change to the SOW (change order).

4. Software Licenses

The AclaraONE software components are licensed in accordance with the Aclara Software and Hardware License Agreements ("Licenses") executed between Aclara and the Client. The Licenses cover the integration with the Client's single production environment and within the Client's current service territory.

5. Changes

Any changes to this SOW shall be subject to mutual written agreement of the parties. Aclara shall not commence work on any such change unless and until the change has been agreed to in writing by both parties. Additional charges may apply based on Aclara's level of effort to complete the requested change.

SAMPLE

IN WITNESS WHEREOF, the parties have so agreed as of the last date signed below.

Accepted By:	Accepted By:
Aclara Technologies LLC **(Aclara)**	**UTILITY** **(Client)**
By: ______________________	**By:** ______________________
Print name: ______________________	**Print name:** ______________________
Title: ______________________	**Title:** ______________________
Date: ______________________	**Date:** ______________________

Attachment 1 = Project Definition

Attachment 2 = Rate Schedule

Attachment 3 = Milestones & Hardware Delivery Schedules

Attachment 4 = Change Order Procedure

SAMPLE

Attachment 1 to Scope of Work

Project Definition

1. Aclara RF Project Scope

Included in the purchase of an Aclara RF Electric Implementation are the Professional Services efforts required to design the AMI network, identify the optimal locations of the DCU sites, complete the commissioning of the DCUs, complete the installation of software and implement standard interface functionality as defined in Section 1.1. The purpose of this document is to outline the tasks and deliverables of the Aclara Team and provide the Client an overview of the responsibilities and time commitment that will be required of their staff.

1.1 Project Scope

Aclara will assist the Client in an implementation of an Aclara RF Electric for all XXX electric endpoints (numbers as provided by the Client). Aclara will work with the Client in the field design, installation of needed hardware, software, maintenance, training, and other related activities needed to complete the project successfully. The project scope includes:

AMI Hardware:

- Total of XXX endpoints with AMI Modules
- XXX Data Collectors

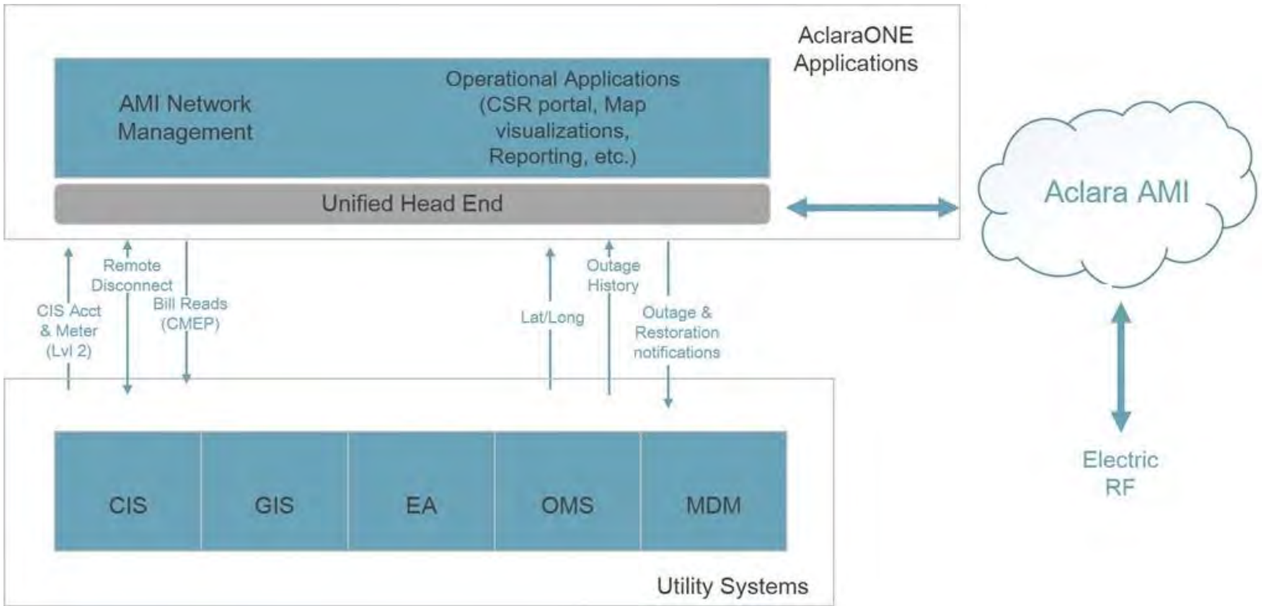
Software:

- AclaraONE unified headend for the total XXX meters, including integration to Client's NAME CIS system, NAME GIS, NAME EA and OMS, and NAME MDM.

Endpoint installations will be completed by NAME.

The schematic below details the components of the solution that are in scope for this project.

SAMPLE



1.2 Implementation Approach

The Aclara implementation approach involves two project stages – Stage 1: Initial Deployment and Stage 2: Mass Deployment.

Stage 1: Initial Deployment

The objective of this initial deployment stage is to confirm the meter-to-cash process. The project manager (PM) will manage the project through a series and tasks and activities to deploy a subset of endpoints and DCUs (endpoint and DCU quantities to be determined), software installation, and integration configuration and concludes with end-to-end testing to confirm meter reads and billing export files are successfully transferred to the Client's CIS system.

The phases for this initial deployment stage include:

Phase 01 Project Planning & Kick-Off

The Aclara Project Team will begin work upon contract execution. The Aclara Project Team will begin the internal preparations for the official launch of the project. The PM will coordinate and schedule the client kick-off meeting. During this kick-off phase, Aclara and the Client will define the project team organization and introduce the teams, review the project scope and proposed timeline, review the Client's goals and business objectives, and develop the communication plan. Aclara will introduce a PM and other leaders assigned to oversee and coordinate the day-to-day activities of all parties involved. Frequency scans will also be completed and the selection of the appropriate frequencies will be made and the FCC application submitted. Entry criteria for this phase to begin are defined as the signature of the contract, the assignment of an Aclara PM, and setting an agreed upon project kick-off start date. This phase will be complete once the project teams have been defined, the kick-off meeting has occurred, and the project plan has been reviewed.

SAMPLE

Phase 02 Requirements Analysis & Design

At the beginning of the implementation process, Aclara meets with the key stakeholders to confirm the detailed functional, integration, and infrastructure requirements for the system. We finalize all product hardware and software requirements and submit product orders as needed. Field installation plans document the approach, logistics, timing, and requirements for installations. Aclara will complete site surveys, propagation studies, and any remaining spectrum analysis to finalize the DCU (network) installation plan. Aclara will work with the Client to jointly create an installation plan that documents how to communicate meter/MTU installation to the end consumer. Aclara will hold software interface requirements sessions and create requirement documents and overall solution architecture specifications.

Aclara delivers a testing strategy that will document System Acceptance test scenario and acceptance criteria. This phase is complete once the Client reviews and approves all associated deliverables.

Phase 03 Configuration & Network Deployment

In this phase, Aclara completes all tasks to support network deployment and prepare for system testing. Aclara provisions and builds the hosted IT environments or if the solution will be installed on premise, the Client sets up and provisions the IT environment for the head end software. For on-premise solutions, the Aclara PM will provide the server hardware and software specifications. Software is installed, configured, and enabled for data loading and testing. In parallel, during this phase, Aclara begins to install, configure, and validate the DCU network (tasks such as DCU installation in this phase may overlap with part of the System Requirements and Design phase). Aclara and the Client's third-party vendor(s) configures software integrations and performs unit testing in preparation of system integration testing. For water endpoints, Aclara will also integrate and configure the field programmers into the Client's meter shop and environments. The Client works with Aclara and delivers sample integration data from production systems to validate interface configuration and software functionality. Additionally, the Client will also work closely with Aclara to review and finalize the endpoint installation and communication plans. Aclara will achieve entry criteria by reviewing the software installation and integration configuration plans with Client. This phase is complete once Aclara and supporting resources install the software solutions, the DCU network, configures interfaces, completes handheld configuration, and completes the first step of software system acceptance.

Phase 04 Training, Testing & Acceptance

The testing phase validates end-to-end meter-to-cash system functionality from the meter read capture through billing. Aclara provides training for all software solutions being deployed, including head end software prior to the start of System Acceptance Testing.

Aclara creates the test plan as described in the previous phases. This includes conducting test cases during acceptance testing. Aclara will support the Client as acceptance test cases are executed and correct any problems to allow for retesting as necessary. The testing concludes when Client signs off on the completion which signifies acceptance of Aclara products and processes, workflows, and end-

SAMPLE

to-end logistics function as expected. This phase is complete once Client executes the prescribed test cases, Aclara resolves or identifies a work-around for all Severity 1 and Severity 2 issues as described in the table below, and Client acknowledges approval to proceed by signing an acceptance certificate.

Issue Severities

Severity Level	Description
1	Requires immediate attention. Service is lost or degraded for all users preventing operation of business
2	Requires priority attention. Service is lost or degraded for single or small number of users, affecting significant business functionality
3	Requires attention. Users can continue business operations, but a problem or issue has been identified that affects operation of business
4	There is a problem or issue that does not affect operation of business

Once training and System Acceptance Testing are complete, Client can begin installing endpoints on a larger scale. The deployment team follows the installation plans that were mutually developed earlier in the project.

Stage 2: Mass Deployment and Project Closure

Upon successful completion of the system acceptance testing activity, an acceptance certificate will be provided to the Client for formal approval. Mass endpoint installation may commence once the application cutover is complete.

At this stage, Aclara will commence closeout activities for this initial phase. During the closeout phase, Aclara will compile all open issues and review the status of these issues with Aclara's Client Technical Support team and the Client's project team. Additionally, by this time the Client is introduced to Aclara's Client Technical Support operations. All support operations will begin to be managed by this team.

The Client will be trained on Aclara's Support processes, which include opening support tickets, managing and obtain status of these tickets. The Client will also be introduced to the AclaraConnect client portal.

1.3 Deliverables and Milestones by Step

The table below details the milestone deliverables for this project. Delivery dates for each milestone will be communicated at project launch.

SAMPLE

Milestone	Deliverables	Payment Milestones Descriptions
1	Contract Execution	• Contract Execution. This milestone is complete after the contract documents are fully executed by both parties.
2	Project Plan, Communication Plan, Project Kick-Off Materials, Project Kick-Off	• Project Kick-Off Complete. Aclara will facilitate a kick-off meeting on-site to walk through the project schedule, introduce team members and roles, client responsibility, upcoming tasks. Additionally, during this meeting the project governance will be established. This includes communications plan, team meetings, status reporting, and issues management.
3	Installation and configuration of base AclaraONE Software	• Base AclaraONE Software installed. This task is complete after the installation of the base software is completed in the Client's environment.
4	DCUs Deployed	• DCUs Deployed. This task is complete after DCUs are deployed and commissioned in the field.
5	Installation and Configuration of integrations – CIS, GIS, EA and OMS Data Validation workshop Network Management Head End Configuration System Acceptance testing (SAT)	• Installation of In-Scope integrations. This task is complete after the installation of these integrations in the Client's environment.
6	Deliver Training and Training Materials Document SAT Results	• Training Complete. Aclara will provide training for Aclara RF network system administrators, field personnel, and customer service representatives.
7	Signed Certificate of Acceptance Project Closure	• System Acceptance Certificate Approved. SAT results will be documented and upon successful completion, a certificate of acceptance will be provided to the utility for signature.
8	Rollout Plan for DCU Network	• In preparation of the mass deployment effort, Aclara will work with the customer to develop a rollout plan for the remaining DCU network.

1.4 Interface Scope

Aclara will provide file-based integration for the standardized Billing Output and Account Import interfaces. Aclara will provide sufficient assistance to the Client for integrating with the standard interface file formats. It is the Client's responsibility to integrate these standards with their CIS. The Client is responsible to extract data as per the prescribed data format from the Client systems to integrate with Aclara interfaces.

SAMPLE

Aclara will provide the integration to AclaraONE as noted in the table below; however, it is the responsibility of the Client to format the data for the described integration below in the standard Aclara integration format. Aclara recommends the Client discuss the integration requirements with their CIS vendor in advance of the project kick-off and confirm the necessary resources are available to support the project.

Input Integration		
Integration Name	**Type**	**Functions**
Customer Import Interface	MultiSpeak	Populate AclaraONE with meter inventory and customer account/location details from Client's CIS
Web Services Brokering Interface	MultiSpeak	MultiSpeak brokering interface for Connect/ Disconnect from Client's CIS
GIS Import Interface	Flat File or MultiSpeak	Provides network topology from Client's GIS to AclaraONE for map visualizations
OMS Outage History	MultiSpeak	Provides outage history to AclaraONE
Input Integration		
Integration Name	**Type**	**Functions**
Billing Output Interface	Flat File	Export Billing Read values from AclaraONE to CIS using the California Meter Exchange Protocol (CMEP) file format
OMS Brokering Interface	Flat File	Send outage and restoration notifications to Client's OMS

Assumptions

- All import and export interfaces meet the standard import and export formats from AclaraONE.
  - AclaraONE's standard bill export format is California Meter Exchange Protocol (CMEP).
- Aclara assumes data in Client's systems do not require any data cleanup. Any data cleanup will be the Client's responsibility.

1.5 Preliminary Project Schedule

The preliminary project schedule is provided in Attachment VI: Proposed Project Plan. This project schedule will be refined for project kick-off after contract execution.

1.6 Accountability

The following shows the key that is used to identify accountability for each deliverable.

[R] **Responsibility**

Indicates that the designated Party has responsibility and accountability to complete the applicable Deliverable or milestone.

[A] **Approve**

SAMPLE

Indicates that the designated Party is responsible for approving the applicable Deliverable or milestone.

[S] **Supports**

Indicates that the designated Party is responsible for supporting the applicable Deliverable or milestone.

[C] **Consulted**

Indicates that the designated Party will need to provide feedback or contribute as the applicable Deliverable or milestone is completed.

[I] **Informed**

Indicates that the designated Party will be informed after completion of the applicable Deliverable or milestone.

The acceptance procedure for all deliverables outlined in this SOW will be as follows:

- Aclara will work with Client personnel to gather input and complete deliverables.
- When complete, final deliverables will be given to Client. Client should review and sign off by Client utilizing a mutually agreed Acceptance Form.
- The Acceptance Form should be physically signed (or electronically signed) indicating approval or disapproval within five (5) business days of receiving the deliverable.

SAMPLE

Key Project Task/Activity	**Accountability**	
	Aclara	**Client**
Project Initiation & Kick Off		
Communication Plan	R	C
Change control procedures	R	I
Contact list – with roles and responsibilities	R	C
Detailed Project Plan	R	C
Requirements Confirmation		
Integration requirements sessions	R	S
Completed requirements document	R	A
Customer Usage portal requirements confirmation	R	S
Setup hosted environment	R	I
Configuration and Unit Testing		
Setup and provision environment for AclaraONE	R	I
Install Base AclaraONE Software	R	A
Configure interfaces	R	R
Configure application - AclaraONE (network management and MDM)	R	I
Configure Customer Usage portal	R	S

Key Project Task/Activity	Accountability		
Develop System Acceptance Test plan	R		A
Execute System Acceptance test scripts	R		S
Certificate of System Acceptance	R		A
Hardware Installations			
DCU site surveys	R		S
DCU Site Prep (AC power and Ethernet if applicable)	C		R
Installation of DCUs	S		S
Installation of RF Meters	S		R

1.7 Project Governance

Project Organization

Client agrees to provide appropriate project resources including, but not limited to, data, information, workspace, and appropriate and cooperative personnel, all as necessary to facilitate Aclara's performance of the Services and the Client's integration.

Client will allocate the following described personnel to the Project to provide appropriate knowledge of the indicated area and the skills to perform the Client tasks, and any additional personnel that may be necessary for Client to perform its obligations under the implementation work plan.

- Project Manager – Main point of contact for the Project. Is responsible for scheduling Client resources, managing the scope and the Client tasks of the Project schedule, facilitating document approvals, and escalating & resolving issues as required.
- Business Owner/SME(s) – Business users or analysts who are business owners of the load research and settlement processes and data and are familiar with meter data processes. These resources will provide input to requirements definition and business process, design validation and acceptance testing.
- Technical Owner/SME(s) – Responsible for architecture, design and development of interfaces on the Client's external systems. Provides input for IT process flow, test data preparation, post-install troubleshooting and diagnostics.
- DBA – Will participate on an as-needed basis. Owns installation and administration of database software and infrastructure management. Post-implementation, this resource will perform database and network administration tasks and troubleshooting for AclaraONE.
- User Acceptance Testing Resources – End users of the system. UAT Resources will participate in training and execute the test cases defined by the Project Team.
- Escalation Resources – Typically the Project sponsor. Will participate in monthly Project review sessions with Aclara Program Manager. Available to assist with any escalated issues.

SAMPLE

Aclara will allocate the following described personnel to the Project to provide appropriate knowledge of the indicated area and the skills to perform the Aclara tasks, and any additional personnel that may be necessary for Aclara to perform its obligations under the implementation work plan.

- Project Manager – Oversees all deliverables and quality control, coordinates scheduling and work assignments, assists in requirements and detailed design, resolves issues and serves as daily interface with Client's Project Manager.
- Business Systems Analyst – Gathers and documents requirements, develops detailed configuration and interface specifications, performs system configuration, performs integration testing and training; supports data migration.
- Systems Engineer – Provides hardware and software planning; completes unit of any configured core product components. Performs installation, testing, and troubleshooting; configures network and OS; provides support and maintenance planning. Develops interfaces and any custom components, performs unit testing.
- Executive Sponsor – Assures project stays on track and meets Client objectives; escalation resource.

Problem Resolution and Exception Management

A defined and understood escalation process is a critical component of any project implementation. The Aclara Project Team is organized with multiple points of escalation that can be utilized as needed. Project issues will be logged, tracked, and reviewed at least weekly. In addition, risks are identified in our status reports along with suggested mitigations. Once an issue has been identified, it will be added to the issues list and worked according to priority. Depending on the type and severity of the problem, the Aclara PM will escalate appropriately within the organization as well as with the Client.

Project leads assigned to the project will communicate daily and will escalate risks and issues that could affect the project timeline or scope to the PM who will be providing active oversight and first-level escalation support to the engagement. The PM may continue to escalate the issue through the Aclara organization to the Program Manager and to the Vice President of Professional Services. Aclara escalation resources will work jointly with Client escalation resources to try to resolve the issue at each level and avoid all issues from escalating further.

In addition, Aclara will establish a communication plan at the start of the project. The communication plan is summarized below. Aclara's goal for the project is to provide the necessary information to the Client to allow for accurate validation of schedule, scope, and deliverables. To accomplish this, Aclara proposes the following activities: status reporting (includes schedule, issue, and risk tracking), quality reviews, and incident reviews.

The table below details the communication and progress reporting for the project.

SAMPLE

Project Status Report	Report sent via email	Weekly	Aclara Project Team Client Project Team
Project Team Meeting	Conference call, on-site meeting	Weekly	Aclara Project Team Client Project Team
Issues Meeting	Conference call, on-site meeting	Weekly or as needed	Aclara Project Team Client Project Team
Quarterly Project Review Meeting	On-site meeting	Quarterly	Aclara Program Manager Project Managers Key Project Sponsors Aclara Executives Sponsors

1.8 Modification

No modifications to the core software are planned for this project.

1.9 System Technical Support

Aclara will support the Client regarding the AclaraONE Solution and field hardware, which operates all main facets of the proposed solution.

SAMPLE

Attachment 2 to Scope of Work

Rates

The following categories have been defined for the Aclara Professional Services Team in the event of a change order:

Professional Services Staff	Hourly Rate	Off-hours hourly rate	On-call hourly rate
Sr. Technical Advisor			
Product Manager			
Project Manager			
Systems Engineer			
Systems Analyst			
Database Administrator			
Field Supervisor			

Expenses: as incurred per visit **Mileage: then current IRS mileage rate**

Services will be charged at the applicable Rates as follows:

1. Standard Hourly Rates will apply to all service hours expended that do not exceed eight (8) consecutive hours during Aclara's normal business hours of 6:30 a.m. – 6:00 p.m. Central Time, Monday through Friday, excluding Aclara Holidays.
2. Off-Hours Hourly Rates will apply to all service hours expended beyond eight (8) consecutive hours during Aclara's normal business hours of 6:30 a.m. – 6:00 p.m. Central Time, Monday through Friday, excluding Aclara Holidays.
3. On-Call service is a pre-arranged service by which the System Owner places a request to have an Aclara staff member accessible for a specified time period. During the period for which an Aclara staff member is accessible, On-Call Rates will be charged. If an Aclara staff member must perform services during the On-Call period, the services will be billed at the appropriate Hourly Rate or Off-Hours Hourly Rate, instead of the On-Call rate. This service will be provided remotely via a telecommunications link.
4. All expenses must be pre-approved by Client.

A. If Aclara is requested to travel to the Customer's site to provide Services, the costs and expenses associated with such travel will be borne by Customer and invoiced as set forth below.

   1. Travel Expenses: Unless otherwise mutually agreed, Aclara's travel expenses for On-Site Services shall include, but are not limited to, transportation fares (air, bus, rail), lodging, meals,

SAMPLE

automobile rental, fuel, parking and local transportation, and will be charged to the System Owner on an actual basis. Actual receipts must be provided as documentation to System Owner.

B. Aclara reserves the right to change the above rates upon 30 days' notice. Changed rates shall not apply retroactively.

Hours

It is not possible to define actual hours at this point until a mutual agreement has been reached between UTILITY and Aclara. Aclara has provided percentages of time anticipated for UTILITY FTE hours.

Phase	Role	Effort (FTE Hrs)
Project Kick-off Phase	APEX PM	50%
Requirements and Design	UTILITY PM	50-75%
	UTILITY SMEs	25-50%
	UTILITY IT	25-50%
Configuration and Network Deploy	UTILITY PM	50-75%
	UTILITY SMEs	0-25%
	UTILITY IT	0-25%
	UTILITY Field Support	50-75%
Testing and Training	UTILITY PM	50-75%
	APEX SMEs	25-50%
	APEX IT	25-50%
	UTILITY Field Support	0-25%
Mass Installation	UTILITY PM	25-50%
	UTILITY Field Support	25 - 50%

SAMPLE

Attachment 3 to Scope of Work

Milestones and Hardware Delivery Schedules

Project Milestones – Total Professional Services Fees: xx

	Milestone	Milestone %	Milestone Value
1	Contract Execution		
2	Project Kick-Off		
3	Install Base AclaraONE Software		
4	DCUs Deployed		
5	Integrations Installed		
6	Conduct Training		
7	SAT Approved		
	Total Professional Services		

Software Milestones – Licenses and Annual Fees: xx

	Milestone	Milestone %	Milestone Value
1	Software License		

Hardware Delivery Schedules

Pending development of delivery schedules.

SAMPLE

Attachment 4 to Scope of Work

Change Order Procedure

Any change to a Scope of Work must be agreed upon in writing by both parties. The following procedure (whether requested by the System Owner or Aclara) will be used to control all changes. All Requests for Change ("RFC") to the applicable Scope of Work must be made in writing and shall be submitted by the appropriate Project Manager. Each request should contain the following information:

- The requested change;
- The impact, if any, on the existing work product;
- Estimated impact, if any, on Project schedule;
- Estimated change, if any, in Services fee

The Project Manager shall review and accept or reflect the RFC. If rejected, the RFC shall be returned to the submitting party with written reasons for rejection and, as appropriate, any alternatives. All approved RFCs will be incorporated into the Change Order to this Scope of Work. Aclara will not perform any Services outside of the Scope of Work until the RFC has been signed by both parties.

1. Describe the requested change: ____________________
2. Define the impact, if any, on existing work product: ____________________
3. Define additional work product required as a result of the requested change, if any: ____________________
4. Define the impact, if any, to the existing Project schedule. Provide an updated Project schedule, if appropriate: ____________________
5. Provide an updated work product and payment schedule, if appropriate: ____________________

SAMPLE

Accepted By:	**Accepted By:**
Aclara Technologies LLC (Aclara)	**CUSTOMER NAME (Client)**
By: SAMPLE	By: SAMPLE
Print name: SAMPLE	Print name: SAMPLE
Title: SAMPLE	Title: SAMPLE
Date: SAMPLE	Date: SAMPLE

First Article Meter Test

This document outlines the testing to be completed on the meters prior to a large number of meters being produced.

Label		
	Expected Results	Actual Results
Utility Name is Accurate		
Serial Number is Accurate		
Barcodes are readable		
Meter type is Accurate (I-210+, I-210+C, kV2c)		
Class and Form are Accurate		
Colors are correct		
Display		
	Expected Results	Actual Results
Are proper UOMs displayed? (Refer to meter program)		
Are proper digits and decimals displayed?		
Did segment check display?		
AMI Data Elements – Confirm in head-end application or Meter Mate		
	Expected Results	Actual Results
Forward Energy kWh		
Reverse Energy KWH		
Total Energy KWH		
Demand KW		
Disconnect works	Meter disconnects	
Connect works	Meter reconnects	
On-demand read works	On-demand read is returned	
Box		
	Expected Results	Actual Results
Does the box label have the right shipping address?		
Does the box label have the correct part number?		

SAMPLE

AclaraONE

System Acceptance Test Cases

Prepared for: Client Name

SAMPLE

Document Version: 1.3

This document and any attachments hereto may contain information that is privileged, confidential or proprietary. Any review, dissemination or use of this document or its contents by persons other than authorized employees of the intended organization is strictly prohibited.

Contents

SAMPLE

REVISION HISTORY

Template Revision History

Date	Version	Description	Author/Editor
9/15/2021	0.1	Initial Version	Kiran Bajwa
05/02/2022	0.2	Refine test cases	Ismael Farias
06/09/2022	0.3	Document review with Kiran Bajwa, Chaidanai Polsing and John Krumenacker.	Ismael Farias
06/13/2022	1.0	First approved version	Ismael Farias
06/17/2022	1.1	Added OMS test cases to section	Kiran Bajwa / Ismael Farias
06/28/2022	1.2	Updated sections Overview, CIS Multispeak Interface and OMS Testing. Re-ordered content of the document to map to the Meter to Cash process.	Ismael Farias
07/12/2022	1.3	Updated section 4.1, specifically updated the Event Types for Event Groups Consumption and Network Health.	Ismael Farias

SAMPLE

1. OVERVIEW

The Test Cases outlined in this document will allow Aclara's clients verify compliance of the Aclara AMI web solution (AclaraONE).
The scenarios in this document vary depending on the commodities in scope for the project, it is especially important to select the right checkbox option as the content of this document will display/hide accordingly based on the selection.
Due to a Microsoft Word limitation, when making a new selection it is important to do it following the steps below.
If the current selection is "Combo: Electric + Water and/or Gas" and you want to change your selection to Electric only:

1. Deselect "Combo: Electric + Water and/or Gas"
2. Click anywhere in the document "outside" the checkboxes area
3. Select the new checkbox option, in this case "Electric Only"
4. Click anywhere in the document "outside" the checkboxes area

☐ Combo: Electric + Water and/or Gas

☑ Electric Only

☐ Water and/or Gas

SAMPLE

Test case execution and approval of the functionality described in this document is necessary for Acceptance of the System.

Pre-requisites to begin System Acceptance Testing are as follows:

1. Aclara has certified that the customer's territory has the correct AMI network hardware and AclaraONE, including meter-to-cash interfaces, and an active Azure account & access.
2. Aclara has validated the configuration and health diagnostics for AclaraONE within the customer's territory, including meter-to-cash interfaces and an active Azure account & access.
3. Meter Factory acceptance testing has been successfully completed.
4. For utility company's with Electric service, at least 4 meters are installed
    - Meters: I210+C and KV2C.
5. For utility company's with Water and/or Gas service points, the client needs to have at least 4 meters installed for each commodity.

2. PROJECT INFORMATION

Question	Answer
Client Name:	
Project Name:	
AclaraOne version:	

SAMPLE

3. SYSTEM ACCEPTANCE TESTING APPROVAL

The purpose of this section is to acknowledge approval of the System Acceptance Test cases presented within. This sign-off will document completion of the System Acceptance Testing phase.

Note: After customer provides sign-off, the present document will be converted into a PDF format file to lock down the System Acceptance results recorded in this Word document.

System Acceptance Testing approved by:

Client Name:

Name, Title: ______________________________

Signature: ______________________________

Date: ______________________________

SAMPLE

4. MENUS AND NAVIGATION

4.1 GENERAL VALIDATION – COMBO: ELECTRIC, WATER/GAS CLIENTS

Description	Activity	Expected Results	Pass/Fail	Comments
The following Primary Menu items or Applications should display by default	Expand the Menu on the upper left corner of the screen	Verify the following options are displayed. CSR Portal Load Control MDM Administration Reporting Aclara RF Electric Aclara RF Water* Job Scheduler *Will be displayed if client has Water or Gas meters.		
Verify the Report Groups on the Event List page	From the Applications menu tab click on MDM> Events> Event List On the Event List screen expand the Report Group drop-down field	Verify the Report Group field has the correct options: All Accounts Group (will be displayed by default) Additional Report Groups will be displayed if created in the AclaraONE > Administration > **Report Group Management** page. This is typically the case when the company has more than one commodity. Example: All Accounts Group – Electric		

SAMPLE

		All Accounts Group – Gas All Accounts Group – Water		
Verify Events screen is displayed and shows the expected options	From the Applications menu tab click on MDM> Events> Event List On the Event List screen expand the Event Group drop-down field	Verify the Event Group drop-down has the following options: Base Overview Consumption DCU Alarms Distribution Health Network Health TimeSync Issues Additional Events Groups will be displayed if configured.		
Note: For the next 6 cases, Event Types may vary depending on the items created within AclaraONE > Administration > Event Management.				
Verify the correct Event Type are displayed under the Event Group= Base Overview	From the Applications menu tab click on MDM> Events> Event List On the Event List screen expand the Event Group drop-down field and select Base Overview.	Verify the Event Type options displayed are: DCU Memory Problem Negative Consumption Power-Outage Power-Restore Read Rate Read Rate- Daily (E) Read Rate- Interval (E)		
Verify the correct Event Type are displayed under the Event Group= Consumption	From the Applications menu tab click on MDM> Events> Event List On the Event List screen expand the Event Group drop-down field and select Consumption.	If utility company offer **Electric, Water and Gas** commodities, the following Event Type options are displayed: Abnormal Consumption Abnormal Consumption (G) Abnormal Daily – High (F) Abnormal Daily – High (N) Abnormal Daily – High (R) Abnormal Daily – High (T) Abnormal Daily – Low (F) Abnormal Daily – Low (N)		

SAMPLE

		Abnormal Daily - Low (R) Abnormal Daily - Low (T) Constant Consumption Consumption Edited Continuous Consumption Continuous Consumption (G) High Consumption High Consumption (G) Negative Backwards (G) Negative Backwards Negative Consumption Negative Daily Use (E) Zero Consumption If utility company offers **Electric commodity only**, the following Event Type options displayed are: Abnormal Consumption (G) Abnormal Daily – High (F) Abnormal Daily – High (N) Abnormal Daily – High (R) Abnormal Daily – High (T) Abnormal Daily – Low (F) Abnormal Daily – Low (N) Abnormal Daily - Low (R) Abnormal Daily - Low (T) Negative Daily Use (E) If utility company has only one commodity, **either Water or Gas**, the following Event Type options displayed are: Abnormal Consumption Constant Consumption Continuous Consumption		

SAMPLE

		High Consumption Negative Backwards Negative Consumption Zero Consumption If utility company has both commodities, **Water and Gas**, the following Event Type options are displayed: Abnormal Consumption Abnormal Consumption (G) Constant Consumption Continuous Consumption High Consumption High Consumption (G) Negative Backwards Negative Consumption Negative-Backwards (G) Zero Consumption Zero Consumption (G)		
Validate the correct Event Type are displayed under the Event Group= Distribution Health **This Event Group will be displayed only if company offers Electric commodity.**	From the Applications menu tab click on MDM> Events> Event List On the Event List screen expand the Event Group drop-down field and select Distribution Health	The following Event Type are displayed: Blink Count Magnetic Tamper- Cleared Magnetic Tamper- Detected Meter High Temp Meter High Temp – Cleared Meter Roll Over Meter Tilt Negative Daily Use (E) Power- Outage Power- Restore Volt Sag- Start (A) Volt Sag- Start (B) Volt Sag – Start (C) Volt Sag – Stop (A) Volt Sag – Stop (B)		

SAMPLE

		Volt Sag – Stop (C) Volt Swell – Start (A) Volt Swell – Start (B) Volt Swell – Start (C) Volt Swell – Stop (A) Volt Swell – Stop (B) Volt Swell – Stop (C)		
Verify the correct Event Type are displayed under the Event Group= Network Health	From the Applications menu tab click on MDM> Events> Event List On the Event List screen expand the Event Group drop-down field and select Network Health.	Verify the Event Type options displayed are: Blink Count* DCU Backup Battery** DCU Did Not Clear** DCU Door Opened** DCU Door Still Open** Low Battery MTUs** Low Battery Warning** MTU Tamper** Magnetic Tamper** Magnetic Tamper – Cleared* Magnetic Tamper – Detected* Memory Map Error** Meter High Temp* Meter High Temp – Cleared* Meter Roll Over* Meter Tilt* Program Memory Error** Read Rate** Read Rate – Daily (E)* Read Rate – Interval (E)* *Will be displayed if Electric commodity is offered. **Will be displayed if either Water and/or Gas commodity is offered.		

SAMPLE

Validate the correct Event Type are displayed under the Event Group= TimeSync Issues	From the Applications menu tab click on MDM> Events> Event List On the Event List screen expand the Event Group drop-down field and select TimeSync Issues.	The following Event Type options are displayed: Time Sync Drift Time Sync Request Time Sync Timeout		

6. ACLARA RF ELECTRIC VALIDATION

6.1 NETWORK

Test Objective: Verify the system health overview screen. Verify functioning of Services and Diagnostic tool for system commands.

Description	Activity	Expected Results	Pass/Fail	Comments
Verify Read Success **(Verification of Interval and Daily Shift data communication status)**	From the Menu tab slide out and navigate to Aclara RF Electric screen Click on Network > System Health Overview • Verify Daily Shift Communication success chart is displayed. • Verify the Interval (i.e. 15 min) Communication Success chart is displayed.	• The Daily Shift Communication Success chart is displayed. • The Interval (i.e. 15 minute) Communication Success chart is displayed • Verify the end-point count in both charts is correct; the sum of Successful and Failed Endpoints is in accordance to the end-points installed in the field.		

SAMPLE

	• Verify successful endpoint			
Verify DCU Uptime	From the Menu tab slide out Navigate to Aclara RF Electric screen Click on Network > System Health Overview Click on 'View full DCU Uptime Report' to review all DCU Uptime result	The DCU Uptime page is displayed. Verify all DCUs are active, up and running. Make sure the uptime percentage for all DCUs is 90% or above.		
Verify System Commands **Verify that the user is able to successfully submit Command (On Demand, Connect, Disconnect, etc.) from the HeadEnd**	From the Menu tab slide out Navigate to Aclara RF Electric screen Click on Network > **Service and Diagnostics Tool** • Add Endpoint and select the Command. (For an On Demand Read test use the command 'Diagnostic Meter Read') • Select DCU routing • Click Send Command	• The following system commands generate successful output o Diag Meter Read o Diag Read MetaData o Diagnostic Demand Read • The following system commands generate successful output. These commands can impact the meter, so ensure you have picked the right test meter o Diag Connect o Diag Decomm endpoint o Diag Demand reset o Diag Disconnect		

SAMPLE

6.2 DCU AND ENDPOINT VERIFICATION

Test Objective: Verify DCUs and Endpoints are installed, transmitting data and available for managing daily network operations.

Description	Activity	Expected Results	Pass/Fail	Comments
Verify Endpoints **Verify that all SRFN endpoints registered in the field are displayed**	From the Menu tab slide out Navigate to Aclara RF Electric screen Click on Equipment > Metering Click the Search button and verify all SRFN endpoints are displayed.	• All SRFN endpoints are displayed on the screen. • Verify Device Status is correct (Active, Inactive). • Verify Communication Status is in Good or Marginal status for at least 90% of the SRFN end-points.		
Verify DCUs **Verify that all DCUs are online and displayed**	From the Menu tab slide out Navigate to **Aclara RF Electric** screen Click on Equipment > DCUs Verify all DCUs are displayed	All DCUs deployed in the field are listed and currently online.		

6.3 NOTIFICATIONS

Test Objective: Verify endpoints notifications are displayed on the UI

Description	Activity	Expected Results	Pass/Fail	Comments
Validate Endpoint Notifications **Verify that all notifcations associated with SRFN endpoints are displayed**	From the Menu tab slide out Navigate to **Aclara RF Electric** screen Click on Notifications > Endpoint Notifications	Endpoint notifications are displayed on the screen.		

SAMPLE

User can search the notifications for a specific endpoint				

7. JOB SCHEDULER

7.1 SRFN JOB SCHEDULER

Description	Activity	Expected Results	Pass/Fail	Comments
Verify that all existing SRFN Jobs are displayed. **The user is able to create a new job for SRFN from this screen**	From the Menu tab slide out Navigate to Job Scheduler screen Click on Job Scheduler > Jobs • Click the Search button. • Click on Create Job button on the upper right corner and create a new job by entering all required fields. On the Create New Scheduled Job page it is recommended to select Command= On Demand Read.	• Verify any previously created jobs are displayed. • The Job is successfully created.		
Verify that all existing Groups are displayed.	From the Menu tab slide out Navigate to Job Scheduler screen	• All the expected groups are displayed as discussed during Requirements gathering meeting(s).		

SAMPLE

The user is able to create a new Group from this screen using 'Create New Group' button	Click on Job Scheduler > Device Groups • Verify results on Device Groups screen. • Click the Create New Group button on the upper right corner and create a new Group by entering all required fields based on selectable criteria.	• Group is successfully created and displayed.		

8. MDM VALIDATION

8.1 EVENT SUMMARY DASHBOARD

Test Objective: Verify that the Dashboard navigation and features are working as designed.

Description	Activity	Expected Results	Pass/Fail	Comments
Validate Event Summary Dashboard screen with map is displayed. **Validate the GIS coordinates are correct for the meters (OR DCU's for DCU alarm events)**	From the Applications menu click MDM> Event Summary Dashboard • The default event group shown on the map is "Base Overview". • Click on one of the meters displayed on the map. Verify	• The map is displayed showing any existing DCU and/or MTU events. • The GIS coordinates for selected meter looks correct.		

SAMPLE

	the Latitude and Longitude are correct.			
Validate the Event Summary Dashboard screen refreshes when changing the Event Group	Click the Event Group drop-down and select a different Event Group option.	The dashboard map refreshes with new data.		
Validate Event Summary Dashboard screen – Report Group Selection	• Expand the Report Group drop-down field. • Select a different Report Group option.	• Report Group options are displayed, as per configuration. • The dashboard map refreshes with new data.		

8.2 Validating Event List

Test objective: Verify that the event/analytics alarm is triggering correctly, and that analytics' navigation, filtering, charting, and reporting presentations are functioning as designed.

Events or Alarms have consistent presentation and behavior in the AclaraONE MDM, including the following screens:

- Event Summary Dashboard or Map presentation
- Event List presentation, and
- Event Trends presentation

Events are generated by Hardware (Meter, DCU) or by the software's analytics e.g., Abnormal Consumption.

The SAT Test cases will exercise the common functionality for some of the Event Groups available in the Event List page.

Description	Activity	Expected Results	Pass/Fail	Comments
Validate Base Overview events on the Event List page	From the Applications menu click MDM> Event> Event List Select Event Group= Base Overview *(defaulted)*. Then, click Search	Verify the list of events is shown in the grid.		

SAMPLE

Validate DCU Alarms events on the Event List page.	From the Applications menu click MDM> Event> Event List Select Event Group= DCU Alarms Then, click Search	Verify the list of DCU events is displayed. If you click the Map tab you should see a map with the DCUs with events.		
Validate Consumption events on the Event List page.	From the Applications menu click MDM> Event> Event List Select Event Group= Consumption Then, click Search	Verify the list of Consumption events is displayed. If you click the Map tab you should see a map with the MTUs with events.		
Validate Network Health events on the Event List page.	From the Applications menu click MDM> Event> Event List Select Event Group= Network Health Make sure you have selected a Date Range with AMI data. Then, click Search	Verify the list of Network Health events is displayed. If you click the Map tab you should see a map with the MTUs with events.		
Validate TimeSync events on the Event List page.	From the Applications menu click MDM> Event> Event List Select Event Group= TimeSync Issues Then, click Search Note: The TimeSync Issues Event Group is designed to function	Verify the list of TimeSync Issues events is displayed.		

SAMPLE

	only for clients with Water and/or Gas meters.			

8.4 TOTAL CONSUMPTION - ELECTRIC

Test Objective: Verify that the Total Consumption navigation, charting, grouping, and grid presentations are working as designed.

Description	Activity	Expected Results	Pass/Fail	Comments
Validate the Total Consumption screen – All Accounts Electric Group **Validate the chart and Summary Card or Panels**	From the Applications menu click MDM> Total Consumption • Verify the options displayed in the Report Groups drop-down are in accordance to what's configured in the Report Group Management page. • Make sure to select 'All Accounts Group" • Validate different Daily Usage options available for Electric Meters • Examine the Summary Cards that display Total, Average, Min, and Max Consumption	• The correct options are displayed in the Report Groups drop-down • The daily chart is displayed correctly. • The chart refreshes accordingly based on the option selected in the Daily Usage drop-down field. • The Summary Cards accurately reflect the data that is displayed in the chart. • Verify hover box is displayed showing Date and Consumption.		

SAMPLE

	• 'Hover' over the chart's data points to display a tooltip with the date and consumption value			

8.5 MDM – ACCOUNT DETAIL

Description	Activity	Expected Results	Pass/ Fail	Comments
Validate the customer information	From the Applications menu click MDM> Account Search Without entering a value in the search field, click the Search button.	A list of accounts is retrieved. Verify the following information is displayed for each record on the screen: Account Number, Customer Id, Meter Serial Number, MTU ID, First Name, Last Name and Address 1.		
Validate Premise Details information	From the Applications menu click MDM> Account Search. Search for your MTU ID. • On the Account Search results page click the Account Number. • Depending on the commodities available for the premise, the Account Details page will have the Consumption (Water & Gas) tab and/or the Consumption (Electric) tab. • Click the Events tab on the left size of the screen.	• The Account Details page is displayed showing Customer Name and Address. • The Consumption tabs are displayed accordingly based on the commodities available for the premise. • The Events screen is displayed showing any event available for the account.		

SAMPLE

	*The Consumption (Water & Gas) title will be adjusted to display either Water or Gas only if the utility company does not offer both commodities.			

8.7 MDM – ELECTRIC CONSUMPTION

Description	Activity	Expected Results	Pass/ Fail	Comments
Validate Account Detail information	From the Applications menu click MDM> Account Search. Search for your MTU ID. • On the Account Search results page click the Account Number with an Electric meter. • Click the Consumption (Electric)) tab. • Click the Events tab on the left size of the screen.	• The Account Details page is displayed showing Customer Name and Address. Validate that the meter(s) displayed for the premise is/are correct. • On clicking the Consumption, the Consumption screen is displayed. • The Events screen is displayed showing any event available for the account.		
Check Interval types on the Consumption screen for Electric Meters	From the Applications menu click MDM> Account Search Click the Search button. Click an Account Number with an Electric meter. Lastly, click on the Consumption (Electric) tab on the left-hand side of the screen.	Verify the Interval Readings and Daily Readings displayed match with the specs in the Requirements Document. Verify that the charts refresh accordingly upon selecting the different the different Interval Readings and Daily Readings.		

SAMPLE

10. CIS INTERFACE - ELECTRIC/COMBO

Important: Depending on the CIS Interface applicable for the project, execute the validation scenarios described in 11.1 if the AclaraONE Implementation is using CIS MultipleSpeak Interface or section 11.2 if the CIS Interface is via an Account Import flat file.

10.1 CIS MULTISPEAK INTERFACE

Test Objective: Verify the Multispeak Interface between CIS and AclaraONE.

Description	Activity	Expected Results	Pass/Fail	Comments
Initial Data Sync: Validate Initial Load for CIS data for all Electric meters	1. AMI Requests Get All Methods for Initial Load (One time initial sync) GetAllElectricMeters GetAllServiceLocations GetAllCustomers CIS returns all Electric Meter, Service Location and Customer information, filtered by AMI Vendor	1.MDM Validation: Search the meter in MDM account meter search page and check the CIS data is available 2.SRFN validation: Verify the Meter # and Location # associated with the endpoint by navigating to Equipment>Metering screen for RF Electric		

SAMPLE

Meter Life Cycle: Utility purchases and uploads meter inventory into the CIS system. **Upon the utility uploading meter('s) into the CIS, manually via the Meter Inventory screen or by batch through the Meter Test Upload screen, the CIS vendor will automatically send MeterAddNotification**	CIS sends MeterAddNotification when a new meter is added to the inventory	1. AO BS consumes method call. 2. NISC will get the response back (empty message) for success. For error, response message will have an error. 3. UI Validation: No updates on the UI (MDM or SRFN)		
Meter Life Cycle: Utility performs a meter install at a service location without an existing meter. **Upon the utility associating a meter in-stock with an active service location in the CIS, through the Meter Install/Main screen or through a Service Order, the CIS vendor will automatically send the proper call InitiateMeterInstallation to **AMI**, notifying them of the meter install.**	CIS sends CustomerChangedNotification InitiateMeterInstallation iHUB --> NISC GetCustomerByCustID is made from iHUB when Customer does not exist in Aclara MDM prior to the meter install.	1. AO BS consumes method call. 2. AO UI validation: Navigate to the MDM account meter search and verifying the service exists. 3. SRFN validation: Verify the Meter # and Location # associated with the endpoint by navigating to Equipment>Metering screen for RF Electric		
Meter Life Cycle: Utility exchanges meter in the field (AMI meter with AMI meter). **Upon the physical meter exchange being completed, the utility updates the CIS manually and/or utilizes the Batch Meter Exchange process, which triggers the CIS to automatically send the proper calls, listed , to **AMI**, notifying them of the meter exchange.**	CIS sends ServiceLocationChangedNotification InitiateMeterExchange MeterChangedNotification (for old meter)	1. AO BS consumes method call. 2. AO UI validation: Navigate to the MDM account meter search and verifying the service / exchange. 3. SRFN Validation: a. SRFN Inactivates removed meter. b. SRFN associates new Meter# with the location		
Meter Life Cycle: Utility exchanges meter in the field, utility retires meter out. **Upon the physical meter exchange being completed, the utility updates the CIS manually and/or utilizes the Batch Meter**	CIS sends InitiateMeterExchange MeterChangedNotification (for old meter) MeterRetiredNotification	1. AO BS consumes method call. 2. AO UI validation: Navigate to the MDM account meter search and verifying the service / exchange.		

SAMPLE

Exchange process, which triggers the CIS to automatically send the proper calls, listed below, to **AMI, notifying them of the meter exchange.**		3. SRFN Validation: a. SRFN Inactivates removed meter (Check in SRFN Equipment>Metering page) b. SRFN associates new Meter# with the location		
Meter Life Cycle: Utility alters Service Location or Customer Moved-In. (Example Address Change) **The utility will alter information in the Service Location Screen of the CIS, which triggers the CIS to automatically send the proper calls, listed , to **AMI**, notifying them of the Service Location Change.**	CIS sends ServiceLocationChangedNotification	1. AO BS consumes method call. 2. AO UI Validation: Retrieve the customer/meter in MDM account meter search page and check the data is modified accordingly. 3. SRFN Validation: No changes		
Meter Life Cycle: Utility alters Customer information for a meter. (Example: Customer #, Phone #) **The utility will alter information through a Service Order and/or in the Customer Screen of the CIS, which triggers the CIS to automatically send the proper calls, listed , to **AMI**, notifying them of the Customer Change**	CIS sends CustomerChangedNotification	1. AO BS consumes method call. 2. AO UI Validation: Retrieve the customer/meter in MDM account meter search page and check the data is modified accordingly. 3. SRFN Validation: For Meter Serial # change validate that corect Meter Serial Number is reflected in the headend		
Meter Life Cycle: Utility alters meter information. (Example: Meter Serial Number) **The utility will alter information in the Meter Inventory screen and/or Meter Install/Maintenance screen of the CIS, which triggers the CIS to automatically send the proper calls, listed below, to **AMI**, notifying them of the Meter Change**	CIS sends MeterChangedNotification	1. AO BS consumes method call. 2. AO UI Validation: Retrieve the customer/meter in MDM account meter search page and check the data is modified accordingly. 3. SRFN Validation: For Meter Serial # change validate that correct Meter Serial Number is reflected in the headend.		
AMI Controls: Utility performs an on-demand meter read through the CIS.	CIS sends InitiateMeterReadingsByMeterID	1)ReadingChangedNotifucation response is generated from AMI system with the latest read.		

SAMPLE

The utility will execute an on-demand meter read through a Service Order or at the Reading screen of the CIS, which triggers the CIS to automatically send the proper calls, listed below, to **AMI, notifying them of the initiate meter read**	GetLatestReadingByMeterID (Sent if InitiateMeterReadingsByMeterID does not produce within 90 seconds or upon receiving errorObject) ReadingChangedNotification (Expected from the AMI system with the latest read)	NISC is able to process the response successfully 2) AO and SRFN Validation: No UI validation needed.		
AMI Controls: Utility remotely disconnects/reconnects a meter but leaves meter in place. **Upon the disconnect being completed, the utility updates the CIS manually or utilizes the remote disconnect/reconnect functionality within the CIS, which triggers the CIS to automatically send the proper calls, listed below, to **AMI**, notifying them of the meter disconnect/reconnect with meter in place. The meter status on meter inventory is made "inactive installed" and neither the "Disconnect at Transformer" nor the "Dead Plug" options are checked. This can be performed through a Service Order, the Delinquent Collection screen, and/or the Prepaid Collection screen in the CIS.**	CIS sends ServiceLocationChangedNotification InitiateMeterReadingsByMeterID InitiateConnectDisconnect MeterChangedNotification InitiateUsageMonitoring or CancelUsageMonitoring (Not supported. GetCDMeterState (Triggered if AMI does not respond sooner) <--CDStateChangedNotification (received) CancelDisconnectStatus (For Disconnects))	1) SRFN Validation: Check RF Electric >Equipment>Metering>Details for switch history. The response will be 'Disconnect' when meter is remotely disconnected. 'Connect' when meter is remotely connected. 2) MDM Validation: Check Consumption in 15 minutes and observe that there is none		
Meter Life Cycle: Utility removes a meter from a Service Location in the field. **Upon the meter being removed from service in the field, the utility updates the CIS through a Service Order, which triggers the CIS to automatically send the proper calls, listed below, to **AMI**, notifying them of the meter remove.**	CIS sends ServiceLocationChangedNotification, MeterRemoveNotification	1. AO BS consumes method call. 2. AO UI Validation: The meter should no longer be reachable from the account meter search page in the MDM . 3.SRFN Validation: Verify the Meter status is inactive by navigating to		

SAMPLE

		Equipment>Metering screen for RF Electric		
Meter Life Cycle: Utility removes a meter from a Service Location in the field and meter is retired **Upon the meter being removed from service in the field, the utility updates the CIS through a Service Order, which triggers the CIS to automatically send the proper calls, listed below, to **AMI**, notifying them of the meter remove.**	CIS sends ServiceLocationChangedNotification, MeterRemoveNotification MeterRetiredNotification	1. AO BS consumes method call. 2. AO UI Validation: The meter should no longer be reachable from the account meter search page in the MDM . 4.SRFN Validation: Verify the Meter status is inactive by navigating to Equipment>Metering screen for RF Electric		
Within AclaraONE validate the MTUs have the Latitude and Longitud in the MDM.	From the Applications menu click MDM> Account Search Look for the Meter you want to verify. Click the Account Number.	Validate the Location map matches with the Lat and Long in the source file.		

10.2 CIS ACCOUNT IMPORT TESTING

Test Objective: Verify the processing of the CIS Account Import file into MDM.

Description	Activity	Expected Results	Pass/Fail	Comments
Validate daily CIS files are delivered by the CIS system on a regular basis in the designated folder on the sftp location.	1. Verify that the CIS is placing daily CIS files in the designated sftp location. 2. Verify that Aclara picks the file from the sftp and process it in MDM.	The file is moved from the sftp by the Aclara configured MoveIT job for processing in MDM.		
Validate the customer information in the MDM.	1. From the Applications menu click MDM> Account Search. Look for the Meter you want to	1. Validate that the Customer Name, Address is shown on the Account Search		

SAMPLE

	verify. Verify the information displayed on the account search page for the meter. 2. Click the Account Number link	grid. Verify that it matches with information in the CIS. 2. When you access the Account Detail validate the Customer Name and Address is also displayed on the Account Detail screen. Validate the Location map matches with the Lat and Long in the source file.		

11. BILLING EXPORT TESTING

The Billing Interface format will vary depending on the specs defined in the Requirements document. A client can either have the CMEP Billing Interface approach or the Bill flat file format.

11.1 BILLING EXPORT TESTING

Description	Activity	Expected Results	Pass/Fail	Comments
Validate Bill file format.	• Validate the format of the Bill file matches to the	• Bill file contains all fields as specified in the requirements document.		

SAMPLE

Validate the file is generated at the expected recurrance in the designated folder on the sftp location	specification in the requirements document. • Validate the file generation process is configured as expected.	• File is generated in the expected folder\\aclaraone\J$\FileExchange\Export\CustomerBilling on the sftp location daily.		
Validate all mandatory fields in the bill file are populated **File includes meters applicable for the utility company: Electric, Water and/or Gas meters.** **UOM is populated as expected.**	• Validate all mandatory fields in the Bill File are populated. • Depending on the scope of the project Electric, Water and/or Gas meters are included in the file. • Verify the expected daily data is included in the file. Check UOM's are reported correctly. • Validate interval consumption is included for the applicable commodities (i.e. electric, water and or gas).	• All mandatory fields in the Bill File are populated. • The file includes the expected meters. Depending on the scope of the project Electric, Water and/or Gas meters are included. • The file includes the expected daily data. • Interval consumption is included for the applicable commodities (i.e. electric, water and or gas).		
Validate counts of meters in the CMEP file	Validate the record count in the file is correct.	Record count in the file is correct and is comparable to total count of active meters.		
Validate a reading for a meter in the Billing file against AclaraONE	Choose any meter in the Billing file, write down the Read and compare it against AclaraONE: a) From the Applications menu click ACLARA RF WATER> Equipment> MTUs> MTUs b) Search for your Meter c) Click the MTU ID link to access the MTU Detail View page	The read in the Billing file matches with AclaraONE.		

SAMPLE

	d) Click View Details on the Meter card e) Click Read History f) Using the Date Selector field, select the day for which you want to compare the read in the Bill file.			

13. OMS TESTING

Note: Only execute OMS test cases if OMS feature is part of the project scope.

Description	Activity	Expected Results	Pass/Fail	Comments
Utility pings a SRFN meter from OMS system	OMS vendor sends InitiateOutageDetection Request	AclaraONE successfully sends the response back for the InitiateOutageDetection request. If meter is powered on, the OMS vendor will validate the reads are in the response.		
Verify SRFN headend/AO sends ODEventNotification to the OMS vendor in case of Power Outage or Restoration event.	**Note**: The outage notification will be triggered only if the outage lasts longer than the parameter set in the NIC. Same applies with the restoration notification. 1) To mimic an outage, the utility may pull the meter from it's socket.	1) Verify the Power Failed notification is logged in the Notifications tab for the meter for which the outage was generated. To do so, within AclaraONE navigate to Aclara RF electric> Equipment> Metering. Search for the meter and open it. Subsequently, click the Notifications tab.		

SAMPLE

	2) The utility will power back the meter again.	Also, confirm with the OMS vendor that they were notified about the Power Failure event. 2) Power restoration notification is logged in the Notifications tab for the meter in question. The OMS vendor is notified for Power Restoration event, no error's are received.		

SAMPLE

Sample AMI Master System Reports

Provided below are sample print-screens taken from the AclaraONE CSR Web Portal.

Aclara

IIDEAS\SuperUser | Logout

CSR Web Portal

Home Search Readings AMI Reports Billing Admin

Gap Report

14 record(s) Download to spreadsheet —

METERS WITH GAPS IN READINGS

Route	MeterType	Account	CustomerName	Address	Meter #	Gap Start	Gap End	Count
SUB 1/2	Electric	0047019400-01167712-70	PW PUBLIC BUILDINGS		17880	04/21/16	01/02/17	256
SUB 1/2	Electric	53216-0	53216		17880	04/21/16	01/02/17	256
SUB 1/2	Electric	55202-0	55202		17880	04/21/16	01/02/17	256
SUB 7	Electric	0047030086-01250172-70	Cara Curry		21501	04/21/16	01/02/17	256
SUB 7	Electric	44696-0	44696		21501	04/21/16	01/02/17	256
Sub_12	Electric	0001006490-00250663-70	Yvette E. Klein WATER		17510	04/21/16	01/02/17	256
Sub_12	Electric	46374-0	46374		17510	04/21/16	01/02/17	256
Sub_12	Electric	46538-0	46538		23390	04/21/16	01/02/17	256
Sub_14	Electric	0001001493-03092423-70	Caldwell Rogers		26655	04/21/16	01/02/17	256
Sub_14	Electric	49713-032	Medge Jacobs		26655	04/21/16	01/02/17	256
Sub_14	Electric	53706-0	53706		26655	04/21/16	01/02/17	256
Sub_15	Electric	0001006286-00103138-70	Mufutau Manning GAS		17710	04/21/16	01/02/17	256
Sub_15	Electric	47479-0	47479		17710	04/21/16	01/02/17	256
Sub_2	Electric	54866-0	54866		22563	04/21/16	01/02/17	256

Negative Consumption

Report parameters listed at bottom of page.

Download to spreadsheet

NEGATIVE CONSUMPTION

Meter	AMISerialNo	Account Rate	UOM	Channel	Neg Cons	Date	Value	Prior Date	Prior Value	Note
09000048	3396409		kWh	1	-0.896	7/13/2016 12:00:00 AM	1282	7/12/2016 7:19:00 PM	1282.896	
09000048	3396409		kWh	1	-0.579	7/12/2016 12:00:00 AM	1282	7/11/2016 8:07:00 PM	1282.579	
09000048	3396409		kWh	1	-0.213	7/11/2016 12:00:00 AM	1282	7/10/2016 9:30:00 PM	1282.213	
09000048	3396409		kWh	1	-0.644	7/10/2016 12:00:00 AM	1281	7/9/2016 7:52:00 PM	1281.644	
09000048	3396409		kWh	1	-0.19	7/7/2016 12:00:00 AM	1279	7/6/2016 8:37:00 PM	1279.19	
09000048	3396409		kWh	1	-0.678	7/6/2016 12:00:00 AM	1278	7/5/2016 9:14:00 PM	1278.678	
09000048	3396409		kWh	1	-0.333	7/5/2016 12:00:00 AM	1278	7/4/2016 7:11:00 PM	1278.333	
09000048	3396409		kWh	1	-0.017	7/4/2016 12:00:00 AM	1278	7/3/2016 9:40:00 PM	1278.017	
09000048	3396409		kWh	1	-0.681	7/3/2016 12:00:00 AM	1277	7/2/2016 9:13:00 PM	1277.681	
09000048	3396409		kWh	1	-0.354	7/2/2016 12:00:00 AM	1277	7/1/2016 7:30:00 PM	1277.354	
09000767	3394448		kWh	1	-0.209	7/5/2016 12:00:00 AM	8270	7/4/2016 8:15:00 PM	8270.209	
09000767	3394448		kWh	1	-0.49	7/2/2016 12:00:00 AM	8247	7/1/2016 8:06:00 PM	8247.49	
3196001	2580469		Cubic Feet	8	-704	7/13/2016 8:01:00 PM	3372	7/13/2016 2:13:00 PM	4076	
72764909	2666268		gallons	9	-21987	7/3/2016 10:10:00 PM	43649	7/3/2016 9:58:00 AM	65636	
73566715	2663992		gallons	9	-38386	7/13/2016 5:06:00 PM	43651	7/13/2016 4:53:00 AM	82037	
73566715	2663992		gallons	9	-38341	7/9/2016 3:23:00 PM	43651	7/9/2016 3:10:00 AM	81992	
73566715	2663992		gallons	9	-38307	7/4/2016 1:11:00 PM	43651	7/3/2016 12:47:00 PM	81958	
73716472	2601123		gallons	9	-23895	7/14/2016 8:08:00 PM	43522	7/14/2016 8:02:00 AM	67417	

IIDEAS\SuperUser | Logout

CSR Web Portal

Home Search Readings AMI Reports Billing Admin

Consumption on Inactive Meters

Report parameters listed at bottom of page.

Download to spreadsheet

CONSUMPTION ON INACTIVE METERS							
MeterIdentifier	AMISerialNo	ReadDateMin	ReadDateMax	ReadValueSum	UOM	ReadQualityCode	ReadSourceDescription
100900593	84069198	7/1/2016 12:00:00 AM	7/15/2016 12:00:00 AM	644.48000000	kWh-T	3	Aclara-AMI
100900630	84069196	7/8/2016 12:00:00 AM	7/8/2016 12:00:00 AM	1.98400000	kWh-T	-1	Aclara-AMI
100900630	84069196	7/1/2016 12:00:00 AM	7/15/2016 12:00:00 AM	679.93600000	kWh-T	3	Aclara-AMI
100900631	84069172	7/1/2016 12:00:00 AM	7/15/2016 12:00:00 AM	1515.77600000	kWh-T	3	Aclara-AMI
100900632	84069199	7/6/2016 12:00:00 AM	7/12/2016 12:00:00 AM	6.14400000	kWh-T	-1	Aclara-AMI
100900632	84069199	7/1/2016 12:00:00 AM	7/15/2016 12:00:00 AM	1217.60000000	kWh-T	3	Aclara-AMI
100900634	84067522	7/13/2016 12:00:00 AM	7/13/2016 12:00:00 AM	0.89600000	kWh-T	-1	Aclara-AMI
100900634	84067522	7/1/2016 12:00:00 AM	7/15/2016 12:00:00 AM	158.08000000	kWh-T	3	Aclara-AMI
100900635	84069195	7/1/2016 12:00:00 AM	7/15/2016 12:00:00 AM	242.36800000	kWh-T	3	Aclara-AMI
100900637	84069171	7/1/2016 12:00:00 AM	7/15/2016 12:00:00 AM	508.22400000	kWh-T	3	Aclara-AMI
100900638	84069180	7/1/2016 12:00:00 AM	7/15/2016 12:00:00 AM	1377.28000000	kWh-T	3	Aclara-AMI
100900639	84069194	7/4/2016 12:00:00 AM	7/4/2016 12:00:00 AM	3.32800000	kWh-T	-1	Aclara-AMI
100900639	84069194	7/1/2016 12:00:00 AM	7/15/2016 12:00:00 AM	896.64000000	kWh-T	3	Aclara-AMI
100900640	84069179	7/1/2016 12:00:00 AM	7/15/2016 12:00:00 AM	1075.84000000	kWh-T	3	Aclara-AMI
100900641	84069170	7/1/2016 12:00:00 AM	7/15/2016 12:00:00 AM	952.00000000	kWh-T	3	Aclara-AMI
100900643	84069193	7/1/2016 12:00:00 AM	7/15/2016 12:00:00 AM	358.78400000	kWh-T	3	Aclara-AMI
100900644	84069160	7/1/2016 12:00:00 AM	7/15/2016 12:00:00 AM	655.74400000	kWh-T	3	Aclara-AMI
100900645	84069189	7/1/2016 12:00:00 AM	7/15/2016 12:00:00 AM	757.44000000	kWh-T	3	Aclara-AMI

Aclara

IIDEAS\SuperUser | Logout

CSR Web Portal

Home Search Readings AMI Reports Billing Admin

Gap Report with Account Status

Report parameters listed at bottom of page.

Download to spreadsheet

GAP REPORT WITH ACCOUNT STATUS

Route	MeterIdentifier	MeterType	CustomerName	Address	SiteId	Account	AccountStatus	GapStart	GapEnd	Count
	17510	Electric	46374		12-125300	46374-0	A	04/21/16	01/02/17	256
	17710	Electric	47479		15-079000	47479-0	A	04/21/16	01/02/17	256
	17880	Electric	53216		01-242000	53216-0	A	04/21/16	01/02/17	256
	17880	Electric	55202		01-242000	55202-0	A	04/21/16	01/02/17	256
	21501	Electric	44696		07-926000	44696-0	A	04/21/16	01/02/17	256
	22563	Electric	54866		02-281400	54866-0	A	04/21/16	01/02/17	256
	23390	Electric	46538		12-785000	46538-0	A	04/21/16	01/02/17	256
	26655	Electric	53706		14-620300	53706-0	A	04/21/16	01/02/17	256
2	17710	Electric	Mufutau Manning GAS		15-079000	0001006286-00103138-70	A	04/21/16	01/02/17	256
352	26655	Electric	Medge Jacobs		14-620300	49713-032	A	04/21/16	01/02/17	256
4	17880	Electric	PW PUBLIC BUILDINGS		01-242000	0047019400-01167712-70	A	04/21/16	01/02/17	256
6	17510	Electric	Yvette E. Klein WATER		12-125300	0001006490-00250663-70	A	04/21/16	01/02/17	256
6	21501	Electric	Cara Curry		07-926000	0047030086-01250172-70	A	04/21/16	01/02/17	256
6	26655	Electric	Caldwell Rogers		14-620300	0001001493-03092423-70	A	04/21/16	01/02/17	256

Aclara

IIDEAS\SuperUser | Logout

CSR Web Portal

Home Search Readings AMI Reports Billing Admin

Zero Consumption on Active Meters (Registers)

Report parameters listed at bottom of page.

Download to spreadsheet

ZERO CONSUMPTION ON ACTIVE METERS (REGISTERS)							
MeterIdentifier	AMISerialNo	AccountNumber	AccountSubNumber	LocationNumber	Address	Cycle	ZeroConsumptionDayCount
000215784	2328409	203020500	0	203020500			14
000478112	2388233	246010515	0	246010515			14
000611169	2388272	150008007	0	150008007			14
000808459	2388274	128004801	0	128004801			14
001027247	2362602	129007500	0	129007500			14
001027253	2362601	129006700	0	129006700			14
005421286	2352088	128005000	0	128005000			14
009530486	2352083	252003008	0	252003008			14
010709824	2352074	129006500	0	129006500			14
010709825	2352077	129007300	0	129007300			14
010709835	2352084	129007600	0	129007600			14
015	2666205	246120090	0	246120090			14
019	2545846	309010200	0	309010200			14
03403605	2656139	150035501	0	150035501			14
03403686	2352079	252003002	0	252003002			14
04374505	2656119	324000611	0	324000611			14
04374515	2656844	234012900	0	234012900			14

The AclaraONE solution provides more than 100 standard reports, and Aclara offers custom report development to meet any additional needs. Reports log information about the system functionality and display meter data using a Windows look and feel (pull downs, radio buttons) as well as a forms view for ease of viewing and entry of tabular data. You can use these reports to identify and/or evaluate a variety of items: customer usage, load profiles, critical peaks, power purchase planning, network performance, and maintenance needs. Aclara provides formal classroom training and online tutorials to teach users to generate reports. The AclaraONE headend is configured for convenience and includes report and alert subscriptions that can also be delivered via email and SMS. In addition, AclaraONE will provide a read-only interface for reporting capabilities.

Partial List of AclaraONE Reports provided below is a partial list of available reports and their functions.

Available Reports in AclaraONE

Partial List of AclaraONE Reports	
Report Name	**Report Description**
Negative Consumption	Pulls a listing of intervals where there is negative consumption for an interval. Electric and water are pulled in the same pull. Only kwh and gallons should be pulled for this report.
Consecutive Days Zero Consumption	Displays a list of meters with the total number of consecutive days where the consumption was zero
SQLJobActivity	Latest activity from SQL server
EvenLogger_ByDateRange	AMI issued calls in MDM
CycleBillingHistory_ConsecutiveNoReads	Cycle billing history – consecutive no reads
CycleBillingHistory_ConsecutiveEstimates	Cycle billing history – consecutive estimates
Estimates By Meter Number	Cycle billing estimates – review for specific meter number
MeterRead_SumCheckSelectByVeeJobHistoryID	Sum check by Vee job history ID
Outage History by Meter Number	Summary of the outage history for a meter from the OMS system
Gap	Provides a list of meters that have had at least one good reading, but have not been reading in from the AMI system for X days to the most recent read day
SumCheck	Sum check by day
Hourly Interval Summary by Account Rate	Lists interval reading summary totaled by account rate for the given date range
MDM Database Object Changes	Pulls a list of database object changes

Hourly Interval Summary by Account Number	Lists interval reading summary totaled by account number for the given date range
Hourly Interval Summary by Meter	Lists interval reading summary totaled by the meter for the given date range

Hubbell, Inc

Security and Privacy Controls Attestation

Rev 6.2 cybersecurity@hubbell.com

HUBBELL INCORPORATED

Hubbell, Inc Confidential and Proprietary

December 1, 2022

Hubbell Security and Privacy Controls Attestation

To: All Hubbell Customers, Vendors and Partners

This document is intended to serve as an attestation of Hubbell and its affiliate's corporate-specific cybersecurity practices and posture.

Daniel Sweeney

Daniel Sweeney
Chief Information Security Officer
Hubbell Incorporated
40 Waterview Drive | Shelton, CT 06484
Tel: 314.895.6566

Email: dsweeney@hubbell.com

Hubbell Security Controls Attestations (Reference NIST SP 800-53)

With respect to the disclosure of Hubbell's cybersecurity posture, the following is intended to augment the standard questionnaires and requests for information on specific areas related to cybersecurity and governance. This document follows the NIST SP800-53 controls outline, providing additional details in those areas requested. Each policies and procedures section of the control discusses Hubbell's areas of alignment.

i. (AC) Access Controls

a. (AC-1) Policies and Procedures – Hubbell follows the NIST standard for access control to the extent applicable for Hubbell's corporate cybersecurity controls, including account management, access enforcement, information flow, separation of duties, least privilege, session termination, remote access, wireless access and privacy.

b. (AC-2.12) Account Management | Account Monitoring for Atypical Usage - Systems and endpoint activity including the logging of telemetry is collected and monitored for security access violations including unauthorized login activity, elevation of privileges or brute force attacks

c. (AC-3) Access Enforcement – Hubbell performs a User Access Review (UAR) on a recurring basis depending on the criticality of the system. The UAR includes an analysis and validation of the user's access and permissions based on their current role.

d. (AC-6.6) Privileged Access by Non-organizational Users - Non-organizational users are configured initially on the concept of least privilege. Access to additional systems or services occurs through a request and approval process. In addition, compensating controls exist to validate the users access through a recurring user access review and are removed completely on termination with follow-up validation with a set timeframe.

e. (AC-7.1) Unsuccessful Logon Attempts – Hubbell enforces a process by which the user is automatically locked out after an unsuccessful number of attempts for a set period of time

f. (AC-17) Remote Access – Hubbell leverages a VPN client to enable remote access by employees and authorized 3rd party contractors. Multi-factor authentication is enforced for remote connections.

g. (AC-19) Access Control for Mobile Devices – Hubbell leverages a Mobile Device Management (MDM) solution to manage access to company resources from a mobile device

h. (AC-20) Use of External Systems – The restrictions and proper and allowable use of external, non-organizational systems is outlined across several policies including the acceptable use of personal devices and equipment.

ii. (AT) Awareness and Training

a. (AT-1) Policies and Procedures – Hubbell follows the NIST standard for awareness and training to the extent applicable for Hubbell's corporate cybersecurity controls including awareness and role-based training.

b. (AT-2) – Literacy Training and Awareness – Hubbell has a Cybersecurity training and awareness program which includes a new hire cybersecurity orientation, a recurring, refreshed for relevancy cyber-themed computer-based training twice per year. Employees are assigned and required to complete training. Additionally, employees take part in phish test simulations on an average of 3 times per month in conjunction with micro-training which is triggered on success or failure. Results on phish test execution are recorded and shared with senior leadership for performance and compliance visibility.

iii. (AU) Audit and Accountability

a. (AU-1) Policies and Procedures - Hubbell follows the NIST standard for event and audit logging to the extent applicable for Hubbell's corporate cybersecurity controls including audit log reviews, analysis and reporting as well as non-repudiation.

b. (AU-8) Time Stamps | Secondary Authoritative Time Source – Hubbell uses a Network Time Protocol (NTP) service to ensure clock synchronization for all domain connected devices.

c. (AU-16.2) Sharing of Audit Information – Hubbell's internal audit function has full visibility and access to audit information across the enterprise.

iv. (CA) Control Assessments

a. (CA-1) Policies and Procedures - Hubbell follows the NIST standard for control assessments to the extent applicable for Hubbell's corporate cybersecurity controls including continuous monitoring and penetration testing.

b. (CA-8) Penetration Testing – Hubbell ensures that independent third-party penetration tests are performed in accordance with our cybersecurity policies, and when required, are part of a product specific SOC2 Type 2 accreditation. The results of the penetration tests are reviewed and tracked with senior IT leadership and the company CISO with a focus on timely remediation of Critical and High findings.

v. (CM) Configuration Management

a. (CM-1) Policies and Procedures - Hubbell follows the NIST standard for configuration management to the extent applicable for Hubbell's corporate cybersecurity controls including configuration change control, impact analysis, access restrictions, least functionality and system component inventory.

b. (CM-2) Baseline Configuration – Hubbell leverages a series of minimum-security baseline procedures to set and maintain consistent baseline configurations.

c. (CM-3) Configuration Change Control – Hubbell enforces the use of a change control process to document and manage changes to configuration items and systems that are under configuration control in conjunction with its CMDB. A formal CAB (Change Advisory Board) process and meeting is scheduled weekly to review proposed changes and impacts.

d. (CM-8) System Component Inventory – Hubbell uses an IT Service Management (ITSM) solution, in conjunction with a Configuration Management Database (CMDB), to inventory, track and manage all discrete, identifiable information technology assets that include hardware, software, and firmware.

e. (CM-10) Software Usage Restrictions – Hubbell leverages an internal Vendor Management Office (VMO) in conjunction with a Software Governance Policy to ensure that software and services are being purchased and licensed properly for the specific application and requirements. In additional, Open Source software and libraries are reviewed for licensing compliance and vulnerabilities.

vi. (CP) Contingency Planning

a. (CP-1) Policies and Procedures - Hubbell follows the NIST standard for contingency planning to the extent applicable for Hubbell's corporate cybersecurity controls including contingency training, testing, alternate sites, back-ups and recovery.

b. (CP-2) Contingency Plan – Hubbell performs business continuity planning on an annual basis incorporating alternate site planning, testing and training. Additionally, systems and platforms, designated as critical to business continuity, receive additional planning to include consideration for redundancy, availability, and disaster recovery.

c. (CP-8.3) Telecommunications Services | Separation of Primary and Alternate Providers – Hubbell maintains a primary and secondary telecommunications service providers as a measure of redundancy.

d. (CP-9) System Backup – Hubbell performs scheduled backups consistent with compliance and audit requirements and aligned with handling and protection of sensitive data. Hubbell takes the necessary steps and employs the technology and processes necessary to protect the confidentiality, integrity and availability of the backup information.

vii. (IA) Identification and Authentication

a. (IA-1) Policies and Procedures - Hubbell follows the NIST standard for identification and authentication to the extent applicable for Hubbell's corporate cybersecurity controls including multi-factor, group, non-privileged accounts, SSO, device trust and cryptography.

b. (IA-5.1) Authenticator Management-Password Based Authentication – Hubbell enforces password- based authentication for all user accounts with the requirement to periodically change and rules for password strength and format.

c. (IA-5.4) Authenticator Management | Automated Support for Password Strength Determination – Hubbell employs an automated robust password strength policy enforcing a standard consistent with a low-risk posture of breach due to brute-force or password cracking attacks

viii. (IR) Incident Response

a. (IR-1) Policies and Procedures - Hubbell follows the NIST standard for incident response to the extent applicable for Hubbell's corporate cybersecurity controls including incident handling and reporting.

b. (IR-4.11) Incident Handling | Integrated Incident Response Team – Hubbell leverages an incident response team with two primary levels of support. A smaller team, comprised of Cybersecurity and Compliance team members, quickly performs the initial triage and evaluation of any incident, which is reported and/or discovered within the Hubbell digital estate, to determine its validity and potential for material impact. Once determined to be an actual incident, the enterprise incident response team and incident response process is engaged.

c. (IR-4.14) Incident Handling | Security Operations Center – Hubbell employs a Security Operations Center (SOC) staffed with Cybersecurity engineers and analysts which manage security operations, Hubbell wide, which has the responsibility of tracking and remediation of all alerts, threats and incidents that occur.

d. (IR-6) Incident Reporting – In the event that a cybersecurity incident presents a potential material impact to our customers or has been verified as an actual breach, Hubbell endeavors to provide notification of the incident as soon as practical, but not more than 48 hours after discovery.

e. (IR-8) Incident Response Plan - Hubbell maintains a comprehensive Cybersecurity Incident Response Plan (CSIRP) which defines the process and procedures to be followed in the event of an incident, including the most probable security threats and associated incidents. The CSIRP is exercised, at a minimum, annually using a 3rd party facilitator to ensure the plans effectiveness and relevancy.

ix. (MA) Maintenance

a. (MA-1) Policies and Procedures - Hubbell follows the NIST standard for maintenance to the extent applicable for Hubbell's corporate cybersecurity controls including tools, personnel, and timing.

b. (MA-5) Maintenance Personnel – Individuals performing maintenance work receive the necessary reviews and filtering prior to being granted access and authorization. Consistent with the outcomes and actions required as a result of the recurring system user access reviews, corrections, adjustments and terminations are made in alignment with those findings as well.

x. (MP) Media Protection

a. (MP-1) Media Protection - Hubbell uses the NIST standard for media protection to the extent applicable for Hubbell's corporate cybersecurity controls including media access, storage transport, sanitization and marking.

b. (MP-6) Media Sanitization – Hubbell has a discrete policy for sanitizing various forms of electronic media deemed end-of-life, end-of-service, reclaimed or returned consistent with local compliance ad regulatory standards.

xi. (PE) Physical and Environmental Protection

a. (PE-1) Policies and Procedures - Hubbell follows the NIST standard for physical and environmental protection to the extent applicable for Hubbell's corporate cybersecurity controls including physical access and control, power management and emergency services.

b. (PE-3.a) Physical Access Control – Each Hubbell location has a discrete set of physical access controls and procedures that are in place to maintain an appropriate level of security including ingress/egress, physical monitoring and audit logging.

xii. (PL) Planning

a. (PL-1) Policies and Procedures - Hubbell follows the NIST standard for planning to the extent applicable for Hubbell's corporate cybersecurity controls including system security and privacy planning.

b. (PL-2) System Security and Privacy Plans – Hubbell maintains a set of formal policies which encompass cybersecurity and governance guidelines for areas of security and privacy including, but not limited to, Endpoint protection, Service Provider Compliance, System Access and Maintenance, Third Party Systems an Security, User Authentication and Monitoring, User Access Reviews and Data Classification. Policy updates and refreshes occur as a result of changes in requirements, technology, risk assessment, customer or market demand or compliance on a continuous basis. Policies are reviewed at multiple levels by relevant subject, matter experts and stakeholders across the enterprise with formal approval occurring through a policy approval committee comprised of senior functional leadership.

xiii. (PM) Program Management

a. (PM-1) Information Security Program Plan – Hubbell leverages a defense-in-depth and layered security strategy to deliver overall redundancy and multiple points of failure for the protection of data assets. This includes tools to manage business email compromise, intrusion detection and protection and a 3rd party 24x7 security operation center performing threat hunting as well as managed detection and response. Hubbell employs best in class tools on all endpoints with collection, aggregation and analytics of enterprise wide telemetry on a continuous basis.

xiv. (PS) Personnel Security

a. (PS-1) Policies and Procedures - Hubbell follows the NIST standard for personnel security to the extent applicable for Hubbell's corporate cybersecurity controls including screening, terminations and access agreements.

xv. (PT) Personally Identifiable Information

a. (PT-1) Policies and Procedures – Hubbell follows the NIST standard for personally identifiable information to the extent applicable for Hubbell's corporate cybersecurity controls including processing, tagging and consent.

xvi. (RA) Risk Assessment

a. (RA-1) Policies and Procedures Hubbell follows the NIST standard for risk assessment to the extent applicable for Hubbell's corporate cybersecurity controls including assessment, vulnerability monitoring and scanning.

b. (RA-5) Vulnerability Monitoring and Scanning – Hubbell maintains and utilizes modern vulnerability scanning solutions to perform recurring analysis of all devices connected to the Hubbell network. Vulnerabilities that are discovered are reviewed and prioritized for remediation, based on the risk level and CVSS score. Any vulnerability identified as Critical or High receives priority attention. The daily SecOps (Security Operations) meeting is used to review new and previously opened vulnerabilities, as well as total and recent scan results. A monthly operations review, which includes attendance by senior IT leadership and the company CISO, is used to report and track vulnerability incident aging and related ITSM metrics.

xvii. (SA) System and Services Acquisition

a. (SA-1) Policies and Procedures - Hubbell uses the NIST standard for system and services acquisition to the extent applicable for Hubbell's corporate cybersecurity controls including developer testing and evaluation, supply chain protection, development process standards, security and privacy architecture and component authenticity.

b. (SA-11) Developer Testing and Evaluation – Hubbell leverages a comprehensive (SDL) Software Development Lifecyle for ensuring the development and delivery of secure code. The SDL process fosters a design-for-security approach encompassing peer reviews and best-practice sharing. To the extent applicable static application security testing (SAST) and source composition analysis (SCA) tools are leveraged prior to release. Vulnerability assessment is managed through threat modeling and attack surface analysis where appropriate.

xviii. (SC) System and Communications Protection

a. (SC-1) Policies and Procedures – Hubbell follows the NIST standard for system and communications protection to the extent applicable for Hubbell's corporate cybersecurity controls including system isolation, segregation, and boundary protection.

b. (SC-7) Boundary Protection – Specific to Hubbell's network architecture configuration, all external traffic is directed to hosts located positioned in a Demilitarized Zone (DMZ). External traffic is blocked at the perimeter, only enabled through a Virtual Private Network (VPN). Hubbell is employing a Wide Area Network (WAN) appliance with a built-in firewall module.

c. (SC-7.10) Boundary Protection | Prevent Exfiltration – Hubbell leverages a Data Classification Policy and methods of discovery to differentiate and prioritize the handling of sensitive data including the data leakage prevention or exfiltration through various egress points. Hubbell's Data Loss Prevention (DLP) program rules continue to evolve and mature ensuring the proper controls are applied relative to the sensitivity and ownership of the data.

d. (SC-8.1) Transmission Confidentiality and Integrity | Cryptographic Protection – Hubbell implements TLS (Transport Layer Security) as a cryptographic mechanism to prevent the unauthorized disclosure of information and detect changes to information during transmission. Hubbell enforces the use of TLS for all email and web traffic where sensitive data is transmitted.

xix. (SI) System and Information Integrity

a. (SI-1) Policies and Procedures- Hubbell follows the NIST standard for system and information integrity to the extent applicable for Hubbell's corporate cybersecurity controls including malicious code protection, system monitoring and software and firmware integrity.

b. (SI-3) Malicious Code Protection – Hubbell employs an active combination of endpoint intrusion detection and prevention next generation anti-virus software with continuous updates of emerging threats, Indicators of Compromise (IOC's) and signatures.

c. (SI-4) System Monitoring – Systems are monitored continuously for CPU, memory, disk space, network traffic anomalies and failure events.

d. (SI-8) Spam Protection – Hubbell uses a combination of SPF (Sender Policy Framework) and DKIM (DomainKeys Identified Mail) protocols to harden the DNS environment and place restrictions on emails sent from the Hubbell domain to prevent domain spoofing and ensure that the content of emails remains trusted and tamper-free. Hubbell does not currently employ DMARC (Domain-based Message Authentication), at this time, for policy enforcement.

e. (SI-12) Information Management and Retention - To the extent any customer information is retained by Hubbell, such information will be held in accordance with the confidentiality terms agreed upon by the parties and applicable law.

f. (SI-12.3) Information Management and Retention | Information Disposal – Hubbell's process for the timing and scope for the disposal of client data is based upon request

xx. (SR) Supply Chain Risk Management

a. (SR-1) Policies and Procedures – Hubbell follows the NIST standard for supply chain risk management to the extent applicable for Hubbell's corporate cybersecurity controls including supplier assessment and reviews, notifications, and component authenticity.

b. (SR-6) Supplier Assessment & Reviews – Hubbell performs risk assessments on suppliers on a recurring basis dependent on their risk status and open issues. Hubbell uses an industry standard cybersecurity framework and questionnaire to solicit, evaluate and risk score suppliers relative to the products and/or services that they are providing. Hubbell leverages a self-service portal and software service to perform initial intakes, collection and submittal of the information from the supplier, highlight key areas of concern and provide a final risk score. Risks are reviewed by the appropriate teams within Hubbell Management and subject to risk treatment and follow-up as needed.

Additional information
For additional information regarding the contents of this document, please send email to cybersecurity@hubbell.com

NIST SP800-53 Standard
Security and Privacy Controls for Information Systems and Organizations
https://csrc.nist.gov/publications/detail/sp/800-53/rev-5/final

HUBBELL®

CELEBRATING
135
YEARS
1888-2023

2022 ANNUAL REPORT

AND NOTICE OF ANNUAL MEETING TO SHAREHOLDERS

At a **Glance**

Founded in 1888, **Hubbell Incorporated** is a best-in-class provider of high quality, reliable electrical and utility solutions for a broad range of customer and end market applications.

TOTAL SALES
2022

$4.9B

UTILITY SOLUTIONS SEGMENT
NET SALES

$2.9B

Hubbell Utility Solutions ("HUS") consists of businesses that design, manufacture, and sell a wide variety of electrical distribution, transmission, substation, and telecommunications products.

ELECTRICAL SOLUTIONS SEGMENT
NET SALES

$2.0B

Hubbell Electrical Solutions ("HES") consists of businesses that design, manufacture, and sell stock and custom electrical products including wiring device products, rough-in electrical products, connector and grounding products, as well as other electrical equipment.

OPERATIONS HIGHLIGHTS *(As of December 31, 2022)*

SHELTON, CT
HEADQUARTERS

16,300
EMPLOYEES

48
MANUFACTURING LOCATIONS

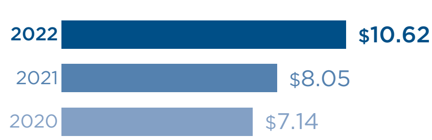
10
WAREHOUSE LOCATIONS

12
COUNTRIES OF OPERATION

PERFORMANCE HIGHLIGHTS[1]

Net Sales
($ Billions)

Adjusted Diluted EPS[2]



Free Cash Flow[2]
($ Millions)

(1) These performance highlights represent the results of continuing operations. See Note 2 in the Notes to the Consolidated Financial Statements in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023 for further details.

(2) Adjusted diluted earnings per share and free cash flow are non-GAAP financial measures. A reconciliation to the comparable GAAP financial measures can be found in Management's Discussion and Analysis of Financial Condition and Results of Operations in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023.

A Letter to **Our Shareholders**

GERBEN W. BAKKER

Chairman, President and Chief Executive Officer, Hubbell Incorporated

2022 was a strong year for Hubbell, one in which we delivered for our customers while investing in the Company's future and driving returns for our shareholders.

STRONG FINANCIAL PERFORMANCE(1)

In 2022 we had record sales of $4.9 billion, record adjusted diluted earnings per share(2) of $10.62 and free cash flow(2) of $507 million. Hubbell increased its dividend by 7% in 2022, representing the 15th consecutive year of a dividend increase.

We also executed a balanced and efficient capital allocation program, repurchasing $182 million in shares of Hubbell and investing over $177 million in acquisitions and $129 million in capital expenditure and restructuring projects to more effectively serve customers while driving growth to the top and bottom line.

2022 HIGHLIGHTS

After closing on the sale of Hubbell's commercial and industrial lighting business in February, 2022 for a sale price of $350 million, we grew our business with three acquisitions in the second half of 2022 – PCX Holdings LLC, Ripley Tools and REF Automation.

We saw unprecedented order demand from our customers across both our Electrical and Utility segments in 2022, as grid modernization and electrification continue to drive demand for Hubbell products and solutions. Hubbell's unique, leading positions across the energy infrastructure are enabling us to solve critical infrastructure problems for our utility and electrical customers in front of and behind the meter.

In 2022 we opened a new manufacturing facility in Oklahoma City, Oklahoma for our enclosures, gas and related product businesses. This new facility, our largest manufacturing facility in the US, consolidates locations while bringing together efficient processes and an increased ability to deliver to our customers.

We also accelerated our innovation efforts, optimizing investment into larger scale, strategic innovation projects. We believe these investments will drive Hubbell's long-term organic growth profile and position the company to continue to capitalize on attractive megatrends in grid modernization and electrification.

LOOKING AHEAD

2023 is Hubbell's 135th anniversary, and I look forward to all of the opportunities for our business, our customers, employees, shareholders and partners. The key to our success continues to be our over 16,000 employees around the world. Their dedication, support and resiliency drive everything we do.

We are well positioned to continue executing on our strategy of solving critical infrastructure problems through reliable and efficient utility and electrical solutions. We will continue to drive value from our positions across the energy infrastructure to grow our business, operate efficiently, innovate and serve our stakeholders.

I thank you for your continued support and investment in Hubbell.

Gerben W. Bakker

Chairman, President and Chief Executive Officer

March 20, 2023

$4.9B
NET SALES

$507M
FREE CASH FLOW(2)

$10.62
ADJUSTED DILUTED EARNINGS PER SHARE(2)

(1) Represents the results of continuing operations. See Note 2 in the Notes to the Consolidated Financial Statements in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023 for further details.

(2) Adjusted diluted earnings per share and free cash flow are non-GAAP financial measures. A reconciliation to the comparable GAAP financial measures can be found in Management's Discussion and Analysis of Financial Condition and Results of Operations in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023.

About **Hubbell**

Recognized for our innovation, quality, and deep commitment to serving our customers for 135 years, Hubbell Incorporated ("Hubbell") is a best-in-class provider of high quality, reliable electrical and utility solutions for a broad range of customer and end market applications.

UTILITY **SOLUTIONS**

IN FRONT OF THE METER

UTILITY | TRANSMISSION | DISTRIBUTION

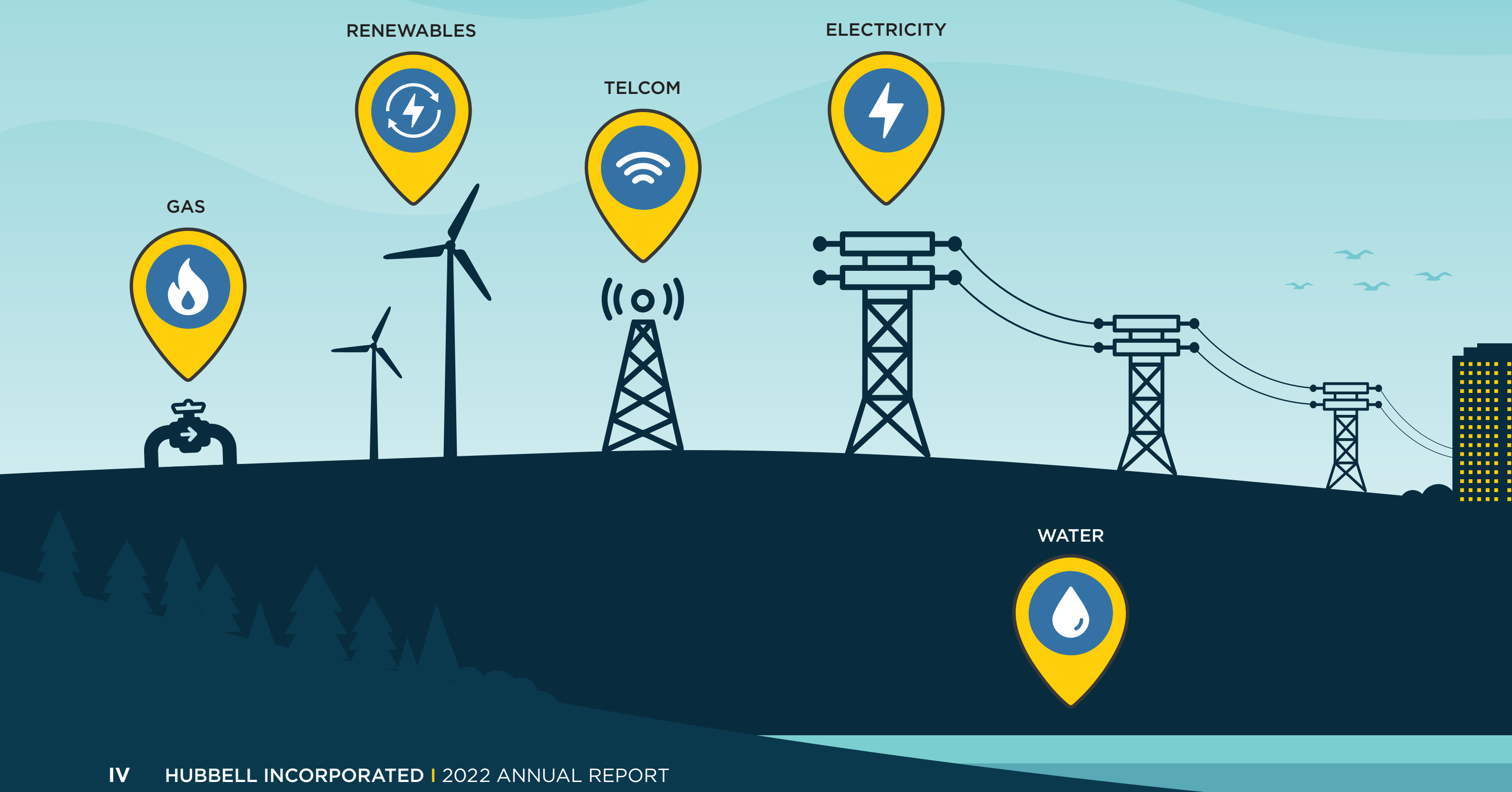
In Front of the Meter is where utilities transmit and distribute energy to their customers. This is the backbone of the grid.

RENEWABLES
ELECTRICITY
GAS
WATER
TELCOM

THE EDGE

COMMUNICATIONS AND CONTROLS

The Edge consists of smart meters and communication systems which connect utilities with owner / operators and allow energy and data to be distributed back and forth.



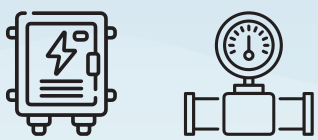
Our Strategy

Our strategic focus is on delivering a comprehensive suite of leading-edge, high-quality electrical and utility solutions. We seek to achieve this through acquisitions of complementary businesses in established markets, as well as by investing in new product development to help our existing products retain their market leadership.

Our Solutions

Our reporting segments, Hubbell Utility Solutions ("HUS") and Hubbell Electrical Solutions ("HES"), support the energy infrastructure and empower and energize communities through innovative solutions In Front Of The Meter, On The Edge, and Behind The Meter.

ELECTRICAL **SOLUTIONS**



BEHIND THE METER

DIVERSIFIED APPLICATIONS | OWNER/OPERATOR

Behind the Meter is where owners and operators of buildings and other critical infrastructure consume energy.

RESIDENTIAL

NON-RESIDENTIAL

LIGHT INDUSTRIAL

HEAVY INDUSTRIAL

Board of Directors

1 Gerben W. Bakker

Chairman, President and Chief Executive Officer of the Company.

Board Committee:
- **Executive, Chair**

2 Carlos M. Cardoso

Retired Chairman of Garrett Motion Inc. (Transportation systems).

Board Committees:
- **Compensation**
- **Nominating and Corporate Governance**

3 Anthony J. Guzzi

Chairman, President and Chief Executive Officer of EMCOR Group, Inc. (Mechanical, electrical construction and facilities services).

Board Committees:
- **Compensation**
- **Executive, Lead Director**
- **Finance**
- **Nominating and Corporate Governance**

4 Rhett A. Hernandez

President of CyberLens, LLC (Cybersecurity and strategic planning firm).

Board Committees:
- **Audit**
- **Finance**

5 Neal J. Keating

Retired Chairman, President and Chief Executive Officer of Kaman Corporation (Aerospace and industrial distribution).

Board Committees:
- **Compensation**
- **Executive**
- **Nominating and Corporate Governance, Chair**

6 Bonnie C. Lind

Retired Senior Vice President, Chief Financial Officer and Treasurer of Neenah, Inc. (Global manufacturer of technical specialties products, fine paper and packaging).

Board Committees:
- **Audit, Chair**
- **Executive**
- **Nominating and Corporate Governance**

7 John F. Malloy

Chairman, Retired President and Chief Executive Officer of Victaulic Company (Mechanical pipe joining systems).

Board Committees:
- **Audit**
- **Executive**
- **Finance, Chair**

8 Jennifer M. Pollino

Executive coach and consultant with JMPollino, LLC (Leadership development, talent management and succession planning firm).

Board Committees:
- **Audit**
- **Compensation**

9 John G. Russell

Chairman of the Boards of CMS Energy Corporation and Consumers Energy Company (Electric and natural gas utility).

Board Committees:
- **Compensation, Chair**
- **Executive**
- **Finance**
- **Nominating and Corporate Governance**

2023
Proxy Statement

Notice of 2023 Annual Meeting of Shareholders

MEETING INFORMATION

Date and Time
Tuesday, May 2, 2023 at 9:00 a.m.

Location
Hubbell Incorporated
40 Waterview Drive, Shelton, CT 06484

Record Date
March 3, 2023

Your proxy is being solicited for the Annual Meeting of Shareholders (the "Annual Meeting") of Hubbell Incorporated ("Hubbell" or the "Company"), or any adjournment, continuation, or postponement of the Annual Meeting, on behalf of the Board of Directors of the Company (the "Board"). Hubbell pays the cost of soliciting your proxy. On March 20, 2023, we mailed a Notice of the Internet Availability of Proxy Materials to all shareholders of record advising that they could view all of the proxy materials (Proxy Statement, Proxy Card and Annual Report on Form 10-K) online at **www.proxyvote.com** free of charge, or request in writing a paper or email copy of the proxy materials free of charge. We encourage all shareholders to access their proxy materials online to reduce the environmental impact and cost of our proxy solicitation. You may request a paper or email copy of the materials using any of the following methods:

- By Internet: Go to www.proxyvote.com
- By Phone: 1-800-579-1639
- By Email: sendmaterial@proxyvote.com

How To Vote

Your vote is important. Please vote as soon as possible by one of the methods shown below. Make sure to have your proxy card, voting instruction form, or notice of Internet availability in hand and follow the instructions.

BY TELEPHONE
You can vote your shares toll-free by calling 1-800-690-6903.

ONLINE
You can vote your shares online at proxyvote.com.

BY MAIL
If you have requested a paper copy of the proxy materials, complete, sign, date and return your proxy card in the prepaid envelope.

IN PERSON
Shareholders who attend the Annual Meeting may request a ballot and vote in person. If you are a beneficial owner of shares, you must obtain a legal proxy from your broker, bank or record holder and present it to the inspectors of election with your ballot to be able to vote at the meeting.

BY SCANNING
You can vote your shares online by scanning the QR code on your proxy card. You will need the 16-digit control number on your proxy card.

You may revoke your proxy at any time prior to its use by any of the following methods:

- Delivering to the Secretary of the Company written instructions revoking your proxy;
- Delivering an executed proxy bearing a later date than your prior voted proxy; or
- If you voted by Internet or telephone, by recording a different vote on the Internet website or by telephone.

If you hold your shares in street name, you must follow the instructions of your broker, bank, or other nominee to revoke your voting instructions.

Items of Business

PROPOSAL 1
Election of 9 directors.

PROPOSAL 2
Say on Pay: advisory vote on the compensation of the named executive officers.

PROPOSAL 3
Say When on Pay: advisory vote on the frequency with which named executive officer compensation will be subject to a shareholder vote.

PROPOSAL 4
Ratify the selection of PricewaterhouseCoopers LLP as our independent registered public accounting firm for 2023.

In addition, any other business properly presented may be acted upon at the meeting.

Record Date

If you were a shareholder of record at the close of business on March 3, 2023, you will be entitled to notice and to vote at the Annual Meeting.

By order of the Board,

Katherine A. Lane

Katherine A. Lane
Senior Vice President, General Counsel and Secretary
March 20, 2023

IMPORTANT NOTICE REGARDING THE AVAILABILITY OF PROXY MATERIALS FOR THE ANNUAL MEETING OF SHAREHOLDERS TO BE HELD ON MAY 2, 2023.

This Notice of Annual Meeting and Proxy Statement and the Company's Annual Report on Form 10-K for the year ended 2022 are available at www.proxyvote.com. Have your Notice of the Internet Availability of Proxy Materials or proxy card in hand when you go to the website.

Table of Contents

Proxy Summary

This Proxy Summary highlights selected information contained in this Proxy Statement. It does not contain all the information that you should consider to determine your vote. You should read the entire Proxy Statement carefully before voting.

Annual Shareholders Meeting

DATE: May 2, 2023

TIME: 9:00 a.m.

MEETING AGENDA: The meeting will cover the proposals listed under voting matters and vote recommendations below, and any other business that may properly come before the meeting.

PLACE: Hubbell Incorporated,
40 Waterview Drive, Shelton, CT 06484

RECORD DATE: March 3, 2023

MAILING DATE: This Proxy Statement was first mailed to shareholders on or about March 20, 2023.

VOTING: Shareholders as of the record date are entitled to vote. Each share of Common Stock of Hubbell Incorporated (the "Company") is entitled to one vote for each director nominee and one vote for each of the proposals.

Voting Matters and Vote Recommendations

A quorum is required to transact business at the Annual Meeting. The presence of the holders of Common Stock, in person or by proxy, representing a majority of the voting power of the Company's outstanding shares constitutes a quorum for the Annual Meeting. Abstentions and broker non-votes are counted as present for quorum purposes.

Proposal	Board's Voting Recommendation	Page
Proposal 1 – Election of Directors	FOR each Nominee	10
Proposal 2 – Advisory vote to approve Named Executive Officer compensation ("Say on Pay" vote)	FOR	32
Proposal 3 – Advisory vote to approve the frequency with which Named Executive Officer compensation will be subject to a shareholder vote ("Say When on Pay" vote)	FOR One (1) Year	33
Proposal 4 – Ratification of the selection of PricewaterhouseCoopers LLP as our independent registered public accounting firm for fiscal year 2023	FOR	72

The Company does not intend to present any business at the Annual Meeting other than the items described in the Proxy Statement and has no information that others will do so. The proxies appointed by our Board of Directors (and named on your Proxy Card) will vote all shares as the Board recommends above unless you instruct otherwise when you vote. If a matter not described in this Proxy Statement is properly presented at the Annual Meeting, the named proxies will have the discretion to vote your shares in their judgment.

Our Vision and Values

Hubbell is a global manufacturer of high quality, reliable electrical and utility solutions for a broad range of customer and end market applications in the Electrical Solutions and Utility Solutions segments. Hubbell is committed to doing business in ways that are principled, transparent, and accountable to our shareholders. We believe doing so generates long-term value.

Our Vision is to be an exceptional supplier, a valued investment, and a rewarding employer. Our commitment is underscored by the four pillars that guide us as a company.

SERVE OUR CUSTOMERS

OPERATE WITH DISCIPLINE

GROW THE ENTERPRISE

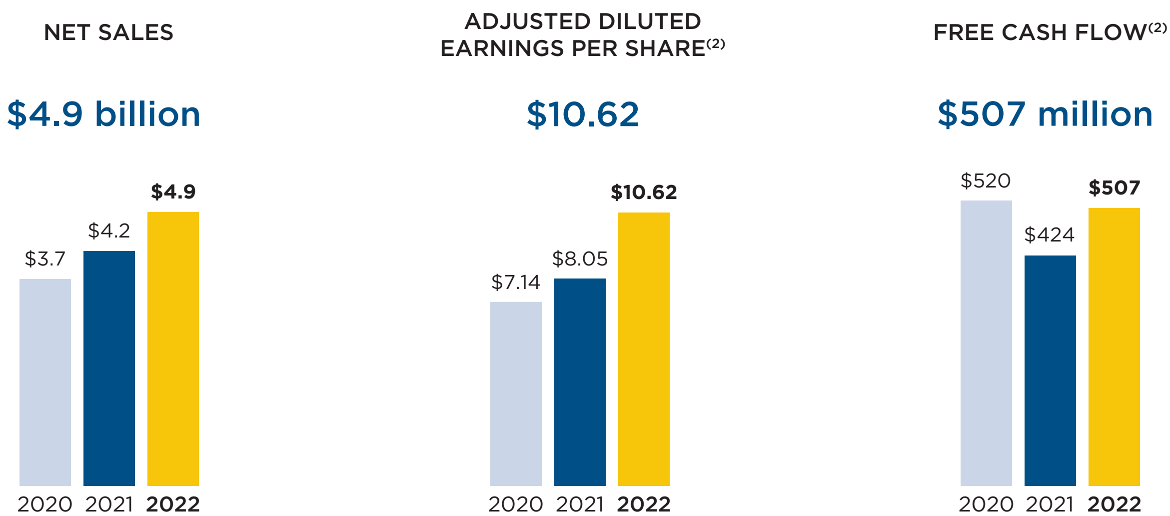
DEVELOP OUR PEOPLE

2022 Performance Highlights

We delivered on our commitments to shareholders.

We measure our progress not only in terms of our financial accomplishments, but in the best interests of our shareholders, suppliers, customers, employees, and the communities in which we operate.

Performance Summary(1)



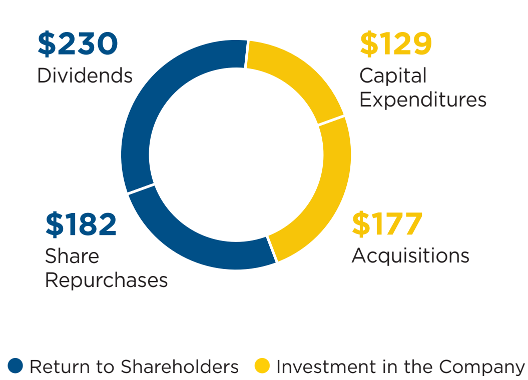
(1) *The performance summary represents the results of continuing operations. See Note 2 in the Notes to the Consolidated Financial Statements in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023 for further details.*

(2) *Adjusted diluted earnings per share and free cash flow are non-GAAP financial measures. A reconciliation to the comparable GAAP financial measures can be found in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023.*

We executed a disciplined plan of capital deployment.

CAPITAL DEPLOYMENT

($ Millions)



- **Invested $129 million in high return capital expenditures.**
- **Deployed $177 million for acquisitions.**
- **Deployed $182 million in share repurchases.**
- **Announced a 7% dividend increase.**

Portfolio

Successful execution of portfolio management to create higher growth and margin characteristics for Hubbell.

As important as it is for Hubbell to grow our enterprise, we also recognize the importance of portfolio management and critically reviewing any businesses that may no longer be core to Hubbell's strategy. In 2022, Hubbell completed the sale of its commercial and industrial ("C&I") lighting business in its Electrical Solutions segment, which disposition closed on February 1, 2022. The sale of the C&I lighting business had a cash sale price of $350 million, subject to customary adjustments with respect to working capital and net indebtedness. Hubbell continued its focus on growth by then closing on three (3) acquisitions in 2022.

NEW PCX

Designer and manufacturer of factory built modular power solutions for the data center market. This business is now part of our Electrical Solutions segment.

NEW Ripley Tools

Manufacturer of cable and fiber prep tools and test equipment for the electrical, utility and communications markets. This business is now part of our Utility Solutions segment.

NEW REF Automation

Designer and manufacturer of electrical power components. This business is now part of our Electrical Solutions segment.

Develop our People

Hubbell continues to focus on its employees through engagement and development.

In 2022, Hubbell conducted an enterprise-wide employee survey, the Elevate Employee Experience Survey, to better understand the voices of our over 16,000 employees worldwide. Elevate was the largest survey ever conducted by the Company and over 80% of Hubbell's employees responded, providing insights at the site, function and enterprise levels that the Company is translating into action plans. The survey results provided details on how employees feel about the Company, their careers, and various opportunities for Hubbell to better connect employees to Hubbell's vision and purpose. Hubbell plans to conduct such employee engagement surveys annually going forward.

To show appreciation for our employees' efforts to continue to serve our customers and deliver throughout challenging supply chain environments, we provided our employees around the world with a Global Recharge Day, our second one ever. This paid day off for all employees in October of 2022 allowed our employees time to relax, refresh and recharge, and was also an opportunity for our Company to reinforce the importance of time away from work and the importance of mental health and wellness to Hubbell.

Sustainability

COMMITMENT TO ENVIRONMENTAL, SOCIAL AND GOVERNANACE ("ESG")

Hubbell publishes an annual sustainability report (available at **www.hubbell.com**) that details Hubbell's commitments to sustainability, human capital management, compliance and ethics.

The report reflects our dedication to building a cohesive ESG strategy intended to drive long-term value and accountability through meaningful progress and transparent and credible disclosures. Explore the 2023 Sustainability Report(1) (available at **www.hubbell.com**), to learn more about our sustainability aspirations and accomplishments.

2023 WORLD'S MOST ETHICAL COMPANIES® ETHISPHERE 3-TIME HONOREE ™

RECOGNIZED AS ONE OF THE 2023 WORLD'S MOST ETHICAL COMPANIES

Hubbell was recognized by the Ethisphere Institute as one of the 2023 World's Most Ethical Companies. This was the third year in a row Hubbell has been named to this list and it reflects the Company's and our employee's commitment to compliance and sustaining an ethical culture.

See additional details on pages 26-28.

(1) *The information within the 2023 Sustainability Report (available at **www.hubbell.com**), and any other information on the Company's sustainability webpage that Hubbell may refer to herein is not incorporated by reference into and does not form any part of this Proxy Statement. Any targets or goals discussed in our sustainability disclosures and within this Proxy Statement may be aspirational, and as such, no guarantees or promises are made that these goals will be met. Furthermore, statistics and metrics disclosed in this Proxy Statement, our sustainability reports, and Hubbell's sustainability webpage are estimates and may be based on assumptions. We are under no obligation to update such information.*

Proposal 1 | Election of 9 Directors

See pages 10-17 for further information.

THE BOARD RECOMMENDS A VOTE ✓ FOR EACH NOMINEE FOR A ONE-YEAR TERM.

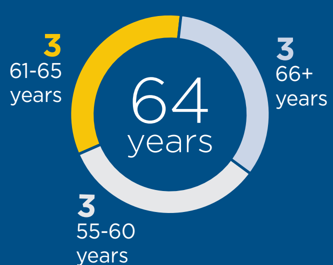
The following table provides summary information about each of the nine Director nominees. Each Director is elected annually by a plurality of votes cast. Existing committee assignments of the Directors are described below. Each nominee is a current Director of the Company and possesses the qualifications and experience recommended by the Nominating and Corporate Governance Committee, and is approved by our Board to serve as a Director.

Our Director Nominees

AVERAGE TENURE

8 years

AVERAGE AGE



DIRECTOR NOMINEE COMPETENCIES AND PROFILES:

- CEO Experience ●●●●●●○○○ 6
- Financial Experience ●●●●●●●●○ 8
- Gender Diversity ●●○○○○○○○ 2
- Independence ●●●●●●●●○ 8
- Manufacturing Experience ●●●●●●●●○ 8
- Racial/Ethnic Diversity ●○○○○○○○○ 1
- Risk Management Experience ●●●●●●●●● 9

Age 58

GERBEN W. BAKKER

Director since: 2020

Chairman, President and Chief Executive Officer, Hubbell Incorporated

Committee:
Executive (Chair)

Age 64

BONNIE C. LIND

INDEPENDENT

Director since: 2019

Retired SVP, CFO and Treasurer, Neenah, Inc.

Committees:
Audit (Chair), Executive, Nominating and Corporate Governance

Age 65

CARLOS M. CARDOSO

INDEPENDENT

Director since: 2013

Retired Chairman, Garrett Motion Inc.

Committees:
Compensation, Nominating and Corporate Governance

Age 68

JOHN F. MALLOY

INDEPENDENT

Director since: 2011

Chairman, Retired President and CEO, Victaulic Company

Committees:
Audit, Executive, Finance (Chair)

Age 58

ANTHONY J. GUZZI

INDEPENDENT,
LEAD DIRECTOR

Director since: 2006

Chairman, President and CEO, EMCOR Group, Inc.

Committees:
Compensation, Executive, Finance, Nominating and Corporate Governance

Age 58

JENNIFER M. POLLINO

INDEPENDENT

Director since: 2020

Executive Coach and Consultant, JMPollino, LLC

Committees:
Audit, Compensation

Age 70

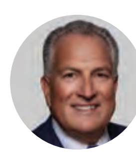
RHETT A. HERNANDEZ

INDEPENDENT

Director since: 2021

President, CyberLens, LLC

Committees:
Audit, Finance



Age 65

JOHN G. RUSSELL

INDEPENDENT

Director since: 2011

Chairman of the Boards of CMS Energy Corporation, Consumers Energy Company

Committees:
Compensation (Chair), Executive, Finance, Nominating and Corporate Governance

Age 67

NEAL J. KEATING

INDEPENDENT

Director since: 2010

Retired Chairman, President and CEO, Kaman Corporation

Committees:
Compensation, Executive, Nominating and Corporate Governance (Chair)

Proposal 2	Say on Pay: advisory vote to approve the compensation of the named executive officers.	See page 32 for further information.

THE BOARD RECOMMENDS A VOTE FOR THIS PROPOSAL.

Proposal 3	Say When on Pay: advisory vote on the frequency of the shareholder vote on executive compensation.	See page 33 for further information.

THE BOARD RECOMMENDS A VOTE FOR ONE YEAR ON THIS PROPOSAL.

Executive Compensation Highlights

Compensation Philosophy

Hubbell's compensation program is designed to achieve the following pay for performance objectives:

- Align executive pay to our Company performance and drive our business strategy.
- Attract and retain key talent.
- Align the interests of executives with our shareholders with effective pay for performance.
- Deliver competitive and fair compensation.

Elements of Compensation

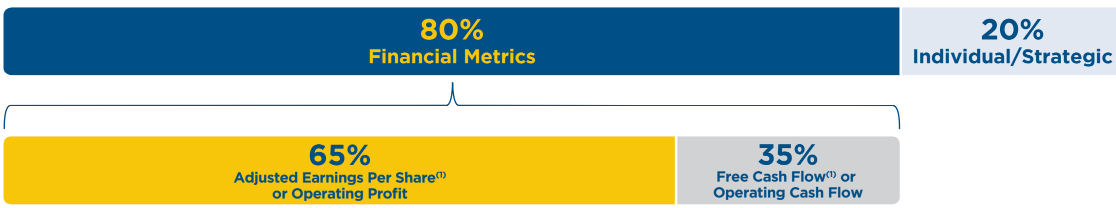
Hubbell compensated its named executive officers ("NEOs") using the following elements for total direct compensation in 2022:

			Target Compensation Mix	
	Element	**Description**	**CEO**	**Other NEOs**
Targeted at 50th percentile of peers	**Salary**	A competitive level of cash is provided to attract and retain executive talent.	15%	28%
	Annual Cash Incentive	Amounts awarded based on achievements with respect to the Company's financial goals and individual performance against strategic objectives.	17%	21%
	Long-Term Equity Incentive	A mix of equity awards designed to drive Hubbell's performance and align executives' interests with shareholders. **75% of equity awards are performance-based.**	68%	51%

Short and Long-Term Incentives

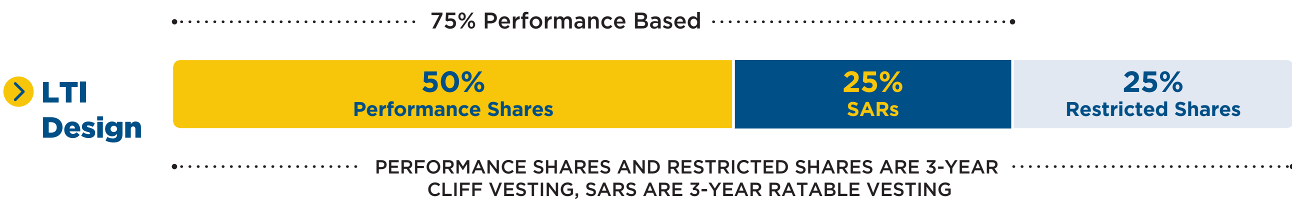
Short-Term Incentive ("STI") Design

The NEOs (including our CEO) had a short-term incentive award design in 2022 that was based 80% on the financial performance of Hubbell and 20% on their individual contributions to Hubbell's objectives. This design further prioritizes and appropriately rewards performance on critical metrics including inclusion and diversity, sustainability / ESG, innovation and acquisitions. This also ensures greater alignment with all the NEOs' performance assessments, that already have a portion of their bonus (20%) focused on strategic initiatives.



Long-Term Incentive ("LTI") Design

The following design of our long-term incentive award program reflects a strong performance-based orientation.



Performance Share Metrics

In 2022, the Compensation Committee decided to change the operating profit margin metric to adjusted operating profit margin(1) to further align across incentive plans and to tie incentive targets to the underlying performance of our business. Performance share grants are comprised of three weighted metrics as described below.

METRIC	2022 Weighting	
Relative Sales Growth	34%	Drives growth initiatives, including organic growth, new product development, innovation, and acquisition performance.
Adjusted Operating Profit Margin(1)	33%	Focuses NEOs on margin expansion and productivity, while executing operational objectives including footprint optimization and product rationalization.
Relative TSR	33%	Ensures pay is aligned to shareholder interests.

Specific details on these metrics may be found on page 47 in the Compensation Discussion & Analysis section.

Our compensation program is designed around pay for performance, informed by our shareholder engagement.

(1) Adjusted earnings per share, adjusted operating profit margin, and free cash flow are non-GAAP financial measures. A reconciliation to the comparable GAAP financial measures can be found in Management's Discussion and Analysis of Financial Condition and Results of Operations in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023.

Shareholder Engagement

Hubbell's 2022 advisory Say on Pay vote on executive compensation resulted in over 96% of the votes cast in favor of the Company's executive compensation program, consistent with votes we have previously received on Say on Pay, which averaged approximately 92% support for the last 10 years. The Board of Directors and Hubbell's management team continue to focus on shareholders' perspectives on our compensation programs and pay for performance philosophy and engage in a robust program of shareholder outreach. In the fall of 2022, Hubbell reached out to our top 30 shareholders (representing approximately 70% of Hubbell's share ownership) as part of its annual governance, compensation and proxy engagement sessions. As a result of such conversations, Hubbell decided to adopt a cadence of issuing our sustainability report consistent with the timing of the publication of our proxy statement.

The Company also regularly engages with its shareholders over the course of a year on diverse topics such as financial performance, compensation, corporate governance and ESG (including climate change and human capital management). Hubbell hosted an in-person Investor Day in New York City in June, 2022. We are committed to not just continued engagement with our shareholders, but to reviewing and applying the feedback received, and have consistently modified our pay and ESG programs based on the feedback provided in these sessions. Hubbell management routinely reports out to the Board and specific Board committees on the substance and nature of its shareholder communications.

Proposal 4	Ratification of the selection of Pricewaterhouse Coopers LLP as the Independent Registered Public Accounting Firm for 2023.	See pages 72-74 for further information.

THE BOARD RECOMMENDS A VOTE ✓ FOR THIS PROPOSAL.

Proposal 1 Election of Directors

The Board has fixed the number of Directors who shall be elected by the shareholders at the 2023 Annual Meeting at 9.

Each Director nominee possesses the appropriate qualifications and experience for membership on the Board of Directors.

Director Qualifications and Experience

The Nominating and Corporate Governance Committee ("NCGC") works with the Board at least annually to determine the appropriate characteristics, skills and experience for the Board and its individual members to properly oversee the interests of the Company and its shareholders.

The NCGC recommends candidates for Board membership using the selection criteria outlined in the Corporate Governance Guidelines (the "Guidelines") and other factors it deems necessary to fulfill its objectives. Candidates are evaluated on the basis of their individual qualifications and experience and in the context of the Board as a whole. The NCGC considers diversity when creating the pool of candidates from which it selects potential Director nominees. Such diversity includes gender, race and ethnicity. The objective is to assemble a diverse Board that can best facilitate the success of the business and represent shareholder interests through the exercise of sound judgment. The NCGC has commenced a search for a new member of the Board of Directors and is focused on candidates who will bring additional gender, racial and/or ethnic diversity to the Board.

Below is a list of certain of the qualifications and experiences sought by the NCGC in recommending candidates for nomination to the Board:

- **Ability to make independent analytical inquiries**
- **Marketing, finance, operations, manufacturing or other relevant public company experience**
- **Financial literacy**
- **Professional background and leadership experience**
- **Education**
- **Corporate governance experience**
- **Experience as a current or former public company officer**
- **Experience in the Company's industry**
- **Public company board service**
- **Academic expertise in areas of the Company's operations**

In determining whether to recommend a current Director for re-election, the NCGC will also consider past attendance at meetings, service on other boards and participation in and contribution to Board activities.

Each Director nominee possesses the appropriate qualifications and experience for membership on the Board of Directors. As a result, the Board is comprised of individuals with strong and unique backgrounds, giving the Board competence and experience in a wide variety of areas to serve the interests of the Company and its shareholders.

The Board is committed to refreshment and selection of talented candidates.

Commitment to Board Integrity, Diversity and Independence

In addition to ensuring that our Director nominees possess the requisite skills and qualifications, the NCGC places an emphasis on ensuring that the nominees demonstrate the right leadership traits, personality, work ethic, independence, and diversity of skills and experiences to align with our performance culture and our long-term strategic vision. Specifically, these criteria include:

- **Exemplification of the highest standards of personal and professional integrity**
- **Potential contribution to the diversity and culture of the Board**
- **Ability to devote sufficient time to performing their Board and committee duties**
- **Independence from management**
- **Willingness to constructively challenge management through active participation in Board and committee meetings**
- **Subject matter expertise**

As noted previously, the NCGC has commenced a search for a new member of the Board of Directors and is focused on candidates who will bring additional gender, racial and/or ethnic diversity to the Board.

The Board nominated nine candidates for election as Directors.

Nomination and Election Process

Hubbell's Directors are elected at each Annual Meeting of Shareholders and hold office for one-year terms or until their successors are duly elected and qualified. The Board of Directors nominated nine candidates for election as Directors. In the event that any of the nominees for Director should become unavailable, it is intended that the shares represented by the proxies will be voted for any substitutes nominated by the Board of Directors, unless the number of Directors constituting the full Board is reduced.

In searching for qualified Director candidates for election to the Board and to fill vacancies on the Board, the Board may solicit current Directors or members of executive management for the names of potentially qualified candidates, consult with outside advisors, retain a Director search firm or consider nominees suggested by shareholders. All Director candidates, including any Director candidates recommended by shareholders, are reviewed, and evaluated by the NCGC in relation to the specific qualifications and experience sought by the Board for membership (as discussed in the "Director Qualifications and Experience" section on page 10), and the Board's needs at that time. A candidate whose qualifications and experience align with this criteria is then interviewed by members of the NCGC, other Board members and executive management to further assess the candidate's qualifications and experience and determine if the candidate would be an appropriate fit. Candidates may be asked to submit additional information to support their potential nomination and references may be requested. If the Board approves of the NCGC's recommendation, the candidate is then nominated for election by the Company's shareholders or appointed by the Board to fill a vacancy, as applicable.

Any shareholder who intends to recommend a candidate to the NCGC for consideration as a Director nominee should timely deliver written notice, which must include the same information requested by Article I, Section 11(A)(2) of our By-Laws, to the Secretary of the Company. In addition, the new proxy access provisions in our By-Laws provide that a shareholder, or a group of up to 20 shareholders, owning at least 3% of the Company's outstanding Common Stock continuously for at least three years, may nominate director nominees constituting up to the greater of two (2) or twenty percent (20%) of the number of Directors serving on the Board for inclusion in our annual meeting proxy materials. Nominating shareholders and nominees must satisfy the requirements set forth in our By-Laws. See the "Shareholder Proposals and Nominations for Director" section on page 77 for additional details regarding shareholder nominations.

Directors are elected by plurality vote. Plurality means that the nominees who receive the most votes cast "FOR" their election are elected as Directors. Votes withheld and broker non-votes will not affect the election of Directors. Pursuant to the terms of our Director Resignation Policy, any Director in an uncontested election who receives more votes "withheld" from his or her election than votes "for" his or her election must promptly tender his or her resignation to the Board. See page 23 for additional details on the Director Resignation Policy. Broker discretionary voting is not allowed, so if your shares are held by a broker and you have not instructed the broker how to vote, your shares will not be voted with respect to Proposal 1.

THE BOARD UNANIMOUSLY RECOMMENDS A VOTE FOR THE ELECTION OF EACH OF THE DIRECTOR NOMINEES FOR A ONE-YEAR TERM.

All of the nominees are current Directors previously elected by the Company's shareholders.

Director Nominees

The nominees are proposed by the Board to stand for election at the 2023 Annual Meeting of Shareholders and to serve as Directors until the 2024 Annual Meeting. All of the nominees are current Directors previously elected by the Company's shareholders.

Our Director nominees offer a diverse range of skills and experiences in relevant areas.

SKILLS AND EXPERIENCE	Bakker	Cardoso	Guzzi	Hernandez	Keating	Lind	Malloy	Pollino	Russell	
PUBLIC COMPANY BOARD EXPERIENCE (OTHER THAN HUBBELL)		●	●		●	●		●	●	67%
BUSINESS DEVELOPMENT AND STRATEGY	●	●	●	●	●	●	●	●	●	100%
CEO	●	●	●		●		●		●	67%
CYBERSECURITY AND TECHNOLOGY	●	●	●	●	●		●		●	78%
FINANCIAL	●	●	●		●	●	●	●	●	89%
GLOBAL EXPERIENCE	●	●	●	●	●	●	●	●		89%
MANUFACTURING	●	●	●		●	●	●	●	●	89%
RISK MANAGEMENT	●	●	●	●	●	●	●	●	●	100%
BACKGROUND										
YEARS ON HUBBELL BOARD	3	10	17	2	13	4	12	3	12	8 year average
AGE	58	65	58	70	67	64	68	58	65	64 year average
RACIAL/ETHNIC DIVERSITY				●						11%
GENDER DIVERSITY						●		●		22%
BORN OUTSIDE OF THE U.S.	●	●								22%

The following biographies provide certain information about each nominee, including each nominee's background, age as of the annual meeting, and relevant experience in more detail.

GERBEN W. BAKKER

Age: 58

Director since: 2020

CHAIRMAN, PRESIDENT AND CEO, HUBBELL INCORPORATED

COMMITTEES:
- Executive (Chair)

DIRECTORSHIPS:
- None

QUALIFICATIONS:

Mr. Bakker brings to the Board extensive financial, operational, and strategic planning experience and a strong background in the manufacturing industry, including:

- Served as the Company's President and COO from June 2019 prior to his appointment to CEO in October 2020.
- Served as President of Hubbell Power Systems from 2014 until June 2019.
- As President of Hubbell Power Systems, Mr. Bakker oversaw a multi-year period of strong performance and built an industry-leading electrical transmission and distribution components business.
- Led Hubbell Power Systems through 12 acquisitions, including Aclara (the Company's largest to date) in 2018, growing the organization from $921 million in net sales to $1.8 billion in net sales in four years.
- Member of the Board of Trustees of Manufacturers Alliance.

Mr. Bakker has served as Chairman, President and Chief Executive Officer of the Company since May 2021 and President and Chief Executive Officer and a Director of the Company since October 2020. Previously, he served as the Company's President and Chief Operating Officer from June 2019 to October 2020. He served as President of Hubbell Power Systems from 2014 until June 2019. Mr. Bakker began his career with Hubbell Incorporated in 1988 as a manufacturing engineer with Hubbell Wiring Systems.

CARLOS M. CARDOSO

Age: 65

Director since: 2013

INDEPENDENT

COMMITTEES:
- Compensation
- Nominating and Corporate Governance

DIRECTORSHIPS:
- Stanley Black & Decker, Inc., since 2007
- Freudenberg Group, since 2021

PRIOR DIRECTORSHIP:
- Garrett Motion Inc., 2018 - 2021

QUALIFICATIONS:

Mr. Cardoso brings to the Board CEO, COO, manufacturing, international business and public company board experience, including:

- Significant manufacturing and operations experience having served as President of the Pump Division of Flowserve Corporation, a manufacturer/provider of flow management products and services; Vice President and General Manager, Engine Systems and Accessories, for Honeywell International, Inc., a technology and manufacturing company; and Vice President Manufacturing Operations for Colt's Manufacturing Company, LLC, a maker of firearms.
- Membership on the board of Stanley Black & Decker, Inc., a public company and a diversified global provider of hand and power tools and accessories.
- Formerly served as Chairman of the board of directors of Garrett Motion Inc., a public company and a provider of transportation systems.

Mr. Cardoso has served as the principal of CMPC Advisors LLC, an investment advisory firm, since January 2015. He previously served as Chairman of Garrett Motion Inc. from July 2018 to April 2021 and Chairman of Kennametal, Inc. (publicly traded manufacturer of metalworking tools and wear-resistant products) from January 2008 until December 2014. He also served as President and Chief Executive Officer of Kennametal from January 2006 until December 2014. Mr. Cardoso joined Kennametal in 2003 and served as Vice President, Metalworking Solutions and Services Group and then as Executive Vice President and Chief Operating Officer before he became President and Chief Executive Officer.

PUBLIC COMPANY BOARD EXPERIENCE | BUSINESS DEVELOPMENT & STRATEGY | CEO | CYBERSECURITY & TECHNOLOGY | FINANCIAL | GLOBAL EXPERIENCE | MANUFACTURING | RISK MANAGEMENT

ANTHONY J. GUZZI

Age: 58

Director since: 2006

INDEPENDENT

LEAD DIRECTOR

COMMITTEES:

- Compensation
- Executive
- Finance
- Nominating and Corporate Governance

DIRECTORSHIPS:

- Emcor Group, Inc., since 2009

QUALIFICATIONS:

Mr. Guzzi brings to the Board CEO, COO, manufacturing, strategic development, operations, consulting, and public company board experience, including:

- Serving as Chairman, President and CEO of EMCOR Group, Inc., a publicly traded mechanical, electrical construction, and facilities services company.
- Extensive experience in manufacturing and distribution having served as President, North American Distribution and Aftermarket and President, Commercial Systems and Services of Carrier Corporation, a subsidiary of United Technologies Corporation.
- Past experience as an engagement manager with McKinsey & Company, a prominent management consulting firm.

Mr. Guzzi has served as Chairman, President and Chief Executive Officer of EMCOR Group, Inc. (a publicly traded mechanical, electrical construction, and facilities services company) since June 2018. Previously, he was President and Chief Executive Officer and a Director of EMCOR from January 2011 to June 2018 and President and Chief Operating Officer from 2004 to 2010. He also served as President, North American Distribution and Aftermarket of Carrier Corporation (HVAC and refrigeration systems), a subsidiary of United Technologies Corporation from 2001 to 2004 and President, Commercial Systems and Services in 2001.

RHETT A. HERNANDEZ

Age: 70

Director since: 2021

INDEPENDENT

COMMITTEES:

- Audit
- Finance

DIRECTORSHIPS:

- USAA Federal Savings Bank, since 2019

QUALIFICATIONS:

Mr. Hernandez brings to the Board significant cybersecurity expertise and strong strategic and operational leadership experience as a retired Lieutenant General of the United States Army, including:

- President and founder of CyberLens, LLC, a cybersecurity consulting company.
- Current Cyber Chair for the United States Military Academy.
- Served as the first commander of the United States Army's Cyber Command/2nd US Army (ARCYBER) where he was responsible for the operations, defense and risk management of the Army's networks, systems and cyber security organization.
- Prior U.S. Army commands include the Deputy Chief of Staff, Army Operations; Chief, U.S. Military Training Mission, Saudi Arabia; and Commanding General, Human Resources Command.
- Serves on the board of USAA Federal Savings Bank.

Mr. Hernandez has served as the President of CyberLens, LLC (a consulting company that focuses on cybersecurity, strategic planning, and risk management) since 2013. Previously he served in the United States Army for almost forty years, rising to the rank of Lieutenant General at the time of his retirement.

PUBLIC COMPANY BOARD EXPERIENCE | BUSINESS DEVELOPMENT & STRATEGY | CEO | CYBERSECURITY & TECHNOLOGY | FINANCIAL | GLOBAL EXPERIENCE | MANUFACTURING | RISK MANAGEMENT

Age: 67

Director since: 2010

INDEPENDENT

NEAL J. KEATING

COMMITTEES:

- Compensation
- Executive
- Nominating and Corporate Governance (Chair)

DIRECTORSHIPS:

- Form Technologies, since 2021
- Triumph Group, Inc., since April 2022
- Barnes Group Inc., since February 2023

PRIOR DIRECTORSHIP:

- Kaman Corporation, 2007 - 2021

QUALIFICATIONS:

Mr. Keating brings to the Board an extensive history of senior executive leadership and board experience and a strong background in international operations, distribution, and mergers and acquisitions, including:

- Formerly served as Chairman, President and Chief Executive Officer of Kaman Corporation, a publicly traded aerospace and industrial distribution company.
- Served as President and CEO of Kaman Corporation from 2008 to August 2020.
- Past experience as COO of Hughes Supply and Executive Vice President and COO of Rockwell Collins, Commercial Systems.
- Former Managing Director and CEO of GKN Aerospace and Director of GKN plc, an international aerospace, automotive and land systems business.
- Membership on the board of Triumph Group, Inc., a public company that designs, engineers, manufactures, repairs, and overhauls a broad portfolio of aerospace and defense systems and components.
- Member of the Board of Trustees of Embry-Riddle Aeronautical University.

Mr. Keating served as the Executive Chairman of the board of Kaman Corporation (a publicly traded aerospace and industrial distribution company) from 2008 to April 2021. Previously, he held the position of President and Chief Executive Officer of Kaman Corporation from 2008 to August 2020 and President and Chief Operating Officer of Kaman Corporation from 2007 to 2008. From 2004 to 2007, he held the position of Chief Operating Officer of Hughes Supply (a wholesale distributor acquired by Home Depot).

Age: 64

Director since: 2019

INDEPENDENT

AUDIT COMMITTEE FINANCIAL EXPERT

BONNIE C. LIND

COMMITTEES:

- Audit (Chair)
- Executive
- Nominating and Corporate Governance

DIRECTORSHIPS:

- Mission Produce, Inc., since May 2020
- Tamarack Timberlands LLC, since January 2022

PRIOR DIRECTORSHIPS:

- U.S. Silica Holdings, Inc., 2019 - 2021
- Federal Signal Corporation, 2014 - 2018
- Empire District Electric Company, 2009 - 2017

QUALIFICATIONS:

Ms. Lind brings to the Board CFO, Treasurer, financing, manufacturing, mergers and acquisitions, and public company board experience, including:

- Served as Senior Vice President, CFO and Treasurer of Neenah, Inc., a global manufacturer of technical specialties products, fine paper and packaging from June 2004 until October 2020.
- Past experience as Assistant Treasurer of Kimberly-Clark Corporation, a manufacturer of personal care, consumer tissue and health care products.
- Membership on the board of Mission Produce, Inc., a publicly traded worldwide avocado business.
- Formerly served on the board of U.S. Silica Holdings, Inc., a publicly traded performance minerals company and one of the largest domestic producers of commercial silica.
- Formerly served on the board of Federal Signal Corporation, a publicly traded international designer and manufacturer of products and solutions that serves municipal, governmental, industrial, and commercial customers.
- Formerly served on the board of Empire District Electric Company, a utility generating, transmitting, and distributing power to southwestern Missouri and adjacent areas.

Ms. Lind served as Senior Vice President, CFO and Treasurer of Neenah, Inc. (a publicly traded technical specialties and fine paper company) from June 2004 to October 2020. Previously, Ms. Lind held a variety of increasingly senior financial and operations positions with Kimberly-Clark Corporation from 1982 until 2004.

PUBLIC COMPANY BOARD EXPERIENCE | BUSINESS DEVELOPMENT & STRATEGY | CEO | CYBERSECURITY & TECHNOLOGY | FINANCIAL | GLOBAL EXPERIENCE | MANUFACTURING | RISK MANAGEMENT

JOHN F. MALLOY

Age: 68

Director since: 2011

INDEPENDENT

AUDIT COMMITTEE FINANCIAL EXPERT

COMMITTEES:
- Audit
- Executive
- Finance (Chair)

DIRECTORSHIPS:
- Victaulic Company, since 2004
- Hollingsworth & Vose, since 2006

QUALIFICATIONS:

Mr. Malloy brings to the Board many years of senior management, operations, economic and strategic planning experience having served as the CEO and COO of a global manufacturing and distribution company, including:

- Serving as Executive Chairman of the board of Victaulic Company, a privately held mechanical pipe joining systems company.
- Served as President and CEO of Victaulic Company, a leading worldwide manufacturing company, from 2006 to January 2021.
- Over fifteen years of experience in various senior level strategic planning positions at United Technologies Corporation.
- Holds a Ph.D. in economics and has taught courses in Economics at Hamilton College.

Mr. Malloy has served as the Executive Chairman of the board of Victaulic Company (a privately held mechanical pipe joining systems company) since January 2021. Previously, he held the position of Chairman, President and Chief Executive Officer from 2006 to January 2021, President and Chief Executive Officer from 2004 to 2006, and President and Chief Operating Officer from 2002 to 2004.

JENNIFER M. POLLINO

Age: 58

Director since: 2020

INDEPENDENT

AUDIT COMMITTEE FINANCIAL EXPERT

COMMITTEES:
- Audit
- Compensation

DIRECTORSHIPS:
- Crane Holdings, Co., since 2013
- Kaman Corporation, since 2015

PRIOR DIRECTORSHIP:
- Wesco Aircraft Holdings, Inc. 2014 - 2020

QUALIFICATIONS:

Ms. Pollino brings to the Board extensive senior management experience, public company board experience and a strong background in accounting, finance, corporate governance, intellectual capital, and organizational issues, including:

- Serving as an executive coach and consultant with JMPollino, LLC since July 2012.
- Over 20 years in senior executive and general management roles with a leading aerospace products company.
- Past experience in finance and accounting as Vice President, Finance and Controller of two Goodrich Corporation divisions and Controller of a savings and loan association.
- Certified Public Accountant.
- Lead Director of Kaman Corporation, a publicly traded aerospace and industrial distribution company.
- Serving as a Director on the Board of Teach for America - North Carolina.
- Member of the Advisory Board of University of North Carolina - Charlotte, Belk College of Business since 2010.
- Serving as a Director of the National Association of Corporate Directors - Carolinas Chapter.

Ms. Pollino has served as an executive coach and consultant with JMPollino LLC, a leadership development, talent management and succession planning firm since July 2012. Previously she served as Executive Vice President, Human Resources and Communications, at Goodrich Corporation from February 2005 to July 2012, when Goodrich Corporation was acquired by United Technologies Corporation. Prior to that, she served in various other positions of increasing responsibility during her 20-year tenure with Goodrich Corporation.

PUBLIC COMPANY BOARD EXPERIENCE | BUSINESS DEVELOPMENT & STRATEGY | CEO | CYBERSECURITY & TECHNOLOGY | FINANCIAL | GLOBAL EXPERIENCE | MANUFACTURING | RISK MANAGEMENT

Age: 65

Director since: 2011

INDEPENDENT

JOHN G. RUSSELL

COMMITTEES:

- Compensation (Chair)
- Executive
- Finance
- Nominating and Corporate Governance

DIRECTORSHIPS:

- CMS Energy Corporation, since 2010
- Consumers Energy Company, since 2010

QUALIFICATIONS:

Mr. Russell brings to the Board many years of experience as a public company executive officer and Director in the utility industry and possesses a strong background in operations, regulated utilities, and governance, including:

- Serving as Chairman of the boards of CMS Energy Corporation ("CMS") and Consumers Energy Company ("Consumers") and as a Director for over fifteen years in the aggregate.
- Serving as the President and CEO of CMS and Consumers and previously as COO.
- Over thirty years of both hands-on and leadership experience in the utility industry, an industry that represents a significant part of the Company's overall business.

Mr. Russell has served as the Chairman of the boards of CMS and Consumers (a publicly traded electric and natural gas utility and its subsidiary) since May 2016. Previously he served as the President and Chief Executive Officer of CMS and Consumers from 2010 to 2016. He also held the position of President and Chief Operating Officer of Consumers from 2004 to 2010.

PUBLIC COMPANY BOARD EXPERIENCE | BUSINESS DEVELOPMENT & STRATEGY | CEO | CYBERSECURITY & TECHNOLOGY | FINANCIAL | GLOBAL EXPERIENCE | MANUFACTURING | RISK MANAGEMENT

Corporate **Governance**

The Board exercises strong corporate governance practices and principles.

The Board of Directors has adopted Corporate Governance Guidelines (the “Guidelines”) to assist the Board in the exercise of its responsibilities and to best serve the interests of the Company and its shareholders. The Guidelines reflect the Board’s commitment to good governance through the establishment of policies and procedures in areas it believes are critical to the enhancement of shareholder value. It is the Board’s intention that these Guidelines serve as a framework within which the Board can discharge its duties and foster the effective governance of the Company. The Board of Directors met 9 times in 2022.

Governance Snapshot

- Shareholders have identical **economic and voting rights -** each share of Common Stock is entitled to one vote.
- Directors are **elected annually** by shareholders to serve a one-year term.
- NEW Hubbell adopted **proxy access** by-law provisions that allow shareholders individually or in a group of up to 20 shareholders holding at least 3% of Hubbell's outstanding shares of common stock continuously for at least 3 years to nominate up to the greater of two (2) or twenty percent (20%) of the number of Directors serving on the Board at such time.
- NEW The Board further **limited** the number of public company Boards on which Directors may serve.
- Corporate funds or resources are **not used for direct contributions** to political candidates or campaigns.
- Independent Board members meet regularly in **Executive Sessions**, without management present.
- 33% of our Board has a **tenure of three years or less**.
- To maintain a diverse Board, Director nominees are evaluated on their background and experience and also **gender, race and ethnicity**.
- Director **compensation is reviewed annually** with advice from our independent compensation consultant and benchmarked for competitiveness.
- There are **no related party transactions** with our Directors, officers and significant shareholders.
- Our **Director Resignation Policy** requires any Director who fails to receive a majority of the votes cast to promptly tender their resignation.
- Board and committees **may hire outside advisors** independent from management.
- The Board receives **regular reports and updates** on key areas of strategy and risk for the Company, including, but not limited to, cybersecurity, climate change and ESG, innovation, talent and human capital management.
- The Board engages in a multi-part **self-evaluation** review on an annual basis in which Board and Committee matters are reviewed and discussed, and changes and improvements are implemented.
- **No poison pill** (shareholders rights plan) is in place.

Board Leadership Structure

An independent Lead Director counterbalances a non-independent Chair and fosters effective collaboration and communication among independent Directors.

Chair

The Company's By-Laws require the Board to choose the Chair of the Board from among the Directors and provides the Board with the ability to appoint the CEO of the Company as the Chair of the Board. This approach gives the Board the necessary flexibility to determine whether these positions should be held by the same person or by separate persons based on the leadership needs of the Company at any particular time. The Board believes that there is no single, generally accepted approach to providing board leadership, and that each of the possible leadership structures for a board must be considered in the context of the individuals involved and the specific circumstances facing a company at any given time. Accordingly, the optimal board leadership structure for a particular company may vary as circumstances change.

Mr. Bakker has served as Chairman, President and Chief Executive Officer of the Company since May 4, 2021. The Board has determined that combining the roles of Chief Executive Officer and Chair is best for the Company and its shareholders at this time because it promotes unified leadership for the Company under Mr. Bakker and allows for a single, clear focus for management to execute the Company's strategic and business plans while being appropriately counterbalanced by an independent Lead Director.

Independent Lead Director

The Board has established the position of an independent Lead Director to serve a three-year term. The Board believes that a three-year term is appropriate for the Lead Director as it affords greater continuity and allows the Lead Director to gain a better understanding of Board and management dynamics and build relationships with the other Directors. The Lead Director is responsible for:

Board Leadership	Providing leadership to the Board in situations where the Chair's role may be perceived to be in conflict.
Executive Sessions	Coordinating the agenda and chairing executive sessions of the independent Directors regularly throughout the year and at each regularly scheduled Board meeting.
Liaison	Regularly meeting with the Chair and facilitating communications among the Chair, management, and the independent Directors.
Spokesperson	Upon request, acting as the spokesperson for the Board in interactions with third parties.
Succession	Working with the NCGC and the Chair to review, refresh and oversee the Company's succession plans.

Mr. Guzzi is the Lead Director and is expected to hold this position until the 2025 Annual Meeting (subject to annual re-election as a Director), having been reappointed to a three year term by the Board in 2022. The Board believes that its present leadership structure and composition provides for independent and effective oversight of the Company's business and affairs. The Board consists of current or former CEOs, CFOs, COOs or senior executives of major companies in similar industries or military leaders, and its Audit, Compensation, and Nominating and Corporate Governance Committees are composed entirely of Directors who meet the independence requirements of the New York Stock Exchange ("NYSE"). Mr. Bakker is the only Director who is a member of executive management. Given the strong leadership of Mr. Bakker as Chairman, President and Chief Executive Officer, the counterbalancing role of Hubbell's strong, independent Lead Director, and a Board otherwise comprised of effective and independent Directors, the Board believes that its current leadership structure is appropriate at this time.

Director Independence

Our Board consists of a majority of independent Directors and our Audit, Compensation, Finance and NCG committees of the Board are 100% independent.

The Guidelines indicate that the Board shall be composed of a majority of independent Directors. Eight of our nine current Directors are independent. In evaluating the independence of Directors, each year the NCGC reviews all direct and indirect relationships between Directors (either directly or as a partner, shareholder or officer of an organization that has a relationship with the Company or any of its subsidiaries) and the Company and its subsidiaries in accordance with the rules of the NYSE and the Securities and Exchange Commission ("SEC") and considers whether any relationship is material. The NCGC also oversees the annual questionnaire process for the Directors and reviews transactions with Director-affiliated entities, Code of Conduct compliance certifications, case submissions filed with the Company's confidential compliance communication resource and Company donations to charitable organizations with which a Director may be affiliated. The Hubbell Foundation's (the "Foundation") various matching gift programs are available to all Directors, officers and U.S. employees and such programs match eligible donations made and volunteer hours served to qualifying charitable organizations and educational institutions in a calendar year up to: (i) $25,000 in the aggregate in cash donations and (ii) such other cash amounts, as applicable, matched in connection with the Foundation's Dollars for Doers matching volunteer hours program - wherein the Foundation makes charitable donations based on certain documented volunteer hours served. Hubbell believes strongly in the impact that volunteerism and charitable contributions can have on local communities and the larger world.

The NCGC considered the nature and dollar amounts of the transactions with Directors and determined that none was required to be disclosed or otherwise impaired the applicable Director's independence as all of these ordinary course transactions were significantly below the NYSE bright-line independence thresholds. As a result of this review, the Board determined that each of the current Directors is independent other than Mr. Bakker. In addition, the Board determined that Mr. Shawley, who served as a Director until his death in February 2022, was independent during the period in which he served as a Director. In evaluating and determining the independence of the Directors, the NCGC considered that in the ordinary course of business, transactions may occur between the Company and its subsidiaries and entities with which some of the Directors are or have been affiliated.

Board Oversight of Risk

Our Board oversees risk management activities.

Members of senior management assist the Board and its committees with their risk oversight responsibilities through routine discussions of risks involved in their specific areas of responsibility. For example, our senior leaders will report to the Board at regular intervals during the year on the Company's strategic planning activities and risks relevant to execution of the Company's strategy. In addition, from time to time, independent consultants with specific areas of expertise are engaged to discuss topics that the Board and management have determined may present a material risk to the Company's operations, plans or reputation.

BOARD OF DIRECTORS

oversees the Company's risk management practices and annually reviews with management the implementation and results of the Company's enterprise risk management program which identifies and quantifies a broad spectrum of risks in various categories, such as strategic, operational, compliance, financial, information technology, cybersecurity and related action plans. The standing committees of the Board have the following oversight of the following key risk areas:

AUDIT COMMITTEE

routinely discusses with management the Company's policies and processes with respect to risk assessment, financial, legal, cybersecurity and compliance risk exposures and related controls.

COMPENSATION COMMITTEE

considers risks associated with our compensation plans, policies, and programs.

NOMINATING AND CORPORATE GOVERNANCE COMMITTEE

reviews risks relating to director selection, governance, Board composition, succession and ESG.

FINANCE COMMITTEE

considers risks associated with the Company's capital structure, acquisition strategy, insurance programs and cash management.

In 2022, as part of our risk management activities, the Company reviewed with the Compensation Committee its compensation policies and practices applicable to all employees that could affect the Company's assessment of risk and risk management and determined that such compensation policies and practices do not create risks that are reasonably likely to have a material adverse effect on the Company. The Board does not believe that its role in the oversight of the Company's risks affects the Board's leadership structure.

Board Committees

The Board of Directors has established the following standing committees to assist it in fulfilling its responsibilities: Audit, Compensation, Executive, Finance and Nominating and Corporate Governance. The principal responsibilities of each of these committees are described generally below and in detail in their respective committee charters which are available on the Company's website at **www.hubbell.com**, or in the case of the Executive Committee Charter, in Article III, Section 1, of the Company's By-Laws. The Board has determined that each member of the Audit, Compensation and Nominating and Corporate Governance Committees is independent for purposes of the NYSE listing standards and SEC regulations.

Audit Committee

BONNIE C. LIND (Chair)

Members:

Rhett A. Hernandez
John F. Malloy
Jennifer M. Pollino

8 Meetings in 2022	94% Attendance	Independence 4 / 4

Key Oversight Responsibilities

- Oversees the Company's accounting and financial reporting and disclosure processes.
- Appoints the independent auditor and evaluates its independence and performance annually.
- Reviews the audit plans and results of the independent auditors.
- Approves all audit and non-audit fees for services performed by the independent auditors.
- Reviews and discusses with management and the independent auditors matters relating to the quality and integrity of the Company's financial statements, the adequacy of its internal controls processes and compliance with legal and regulatory requirements.
- Reviews the Company's cybersecurity plans, policies, threats and prevention strategies.

The Board of Directors has determined that all members of the Audit Committee are financially literate and meet the NYSE standard of having accounting or related financial management expertise. Each member of the Audit Committee other than Mr. Hernandez is an "Audit Committee Financial Expert" as defined by the SEC.

Compensation Committee

JOHN G. RUSSELL (Chair)

Members:

Carlos M. Cardoso
Anthony J. Guzzi
Neal J. Keating
Jennifer M. Pollino

4 Meetings in 2022	100% Attendance	Independence 5 / 5

Key Oversight Responsibilities

- Determines and oversees the Company's execution of its compensation programs and employee benefit plans.
- Reviews and approves all compensation of the CEO and officers of the Company, with input from the independent compensation consultant, Exequity LLP.
- Appoints the independent compensation consultant and evaluates its independence and performance annually.
- Determines stock ownership and retention guidelines for the CEO and officers of the Company.
- Reviews and approves of the Company's compensation peer group.

Executive Committee

GERBEN W. BAKKER (Chair)

Members:
Anthony J. Guzzi
Neal J. Keating
Bonnie C. Lind
John F. Malloy
John G. Russell

Did not meet in 2022	Independence 5 / 6

Key Oversight Responsibilities

- The Executive Committee may meet during intervals between meetings of the Board of Directors and may exercise all the powers of the Board of Directors in the management of the business and affairs of the Company, except certain powers set forth in the By-Laws of the Company.

Finance Committee

JOHN F. MALLOY (Chair)

Members:
Anthony J. Guzzi
Rhett A. Hernandez
John G. Russell

5 Meetings in 2022	95% Attendance	Independence 4 / 4

Key Oversight Responsibilities

- Oversees the Company's financial and fiscal affairs and reviews proposals regarding long-term and short-term financing, material acquisitions, dividend policies, stock repurchase programs and changes in the Company's capital structure.
- Reviews the Company's major capital expenditure plans and monitors the Company's insurance and tax programs.
- Reviews the administration and management of the Company's pension plans and investment portfolios.

Nominating and Corporate Governance Committee

NEAL J. KEATING (Chair)

Members:
Carlos M. Cardoso
Anthony J. Guzzi
Bonnie C. Lind
John G. Russell

4 Meetings in 2022	100% Attendance	Independence 5 / 5

Key Oversight Responsibilities

- Identifies qualified individuals to become Board members and recommends nominees for election or appointment to the Board.
- Oversees the Board's and management's performance evaluation and succession planning process.
- Develops the Company's corporate governance guidelines and monitors adherence to its principles.
- Approves related person transactions.
- Evaluates Director independence and compensation.
- Oversees the development and administration of the Company's sustainability and ESG program policies and practices.

See the "Nomination and Election Process" section on page 11 and the "Director Independence" section on page 20 for more information on the actions taken by the Nominating and Corporate Governance Committee in these areas.

Board Practices and Procedures

Code of Business Conduct and Ethics

The Company requires its Directors and officers to act in accordance with the highest standards of ethical conduct and has adopted a Code of Business Conduct and Ethics (the "Code of Conduct") that supports the Company's commitment to the people we serve, the communities we work in, the Company and each other. Our Code of Conduct covers many areas of professional conduct ranging from conflicts of interest, ethical business conduct, employment practices, compliance with applicable laws and regulations, protection of Company assets and confidential information and reporting obligations. Each year, to strengthen the Company's commitment to ethical conduct, we provide training on various aspects of the Code of Conduct and require all Directors and officers to complete such training and certify compliance with the Code of Conduct. The Code of Conduct can be viewed on the Company's website at **www.hubbell.com**. We will disclose any future amendments to, or waivers from, provisions of our Code of Conduct on our website as promptly as practicable, as may be required under applicable SEC and NYSE rules.

Director Resignation Policy

The Board of Directors has adopted a Director resignation policy whereby any Director in an uncontested election who receives more votes "withheld" from their election than votes "for" their election will promptly tender their resignation to the Board. Following receipt of the tendered resignation and within 60 days of certification of the shareholder vote, the NCGC will consider and recommend to the Board whether to accept or reject the resignation, or whether other action should be taken. The Board will then, within 90 days of certification of the shareholder vote, make a determination taking into consideration the recommendation of the NCGC, the vote results, shareholder input and other relevant factors.

NEW Increased Restrictions on Service on other Public Company Boards

In 2022, the Board amended its Guidelines to include further limitations on public company board service for its directors. The Guidelines were revised to reduce the number of public company boards on which independent directors may serve while serving on Hubbell's Board from four (4) to three (3). The number of additional public company boards on which the CEO may serve at the same time serving as Chair of the Hubbell Board was reduced from two (2) to one (1). The Board believed these changes were important to ensure that each director has sufficient time to dedicate to Hubbell.

Shareholder Outreach and Engagement

We value shareholders' perspectives and have a regular process throughout the year to discuss a range of topics, including our performance, strategy, executive compensation, environmental, social and governance matters. Discussions with our shareholders assist us to set goals and expectations for our performance and facilitate identification of emerging issues that may affect our strategies, corporate governance, compensation practices and other aspects of our operations.

Our shareholder engagement program includes investor conferences, investor events and one-on-one discussions with our shareholders. In 2022, we reached out to our top 30 shareholders (representing approximately 70% of our outstanding common stock) to discuss a wide range of business performance, sustainability, climate change, governance, succession, human capital management and compensation topics. Hubbell also hosted an in-person Investor Day in New York City in June, 2022. In addition, our Chairman, President and CEO, Executive Vice President and Chief Financial Officer, Senior Vice President, General Counsel and Secretary and other members of senior management engaged with our shareholders on a frequent basis year-round to discuss Hubbell's strategy, financial and business performance, and ESG programs.

ANNUAL SHAREHOLDER ENGAGEMENT

SPRING

Regularly scheduled investor meetings and conferences. Hosted an Investor Day conference in New York City in June 2022.

SUMMER

Review of prior proxy season results and messages from shareholders: prepare for fall shareholder engagement season: ongoing scheduled investor meetings and discussions with shareholders on results, sustainability, and other topics.

FALL

Engage with largest shareholders on performance. compensation and sustainability matters: review regulatory and governance changes impacting the Company and its shareholders; ongoing scheduled investor meetings and conferences.

WINTER

Governance reviews. annual evaluations, ongoing engagement with shareholders at road shows and via investor calls.

Proxy Access

The Board adopted a proxy access by-law amendment in February, 2023.

By-laws Amendment

During 2022, Hubbell discussed adopting proxy access with some of its key shareholders, including the appropriate terms and conditions of such right. After such discussions with shareholders, analysis of corporate governance trends, review of market practice among companies that had adopted proxy access bylaws, and further review and discussion by the NCGC and Board, the Board amended the Company's By-Laws as of February 15, 2023 to adopt a "proxy access" provision. The proxy access provision permits the inclusion in the Company's annual meeting proxy solicitation materials director candidates nominated by shareholders holding at least three percent (3%) of the Company's outstanding Common Stock for at least three years, with the number of director candidates not to exceed the greater of two (2) or twenty percent (20%) of the number of directors serving on the Board at such time. Twenty (20) or fewer shareholders may aggregate their holdings in the Company's Common Stock to reach the three percent (3%) threshold. Nominations are subject to certain eligibility, procedural, and disclosure requirements as set forth in our By-Laws.

Communications with Directors

Shareholders and interested parties may communicate with the full Board, the Lead Director, the non-management Directors as a group, or with individual Directors by using either of the following methods:

By Writing: Board of Directors
Hubbell Incorporated
c/o Katherine A. Lane, Senior Vice President, General Counsel and Secretary
40 Waterview Drive
Shelton, Connecticut 06484

By Email: **Secretary@hubbell.com**

Communications will be forwarded to the specific Director(s) requested by the interested party. General communications will be distributed to the full Board or to a specific member of the Board depending on the material outlined in the communication. Certain items unrelated to the duties and responsibilities of the Board will not be forwarded including job inquiries and resumes, business opportunities, junk or mass mailings, spam, or any hostile, improper, threatening, or illegal communications.

Attendance

The Board of Directors held 9 total meetings in 2022. During 2022, Directors attended 96% of all meetings of the Board of Directors and committees of which such Director served as a member. Board members are expected to attend the Annual Meeting of Shareholders. At the 2022 Annual Meeting, all Directors were in attendance.

Additional Resources

The Guidelines and the following additional materials relating to corporate governance are published on our website at **www.hubbell.com**.

- Board of Directors - Current Members and Experience
- Board Committees - Members and Charters
- Code of Business Conduct and Ethics
- Third-Party Code of Business Conduct and Ethics
- Amended and Restated By-Laws
- Amended and Restated Certificate of Incorporation
- Compensation Recovery Policy
- Stock Ownership and Retention Policy
- Sustainability Report and site
- Contacting our Board of Directors

Our Commitment to **Sustainability**

Hubbell's sustainability programs align with driving long-term shareholder growth(1).

Hubbell's commitment to sustainability and social responsibility has been a vital part of our business model for years. Our obligations to our employees, customers, suppliers, shareholders, and communities we serve go well beyond providing products and services: we have the opportunity to improve people's lives and the world around us.

Hubbell's Sustainability Priorities

In 2022, we conducted an environmental, social, and governance (ESG) prioritization assessment to reevaluate the sustainability issues that are most significant to our stakeholders, our impact as a company, and our ability to create long-term value. Hubbell's new sustainability priorities serve as the foundation to our ESG strategy.

ENVIRONMENTAL

Climate change

Water and waste

Energy and emissions

Products with impact

SOCIAL

Supply chain responsibility

Community impact

Inclusion, diversity, and equity

Human rights in the workplace and value chain

Employee experience

Employee health and safety

Product quality and safety

GOVERNANCE

Risk excellence

Business ethics, integrity, and transparency

Data privacy and cybersecurity

*(1) The information within the 2023 Sustainability Report (available at **www.hubbell.com**), and any other information on the Company's sustainability webpage that Hubbell may refer to herein is not incorporated by reference into and does not form any part of this Proxy Statement. Any targets or goals discussed in our sustainability disclosures and within this Proxy Statement may be aspirational, and as such, no guarantees or promises are made that these goals will be met. Furthermore, statistics and metrics disclosed in this Proxy Statement, our sustainability reports, and Hubbell's sustainability webpage are estimates and may be based on assumptions. We are under no obligation to update such information.*

Hubbell's Sustainability Goals

We are focused on reducing the environmental impact of our global operations. To accelerate our sustainability performance, we established new goals[(1)]. These enterprise-wide goals provide measurable targets against which we will track our progress.

GREENHOUSE GAS EMISSIONS GOAL

Reduce Scope 1 and 2 emissions by 30% by 2030[(2)]

WASTE GOAL

Reduce hazardous waste generation by 30% by 2030[(2)]

WATER GOAL

Reduce water usage by 25% by 2030[(2)]

*(1) The information within the 2023 Sustainability Report (available at **www.hubbell.com**), and any other information on the Company's sustainability webpage that Hubbell may refer to herein is not incorporated by reference into and does not form any part of this Proxy Statement. Any targets or goals discussed in our sustainability disclosures and within this Proxy Statement may be aspirational, and as such, no guarantees or promises are made that these goals will be met. Furthermore, statistics and metrics disclosed in this Proxy Statement, our sustainability reports, and Hubbell's sustainability webpage are estimates and may be based on assumptions. We are under no obligation to update such information.*

(2) Goals are compared to Hubbell's 2022 baseline of each applicable metric.

YEAR IN REVIEW: Reflecting on our ESG milestones

ENVIRONMENTAL STEWARDSHIP

- We implemented an ESG data management system for ongoing and historical data collection, enabling us to track our performance against our goals.
- We continued to increase investment in environmental-related capital expenditure projects.
- We set new emissions, water, and waste targets for 2030.

SOCIAL RESPONSIBILITY

- We published our EEO-1 diversity data.
  - Female employees comprised 32% of our global workforce.
  - Diverse employees comprised 45% of our U.S. workforce.
- Hubbell issued an enterprise-wide survey ("Elevate") to better engage and learn from our employees.
- The Hubbell Foundation donated over $1.2 million to charities.

GOVERNANCE & ACCOUNTABILITY

- Hubbell was recognized as one of the 2023 World's Most Ethical Companies.
- We added proxy access for our shareholders.
- We added further restrictions on the number of public company boards on which our directors can serve.
- 100% of compliance cases were investigated.

Disclosing Our ESG Performance

We published our third annual sustainability report in 2023.

The publication of our 2023 Sustainability Report[1] (available at **www.hubbell.com**) demonstrates Hubbell's sustained commitment to providing credible and decision-useful information to stakeholders to enhance transparency, accountability, and trust in our sustainability programs and initiatives.

The 2023 Sustainability Report covers our sustainability commitment, strategy, programs, and performance, as well as our key accomplishments in the reporting year. Review our Report for additional insights on Hubbell's sustainability progress.

(1) *The information within the 2023 Sustainability Report (available at **www.hubbell.com**), and any other information on the Company's sustainability webpage that Hubbell may refer to herein is not incorporated by reference into and does not form any part of this Proxy Statement. Any targets or goals discussed in our sustainability disclosures and within this Proxy Statement may be aspirational, and as such, no guarantees or promises are made that these goals will be met. Furthermore, statistics and metrics disclosed in this Proxy Statement, our sustainability reports, and Hubbell's sustainability webpage are estimates and may be based on assumptions. We are under no obligation to update such information.*

Director **Compensation**

No changes were made to the Director compensation program in 2022.

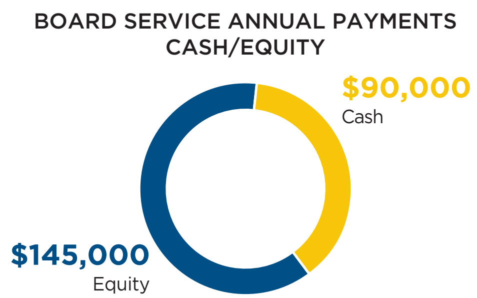
The NCGC annually reviews all forms of independent Director compensation in relation to other U.S. companies of comparable size and the Company's competitors, and recommends changes to the Board, when appropriate. The NCGC is supported in this review by Exequity LLP ("Exequity"), an independent outside compensation consultant engaged by the NCGC, which provides compensation consultation and competitive benchmarking. The NCGC targets director compensation at the median of our peer group, the same peer group used to evaluate the competitiveness of the Company's executive compensation levels. In addition, the NCGC also reviews Director compensation in relation to general industry companies similar to Hubbell in terms of revenue size as a secondary reference.

Elements of Compensation

In December 2022, following its annual review, the Board of Directors, upon the recommendation of the NCGC and further supported by Exequity, decided to make no changes to the value of total director compensation as reflected in the table below.

Annual Compensation

Compensation Component	Payment or Value of Equity	
Board Service		
Annual Board Retainer	$ 90,000	
Annual Restricted Share Grant(1)	$ 145,000	
Lead Director Retainer	$ 30,000	
Committee Service		
Committee Annual Retainer(2)	Chair	Member
Audit Committee	$ 20,000	$ 10,000
Compensation Committee	$ 15,000	$ 7,000
Finance Committee	$ 13,000	$ 5,000
NCGC Committee	$ 13,000	$ 5,000
Board/Committee Meeting Fees	None	
Discretionary Fee(3)	Upon NCGC recommendation and consent of the Chairman of the Board, fees commensurate with any activities performed outside the scope of normal Board and Committee service, at the Company's request. No discretionary fees were paid in 2022.	



(1) The Annual Restricted Share Grant vests on the date of the next Annual Meeting if the Director is still serving (or earlier, upon death or a change in control).
(2) Annual Retainers are paid on a quarterly basis.
(3) Activities may include customer visits, conference attendance or training meetings.

Deferred Compensation Plan

The Company maintains a Deferred Compensation Plan for non-management Directors ("Deferred Plan for Directors") which enables Directors, at their election, to defer all or a portion of their annual Board and Committee retainers into:

- A Stock Unit account in which each stock unit consists of one share of the Company's Common Stock. Dividend equivalents are paid on the stock units contained in the Director's account and converted into additional stock units. Upon distribution, all stock units are payable in shares of Common Stock.
- A cash account which is credited with interest at the prime rate in effect at the Company's principal commercial bank on the date immediately following each regularly scheduled quarterly Board meeting.

The Deferred Plan for Directors also enables such Directors, at their election, to defer all or a portion of their annual restricted share grant into a Restricted Stock Unit account providing for the credit of one restricted stock unit for each share of restricted stock deferred. Restricted stock units are subject to the same vesting terms described above and are payable in the form of one share of Common Stock for each restricted stock unit. Dividend equivalents are paid on the restricted stock units contained in the account and converted into additional restricted stock units.

Generally, all distributions under the Deferred Plan for Directors are paid only after termination of service and may be paid in a lump sum or in annual installments, at the Director's election. However, in the event of a change of control, all amounts credited to a Director's account are paid in a lump sum, with amounts credited as stock units immediately converted into a right to receive cash.

Charitable Match

Hubbell provides its Directors a charitable contribution matching program for qualifying charitable organizations and educational institutions on exactly the same terms available to Hubbell's employees. The Hubbell Foundation provides: (i) cash donation matches of up to $25,000 for eligible charitable contributions and (ii) cash donations to qualifying charitable organizations pursuant to the Hubbell Foundation's Dollars for Doers program - wherein the Foundation makes charitable donations based on certain documented volunteer hours served. Hubbell believes strongly in the impact that volunteerism and charitable contributions can have on local communities and the larger world.

Director Compensation Table

The following table shows the compensation paid by the Company to non-management Directors for service on the Company's Board of Directors during fiscal year 2022. Mr. Bakker received no compensation beyond that described in the Executive Compensation section on page 56 for his service as a Director.

Name	Fees Earned or Paid in Cash[(2)] ($)	Stock Awards[(3)] ($)	All Other Compensation[(4)] ($)	Total ($)
Carlos M. Cardoso	102,000	144,946	20,000	266,946
Anthony J. Guzzi	137,000	144,946	23,000	304,946
Rhett A. Hernandez	105,000	144,946	25,000	274,946
Neal J. Keating	110,000	144,946	-	254,946
Bonnie C. Lind	113,194	144,946	-	258,140
John F. Malloy	113,000	144,946	-	257,946
Jennifer M. Pollino	107,000	144,946	32,500	284,446
John G. Russell	115,000	144,946	-	259,946
Steven R. Shawley[(1)]	28,750	-	-	28,750

(1) Mr. Shawley was a member of the Board until his death in February, 2022.

(2) Includes the following amounts deferred and held under the Company's Deferred Plan for Directors: Mr. Guzzi - $137,000, Mr. Keating - $55,000, Ms. Lind – $113,194 and Mr. Shawley - $28,750.

(3) Amounts shown represent the grant date fair value of 744 shares of restricted stock granted to each Director at the Company's May 3, 2022, Annual Meeting of Shareholders as computed in accordance with FASB ASC Topic 718. For a discussion of the assumptions made in the valuation reflected in these columns, see Note 18 to the Notes to Consolidated Financial Statements for 2022 contained in the Form 10-K filed with the SEC on February 9, 2023. These shares will vest as of the date of the 2023 Annual Meeting of Shareholders if the Director is still serving at that time (or earlier, upon death or a change in control). Mr. Guzzi, Mr. Keating, and Ms. Lind each elected to defer their entire 2022 annual restricted stock grant pursuant to the terms of the Deferred Plan for Directors. See the below table for the aggregate number of stock awards held by each Director as of December 31, 2022.

(4) Amounts shown include Company matching contribution to an eligible institution under The Hubbell Foundation Matching Gifts Program.

As of December 31, 2022, the following table shows the balance in each non-management Director's (i) stock unit account (each stock unit represents the right to receive one share of Common Stock) and (ii) restricted stock unit account (each restricted stock unit represents the right to receive one share of Common Stock) under the Deferred Plan for Directors. See the "Deferred Compensation Plan" section on page 30 for additional information:

Name	Aggregate No. of Stock Units Held at Year End (#)	Aggregate No. of Restricted Stock Units Held at Year End (#)
Carlos M. Cardoso	2,310	7,665
Anthony J. Guzzi	30,761	13,231
Rhett A. Hernandez	-	-
Neal J. Keating	6,998	13,231
Bonnie C. Lind	1,632	3,780
John F. Malloy	1,739	1,786
Jennifer M. Pollino	-	-
John G. Russell	6,139	6,915
Steven R. Shawley	-	-

Proposal 2 Advisory Vote to Approve Named Executive Officer Compensation

We have determined that our shareholders should vote on the compensation of our NEOs each year, consistent with the preference expressed by our shareholders at the 2017 Annual Meeting. In accordance with the Dodd-Frank Wall Street Reform and Consumer Protection Act and Section 14A of the Securities Exchange Act of 1934, as amended (the "Exchange Act"), we are requesting shareholder approval, on an advisory (non-binding) basis, of the compensation of our NEOs as presented in this Proxy Statement in the Compensation Discussion and Analysis section beginning on page 34 and the compensation tables and accompanying narrative disclosure in the Executive Compensation section beginning on page 56. As discussed in Proposal 3 below, we are also requesting that our shareholders vote on the frequency of a vote on the compensation of our NEOs at this Annual Meeting.

Accordingly, we will present the following resolution for vote at the Annual Meeting:

"**RESOLVED**, that the shareholders of Hubbell Incorporated (the "Company") approve, on an advisory basis, the compensation of the Company's named executive officers as described in the Compensation Discussion and Analysis and disclosed in the 2022 Summary Compensation Table and related compensation tables and narrative disclosure as set forth in this Proxy Statement."

As described more fully in the Compensation Discussion and Analysis section of this Proxy Statement, our executive compensation program has been designed to attract and retain highly talented executives, deliver compensation that is competitive and fair compared to relevant benchmarks, reward strong Company performance and motivate executives to maximize long-term shareholder returns. To achieve our objectives, we have adopted and maintain sound compensation governance practices and a strong pay for performance philosophy pursuant to which the greatest portion of an executive's total direct compensation is variable and therefore linked to performance on both a short-term and long-term basis.

As an advisory vote, the outcome of this proposal is not binding upon the Company. However, our Compensation Committee and our Board value the opinions of our shareholders and will consider the outcome of this vote when making future compensation decisions for our NEOs.

The affirmative vote of a majority of the votes cast by the holders of the outstanding shares of Common Stock is required to approve, on an advisory, non-binding basis, the compensation of our NEOs. Majority of votes cast means that the number of votes cast "FOR" the proposal exceed the number of votes cast "AGAINST" the proposal. Abstentions and broker non-votes will not affect the voting results. Broker discretionary voting is not allowed, so if your shares are held by a broker and you have not instructed the broker how to vote, your shares will not be voted with respect to Proposal 2.

THE BOARD UNANIMOUSLY RECOMMENDS A VOTE ✓ FOR THE APPROVAL BY NON-BINDING VOTE OF THE COMPENSATION OF OUR NAMED EXECUTIVE OFFICERS.

Proposal 3 Advisory Vote on the Frequency of Shareholder Vote on Executive Compensation

In accordance with the requirements of Section 14A of the Exchange Act and the related rules of the SEC, we are seeking a non-binding recommendation from our shareholders on whether shareholders should have an opportunity to provide an advisory approval of the compensation of our NEOs every year, every two years or every three years. Accordingly, we are asking shareholders to vote on the following advisory resolution:

"**RESOLVED**, that the shareholders of Hubbell Incorporated (the "Company") recommend, on an advisory basis, that the frequency with respect to which the Company's shareholders are presented with an advisory vote on the compensation of the Company's named executive officers shall be every one (1) year; two (2) years; or three (3) years."

The Board of Directors believes that an advisory vote on the compensation of our NEOs should be conducted every one (1) year so that shareholders may annually express their views on the Company's executive compensation program. The Board of Directors believes that holding this advisory vote annually will provide the Company with timely and appropriate feedback on compensation decisions for its NEOs.

Although the Board of Directors recommends a vote every year, shareholders will be able to specify one of four choices for this proposal on the proxy card: one year, two years, three years or abstain. Shareholders are not voting to approve or disapprove of the Board's recommendation.

Because this vote is advisory and not binding on the Board of Directors or the Company in any way, the Board may decide that it is in the best interests of our shareholders and the Company to hold an advisory vote on executive compensation more or less frequently than the option approved by our shareholders. However, we value the opinions of our shareholders, and we will consider the outcome of the vote when determining the frequency of the shareholder vote on executive compensation.

The affirmative vote of a majority of the votes cast by the holders of the outstanding shares of Common Stock is required to approve, on an advisory, non-binding basis, the frequency of the shareholder vote on the compensation of our NEOs. Majority of votes cast means that the number of votes cast "FOR" the proposal exceeds the number of votes cast "AGAINST" the proposal. Abstentions and broker non-votes will not affect the voting results. Broker discretionary voting is not allowed, so if your shares are held by a broker and you have not instructed the broker how to vote, your shares will not be voted with respect to Proposal 3. If no frequency receives the foregoing vote, then we will consider the option that receives the highest number of votes cast to be the frequency recommended by shareholders.

It is expected that the next Say When On Pay frequency vote will occur at the 2029 annual meeting of shareholders.

THE BOARD UNANIMOUSLY RECOMMENDS THAT SHAREHOLDERS VOTE FOR THE SELECTION OF ONE YEAR ON THIS PROPOSAL.

Compensation Discussion and Analysis (CD&A)

CD&A Table of Contents

Our Named Executive Officers

Our business benefits from a strong leadership team with deep experience within and outside our industry.

This Compensation Discussion and Analysis ("CD&A") section describes the material elements of the compensation program for the following individuals, who are our Named Executive Officers ("NEOs") for 2022:

Name	Position
Mr. Gerben W. Bakker	Chairman, President and Chief Executive Officer
Mr. William R. Sperry	Executive Vice President, Chief Financial Officer
Mr. Allan J. Connolly	President, Utility Solutions Segment
Mr. Peter J. Lau(1)	Former President, Electrical Solutions Segment
Ms. Katherine A. Lane	Senior Vice President, General Counsel and Secretary
Ms. Alyssa R. Flynn	Chief Human Resources Officer

(1) Mr. Lau's last day with the Company was September 30, 2022.

2022 Business Performance Highlights

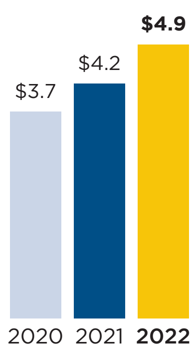
Performance Summary[1]

We measure our progress not only in terms of our financial accomplishments, but also by reference to how we run our business to serve the interests of our shareholders, suppliers, customers, employees, and the communities in which we operate. Our financial accomplishments in 2022 included:

We delivered on our commitments to our shareholders.

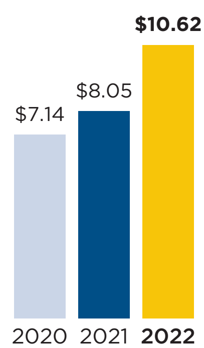
NET SALES

$4.9 billion



ADJUSTED DILUTED EARNINGS PER SHARE[2]

$10.62



FREE CASH FLOW[2]

$507 million

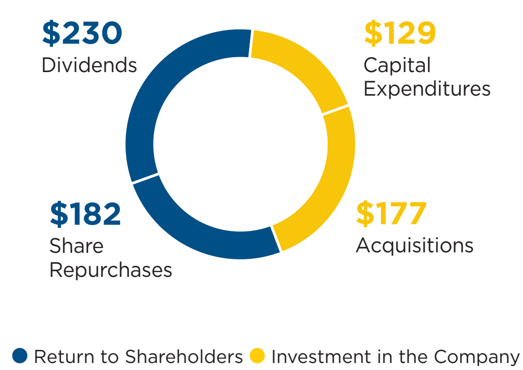
(1) The performance summary represents the results of continuing operations. See Note 2 in the Notes to the Consolidated Financial Statements in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023, for further details.

(2) Adjusted diluted earnings per share and free cash flow are non-GAAP financial measures. A reconciliation to the comparable GAAP financial measures can be found in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023.

We executed a disciplined plan of capital deployment.

CAPITAL DEPLOYMENT

($ Millions)



- Invested $129 million in **high return** capital expenditures.
- Deployed $177 million for **acquisitions.**
- Deployed $182 million in **share repurchases**.
- Announced a **7% dividend increase.**

Results of 2022 Advisory Vote on Executive Compensation

Hubbell's 2022 advisory Say on Pay vote on executive compensation resulted in 96.9% of the votes cast in favor of the Company's executive compensation program. Hubbell's Say on Pay votes have averaged approximately 92% support for the last 10 years. We believe these strong results indicate that our shareholders are generally supportive of our compensation program.

Engagement with Shareholders

Engaging with our shareholders informs our approach to our executive compensation program.

Hubbell engages with shareholders throughout the year on diverse topics such as financial performance, compensation and pay for performance, corporate governance, human capital management, and sustainability and environmental, social and governance ("ESG"). In 2022, members of our senior management engaged in a targeted outreach to Hubbell's top 30 shareholders (representing approximately 70% of Hubbell's outstanding common stock). The calls were led by a cross-functional group of senior leaders and helped inform the Compensation Committee's review of the executive compensation programs and confirmed such shareholders' support of our compensation philosophy, design and programs.

See additional details on shareholder outreach and engagement on page 23 and on Hubbell's ESG and sustainability focus on page 26.

Compensation Summary

The Compensation Committee, in consultation with Exequity, reviews the objectives and components of Hubbell's executive compensation program and reviewed and approved the 2022 compensation earned by our NEOs. The Compensation Committee also considers ongoing shareholder feedback on Hubbell's compensation programs to ensure our executive team continues to deliver exceptional shareholder value.

Key Compensation Elements

The compensation program includes both short-term and long-term incentive for all NEOs.

SHORT-TERM INCENTIVE COMPENSATION

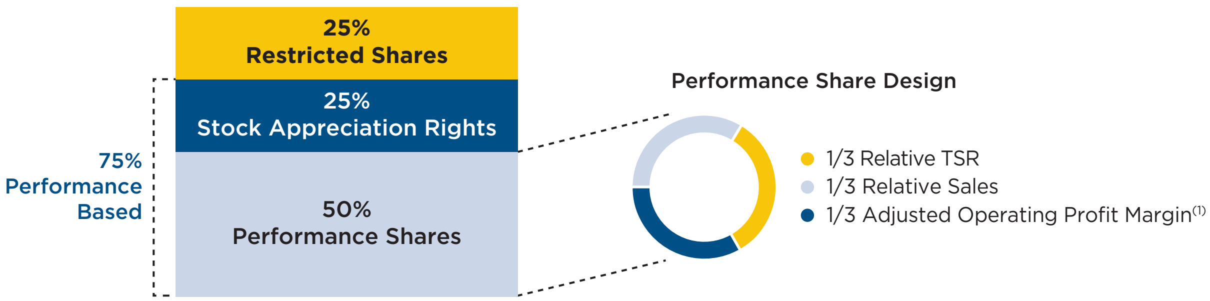
- All Short-Term Incentive eligible employees, including our NEOs, have 20% of their annual bonus award tied to initiatives aligned with our strategic pillars. This allows the Compensation Committee to further prioritize and appropriately reward performance on critical metrics including inclusion and diversity, sustainability / ESG, innovation, and acquisitions.

LONG-TERM INCENTIVE FOR ALL NEOs

- The performance share grant has three equally-weighted metrics and is 50% of the overall equity award.
- 75% of the Long Term Incentive Award is performance oriented.

Long-Term Incentive Metrics and Weightings

Weightings



The overall design of our Long-Term Incentive program continued to focus our NEOs on our strategic priorities of profitable growth balanced with operational effectiveness, while ensuring alignment with shareholder interests. This program design is described in more detail on page 47.

We believe the elements of our program continue to drive our overall pay for performance philosophy and alignment with shareholders, and allow continued focus on Hubbell's strategic initiatives.

Our Compensation Program

Executive Compensation Objectives

Our compensation decisions for 2022 were directly influenced by our 2022 operating results and our shareholder outreach, and the decisions reflect our commitment to pay for performance compensation practices. We use the following objectives to guide our decisions:

PAY FOR PERFORMANCE	Align interests of executives with our shareholders by linking executive pay to Company performance.
ATTRACT, RETAIN, AND MOTIVATE	Incentivize high-quality executive talent essential to our immediate and long-term success.
DELIVER COMPETITIVE AND FAIR COMPENSATION	Target compensation for our executives aligned with relevant external benchmarks.

(1) *Adjusted Operating Profit Margin is a non-GAAP financial measure. A reconciliation to the comparable GAAP financial measure can be found in Management's Discussion and Analysis of Financial Condition and Results of Operations in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023.*

Compensation Governance Snapshot

The following are highlights of our compensation practices and decisions that exemplify our commitment to sound compensation governance and shareholders' interests.

What We Do

Pay for Performance. We closely align pay and performance by placing a significant portion of target total direct compensation at-risk.

Robust Performance Goals. We establish clear and measurable goals and targets and hold our executives accountable for achieving specified targets to earn a payout under our incentive plans. Performance goals are linked to operating priorities designed to create long-term shareholder value.

Independent Compensation Consultant. The Compensation Committee retains an independent compensation consultant to review and advise on executive compensation matters.

Annual Benchmarking. We review peer and market practice, as well as pay levels on an annual basis.

Shareholder Engagement. We conduct formal outreach annually with our investors to discuss our compensation programs, ESG, and other issues.

Strong Governance. We have a strong clawback policy, and our Short-Term Incentive plans include the option for only negative discretion by the Compensation Committee regarding award amounts paid.

Stock Ownership. We require senior executives, including our NEOs, to maintain ownership in company stock. Our CEO has an ownership requirement of 5 times his base salary, which he currently satisfies.

What We Don't Do

No Guaranteed Annual Salary Increases or Bonuses. Annual salary increases are based on evaluations of individual performance and the competitive market. In addition, we do not provide guarantees on bonus payouts.

No Consultant Conflicts. The independent compensation consultant cannot provide any other services to Hubbell without the Compensation Committee's approval.

No Hedging or Pledging. We prohibit our executives, including our NEOs, from hedging or engaging in derivatives trading with respect to company stock and from pledging company stock as collateral for a loan.

No Excessive Perks. The perquisites provided are typically restricted to relocation benefits, financial and tax planning and limited use of the corporate aircraft and are subject to Board oversight.

Limited Tax Gross Ups. We do not provide tax gross ups for severance, excise tax, or other benefits provided to our executives (including the NEOs), other than in the case of relocation reimbursements.

No Excessive Supplemental Retirement Plans. We have frozen our supplemental executive retirement plan and only provide new benefits under qualified retirement plans that are made available generally to employees and non-qualified defined contribution plans that are made available to certain executives.

No Repricing or Cash Buyouts. We prohibit the repricing or buyout of options and SARs without shareholder approval.

No Employment Agreement with CEO or NEOs. Mr. Bakker, our CEO, does not have and has never had an employment agreement with the Company. We do not have any employment agreements with our other NEOs as well.

No Single Trigger on Change in Control Benefits. Change in control benefits are provided only if there is both a change in control and qualifying termination.

CEO Pay vs. Realized Pay vs. Company Performance

The Summary Compensation Table on page 56 discloses annual compensation for our NEOs in accordance with SEC regulations. These regulations require Long-Term Incentive awards to be presented at their grant date value according to accounting rules. While grant-date pay can be a helpful measure for comparing target pay across companies, it does not reflect the actual value delivered to the NEOs based on Company performance.

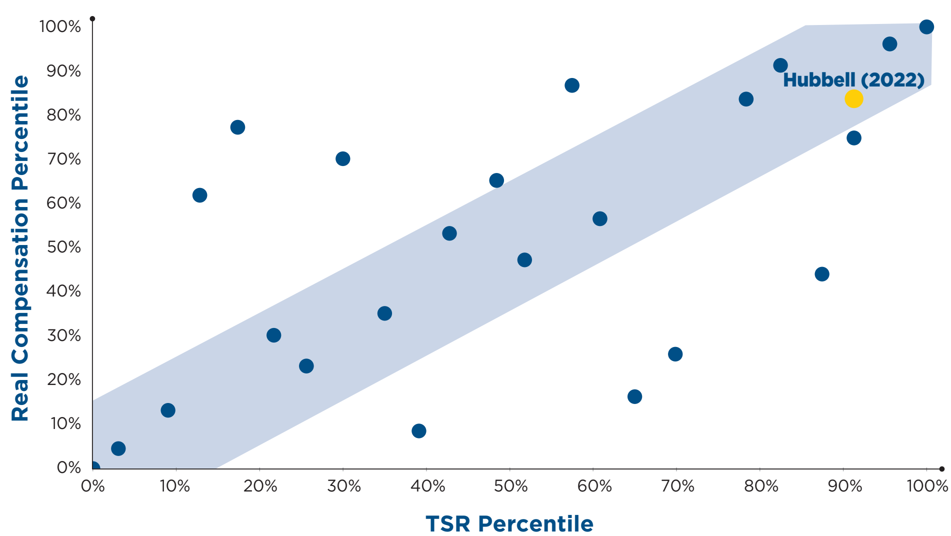
In order to better assess the relationship between pay and performance, the Compensation Committee reviews NEOs' realized compensation and performance, as well as realized compensation and performance relative to our peer group. The following table explains Summary Compensation Table pay and realized compensation and how they differ.

Pay Summary	Description
Summary Compensation Table ("SCT")	***SEC mandated disclosure*** Compensation awarded in the reporting year, as well as value estimates for other types of compensation. Base salary, bonuses, and cash incentives reflect amounts earned relative to year of service. Long-Term Incentive awards reflect grant-date fair value of restricted shares, stock appreciation rights, and performance shares.
Realized Compensation	***Used to measure impact of performance on pay*** Compensation earned during the reporting year, including the actual results of performance-based Long-Term Incentive compensation, plus compensation awarded prior to the reporting year that remains dependent on Company performance. Base salary, bonuses, and cash incentives reflect amounts earned relative to year of service (consistent with the SCT). Long-Term Incentive awards reflect the value of restricted shares that vested during the period, performance awards paid out during the period, the value of stock appreciation rights exercised during the period, and changes in the value of unvested restricted shares and stock appreciation rights based on changes in stock price during the period.

Hubbell's CEO Pay is aligned with performance.

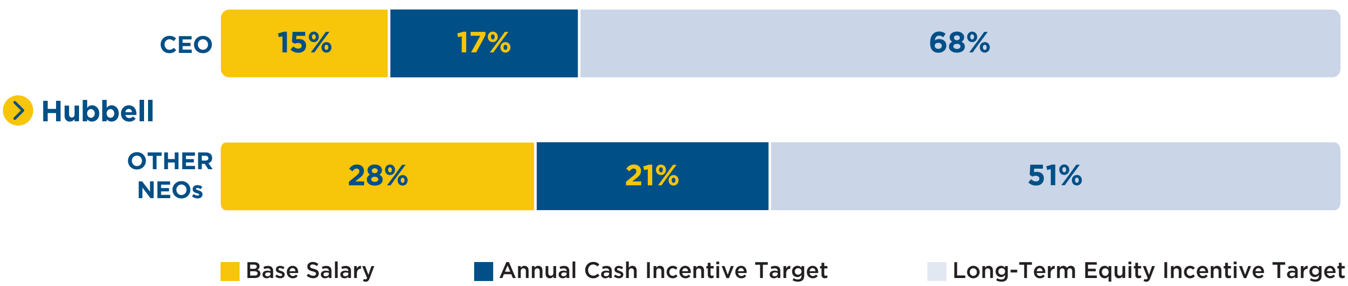
The graph below identifies for Hubbell and our Peer Group (as described on page 42) the relationship between CEO pay rank and relative return to shareholders. Each blue dot represents a company in the Peer Group, and the yellow dot represents Hubbell for 2022. The shaded area marks the range that characterizes ideal pay-for-performance alignment given the pay-for-performance relationships exhibited across the peer group. "Hubbell (2022)" in the below graph reflects our CEO's 2022 realized compensation and TSR performance. Peer company estimated compensation reflects 2021 compensation as reported, including 2022 stock price performance and corresponding 2022 TSR performance. Hubbell (2022) illustrates that our CEO's compensation is aligned with the Company's TSR performance.

1-YEAR CEO REALIZED COMPENSATION PERCENTILE VS. TOTAL SHAREHOLDER PERCENTILE



Elements of Compensation

Hubbell's compensation program puts the majority of pay at risk dependent on Hubbell's performance.



The above chart represents Mr. Bakker's compensation as of December 31, 2022, compared to compensation for the other NEOs.

Our pay for performance compensation philosophy is intended to reward our executives for their contributions toward achievement of the Company's business strategy and goals. The Company provides its executives with a total direct compensation package consisting of fixed and variable elements that deliver competitive compensation that enhances the Company's ability to attract and retain high quality management talent. Our compensation objectives and business strategy drive how our Compensation Committee designs the elements of our compensation program, as outlined in the following table.

2022 Compensation	What?	When?	How?	Link to Strategy and Performance
Base Salary	Fixed Cash	Annual	Reviewed annually for potential adjustment based on factors such as market competitiveness, individual performance and scope of responsibility.	Competitive fixed cash compensation that attracts high caliber executives to lead our Company.
Short-Term Incentive	Variable Cash	Annual	Based on achievements with respect to the Company's financial goals and individual performance against the Company's strategic objectives.	Designed to motivate our executives to attain short-term performance goals that are linked to our long-term financial and strategic performance objectives.
Long-Term Incentive **50% Performance Shares**	Variable Equity	3-year perform-ance period	Performance metrics: relative sales growth, adjusted operating profit margin, and relative total shareholder return.	Motivates executives to achieve critical long-term financial goals of the Company. Aligns executives' and shareholders' interests in share price appreciation.
25% Stock Appreciation Rights (SARs)	Variable Equity	3-year period, ratable	Provides value based on the appreciation in our stock price between the date of grant and the date of exercise.	Aligns executives' and shareholders' interests in share price appreciation.
25% Restricted Shares	Variable Equity	3-year period, cliff	Represents a grant of shares of Hubbell's Common Stock that vest after a three-year period.	Promotes the retention of key executives. Aligns executives' and shareholders' interests in share price appreciation.

Roles for Designing and Delivering Compensation

Hubbell has a clearly defined process and roles in making decisions about executive compensation.

Role	Process
Compensation Committee	Oversees programs and has ultimate responsibility
Independent Compensation Consultant	Provides market data, insight, and support to the Compensation Committee
CEO and Management	Provide data and limited input to the Compensation Committee
Shareholders	Feedback drives our compensation program design

Process and Timeline for Designing and Delivering Compensation

The Compensation Committee follows a comprehensive process to determine compensation values and program design that is informed by Peer Group and market data and supported by the review and advice of an independent compensation consultant.

Over the course of four planned meetings each year, consistent Compensation Committee agendas ensure thorough review of compensation design and levels for our NEOs. In addition to the meetings described below, the Compensation Committee may schedule additional meetings throughout the year. The below sets forth a subset of the various topics the Compensation Committee considers in consultation with Exequity.

FEBRUARY	• Approve base pay changes, Short-Term Incentive targets and Long-Term grant values. • Finalize performance share payouts for the three-year performance period ending the previous December. • Approve performance goals for the long-term and short-term programs. • Review tally sheets(1) for all NEOs and officers of the Company.
APRIL / MAY	• Pay for performance and realized compensation analysis for prior year and three-year periods. • Executive compensation design trends and regulatory review. • Review Peer Group. • Conduct risk assessment.
SEPTEMBER	• Review executive compensation benchmarking against the Peer Group and the general market. • Review/discuss any program design changes for upcoming year. • Conduct review of the Short-Term Incentives and Long-Term performance grants. • Review Short-Term Incentive and Long-Term Incentive projections.
DECEMBER	• Conduct initial review of individual executive compensation changes for upcoming year. • Review/discuss any program design changes for upcoming year. • Conduct review of the Short-Term Incentives and Long-Term performance grants. • Review Short-Term incentive targets and Long-Term Incentive projections.

(1) Tally sheets identify and value each element of compensation, including base salary, Short-Term and Long-Term Incentive awards, pension benefits, deferred compensation, perquisites, potential change in control and severance benefits and provide an aggregate sum for each NEO and officer.

Role of the Compensation Committee and the Independent Compensation Consultant

The Compensation Committee determines the Company's compensation philosophy and approves each element of executive compensation. The Compensation Committee relies on advice and data provided by Exequity, an independent compensation consultant engaged by the Compensation Committee. Exequity does not advise management and receives no compensation from the Company for services other than those provided to the Compensation Committee and the NCGC (for which it provides guidance on independent Director compensation; see the "Director Compensation" section on page 29). Although the Compensation Committee considers recommendations made by the CEO with respect to executive compensation for executives other than himself, the Compensation Committee is solely responsible for making all executive compensation decisions.

The Compensation Committee discusses its compensation philosophy with Exequity and expects Exequity to present options for award practices and to provide context for any proposals, but otherwise does not impose any specific limitations or constraints on or direct the manner in which Exequity performs its advisory services. As advisor to the Compensation Committee, Exequity reviews the compensation strategy and pay levels for the Company's NEOs, examines all aspects of the Company's executive compensation programs to ensure the support of the Company's business strategy and objectives, informs the Compensation Committee of developing legal and regulatory considerations affecting executive compensation and benefit programs and provides general advice with respect to all compensation decisions pertaining to the CEO and to all officer compensation recommendations submitted by management.

The Compensation Committee assesses the independence of Exequity annually and has concluded that no conflict of interest currently exists or existed in 2022 that would prevent Exequity from providing independent advice to the Compensation Committee regarding executive compensation matters. In making this determination, the Compensation Committee considered, among other things, the following factors: (1) Exequity did not provide any non-compensation-related services (and did not receive any fees for any non-compensation-related services); (2) the engagement complied with Exequity's internal conflict of interest policies; (3) there are no other business or personal relationships between Company management or members of the Compensation Committee and any representatives of Exequity who provide services to the Company; and (4) neither Exequity nor any representatives of Exequity who provide services to the Company own any Common Stock or other Hubbell securities.

Compensation Peer Group

The Compensation Committee assesses each element of executive compensation against the median compensation levels paid to executives in comparable positions in similar industries. The Compensation Committee reviewed 2021 benchmark data from two sources, the Peer Group and general industry survey data to help inform 2022 target compensation. The Peer Group used to determine pay levels for 2022 was constructed using three criteria, as described below:

Industry Affiliation

Companies in the Peer Group are manufacturing or distribution companies in the electrical space.

Similar Size

Companies in the Peer Group range from approximately 0.6x to 3x the revenue size of Hubbell, with Hubbell at the 54th percentile of revenue.

Competitors for Talent

Companies in the Peer Group are ones we would consider as competing for the critical sales, engineering and other functional talent that drives our business.

Acuity Brands, Inc.	Donaldson Company, Inc.	IDEX Corporation	Sensata Technologies Holding plc
AGCO Corporation	Dover Corporation	ITT Inc.	Snap-on Incorporated
AMETEK, Inc.	EnerSys	Lincoln Electric Holdings, Inc.	WESCO International, Inc.
Carlisle Companies Incorporated	Fastenal Company	Regal Rexnord Corporation	Woodward, Inc.
Crane Holdings, Co.	Fortive Corporation	Rockwell Automation, Inc.	Xylem, Inc.
Curtiss-Wright Corporation	Fortune Brands Innovations, Inc.	Roper Technologies, Inc.	

2022 Compensation Results

The Committee targets the 50th percentile of the Peer Group data for compensation elements.

Base Salary

Base salary is the principal fixed component of total direct compensation paid to the NEOs. Salaries are determined by reference to prevailing market pay rates, scope of job responsibility and performance considerations. The Company intends its base salary expenditures to be consistent with those incurred by similarly positioned companies in our industry, so the Compensation Committee expects base salaries to approximate the 50th percentile of the benchmark community practices. Annually, the Compensation Committee reviews and approves increases as appropriate for the NEOs to ensure their base salaries remain close to market-representative pay levels. In February 2022, the Compensation Committee, after consultation with Exequity, approved certain market and performance-based increases to the base salaries of the NEOs.

Short-Term Incentive Compensation

Hubbell's Short-Term Incentive program emphasizes our most critical annual financial metrics, Earnings Per Share and Cash Flow.

Hubbell's Short-Term Incentive ("STI") program, which provides benefits under our Incentive Compensation Plan, is similar to executive STI award plans that are common at other companies in the general manufacturing environment. Maintaining an STI program that typifies those used elsewhere makes the Company's program competitive and helps us attract and retain high quality executive talent. Actual STI awards can range in size from 0% to 200% of an NEO's STI target, and are only paid to the extent the Company achieves the performance goals established by the Compensation Committee at the beginning of each year. These goals are intended to be challenging, and consistent with the Compensation Committee's view of strong business performance. The Compensation Committee may also use its discretion to reduce (but not increase) the actual amount of the STI awards paid. Payouts are delivered in cash, subject to applicable tax withholding.

Other elements of the STI program include:

- The STI payout mix for the NEOs is based 80% on financial performance of the enterprise or business segment, as applicable, and 20% on their individual contributions to Hubbell's strategic objectives. Strategic objectives, as described more fully on page 45, are annual targets that align to Hubbell's strategic priorities across our key pillars of Serve Our Customer, Grow the Enterprise, Operate with Discipline, and Develop our People.
- Payouts for threshold performance are 50% of target, and payouts are capped at 200% of target for above target performance. No payout is provided if threshold performance is below 50% of target. Payouts are limited to no more than $5 million per person per year.
- The Compensation Committee may use negative, but not positive discretion on payouts.
- Metrics are evaluated annually and are reviewed to ensure they drive business performance and complement the metrics in the Long-Term Incentive program.

Annual Short-Term Incentive Targets

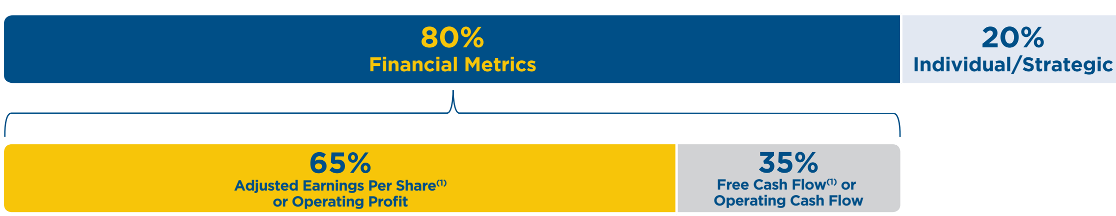
The Compensation Committee approves annual STI targets for the NEOs based on the 50th percentile of Peer Group data. STI targets are expressed as a percentage of base salary. If targets are changed during the course of the year, the full year target is pro-rated to reflect pre- and post-change periods. The 2022 target awards for the NEOs are shown below.

NEO	Annual Bonus Target
Gerben W. Bakker	115%
William R. Sperry	90%
Allan J. Connolly	75%
Peter J. Lau	75%
Katherine A. Lane	70%
Alyssa R. Flynn	50%

STI Design and Metrics

Hubbell's 2022 STI program for our NEOs is designed to drive performance on our most critical short-term objectives.

STI DESIGN



(1) Adjusted earnings per share and free cash flow are non-GAAP financial measures. A reconciliation to the comparable GAAP financial measures can be found in Management's Discussion and Analysis of Financial Condition and Results of Operations in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023.

STI METRICS

The following table explains the metrics and measurements in Hubbell's 2022 STI design.

Metric	Level Measured	How is it calculated?	Why is it included in the STI Program?
Adjusted Earnings Per Share (EPS)(1)	**Enterprise**	Adjusted net income divided by outstanding shares of Common Stock.	Affects TSR most directly and is the most critical measure of growth.
Operating Profit (OP)	**Business Segment**	Segment level net sales less cost of goods sold and selling and administrative expenses.	The most comprehensive measure of business segment performance; represents the direct impact of the segment leader on the business.
Free Cash Flow (FCF)(1)	**Enterprise**	Cash flow from operations less capital expenditures.	Demonstrates management's ability to generate cash for the business for on-going operations and future investments.
Operating Cash Flow (OCF)	**Business Segment**	Net cash from operating activities.	Demonstrates segment leaders' ability to manage on-going operations in a positive manner, generating cash for the enterprise.
Strategic Objectives	**Individual**	Compensation Committee evaluation of the CEO's and other NEOs' individual impact on Hubbell's strategic objectives (including CEO input regarding the other NEOs).	Strategic objectives prioritize the most critical short-term and long-term actions for the business in order to deliver shareholder value.

(1) Adjusted earnings per share and free cash flow are non-GAAP financial measures. A reconciliation to the comparable GAAP financial measures can be found in Management's Discussion and Analysis of Financial Condition and Results of Operations in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023.

STI Calculations

As shown below, the NEOs' STI awards are calculated differently depending on their respective roles at Hubbell.

Step 1 - Determine the STI Target

BASE SALARY × TARGET % = STI TARGET $

Step 2 - Multiply the STI Target by STI Payout Factors

Mr. Bakker, Mr. Sperry, Ms. Lane and Ms. Flynn

STI TARGET $ × [ENTERPRISE FINANCIAL RESULTS (80% WEIGHT) + STRATEGIC OBJECTIVES (20% WEIGHT)] = STI PAYOUT

Mr. Connolly and Mr. Lau(1)

STI TARGET $ × [ENTERPRISE FINANCIAL RESULTS (40% WEIGHT) + SEGMENT LEVEL RESULTS (40% WEIGHT) + STRATEGIC OBJECTIVES (20% WEIGHT)] = STI PAYOUT

(1) Mr. Lau's STI award was paid pursuant to his Separation Agreement. See the "Separation Agreement" section on page 66.

Enterprise and Segment Level Measures

Targets for EPS (65% weighting of overall financials) and Free Cash Flow (35% weighting of overall financials) are approved by the Compensation Committee in February of each year.

In addition to the enterprise measures, which are a part of the STI Design for all NEOs, NEOs who are responsible for business segments within the enterprise are also measured on the financial performance of their segments. In the segments, financial performance is measured through Operating Profit and Operating Cash Flow.

Strategic Objectives

For all the NEOs, a portion of their 2022 STI award is based on the attainment of Hubbell's strategic objectives. Strategic objectives are set at the beginning of each year in the categories listed below. At the end of the annual performance period, the Compensation Committee, with input from the CEO and senior management, evaluates Hubbell's performance on these objectives, and assigns a payout factor for this portion (20%) of the NEO's overall STI payout. Payout factors can range from 0-200%. The objectives that were set for 2022 are as follows:

SERVE OUR CUSTOMERS
We strive to exceed customer expectations by providing exceptional service and implementing processes that make it easy to do business with us.

OPERATE WITH DISCIPLINE
We implement industry leading processes to ensure a productive, safe and compliant organization, and maximize our footprint for operational efficiency.

GROW THE ENTERPRISE
We continue to grow our organization, both through developing innovative new products and by acquiring complementary businesses.

DEVELOP OUR PEOPLE
We recruit, hire and develop talent that meets and anticipates the ever-changing needs of our enterprise, while fostering an inclusive and diverse workplace.

2022 Performance Results and Payout

Enterprise Level Measures

For 2022, adjusted earnings per share[(1)] was $10.62, which the Compensation Committee then reduced for predetermined discrete items not considered in determining the performance versus target, including unspent but planned restructuring and related expenses as well as a one-time impact to the financials from changes in foreign currency exchange rates. These adjustments had no impact on the overall payout given the Company's overall performance.

The table below shows the enterprise targets and financial payout for 2022 as reviewed and approved by the Compensation Committee.

Metric	Target	Performance vs. Target	Payout %
Adjusted Earnings Per Share[(1)]	$9.10	117%	200%
Free Cash Flow[(1)]	$470M	110%	148%
Blended Payout for Enterprise Level Financial Metrics			**182%**

(1) Adjusted earnings per share and free cash flow are non-GAAP financial measures. A reconciliation to the comparable GAAP financial measures can be found in Management's Discussion and Analysis of Financial Condition and Results of Operation in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023.

Segment Level Measures

Mr. Connolly leads the Utility Solutions segment and had a portion of his STI based on the Operating Profit and Operating Cash Flow performance of that business segment.

Utility Solutions Segment

Metric	Target	Performance vs. Target	Payout %
Operating Profit	122% (% vs. PY)	123%	200%
Operating Cash Flow	116% (% of OP)	112%	161%
Blended Payout for Segment Level Financial Metrics			**186%**

Mr. Lau led the Electrical Solutions segment until his separation from the Company on September 30, 2022. Mr. Lau's annual cash incentive award was paid pursuant to his Separation Agreement. See the "Separation Agreement" section on page 66.

Electrical Solutions Segment

Metric	Target	Performance vs. Target	Payout %
Operating Profit	105% (% vs. PY)	104%	119%
Operating Cash Flow	104% (% of OP)	107%	134%
Blended Payout for Segment Level Financial Metrics			**124%**

Strategic Objective Measures

At the end of the annual performance period, Hubbell's performance on the strategic objectives for 2022 was evaluated to determine the payout percentage for this portion of the Short-Term Incentive. Over the course of 2022, the Company made progress against all the strategic objectives as outlined below.

Strategic Objective	Achievements
Serve our Customers	• Increased digital commerce capabilities and sales. • Increased enterprise sales tools and training activities.
Operate with Discipline	• Successfully managed price cost productivity. • Continued positive execution on footprint and restructuring projects.
Grow the Enterprise	• Achieved 2025 emissions and water reduction goals in 2022. • Exceeded targets on strategic innovation and exceeded sales projections on new product development. • Sold C&I lighting business and acquired 3 new companies (PCX, Ripley Tools and REF).
Develop our People	• Increased focus and participation on leadership development programs and retention of top talent. • Completed employee engagement survey with best in class employee response rate of over 80% and developed action plans across the Company.

To determine the payout of the strategic objective portion of the NEOs' 2022 Short-Term Incentive, the achievements in each of the four strategic pillars (as described above) were assessed on a scale of 0 - 200%. The rating for each of the four strategic objectives was then averaged with equal weighting to determine a final payout percentage. Based on the strong performance outlined above, the weighted average across all four objectives resulted in a 135% payout for this component.

In addition to leadership on the enterprise-wide objectives as described above, factors considered by the Board and the Compensation Committee in evaluating the performance of the CEO for the 20% strategic portion of his STI award include objectives targeted against Hubbell's vision to be a valued investment, an inclusive organization, and an exceptional customer partner. In considering Mr. Bakker's performance in such areas, and in light of the overall assessment of the enterprise as described above, the Compensation Committee approved a 135% payout for Mr. Bakker for the strategic portion of his STI award.

Short-Term Incentive Payout

The following table shows the STI award earned by each of the NEOs. These amounts also appear in the Non-Equity Incentive Plan Compensation column of the SCT on page 56.

	Performance Measures/Results						
	EPS and Free Cash Flow (Enterprise Level)	**Operating Profit and Operating Cash Flow** (Business Level)	**Strategic Objectives** (Individual)	**Total Composite Payout**	×	**STI Target ($)**	= **STI Award ($)**
Gerben W. Bakker	182%	—	135%	173%		1,199,450	2,075,000
William R. Sperry	182%	—	135%	173%		625,500	1,082,100
Allan J. Connolly	182%	186%	135%	174%		457,500	796,100
Peter J. Lau(1)	182%	124%	N/A	N/A		450,000	N/A
Katherine A. Lane	182%	—	135%	173%		357,000	617,600
Alyssa R. Flynn	182%	—	135%	173%		195,000	337,400

(1) Mr. Lau's STI award was paid pursuant to his Separation Agreement. See the "Separation Agreement" section on page 66.

Long-Term Incentive Compensation

Hubbell maintains a Long-Term Incentive ("LTI") plan that extends to its top talent the opportunity to earn rewards in the form of Company Common Stock pursuant to the Company's Amended and Restated 2005 Incentive Award Plan (as amended and in effect, the "Equity Plan"). The Equity Plan is designed to:

- Generate growth in the Company's share price by rewarding activity that enhances enterprise value.
- Ensure long-term rewards are commensurate with performance.
- Help leadership accumulate shares, ensuring greater alignment with shareholders.
- Motivate, retain, and reward the NEOs.

75% Performance Based

Design

50% Performance Shares	25% SARs	25% Restricted Shares

PERFORMANCE SHARES AND RESTRICTED SHARES ARE 3-YEAR CLIFF VESTING, SARS ARE 3-YEAR RATABLE VESTING

We believe the design of our LTI program creates a long-term performance-based orientation and encourages executives to remain with the Company.

The value of LTI awards granted to our executives each year is based on several factors, including external benchmarking practices, the Company's short- and long-term financial performance, the value of awards granted in prior years, succession considerations and individual performance.

Our LTI program includes financial metrics that align with our business strategy and closely correlate with shareholder return within our Peer Group.

Performance Share Awards

Our performance share program continues to evolve in response to our shareholders' feedback to ensure alignment with our business strategy. The following table outlines the outstanding performance awards granted to our NEOs.

Grant Date	Performance Period	Program Metrics	Status	See Page(s)
Feb. 2022	2022 – 2024	Relative Sales Growth, Adjusted Operating Profit Margin[1], Relative Total Shareholder Return	Pending end of performance period	48
Feb. 2021	2021 – 2023	Relative Sales Growth, Operating Profit Margin, Relative Total Shareholder Return	Pending end of performance period	49
Feb. 2020	2020 – 2022	Relative Sales Growth, Operating Profit Margin, Trade Working Capital as % of Revenue, Relative TSR Modifier	Performance period complete	50-51

In all cases, the actual number of performance shares earned by an NEO will be determined at the end of the three-year period based on Company performance as measured by the performance metrics and targets set out at the time of the grant, all of which are described in the following pages.

Performance Share Award Index

For all relative measures in the Performance Share Program, Hubbell uses the S&P Capital Goods 900 Index which is a compilation of the S&P 400 and S&P 500 Capital Goods indices and not a published index. The Compensation Committee chose this group as it is the most direct comparison to Hubbell's business and size than any other index.

(1) Adjusted operating profit margin is a non-GAAP financial measure. A reconciliation to the comparable GAAP financial measure can be found in Management's Discussion and Analysis of Financial Condition and Results of Operations in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023.

Performance Share Grant Design (2022 Grant)

Performance Share Grants made in February of 2022 are comprised of three equally weighted metrics: Relative Sales Growth, Adjusted Operating Profit Margin(1), and Relative Total Shareholder Return. In 2022, the Compensation Committee decided to change the operating profit margin metric to adjusted operating profit margin(1) to further align across incentive plans and to tie incentive targets to the underlying performance of our business. The table below details the metrics and calculation methodology, and why each metric is important to the business.

Metric	Weight	How is it calculated?	Why is it included in the LTI Program?
Relative Sales Growth	34%	Hubbell's compounded annual growth rate as compared to the companies that make up the S&P Capital Goods 900 Index.	Drives growth initiatives, including organic growth, new product development, innovation, and acquisition performance.
Adjusted Operating Profit Margin(1)	33%	Adjusted operating income divided by net sales, as compared to a target set at the beginning of the performance period.	Focuses NEOs on margin expansion and productivity, while they execute operational objectives including footprint optimization and product rationalization.
Relative TSR	33%	Total Shareholder Return (average of the last 20 trading days of the preceding performance period as compared to the average of the last 20 trading days of the performance period, with dividends reinvested as shares), as compared to the companies that make up the S&P Capital Goods 900 Index.	Provides balance between internal and external performance and ensures alignment with shareholder value creation.

Performance Share Grant Targets (2022 Grant)

The table below sets out each metric at the enterprise level, the respective goals for the three-year period, and the payout percentage of performance shares that would be earned at each specified level of performance. Internally, we communicate to our executives the quartile performance of our peers and Hubbell for each metric and focus our executives on achieving top or 2nd quartile performance, while looking to avoid 3rd or 4th quartile performance. As part of the 2022 LTI design, relative scales align explicitly with this approach.

RELATIVE SALES GROWTH		
	Target(2)	**Payout**
Max	> 75th percentile	200%
Target	50th percentile	100%
Threshold	25th percentile	50%
No Payout	< 25th percentile	0%

ADJUSTED OPERATING PROFIT MARGIN(1)		
	Target(2)	**Payout**
Max	17%	200%
Target	15.25%	100%
Threshold	13.5%	50%
No Payout	< 13.5%	0%

RELATIVE TSR		
	Target(2)	**Payout**
Max	>75th percentile	200%
Target	50th percentile	100%
Threshold	25th percentile	50%
No Payout	< 25th percentile	0%

(1) Adjusted operating profit margin is a non-GAAP financial measure. A reconciliation to the comparable GAAP financial measure can be found in Management's Discussion and Analysis of Financial Condition and Results of Operations in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023.

(2) If the Company's performance for any of the performance metrics falls between the percentages listed on the table, the percentage performance shares earned will be determined by linear interpolation.

Performance Share Grant Design (2021 Grant)

Performance share grants made in February 2021 are based on three equally weighted metrics, which are explained in the table below.

Metric	Weight	How is it calculated?	Why is it included in the LTI Program?
Relative Sales Growth	34%	Hubbell's compounded annual growth rate as compared to the companies that make up the S&P Capital Goods 900 Index.	Drives growth initiatives, including organic growth, new product development, innovation, and acquisition performance.
Operating Profit Margin	33%	Operating income divided by net sales, as compared to a target set at the beginning of the performance period.	Focuses NEOs on improving pricing, productivity, and costs while they execute operational objectives including footprint optimization and SKU rationalization.
Relative TSR	33%	Total Shareholder Return (average of the last 20 trading days of the preceding performance period as compared to the average of the last 20 trading days of the performance period, with dividends reinvested as shares), as compared to the companies that make up the S&P Capital Goods 900 Index.	Provides balance between internal and external performance and ensures alignment with shareholder value creation.

Performance Share Grant Targets (2021 Grant)

The table below sets out each metric at the enterprise level, the respective goals for the three-year period, and the payout percentage of performance shares that would be earned at each specified level of performance.

RELATIVE SALES GROWTH		
	Target(1)	**Payout**
Max	> 75th percentile	200%
Target	50th percentile	100%
Threshold	25th percentile	50%
No Payout	< 25th percentile	0%

OPERATING PROFIT MARGIN		
	Target(1)	**Payout**
Max	15.5%	200%
Target	14.5%	100%
Threshold	13%	50%
No Payout	< 13%	0%

RELATIVE TSR		
	Target(1)	**Payout**
Max	>75th percentile	200%
Target	50th percentile	100%
Threshold	25th percentile	50%
No Payout	< 25th percentile	0%

(1) If the Company's performance for any of the performance metrics falls between the percentages listed on the table, the percentage performance shares earned will be determined by linear interpolation.

Performance Share Grant Design (2020 Grant)

Performance share grants made in February 2020 are based on three equally weighted metrics, with a possible Relative TSR modifier, as explained in the following table.

Metric	Weight	How is it calculated?	Why is it included in the LTI Program?
Relative Sales Growth	**34%**	Hubbell's compounded annual growth rate as compared to the companies that make up the S&P Capital Goods 900 Index.	Drives growth initiatives, including organic growth, new product development, innovation, and acquisition performance.
Operating Profit Margin	**33%**	Operating income divided by net sales, as compared to a target set at the beginning of the performance period.	Focuses NEOs on improving pricing, productivity, and costs while they execute operational objectives including footprint optimization and SKU rationalization.
Trade Working Capital as a % of Sales	**33%**	Accounts receivable plus inventory minus accounts payable, the result of which is divided by net sales, as compared to a target set at the beginning of the performance period.	Encourages focus on activities that improve operational effectiveness and cash generation, specifically inventory management and accounts payable/ receivable.
Relative TSR	**Modifier**	Modifies the award up or down if Total Shareholder Return (average of the last 20 trading days of the preceding performance period as compared to the average of the last 20 trading days of the performance period, with dividends reinvested as shares), is in the top or bottom 25% as compared to the companies that make up the S&P Capital Goods 900 Index.	Provides balance between internal and external performance and ensures alignment with shareholder value creation.

Performance Share Grant Targets (2020 Grant)

The table below sets out each metric at the enterprise level, the respective goals for the three-year period, and the payout percentage of performance shares that would be earned at each specified level of performance.

RELATIVE SALES GROWTH		
	Target(1)	**Payout**
Max	> 80th percentile	200%
Target	50th percentile	100%
Threshold	35th percentile	50%
No Payout	< 35th percentile	0%

OPERATING PROFIT MARGIN		
	Target(1)	**Payout**
Max	16%	200%
Target	14.5%	100%
Threshold	13%	50%
No Payout	< 13%	0%

TRADE WORKING CAPITAL (as % of sales)		
	Target(1)	**Payout**
Max	18.5%	200%
Target	19%	100%
Threshold	20%	50%
No Payout	> 20%	0%

(1) If the Company's performance for any of the performance metrics falls between the percentages listed on the table, the percentage performance shares earned will be determined by linear interpolation.

TSR MODIFIER	
Relative TSR Percentile	**Target**
= or > 75th	X 150%
> 25th to < 75th	X 100%
< or = 25th	X 50%

Performance Share Grant Payout (2020 Grant)

The performance period for the LTI performance share grant made in February 2020 ended on December 31, 2022. The table below shows Hubbell's actual performance with respect to each metric, and the associated payouts.

Metric	Weight	Target for 100% Payout	Actual Performance	Payout	TSR Modifier(2)	Final Payout
Projected Relative Sales Growth(1)	34%	50th percentile	63rd percentile	145%	150%	218%
OP Margin	33%	14.5%	14.6%	107%	150%	161%
Trade Working Capital	33%	19%	19.2%	90%	150%	135%
BLENDED PAYOUT ACROSS PERFORMANCE SHARES						**171%**

(1) *The calculation of the relative sales growth measure is dependent upon public availability of financial results from our peer companies. The Compensation Committee cannot determine the level of achievement of the performance criteria until a sufficient number of S&P Capital Goods 900 Index companies report their earnings for the year ended December 31, 2022. As a result, the actual payout results for the 2020-2022 performance share award grants based on Relative Sales Growth will not be determined until April 2023 and such payouts will not be approved by the Compensation Committee until April 2023 after the filing of this Proxy Statement. The above projections reflect the results available as of March 20, 2023, including consensus estimates for sales growth for the Peer Group. Shareholders are cautioned that this information is preliminary, is subject to change based on the actual reported results of the S&P Capital Goods 900 Index companies and has not been approved by the Compensation Committee.*

(2) *The actual performance for the TSR Modifier resulted in a 87th percentile ranking which resulted in a payout of 150%.*

Shares Received for the 2020 Grant

NEO	Target Shares (February 2020)	Final Shares (February 2023)
Gerben W. Bakker	11,218	19,219
William S. Sperry	5,352	9,169
Allan J. Connolly	3,345	5,730
Peter J. Lau	—	—
Katherine A. Lane	2,509	4,297
Alyssa R. Flynn	619	1,060

Stock Appreciation Rights ("SARs")

A SAR gives the holder the right to receive, once vested, the value in shares of the Company's Common Stock equal to the positive difference between the base price and the market value of a share of Common Stock upon exercise. Generally, SARs vest in three equal installments on each of the first three anniversaries of the grant date. The base price used to determine the value of the SARs is the mean between the high and low trading prices of the Company's Common Stock as reported on the NYSE on the trading day immediately preceding the date of grant (i.e. for the February 8, 2022 grants, February 7, 2022 - $185.87). The Company uses this measure for two reasons: (i) using the trading prices from the day before the grant enables the Compensation Committee to know the exact grant price and therefore the exact value of each grant before it is made; and (ii) because of the relatively low volume at which the Company's stock trades, the mean represents a more accurate picture of the fair market value of the stock than does the closing price. For purposes of determining individual award levels, the number of shares subject to each SAR is formulated on the basis of a modified Black-Scholes calculation. See the section entitled "Equity Award Plan Vesting Provisions-Grant Terms" on page 59 for additional information on the terms of these awards.

Time Based Restricted Stock

Time based restricted stock provides incentives for executives to remain employed by the Company and to create and maintain value for shareholders because the value of a restricted share depends on the executive's continued employment and the value of the Company's stock on the vesting date. Restricted stock awards are granted in shares of the Company's Common Stock and generally vest on the third-year anniversary of the grant date.

Other Compensation Policies and Benefit Programs

Stock Ownership and Retention Policy

Hubbell has stock ownership requirements for its NEOs that they each currently satisfy.

The Company has a Stock Ownership and Retention Policy (the "Stock Ownership Policy") that is applicable to the NEOs, the other officers of the Company, senior level employees and the Directors. The terms and conditions of the Stock Ownership Policy are annually reviewed by the Compensation Committee and Exequity to ensure consistency with current market practices and external benchmarks and alignment between the interests of the employees covered by the Stock Ownership Policy and the interests of the Company's shareholders.

The Stock Ownership Policy provides:

- A covered employee who has not yet satisfied the applicable ownership minimum must retain 100% of the net shares acquired pursuant to the exercise of a SAR and all other shares that person directly or indirectly acquires.
- Once the minimum share ownership level is satisfied, a covered employee is expected to continue to satisfy such requirement for as long as they are subject to the policy.
- Shares that count toward the minimum share ownership requirement include shares held directly and indirectly by the covered employee, including restricted stock granted under the Equity Plan, and in-the-money vested (but unexercised) SARs. Shares underlying unearned performance shares are not counted.
- Covered employees have approximately five (5) years from the earliest date they become subject to the Stock Ownership Policy to achieve their minimum ownership requirement. A covered employee who is promoted to a position with a higher minimum ownership requirement similarly has five (5) years to increase their holdings to satisfy the new requirement.

The policy requires covered employees to attain a minimum share ownership level equal to their base salary times a certain multiplier, as indicated in the below table.

Minimum Stock Ownership Requirement

5x BASE SALARY	3x BASE SALARY	2x BASE SALARY
CEO	**CFO, Segment Presidents, General Counsel, EVPs, SVPs**	**Other officers and senior leaders**

As of December 31, 2022, all NEOs (other than Mr. Lau, who departed Hubbell on September 30, 2022) are in compliance with the Stock Ownership Policy. The Stock Ownership Policy can be viewed on the Company's website at **www.hubbell.com**.

Compensation Recovery Policy (Clawback)

Hubbell's Compensation Recovery Policy provides that an executive (including a NEO), who is determined to have engaged in fraud or other gross misconduct that contributed in whole or in part to a restatement of the Company's financial results, may be subject to any one or more of the following disciplinary actions:

- Termination of employment.
- Recovery of all or any portion of any performance-based cash or equity paid or vested during the previous three years that would otherwise not have been paid or vested based on the restated financial results.
- Cancellation or forfeiture of any performance-based cash or equity awards not yet paid or vested or offset against future awards.

The Compensation Committee annually reviews the Compensation Recovery Policy and benchmarks the provisions with its independent compensation consultant, Exequity. The Compensation Committee is in the process of further evaluating the Compensation Recovery Policy in light of the proposed new NYSE listing rule, and will make changes as required to comply with the NYSE requirements once they have been finalized. All actions taken under this policy will be determined by the Board of Directors in its sole discretion upon consultation with the Audit Committee and the NCGC.

Policy Prohibiting Hedging and Pledging

Our officers, Directors, and certain employees designated by Hubbell's Senior Vice President, General Counsel and Secretary who may have access to material, non-public information about Hubbell and its financial condition, as well as anyone living in such restricted persons' households and any entities directly or indirectly controlled by such restricted persons, are prohibited from (i) engaging in hedging, monetization transactions or similar arrangements involving our stock, including short sales, margin transactions, put or call options, and derivatives such as swaps, forwards, and futures transactions; (ii) pledging our stock as collateral for a loan, credit, stop loss, or any other limit orders placed with a broker, except pursuant to an approved 10b5-1 plan; and (iii) purchasing our stock on margin or holding our securities in a margin account.

Employee Benefits

NEOs receive employee health and welfare and retirement benefits that are generally available to all employees, which include cafeteria-style plans that provide medical, dental, prescription, life insurance, disability and the option to purchase other voluntary benefits. The NEOs also receive certain additional retirement benefits, limited perquisites (as detailed on page 54), severance and change in control protections. These additional benefits are similar to the types and amounts available to senior executives of other manufacturing companies as demonstrated in benchmark data. The following outlines the benefit plans available to the NEOs. The purpose of these plans is, as applicable, to provide retirement planning tools to such senior employees and thus assist the Company in attracting and retaining senior management.

Retirement Plans and Nonqualified Deferred Compensation Plans

Qualified Pension Plans

The Company maintains a defined benefit pension plan (the "DB Plan") and a defined contribution retirement plan (the "DC Plan") in which NEOs participate along with the other Hubbell employees.

Employees hired after December 31, 2003, are not eligible to participate in the DB Plan but may participate in the DC Plan. The Company closed the DB Plan to new employees after 2003 after determining that a plan of this nature was no longer necessary to attract talent in the marketplace. Service credit under the DB Plan ceased effective February 28, 2017, and a subsequent freeze on eligible compensation was effective December 31, 2020. Mr. Bakker is the only NEO who is a participant in the DB Plan.

The DC Plan provides that the Company will make a fully vested annual non-elective Company contribution of 4% of eligible earnings on behalf of all eligible participants, including the NEOs. Additionally, the Company makes a matching contribution equal to 50% of the first 6% of a participant's eligible earnings contributed to the DC Plan, subject to Code limitations. NEOs are participants in the DC Plan on the same terms as other employees in the Company.

Non-Qualified Supplemental Retirement Plans

Certain senior executives of the Company, including the NEOs, are eligible to participate in supplemental retirement plans including the Top Hat Restoration Plan ("DB Restoration Plan") and the Defined Contribution Restoration Plan ("DC Restoration Plan") which are available to DB Plan and DC Plan participants, respectively, with compensation in excess of Code limitations applicable to qualified plans.

The DB Restoration Plan is an "excess benefit plan" under which participants in the DB Plan receive additional retirement benefits, calculated in the same manner as benefits are calculated under the DB Plan, but without regard to the applicable limits on compensation or benefit accruals imposed by the tax-qualified plan rules. Mr. Bakker is the only NEO who is a participant in the DB Restoration Plan, and he ceased to accrue benefits under the DB Restoration Plan when the DB Plan was frozen. The DC Restoration Plan, also an "excess benefit plan," enables participants in the DC Plan to receive Company contributions equal to the additional contributions they would have received under the DC Plan, but for the compensation limits imposed by the tax-qualified plan rules.

The DB Restoration Plan and DC Restoration are intended to promote the retention of our eligible senior management employees by providing them with the opportunity to earn pension and retirement benefits that supplement the benefits available under the Company's tax-qualified retirement plans.

Executive Deferred Compensation Plan

The Company has a non-qualified Executive Deferred Compensation Plan ("EDCP"), which permits senior employees, including our NEOs, to defer the receipt of up to 50% of their base salary and 100% of their short-term incentive award. The EDCP also provides for discretionary contributions by the Company. No Company discretionary contributions were made in 2022. Amounts deferred under the EDCP are credited with earnings reflecting individual investment directions made by each participant. See the "Non-Qualified Deferred Compensation in Fiscal Year 2022" section on page 63.

Perquisites

In 2022, the Company provided the following limited perquisites to the NEOs: relocation benefits and related tax gross-ups, financial planning and tax preparation services and limited personal travel on the Company aircraft. These perquisites provide flexibility to the executives and increase travel efficiencies, thereby allowing executives to use their time more productively. These perquisites also protect the executives' personal and financial health and thus the Company's investment in their development. The Company routinely examines the competitiveness of the perquisites offered in light of the evolving competitive landscape and determines whether any modifications are appropriate. Footnote 7 to the "Summary Compensation Table" on page 57 outlines the benefits received by each NEO in 2022.

Severance and Change in Control Benefits

Hubbell maintains a Policy for Providing Severance to Senior Employees (the "Senior Severance Policy") that generally provides severance to senior management in the event of certain "involuntary" terminations of employment with Hubbell.

It has long been Hubbell's practice to provide Change in Control Severance Agreements ("CIC Agreements") to its Board appointed officers. Previously, the Board had issued CIC Agreements to Mr. Bakker in 2014, to Mr. Sperry in 2010, as amended in 2012, and to Ms. Lane in 2019 (collectively, the "Prior CIC Agreements").

The CIC Agreements with the NEOs have traditionally, and continue to, provide certain alternative severance benefits in the event an NEO's employment is involuntarily or constructively terminated in connection with a change in control. Such severance benefits are designed to alleviate the financial impact of termination of employment by providing continued base salary and health benefits and outplacement services. These benefits are designed to foster a stable work environment by reinforcing and encouraging executives' continued attention and dedication to job responsibilities without the personal distraction or conflict of interest that could arise from concerns about a potential change in control.

More recently, the Board desired to issue new CIC Agreements to Hubbell's officers that would be on a single form of agreement for all of Hubbell's officers, a form of agreement that was updated to align with market terms and provisions, which include restrictive covenants to which the recipient of the agreement would be subject. Such covenants cover the execution of a release of claims agreement, provisions on continuing compliance with non-competition and non-solicitation of employees and customers and confidentiality. In December, 2022, Hubbell replaced the Prior CIC Agreements with Messrs. Bakker and Sperry and Ms. Lane using the new form and entered into new CIC Agreements with Mr. Connolly and Ms. Flynn and the other officers of Hubbell (collectively, the "New CIC Agreements"). The New CIC Agreements are substantially similar in scope to the Prior CIC Agreements and there was no increase made to any of the existing severance multiples or benefit continuation periods previously provided to Messrs. Bakker and Sperry or Ms. Lane.

The decision to offer benefits under the Senior Severance Policy and the New CIC Agreements does not influence the Compensation Committee's determinations concerning other direct compensation or benefit levels. In making the decision to extend these benefits, the Compensation Committee relied on its independent compensation consultant, Exequity, to ensure that such severance and change in control benefits align with relevant market practices and policy statements put forth by governance rating agencies. The Compensation Committee annually reviews Hubbell's CIC Agreements and benchmarks the provisions with Exequity.

The Company's New CIC Agreements contain, among other things, the following types and amounts of compensation benefits payable to NEOs upon a change in control:

- Double trigger (change in control plus termination of employment) required to obtain cash severance benefit.
- Lump sum cash payments equal to 2.5/2.0 times base salary and 2.5/2.0 times target bonus for the year in which the change-in-control occurs.
- Lump sum payment of the pro-rated target bonus for the year in which termination occurs.
- Continued insurance benefits and outplacement services.

Upon a change in control, under the terms of the LTI awards, all outstanding awards (other than any portion subject to performance-based vesting) will continue in effect or be assumed or substituted by an acquiring company, unless the Compensation Committee elects to terminate an award or cause it to fully vest. If the acquiring company refuses to assume or substitute an award, the Compensation Committee may exercise its discretion to terminate the award in exchange for cash, rights or property, or cause the awards to become fully exercisable prior to the change in control. The portion of an LTI award that is subject to performance-based vesting will remain subject to the terms of the award agreement and the Compensation Committee's discretion.

If an LTI award continues in effect or is assumed or substituted, and the grantee's employment is terminated without cause or within twelve months following a change in control, then the award will fully vest as of the date of termination.

For additional information relating to the Company's change in control and severance benefits, including under the New CIC Agreements and the Senior Severance Policy, see the "Potential Post-Employment Compensation Arrangements" section on page 64.

Compensation Committee Report

The Compensation Committee has reviewed the Compensation Discussion and Analysis and discussed its contents with members of the Company's management and its independent compensation consultant, Exequity. Based on this review and discussion, the Compensation Committee has recommended to the Board that the Compensation Discussion and Analysis be included in this Proxy Statement and the Company's Annual Report on Form 10-K for the fiscal year ended December 31, 2022.

Compensation Committee

John G. Russell, Chair
Carlos M. Cardoso
Anthony J. Guzzi
Neal J. Keating
Jennifer M. Pollino

Executive **Compensation**

Summary Compensation Table ("SCT")

Named Executive Officer	Year	Salary ($)	Bonus[3] ($)	Stock Awards[4] ($)	Option Awards[4] ($)	Non-Equity Incentive Plan Compensation[5] ($)	Change in Pension Value and Nonqualified Deferred Compensation Plan Earnings[6] ($)	All Other Compensation[7] ($)	Total ($)
Gerben W. Bakker Chairman, President and Chief Executive Officer	2022	1,032,154	—	3,579,025	1,174,988	2,075,000	—	283,944	8,145,111
	2021	972,500	—	3,130,670	1,025,488	823,700	—	136,342	6,088,700
	2020	768,319	—	2,541,156	838,512	703,400	1,716,976	106,323	6,674,686
William R. Sperry Executive Vice President, Chief Financial Officer	2022	691,923	—	1,370,664	450,001	1,082,100	—	101,161	3,695,849
	2021	672,692	—	1,335,717	437,506	467,800	—	89,107	3,002,822
	2020	618,846	—	1,212,363	400,005	457,400	—	96,008	2,784,622
Allan J. Connolly President, Utility Solutions Segment	2022	608,462	—	837,695	274,986	796,100	—	75,810	2,593,053
	2021	597,692	—	782,325	256,247	333,000	—	365,437	2,334,701
	2020	548,415	—	757,652	249,994	438,800	—	372,777	2,367,638
Peter J. Lau[1] Former President, Electrical Solutions Segment	2022	455,385	—	761,443	249,983	—	—	675,898	2,142,709
	2021	558,462	—	610,526	200,006	340,200	—	64,687	1,773,881
Katherine A. Lane Senior Vice President, General Counsel and Secretary	2022	506,923	100,000	647,269	212,500	617,600	—	57,091	2,141,383
	2021	487,692	—	610,526	200,006	264,100	—	49,432	1,611,756
	2020	442,223	—	568,276	187,502	237,700	—	46,630	1,482,331
Alyssa R. Flynn[2] Chief Human Resources Officer	2022	385,288	30,000	266,665	87,488	337,400	—	38,638	1,145,479

(1) The Company entered into a Separation Agreement with Mr. Lau on September 23, 2022. See the "Separation Agreement" section on page 66.

(2) First reported as a NEO in 2022.

(3) The amounts in the Bonus column reflect a one time cash bonus paid to Mses. Lane and Flynn related to their significant contributions to the Company's disposition of its commercial and industrial lighting business.

(4) The amounts reported in the Stock Awards and Option Awards columns reflect the aggregate grant date fair value of restricted stock, performance shares and SARs granted in 2022 as calculated in accordance with FASB ASC Topic 718. For a discussion of the assumptions made in the valuation, see Note 18 to the Consolidated Financial Statements for 2022 in the Form 10-K filed with the SEC on February 9, 2023. The actual value that an executive may realize from an award is contingent upon the satisfaction of the vesting conditions of the award. For SARs, the actual value of the award is based upon the positive difference between the base price and the market value of a share of Common Stock on the date of exercise. Thus, there is no assurance that the value, if any, eventually realized by the executive will correspond to the amount shown. For performance shares with a Relative Sales Growth performance metric, fair value is based upon the average between the high and low trading prices of the Company's Common Stock on the date preceding the grant date and assumes that the award will vest at target.

(5) The amounts reported in the Non-Equity Incentive Plan Compensation column reflect short-term incentive awards earned under the Company's Short-Term Incentive Plan. Mr. Lau received a payment equal to a pro rata portion of his target annual cash incentive award pursuant to the Senior Severance Policy and as set forth in his Separation Agreement. See the "Separation Agreement" section on page 66.

(6) *The amounts reported in the Change in Pension Value and Nonqualified Deferred Compensation Earnings column reflect the aggregate change in the actuarial present value of each NEO's accumulated benefit under the retirement plans in which they participate. See the "Employee Benefits" section on page 53 and "Nonqualified Deferred Compensation" section on page 63. The present value of accrued benefits at December 31, 2020 is based on the Pri-2012 Healthy Annuitant Mortality White Collar Tables, sex distinct, with generational projection from 2012 using Scale MP-2020 and using a discount rate of 2.60%. The present value of accrued benefits at December 31, 2021 is based on the Pri-2012 Healthy Annuitant Mortality White Collar Tables, sex distinct, with generational projection from 2012 using Scale MP-2021 and using a discount rate of 2.90%. The present value of accrued benefits at December 31, 2022 is based on the Pri-2012 Healthy Annuitant Mortality White Collar Tables, sex distinct, with generational projection from 2012 using Scale MP-2021 and using a discount rate of 5.50%. Participants are assumed to retire at age 62 or current age, if later. Based on these assumptions, the actuarial value of Mr. Bakker's pension decreased by $1,319,766 from 2021 to 2022, and therefore the amount is reported in the above table as $0.*

(7) *The amounts reported in the All Other Compensation column for 2022 are detailed in the following table:*

Name	Severance[a] ($)	Perquisites[b] ($)	Relocation[c] ($)	Retirement Plan Contributions[d] ($)	Total ($)
Gerben W. Bakker	—	46,660	107,374	129,910	283,944
William R. Sperry	—	19,980	—	81,181	101,161
Allan J. Connolly	—	9,908	—	65,902	75,810
Peter J. Lau	637,500	7,480	12,160	18,758	675,898
Katherine A. Lane	—	12,000	—	45,091	57,091
Alyssa R. Flynn	—	—	—	38,638	38,638

(a) *The amounts in the Severance column reflect payments made to Mr. Lau in connection with his departure from the Company and in accordance with the Company's Senior Severance Policy. See the "Separation Agreement" section on page 66.*

(b) *The amounts in the Perquisites column reflect the incremental cost to the Company for the actual cost of financial planning or tax preparation services up to a maximum of $10,000 for each NEO, the matching gifts made by The Hubbell Foundation; and personal use of the Company aircraft for Messrs. Bakker - $36,660 and Sperry - $4,980 which includes fuel costs, crew expenses, and landing, hangar, airplane parking, ramp, and maintenance fees.*

(c) *The amounts in the Relocation column reflect amounts paid to Messrs. Bakker and Lau as reimbursement for costs associated with their Company required relocations and includes a tax gross-up benefit for Mr. Bakker of $31,830 provided in connection with his relocation.*

(d) *The amounts in the Retirement Plan Contributions column reflect Company 401(k) matching contributions of $9,150 for Messrs. Bakker, Sperry, Connolly and Mses. Lane and Flynn, and $6,558 for Mr. Lau; and an automatic company retirement contribution of $12,200 for each NEO under the DC Plan. This column also includes the following Company Retirement Contributions earned under the DC Restoration Plan in 2022 to be contributed in 2023 for: Mr. Bakker - $62,034, Mr. Sperry - $34,189, Mr. Connolly - $25,458, Ms. Lane - $22,641, and Ms. Flynn - $9,879. This column also includes the following restoration match contributions under the DC Restoration Plan earned in 2022 and to be contributed in 2023 for: Mr. Bakker - $46,526, Mr. Sperry - $25,642, Mr. Connolly - $19,094, Ms. Lane - $1,100, and Ms. Flynn $7,409.*

Other Compensation Tables

Grants of Plan-Based Awards in Fiscal Year 2022

The following table presents information concerning plan-based awards granted in 2022 to the NEOs under the Company's Incentive Plan and Equity Plan. All stock awards are payable in shares of the Company's Common Stock.

			Est. Future Payouts Under Non-Equity Incentive Plan Awards(2)			Est. Future Payouts Under Equity Incentive Plan Awards(3)			All Other Stock Awards: Number of Shares of Stock or Units(4)	All Other Option Awards: Number of Shares Underlying Options(4)	Exercise or Base Price of Option Awards(5)	Grant Date Fair Value of Stock and Option Awards(6)
Name	Type of Award	Grant Date	Threshold ($)	Target ($)	Max ($)	Threshold (#)	Target (#)	Max (#)	(#)	(#)	($/Sh)	($)
Gerben W. Bakker	STI	2/8/22	599,725	1,199,450	2,398,900	—	—	—	—	—	—	—
	RS	2/8/22	—	—	—	—	—	—	6,322	—	—	1,175,070
	SAR	2/8/22	—	—	—	—	—	—	—	29,936	185.87	1,174,988
	PS/RSG	2/8/22	—	—	—	2,150	4,299	8,598	—	—	—	750,090
	PS/OPM	2/8/22	—	—	—	2,086	4,172	8,344	—	—	—	727,931
	PS/TSR	2/8/22	—	—	—	2,086	4,172	8,344	—	—	—	925,934
William R. Sperry	STI	2/8/22	312,750	625,500	1,251,000	—	—	—	—	—	—	—
	RS	2/8/22	—	—	—	—	—	—	2,421	—	—	449,991
	SAR	2/8/22	—	—	—	—	—	—	—	11,465	185.87	450,001
	PS/RSG	2/8/22	—	—	—	823	1,646	3,292	—	—	—	287,194
	PS/OPM	2/8/22	—	—	—	799	1,598	3,196	—	—	—	278,819
	PS/TSR	2/8/22	—	—	—	799	1,598	3,196	—	—	—	354,660
Allan J. Connolly	STI	2/8/22	228,750	457,500	915,000	—	—	—	—	—	—	—
	RS	2/8/22	—	—	—	—	—	—	1,480	—	—	275,088
	SAR	2/8/22	—	—	—	—	—	—	—	7,006	185.87	274,986
	PS/RSG	2/8/22	—	—	—	503	1,006	2,012	—	—	—	175,527
	PS/OPM	2/8/22	—	—	—	488	977	1,954	—	—	—	170,467
	PS/TSR	2/8/22	—	—	—	488	976	1,952	—	—	—	216,613
Peter J. Lau(1)	STI	2/8/22	225,000	450,000	900,000	—	—	—	—	—	—	—
	RS	2/8/22	—	—	—	—	—	—	1,345	—	—	249,995
	SAR	2/8/22	—	—	—	—	—	—	—	6,369	185.87	249,983
	PS/RSG	2/8/22	—	—	—	458	915	1,830	—	—	—	159,649
	PS/OPM	2/8/22	—	—	—	444	888	1,776	—	—	—	154,938
	PS/TSR	2/8/22	—	—	—	443	887	1,774	—	—	—	196,861
Katherine A. Lane	STI	2/8/22	178,500	357,000	714,000	—	—	—	—	—	—	—
	RS	2/8/22	—	—	—	—	—	—	1,143	—	—	212,449
	SAR	2/8/22	—	—	—	—	—	—	—	5,414	185.87	212,500
	PS/RSG	2/8/22	—	—	—	389	778	1,556	—	—	—	135,745
	PS/OPM	2/8/22	—	—	—	377	755	1,510	—	—	—	131,732
	PS/TSR	2/8/22	—	—	—	377	754	1,508	—	—	—	167,343
Alyssa R. Flynn	STI	2/8/22	97,500	195,000	390,000	—	—	—	—	—	—	—
	RS	2/8/22	—	—	—	—	—	—	471	—	—	87,545
	SAR	2/8/22	—	—	—	—	—	—	—	2,229	185.87	87,488
	PS/RSG	2/8/22	—	—	—	160	320	640	—	—	—	55,834
	PS/OPM	2/8/22	—	—	—	155	311	622	—	—	—	54,263
	PS/TSR	2/8/22	—	—	—	155	311	622	—	—	—	69,023

(1) *The Company entered into a Separation Agreement with Mr. Lau on September 23, 2022. Any of Mr. Lau's unvested RS, SAR, PS/RSG, PS/OPM and PS/TSR awards at the time of his separation from the Company on September 30, 2022 were forfeited. An amount equal to Mr. Lau's target 2022 annual cash incentive award, prorated for the period of service during the year, was paid pursuant to the Senior Severance Policy as set forth in his Separation Agreement. See the "Separation Agreement" section on page 66.*

(2) *The amounts reported in the Estimated Future Payouts Under Non-Equity Incentive Plan Awards columns reflect the target, threshold and maximum short-term incentive award opportunity for each of the NEOs under the Company's Short-Term Incentive Plan. The NEOs are eligible for a payout within the threshold and maximum range depending upon several performance factors such as earnings per share, operating profit improvement, free and operating cash flow and strategic objectives. See the "Short-Term Incentive Compensation" section on page 42.*

(3) *The amounts reported in the Estimated Future Payouts Under Equity Incentive Plan Awards columns reflect the target number of performance shares ("PS") awarded to the NEOs under the Equity Plan on February 8, 2022, and the threshold and maximum number of performance shares that may be earned. Performance shares are earned on three measures: (i) Relative Sales Growth ("RSG"), (ii) Adjusted Operating Profit Margin ("OPM") and (iii) Relative Total Shareholder Return ("TSR"). The actual number of performance shares earned will be determined at the end of a three-year period. See the "Performance Share Awards" section on page 47.*

(4) *The amounts reported in the All Other Stock Awards and All Other Option Awards columns reflect the number of shares of Restricted Stock ("RS") and Stock Appreciation Rights ("SARs") awarded under the Equity Plan on February 8, 2022. SARs are subject to vesting in three equal annual installments on the anniversary of the grant date. Upon retirement, RS will vest in full. SARs and RS become fully vested upon death or disability.*

(5) *The amount reported in the Exercise or Base Price of Option Awards column reflects the mean between the high and low trading prices of the Company's Common Stock on the trading day immediately preceding the date of grant which was the fair market value of the Company's Common Stock as defined under the Equity Plan.*

(6) *The amounts reported in the Grant Date Fair Value of Stock and Option Awards column reflect the aggregate fair value of the RS and SARs granted to each NEO on February 8, 2022, based upon the probable outcome of performance conditions, as applicable, and disclosed in Note 18 within the Notes to the Consolidated Financial Statements in the Company's 2022 Annual Report on Form 10-K filed with the SEC on February 9, 2023.*

Equity Award Plan Vesting Provisions - Grant Terms

The following table describes the general terms of each of the equity incentive awards granted to the applicable NEOs on February 8, 2022.

	Restricted Stock	Performance Shares	Stock Appreciation Rights
Description	A grant of a number of shares subject to forfeiture if not vested.	A promise to receive a number of shares on the third-year anniversary of the grant date subject to meeting performance goals.	Right to receive, in stock, the appreciation in value between the stock price on the date of grant and date of exercise.
Abbreviation	RS	PS	SARs
Vesting Period	3-year cliff vesting on the anniversary of the grant date[(1)].	3-year cliff vesting on attainment of three stated performance measures.	1/3 per year on the anniversary of the grant date.

(1) *The vesting period for restricted stock is generally three-years except in limited instances for retention or for talent acquisition purposes.*

Outstanding Equity Awards at 2022 Fiscal Year End

The following table provides information on all restricted stock, SARs and performance share awards held by the NEOs and the value of such holdings measured as of December 31, 2022. All outstanding equity awards are in shares of the Company's Common Stock.

		Option Awards(2)				Stock Awards			
Name	Grant Date	No. of Securities Underlying Unexercised Options Exercisable (#)	No. of Securities Underlying Unexercised Options Unexercisable (#)	Option Exercise Price ($)	Option Expiration Date	No. of Shares or Units of Stock that have not Vested(3) (#)	Market Value of Shares or Units that have not Vested(4) ($)	Equity Incentive Plan Awards: No. of Unearned Shares, Units, or other Rights that have not Vested(5) (#)	Equity Incentive Plan Awards: Market or Payout Value of Unearned Shares Units or other Rights that have not Vested(6) ($)
Gerben W. Bakker	2/1/14	4,668	—	117.16	2/1/24	—	—	—	—
	12/2/14	9,970	—	106.44	12/2/24	—	—	—	—
	12/8/15	13,813	—	97.48	12/8/25	—	—	—	—
	12/6/16	17,090	—	113.69	12/6/26	—	—	—	—
	12/5/17	19,170	—	127.51	12/5/27	—	—	—	—
	12/14/18	16,547	—	105.49	12/14/28	—	—	—	—
	7/1/19	13,765	—	129.28	7/1/29	—	—	—	—
	2/13/20	22,112	11,057	149.49	2/13/30	5,609	1,316,320	11,218	2,632,640
	2/10/21	11,615	23,230	163.26	2/10/31	6,281	1,474,025	12,563	2,948,285
	2/8/22	—	29,936	185.87	2/8/32	6,322	1,483,647	12,643	2,967,059
William R. Sperry	2/13/20	—	5,275	149.49	2/13/30	2,676	628,004	5,352	1,256,007
	2/10/21	4,955	9,911	163.26	2/10/31	2,680	628,942	5,360	1,257,885
	2/8/22	—	11,465	185.87	2/8/32	2,421	568,160	4,842	1,136,321
Allan J. Connolly	12/14/18	4,137	—	105.49	12/14/28	—	—	—	—
	7/1/19	5,882	—	129.28	7/1/29	—	—	—	—
	2/13/20	6,592	3,297	149.49	2/13/30	1,672	392,385	3,345	785,005
	2/10/21	2,902	5,805	163.26	2/10/31	1,570	368,448	3,139	736,661
	2/8/22	—	7,006	185.87	2/8/32	1,480	347,326	2,959	694,418
Peter J. Lau(1)	—	—	—	—	—	—	—	—	—
Katherine A. Lane	7/1/17	883	—	113.03	7/1/27	—	—	—	—
	12/5/17	2,442	—	127.51	12/5/27	—	—	—	—
	12/14/18	2,868	—	105.49	12/14/28	—	—	—	—
	7/1/19	8,118	—	129.28	7/1/29	—	—	—	—
	2/13/20	4,944	2,473	149.49	2/13/30	1,254	294,289	2,509	588,812
	2/10/21	2,265	4,531	163.26	2/10/31	1,225	287,483	2,450	574,966
	2/8/22	—	5,414	185.87	2/8/32	1,143	268,239	2,287	536,713
Alyssa R. Flynn	12/5/17	2,442	—	127.51	12/5/27	—	—	—	—
	12/14/18	2,722	—	105.49	12/14/28	—	—	—	—
	2/13/20	1,220	610	149.49	2/13/30	309	72,516	619	145,267
	2/10/21	566	1,133	163.26	2/10/31	306	71,812	613	143,859
	2/8/22	—	2,229	185.87	2/8/32	471	110,534	942	221,069

(1) *The Company entered into a Separation Agreement with Mr. Lau on September 23, 2022. Any of Mr. Lau's unvested restricted stock, SARs and performance share awards at the time of his separation from the Company on September 30, 2022 were forfeited. See the "Separation Agreement" section on page 66.*

(2) *The Option Awards column reflects SARs that were granted to each NEO on the dates shown. SARs entitle the recipient to receive the value in shares of the Company's Common Stock equal to the positive difference between the base price and the fair market value of a share of Common Stock upon exercise. Generally, SARs vest and become exercisable in three equal installments on each of the first three anniversaries of the grant date. See the "Equity Award Plan Vesting Provisions-Grant Terms" section on page 59.*

(3) *The No. of Shares or Units of Stock that have not Vested column reflects restricted stock granted on the following dates and terms: (i) 2/8/22, 2/10/21, and 2/13/20 RS grants - vest on the third-year anniversary of the grant date. See the "Equity Award Plan Vesting Provisions-Grant Terms" section on page 59.*

(4) *The Market Value of Shares or Units that have not Vested is based upon the closing market price of the Company's Common Stock on December 30, 2022, the last business day of 2022, of $234.68.*

(5) *The Equity Incentive Plan Awards: No. of Unearned Shares, Units, or Other Rights that have not Vested column reflects performance shares granted at target on the following dates and terms for the performance periods noted: (A) 2/8/22 and 2/10/21 - vest based on achievement of each of three measures as described in the "Performance Share Awards" section on page 47 at the end of a three-year performance period (1/1/22 - 12/31/24 and 1/1/21 - 12/31/23, respectively) and (B) 2/13/20 - vest based on achievement of each of three measures as described in the "Performance Share Awards" section on page 47 at the end of a three-year performance period (1/1/20 - 12/31/22), as adjusted based on TSR performance.*

(6) *The Equity Incentive Plan Awards: Market or Payout Value of Unearned Shares, Units or Other Rights that have not Vested column is based upon the closing market price of the Company's Common Stock on December 30, 2022, the last business day of 2022, of $234.68.*

Option Exercises and Stock Vested During Fiscal Year 2022

The following table provides information on the number of shares acquired and the value realized by the NEOs during fiscal year 2022 on the exercise of SARs and on the vesting of restricted stock and performance shares.

	Option Awards[1]		Stock Awards	
Name	No. of Shares Acquired on Exercise (#)	Value Realized Upon Exercise ($)	No. of Shares Acquired on Vesting (#)	Value Realized Upon Vesting ($)
Gerben W. Bakker	3,971	312,061	2,263	406,254[2]
	—	—	3,575	688,297[3]
William R. Sperry	24,778	2,331,246	1,160	208,243[2]
	—	—	4,649	895,075[3]
Allan J. Connolly	—	—	967	173,596[2]
	—	—	893	171,929[3]
Peter J. Lau	2,265	173,590	1,381	284,776[2]
	—	—	—	—
Katherine A. Lane	—	—	1,334	239,480[2]
	—	—	230	44,282[3]
Alyssa R. Flynn	5,998	414,526	1,338	247,209[2]
	—	—	330	63,536[3]

(1) *The amounts reported in the **Option Awards - Value Realized Upon Exercise** column reflect the number of shares acquired upon exercise multiplied by the difference between the base price of the SAR and the market price of the Company's Common Stock on the date of exercise.*

(2) *The amounts reported in the **Stock Awards - Value Realized Upon Vesting** column reflect the number of shares of time-based restricted stock acquired upon vesting multiplied by the closing market price of the Company's Common Stock on the following vesting dates: February 10, 2022 - $188.44, February 11, 2022 - $184.76, July 1, 2022 - $179.52 and September 1, 2022 - $206.21.*

(3) *The amounts reported in the **Stock Awards - Value Realized Upon Vesting** column reflect the number of performance shares earned multiplied by the closing market price of the Company's Common Stock on the following vesting dates - February 9, 2022 - $191.95 and May 2, 2022 - $193.50.*

Pension Benefits in Fiscal Year 2022

The following table provides information on the retirement benefits for the NEOs under the Company's DB Plan and DB Restoration Plan in which they participate. See the "Employee Benefits" section on page 53.

Name	Plan Name	No. of Years Credited Service (#)	Present Value of Accumulated Benefit[1] ($)	Payments During the Last Fiscal Year ($)
Gerben W. Bakker	DB Plan	25.92	807,045	—
	DB Restoration Plan	25.92	2,692,894	—

(1) *For the DB Plan and the DB Restoration Plan, the present value of accrued benefits at December 31, 2022 are determined based on the Pri-2012 Healthy Annuitant Mortality White Collar tables, sex distinct, with generational projection from 2012 using Scale MP-2021 and using a discount rate of 5.50%. Participants are assumed to retire at age 62 or current age, if later.*

Pension Benefit Calculations

The following paragraphs describe the manner in which benefits are calculated under each of the Company's retirement plans:

DB Plan and DB Restoration Plan

The DB Plan provides for participation by all regular full-time salaried employees (other than employees who are subject to a collective-bargaining agreement) who were employed by covered Company businesses on December 31, 2003.

The annual benefits under the DB Plan upon normal retirement (age 65) are calculated under the following formula in which Final Average Pay refers to the average of the executive's highest three consecutive years' earnings (base salary and short-term incentives) in the last ten years:

- For certain participants hired before January 1, 2004, including Mr. Bakker, the formula is as follows:

0.85% × Years of Service (up to 35) × Final Average Pay + 0.65% × [Final Average Pay less Social Security Covered Compensation] × Years of Service (up to 35) + 1.10% × [Final Average Compen-sation] × Years of Service (>35)

Benefits under the DB Restoration Plan are calculated in the same manner as benefits under the DB Plan, but without regard to any limits on compensation or benefit accruals that may apply under the DB Plan as required by the tax-qualified plan rules. DB Restoration benefits are payable based on a life annuity distribution (although 50% of the benefits are payable to the participant's surviving spouse in the event of his or her death after commencing benefits), except that benefits are paid out as a lump sum if a participant as of the date of a change in control experiences a termination of employment within 2 years following the change in control.

Beginning in 2017, the DB Plan began a transition to being fully frozen. Years of Service was frozen under the DB Plan and the DB Restoration Plan effective February 28, 2017 and Final Average Pay, Social Security Covered Compensation, and Social Security Benefit was frozen under the DB Plan and the DB Restoration Plan effective December 31, 2020.

DC Plan and DC Restoration Plan

As described under the Employee Benefits section on page 53, the DC Plan provides eligible participants with a fixed non-elective contribution of 4% of eligible earnings and a matching contribution equal to 50% of the first 6% of a participant's eligible earnings that the employee voluntarily contributes to the DC Plan.

The Company also provides a DC Restoration Plan to allow for excess contributions on behalf of those employees whose contributions are limited under the tax-qualified DC Plan due to compensation limits imposed by the IRS. Employees impacted by those limitations receive a contribution under the DC Restoration Plan equal to the same percentage used for the DC Plan multiplied by their eligible earnings in excess of the IRS limits.

The DC Restoration Plan provides each participant with (i) an annual non-elective contribution equal to the excess of 4% of eligible earnings over the amount credited as a safe harbor non-elective contribution to the DC Plan for that year and (ii) an annual matching contribution equal to 50% of the first 6% of a participant's eligible earnings that he or she voluntarily contributes to the DC Plan and/or defers to the Executive Deferred Compensation Plan less the maximum amount of matching contributions that could have been credited under the DC Plan if he or she had contributed the maximum amount permitted under the DC Plan for that year.

Non-Qualified Deferred Compensation

Executive Deferred Compensation Plan ("EDCP")

The EDCP enables certain designated senior executives (including the current NEOs) to defer up to 50% of their annual base salary and up to 100% of their annual short-term incentive compensation. Amounts deferred under the EDCP are nominally invested at the discretion of the participant in the same mutual funds available to all employees in the DC plan and all participants are immediately 100% vested in the amounts they elect to defer. The Company is permitted to make discretionary contributions to EDCP participants and to make contributions subject to vesting conditions or other restrictions.

Participants are generally required to make their deferral elections by December 31 of the year prior to the year in which the base pay is paid, and the short-term incentive award is earned. At that time, participants also elect the future date for distributions. Distributions can be made at any time while the participant remains an employee (but no sooner than two years after the year for which the deferral is made) or upon separation from service or a change in control. Distributions upon separation from service may be made in a lump sum or installments over 5, 10 or 15 years. In-service distributions and distributions upon a change in control are made in a lump sum. Participants may also access their accounts under the EDCP in the event of an unforeseen emergency.

Non-Qualified Deferred Compensation in Fiscal Year 2022

The following table provides information on the benefits earned by each NEO under the Company's EDCP and DC Restoration Plan.

Name	EDCP Executive Contributions in 2022(1) ($)	EDCP Aggregate Earnings in Last FY(2) ($)	DC Restoration Plan Registrant Contributions in 2022(3) ($)	DC Restoration Plan Aggregate Earnings in Last FY(2) ($)	Aggregate Withdrawals/ Distributions ($)	Aggregate Balance at 12/31/22(4) ($)
Gerben W. Bakker	111,351	(133,382)	88,911	(51,316)	—	1,039,155
William R. Sperry	48,435	(27,773)	58,806	(95,578)	—	760,775
Allan J. Connolly	42,592	(20,992)	63,168	(22,152)	—	273,418
Peter J. Lau	31,715	(5,042)	26,206	(1,533)	—	74,776
Katherine A. Lane	—	(5,069)	18,466	(10,586)	—	84,527
Alyssa R. Flynn	34,169	(48,548)	12,265	(16,165)	—	320,466

(1) *The amounts reported in the EDCP Executive Contributions in 2022 column reflect elective deferrals of short-term incentive awards into the EDCP as follows: Mr. Bakker – 6% and Ms. Flynn - 25%, and elective deferral of base salary as follows: Mr. Bakker - 6%, Mr. Sperry - 7%, Mr. Connolly - 7%, and Mr. Lau - 4%. The short-term incentive amounts were earned and deferred for services in 2021 but credited to the EDCP in 2022, which is the time payments under the Incentive Compensation Plan are generally made. The amounts in this column include amounts also included in the Summary Compensation Table for 2022 under the Salary column (for 2022) and the Non-Equity Incentive Compensation Plan column (for 2021).*

(2) *The amounts reported in the EDCP Aggregate Earnings in Last FY and DC Restoration Plan Aggregate Earnings in Last FY columns include aggregate notional earnings on the EDCP account balances and the DC Restoration Plan balances in 2022. Amounts deferred under the EDCP and the DC Restoration Plan are credited with earnings on the basis of individual notional investment directions made by each participant.*

(3) *The amounts reported in the DC Restoration Plan Registrant Contributions in 2022 column reflect each NEO's credits under the DC Restoration Plan earned for services in 2021 and credited to the DC Restoration Plan in 2022. The amount does not include the following accrued restoration company retirement contribution and restoration match contributions earned in 2022 to be credited in 2023, which amounts are detailed in the footnote and included in the All Other Compensation column of the Summary Compensation Table on page 56 for 2022: Mr. Bakker - $108,560, Mr. Sperry - $59,831, Mr. Connolly - $44,552, Ms. Lane - $23,741 and Ms. Flynn - $17,288.*

(4) *The amounts reported in the Aggregate Balance at 12/31/22 column reflect each NEO's balance credited to the EDCP and the DC Restoration Plan.*

The material terms of the non-qualified deferred compensation plans are further described under the "Pension Benefit Calculations" section on page 62 and the "Non-Qualified Deferred Compensation" section above.

Potential Post-Employment Compensation Arrangements

The Company does not have employment agreements with any of the NEOs. The Company offers post-employment compensation and benefits to the NEOs under its Senior Severance Policy (which is available to senior level employees in addition to NEOs), its retirement plans and individual CIC Agreements with its NEOs that provide compensation and benefits only in the event of certain terminations in connection with a change in control (as defined in the CIC Agreements). In addition, NEOs may be entitled to post termination compensation and benefits under the terms of the Company's Equity Plan, STI Plans and other benefit plans. The section below describes the types of compensation and benefits an NEO is eligible to receive under these plans, policies and agreements based on five termination scenarios: (i) involuntary termination, (ii) death, (iii) disability, (iv) retirement and (v) following a change in control and involuntary termination. No amounts in excess of vested rights under any of the Company's plans are generally payable to the NEOs upon voluntary termination or termination for cause.

Senior Severance Policy

The Senior Severance Policy offers the following benefits to NEOs:

- 4 weeks base salary continuation for each year of service with a minimum of 26 weeks and a maximum of 78 weeks.
- Continued medical, dental and life insurance benefits for the salary continuation period.
- Pro-rated portion of their target short-term incentive award earned through the date of termination.
- Outplacement services for up to 12 months.

Involuntary termination includes, for purposes of the Senior Severance Policy, a termination by the employer without cause and a resignation by the NEO due to a material change in the NEO's authority, duties, responsibilities or base compensation, or a significant change in the location of the NEO's employment location. In the event of a change in control followed by an involuntary termination, in lieu of any benefits under the Senior Severance Policy, the NEOs would be eligible for severance benefits pursuant to the terms of their CIC Agreements, as applicable.

Equity Plan

NEOs received grants under the Equity Plan in 2022. The treatment of outstanding equity awards upon involuntary termination (i.e. termination by the Company without cause), retirement and death and disability is set forth in the Post-Employment and Change in Control Payment table on page 67.

Outstanding awards under the Equity Plan do not automatically vest and become payable upon a change in control (as defined in the Equity Plan). Instead, the awards may vest in the discretion of the Compensation Committee in the event they are not assumed by the acquiring company. The table below shows the treatment of equity awards upon a change in control under the Equity Plan:

Post-Termination Vesting Terms for Equity Plan Grants

The following table shows the vesting provisions of equity awards upon termination under the scenarios shown.

Award Type	Involuntary Termination	Retirement(1)	Death/Disability
Performance Shares	Unvested shares forfeited	Eligible for a pro-rata portion of shares based on the number of months the NEO served during the performance period	Target number of shares fully vest
RS (time-based)	Unvested shares forfeited	Unvested shares fully vest	Unvested shares fully vest
SARs	Unvested SARs forfeited. May exercise vested SARs for the earlier of 90 days after the termination date or the 10th anniversary of the grant date	Unvested SARs continue to vest in the normal course. Vested SARs exercisable until the 10th anniversary of the grant date	Unvested SARs fully vest. Following disability termination, vested SARs are exercisable until the earlier of 90 days after the termination date or the 10th anniversary of the grant date. Upon death (or if the NEO dies within 90 days of termination due to disability or retirement) SARs are exercisable until the earlier of one year after death or the 10th anniversary of the grant date

(1) Retirement means that the NEO has terminated employment with the Company, is at a minimum age of 55 and the executive's age plus years of service with the Company equals or exceeds 70.

Change in Control	Change in Control and Involuntary Termination
Unless otherwise determined by the Compensation Committee, unvested time-based RS and SARs will be assumed by the acquirer and continue to vest. Treatment of unvested PS are subject to discretion of the Compensation Committee.	Unvested awards fully vest only if the NEO is involuntarily terminated without cause within 12 months following a change in control.

Change in Control Severance Agreements

Each of our NEOs (other than Mr. Lau) is a party to a CIC Agreement, which provides severance benefits in the event of a termination of employment by the executive for good reason or by the Company (other than for cause or due to the executive's death, disability or retirement) within two years after a change in control or, in certain circumstances, in anticipation of a change in control.

A "change in control" is generally defined as a change in the majority of the Company's Board of Directors during any 12 month period, the acquisition by a party directly or indirectly of 30% or more of the voting power of the Company during any 12 month period, a sale of substantially all of the Company's assets and the acquisition by a party of more than 50% of either the voting power of the Company or the fair market value of the Company. CIC Agreements may only be granted with the approval of the Board of Directors upon the recommendation of the Compensation Committee. The Compensation Committee and the Board of Hubbell believe that these agreements with the NEOs (other than Mr. Lau) are intended to eliminate or reduce any transactions that may be in the best interests of the Company's shareholders and are only offered to officers of the Company.

In the event of a change in control, the benefits provided to the NEOs under their CIC Agreements are as follows:

- A lump sum payment of the NEO's base salary multiplied by 2.5 for Messrs. Bakker and Sperry and 2.0 for Mr. Connolly and Mses. Lane and Flynn.
- Continued medical, dental, vision and life insurance benefits after termination for 2.5 years for Messrs. Bakker and Sperry and 2 years for Mr. Connolly and for Mses. Lane and Flynn.
- A lump sum payment of the target short-term incentive award for the year in which the change in control occurs multiplied by 2.5 for Messrs. Bakker and Sperry and 2.0 for Mr. Connolly and for Mses. Lane and Flynn.
- A lump sum payment of the pro-rated portion of their target annual short-term incentive award for the year in which the termination occurs.
- The incremental value of additional age and service credit under all applicable Supplemental Plans (subject to the terms of each plan freeze) payable as a lump sum.
- Outplacement services up to 12 months following termination at a cost not to exceed the lesser of 15% of the NEO's annual base salary or $50,000.

The CIC Agreements contain a provision whereby the severance multiple is reduced in monthly increments over the two-year period following the NEO's 63rd birthday until it reaches one times the executive's base salary and average short-term incentive award. The CIC Agreements also provide that if an executive would have otherwise incurred excise taxes under Section 4999 of the Code, such payments may be reduced to the "safe harbor amount" so that no excise taxes would be due, if such reduction would result in the executive being in a better net after tax position. The CIC Agreements do not provide for any tax gross up in the event the payments are not reduced and thus the executive would be required to pay any excise taxes under Section 4999 of the Code. Benefits described above in this section are only payable under the CIC Agreements if an NEO is terminated by the Company other than for "cause" or if the NEO terminates employment for "good reason", as each term is defined in the CIC Agreements.

The Company has established a grantor trust to secure the benefits to be provided under the CIC Agreements, the Non-Qualified Supplemental Retirement Plans and other plans maintained by the Company for the benefit of members of the Company's senior management.

For additional information relating to change in control benefits, see the Severance and Change in Control Benefits section on page 54.

Employment Agreements with Named Executive Officers

The Company does not have employment agreements with any of the NEOs.

Separation Agreement

The Company entered into a Separation Agreement with Mr. Lau on September 23, 2022 (the "Separation Agreement") in connection with his termination of employment with the Company on September 30, 2022. The terms of the Separation Agreement were governed by the Senior Severance Policy and included Mr. Lau's receipt of: (i) severance of $300,000; (ii) a cash payment of $337,500, which is equal to his 2022 STI award at target, prorated for his period of employment during 2022, and (iii) continuation of benefits. The Separation Agreement also contains a release of claims against the Company.

DB Restoration Plan

Under the terms of the DB Restoration Plan, upon a termination of employment due to disability, a participant is entitled to an unreduced immediate pension benefit based upon such participant's service as of the date service was frozen under each plan (February 28, 2017, for the DB Restoration Plan).

Among other provisions, the DB Restoration Plan provides for the (i) suspension, reduction or termination of benefits in cases of gross misconduct by a participant; (ii) forfeiture of benefits if a retired participant engages in certain competitive activities; and (iii) reduction in benefits upon early retirement. In addition, a participant's years of service with the Company (as calculated for the purpose of determining eligibility for the DB Restoration Plan benefits) and benefits accrued prior to the change in control event, may not be reduced after the occurrence of a change in control. If a participant's employment is terminated within 2 years after a change in control, the participant will receive payment of DB Restoration Plan benefits in one lump sum within 10 days after termination. In addition, all amounts under the DC Restoration Plan are paid in a lump sum within 60 days following a change in control.

As described above, the CIC Agreements also provide for additional incremental benefits based on age and service credit, to the extent applicable, under the Supplemental Plans upon qualifying terminations of employment in connection with a change in control.

Potential Payments

The following table reflects the estimated incremental post-termination amounts that would have been payable to an NEO on December 31, 2022, in the event of death, disability, involuntary termination without cause, retirement (if potentially applicable, as of December 31, 2022), or a change in control combined with an involuntary termination (other than for Mr. Lau, whose table entries show his actual payment entitlements upon termination on September 30, 2022). No benefits are provided to an NEO solely upon a change in control unless such officer experiences a qualifying termination following a change in control. The amounts in the table are calculated in accordance with the terms of the applicable plans, policies and agreements described in the preceding table and assume that the NEO has met the applicable eligibility requirements. The amounts in the table do not include (i) any value that would be realized upon the exercise of vested SARs or settlement of vested Performance Shares or RS to the extent the awards were vested prior to December 31, 2022, by their terms, and (ii) the estimated value of vested and accrued pension benefits that would be received upon any termination of employment under the terms of the Company's retirement plans.

Post-Employment and Change in Control Payment Table

Name	Severance[1] ($)	Equity Awards with Accelerated Vesting[2][3] ($)	Pension Benefits[4] ($)	Welfare Benefits[5] ($)	Total ($)
Gerben W. Bakker					
Death	—	16,884,184	—	—	16,884,184
Disability[6]	—	16,884,184	—	—	16,884,184
Involuntary Termination[7]	2,763,974	4,273,992	—	79,484	7,117,450
Retirement[8]	—	4,273,992	—	—	4,273,992
Change in Control and Involuntary Termination[9],[10],[11]	3,935,002	16,884,184	729,222	103,253	21,651,661
William R. Sperry					
Death	—	7,192,145	—	—	7,192,145
Disability[6]	—	7,192,145	—	—	7,192,145
Involuntary Termination[7]	1,373,940	1,825,106	—	74,080	3,273,126
Retirement[8]	—	1,825,106	—	—	1,825,106
Change in Control and Involuntary Termination[9],[10],[11]	2,471,038	7,192,145	—	109,935	9,773,118
Allan J. Connolly					
Death	—	4,361,670	—	—	4,361,670
Disability[6]	—	4,361,670	—	—	4,361,670
Involuntary Termination[7]	832,892	—	—	62,096	894,988
Change in Control and Involuntary Termination[9],[10],[11]	1,694,436	4,361,670	—	92,602	6,148,708
Peter J. Lau					
Death	N/A	N/A	N/A	N/A	N/A
Disability[6]	N/A	N/A	N/A	N/A	N/A
Involuntary Termination[7]	637,500	—	—	58,970	696,470
Katherine A. Lane					
Death[6]	—	3,349,039	—	—	3,349,039
Disability	—	3,349,039	—	—	3,349,039
Involuntary Termination[7]	827,784	—	—	57,872	885,656
Change in Control and Involuntary Termination[9],[10],[11]	1,199,190	3,349,039	—	69,696	4,617,925
Alyssa R. Flynn					
Death[6]	—	1,006,739	—	—	1,006,739
Disability	—	1,006,739	—	—	1,006,739
Involuntary Termination[7]	435,000	—	—	61,040	496,040
Change in Control and Involuntary Termination[9],[10],[11]	859,536	1,006,739	—	87,844	1,954,119

(1) The amounts reported in the Severance column reflect base salary entitlements under the Senior Severance Policy and base salary and bonus entitlements under each NEO's CIC Agreement. In addition, Severance includes a pro rata portion of the NEO's target bonus through the date of termination.

(2) The amounts reported in the Equity Awards with Accelerated Vesting column reflect the value realized by the NEO upon the exercise of all unvested SARs, the vesting of all unvested RS and PS that would vest upon death, disability, or a qualifying change in control. Upon a change in control, if the unvested RS and SARs are assumed by the acquirer and an NEO is terminated without cause within one year of such change in control, such awards will become fully vested prior to the date of termination. If the NEO is not terminated without cause within one year of the change in control, such equity awards will not accelerate. Treatment of unvested PS upon a change in control shall be subject to the discretion of the Compensation Committee.

(3) For Mr. Bakker and Mr. Sperry who meet the definition of retirement eligibility, the amounts shown reflect the value realized upon the vesting of all unvested restricted shares upon retirement. No other executive officer will be retirement eligible during the open vesting period of outstanding equity awards. The value realized is calculated using the closing market price of the Company's Common Stock on December 30, 2022, the last business day of 2022, of $234.68. The amounts shown do not include the value of (i) SARs that are unvested at retirement, but become exercisable post-retirement, or (ii) outstanding performance shares at retirement which may vest on a pro-rated basis at the end of the applicable performance period, because in each case the value would not be determinable as of the last day of the calendar year as it would not have vested on such date.

(4) The amounts reported in the Pension Benefits column include amounts payable under the Company's qualified and nonqualified pension plans and nonqualified deferred compensation plans only to the extent the amounts are not described in the Pension Benefit Calculations section discussed above on page 62 or the Non-Qualified Deferred Compensation section discussed on page 63. In the event of a Change in Control, even without termination of employment, amounts under the EDCP distributions will be paid in a lump sum, but no additional value is allocated to the payment in this table. The value listed represents the present value of the payments under EDCP in the Non-Qualified Deferred Compensation section discussed above on page 63.

(5) The amounts reported in the Welfare Benefits column include the payment of outplacement services for the NEOs for up to twelve months and insurance benefit continuation calculated in accordance with the terms of the Senior Severance Policy and CIC Agreements, as applicable.

(6) The amounts reported in the "Disability" rows are calculated based on a 5.5% discount rate and using the disability mortality table published in Internal Revenue Ruling 96-7. This table assumes a different life expectancy than the tables used to calculate the present value of accumulated benefits under the Company's retirement plans. In the event of disability, the incremental retirement plan benefit was calculated by comparing the disability benefit to the vested accrued benefit under the qualified and non-qualified plans as of December 31, 2022.

(7) "Involuntary Termination," for purposes of this row, refers to a termination by the Company without cause as described in the Senior Severance Policy prior to the occurrence of a Change in Control. NEOs are not entitled to these benefits in the event of a termination for cause, death or disability.

(8) "Retirement," for purposes of this row, refers to a voluntary termination by the NEO (after age 55 and 10 years of service). In addition to the amounts described in this chart, the executive will be entitled to payout of the amounts described under the Pension Benefit Calculations section discussed above on page 62.

(9) The amounts reported in the Severance column for Change in Control and Involuntary Termination are equal to the product of (a) a multiple specified in each NEO's CIC Agreement and (b) the sum of (x) the NEO's base salary and (y) the then-current target bonus payable to the NEO in the year which the change in control occurs. The specified multiple may be reduced pursuant to the CIC Agreements, as discussed further in the "Change in Control Severance Agreements" section above. In addition, Severance includes a pro rata portion of the NEO's target bonus through the date of termination.

(10) "Change in Control and Involuntary Termination," for purposes of this row, refers to a termination by the Company without cause (as defined in the CIC Agreement) or by the NEO for good reason (as defined in the CIC Agreement) within 2 years following a change in control (as defined in the CIC Agreement). As noted above, the amounts payable include a lump sum payment of the NEO's base salary multiplied by 2.5 for Messrs. Bakker and Sperry and 2.0 for Mr. Connolly and Mses. Lane and Flynn.

(11) No benefits shall automatically become payable to the NEOs upon a change in control (as defined in the Equity Plan) due to their unvested RS and SARs until and unless the NEO experiences a qualifying termination related to such change in control. This row assumes such a qualifying termination (a termination by the Company without cause) occurs within 12 months following a change in control. Treatment of unvested PS upon a change in control shall be subject to the discretion of the Compensation Committee.

CEO Pay Ratio

The SEC requires annual disclosure of the ratio of the CEO's annual total compensation to the annual total compensation of the Company's median employee.

We identified the median of the annual total compensation of all our employees by examining the 2022 annual salary for all employees, excluding the CEO, who were employed by us on November 15, 2022, as reflected in our payroll records as reported to the Internal Revenue Service on Form W-2 for 2022, as well as our payroll records for all non-U.S. entities. We selected November 15, 2022 because it enabled us to make such identification in a reasonably efficient and economical manner. We did not make any assumptions, adjustments, or estimates with respect to this compensation measure and we did not annualize the compensation for any full-time employees that were not employed by us for all of 2022.

After identifying the median employee, we calculated annual total compensation for 2022 for such employee in accordance with SEC rules. Hubbell's median employee's annual total compensation for 2022 was estimated at $47,027.

Mr. Bakker had 2022 annual total compensation of $8,145,111 as reflected in the "Total" column reported in the Summary Compensation Table on page 56. As a result, we estimate that Mr. Bakker's annual compensation was approximately 173 times that of Hubbell's median employee.

Due to the use by other companies of estimates, assumptions, adjustments, and statistical sampling permitted by SEC rules, pay ratio disclosures generally may involve a degree of imprecision. Accordingly, our pay ratio is merely a reasonable estimate calculated in a manner consistent with SEC Rules and may not be comparable to the pay ratio disclosures of other companies.

Pay Versus Performance

The following table provides information in accordance with rules adopted by the SEC pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010.

Year	Summary Compensation Table Total for PEO 1 ($)(1)	Compensation Actually Paid to PEO 1 ($)(2)	Summary Compensation Table Total for PEO 2 ($)(1)	Compensation Actually Paid to PEO 2 ($)(2)	Average Summary Compensation Table Total for Non-PEO Named Executive Officers ($)(1)	Average Compensation Actually Paid to Non-PEO Named Executive Officers ($)(2)	Value of Initial Fixed $100 Investment Based on: Total Shareholder Return ($)(3)	Peer Group Total Shareholder Return ($)(3)(4)	Net Income from Continuing Operations Attributable to Hubbell ($ millions)	Adjusted Diluted EPS (5)
2022	8,145,111	16,337,722	N/A	N/A	2,343,695	4,107,995	169.88	119.67	511.3	10.62
2021	6,088,700	12,169,471	N/A	N/A	2,180,790	3,924,025	147.66	146.76	365.0	8.05
2020	6,674,686	5,334,561	8,981,039	7,598,826	2,228,169	2,320,228	108.90	118.61	330.0	7.14

(1) *Gerben W. Bakker became Chief Executive Officer, effective on October 1, 2020, and is reflected in the tables above and below as Principal Executive Officer ("PEO") 1. Prior to that, David G. Nord served as Chief Executive Officer, and he is reflected in the tables as PEO 2. The non-PEO NEOs for 2020 are William R. Sperry, Allan J. Connolly, Stephen M. Mais, and Rodd R. Ruland; for 2021 are William R. Sperry, Allan J. Connolly, Peter J. Lau and Katherine A. Lane; and for 2022 are William R. Sperry, Allan J. Connolly, Peter J. Lau, Katherine A. Lane and Alyssa R. Flynn.*

(2) *Compensation Actually Paid ("CAP") reflects the exclusions and inclusions for the PEOs and NEOs set forth below.*

PEO 1: Gerben W. Bakker	2022	2021	2020
Summary Compensation Table Total	8,145,111	6,088,700	6,674,686
Less: Aggregate grant date fair value of restricted stock and performance shares granted in the applicable year as calculated in accordance with FASB ASC Top 718	(3,579,025)	(3,130,670)	(2,541,156)
Less: Aggregate grant date fair value of SARs granted in the applicable year as calculated in accordance with FASB ASC Top 718	(1,174,988)	(1,025,488)	(838,512)
Plus: The fair value as of the end of the fiscal year of unvested equity awards granted in that year	8,505,609	6,411,661	3,663,876
Plus: The change in fair value during the year of equity awards granted in prior years that remained outstanding and unvested at the end of the year	2,784,556	3,216,228	(55,020)
Plus: The change in fair value during the year through the vesting date of equity awards granted in prior years that vested during that year	1,656,459	601,582	147,663
Plus: Dividends or other earnings paid in stock or option awards in the covered fiscal year prior to the vesting date that are not otherwise included in the total compensation for the covered fiscal year	—	—	—
Plus: Awards that are granted and vest in the same year, the fair value as of the vesting date	—	—	—
Less: Aggregate change in the actuarial present value of accumulated benefit under the retirement plans in which they participate	—	—	(1,716,976)
Less: Awards granted in any prior fiscal year that fail to meet the applicable vesting conditions during the covered fiscal year, the amount equal to the fair value at the end of the prior fiscal year	—	—	—
Plus: Service costs, or the actuarial present value of applicable benefit under all such plans attributable to services rendered during the applicable fiscal year and any prior service costs, where applicable	—	7,458	—
Compensation Actually Paid to PEO 1	16,337,722	12,169,471	5,334,561

PEO 2: David G. Nord	2022	2021	2020
Summary Compensation Table Total	N/A	N/A	8,981,039
Less: Aggregate grant date fair value of restricted stock and performance shares granted in the applicable year as calculated in accordance with FASB ASC Top 718	N/A	N/A	(3,862,554)
Less: Aggregate grant date fair value of SARs granted in the applicable year as calculated in accordance with FASB ASC Top 718	N/A	N/A	(1,274,491)
Plus: The fair value as of the end of the fiscal year of unvested equity awards granted in that year	N/A	N/A	5,569,030
Plus: The change in fair value during the year of equity awards granted in prior years that remained outstanding and unvested at the end of the year	N/A	N/A	(770,376)
Plus: The change in fair value during the year through the vesting date of equity awards granted in prior years that vested during that year	N/A	N/A	1,026,483
Plus: Dividends or other earnings paid in stock or option awards in the covered fiscal year prior to the vesting date that are not otherwise included in the total compensation for the covered fiscal year	N/A	N/A	—
Plus: Awards that are granted and vest in the same year, the fair value as of the vesting date	N/A	N/A	—
Less: Aggregate change in the actuarial present value of accumulated benefit under the retirement plans in which they participate	N/A	N/A	(2,070,305)
Less: Awards granted in any prior fiscal year that fail to meet the applicable vesting conditions during the covered fiscal year, the amount equal to the fair value at the end of the prior fiscal year	N/A	N/A	—
Plus: Service costs, or the actuarial present value of applicable benefit under all such plans attributable to services rendered during the applicable fiscal year and any prior service costs, where applicable	N/A	N/A	—
Compensation Actually Paid to PEO 2	N/A	N/A	7,598,826

Non-PEO Named Executive Officers	2022	2021	2020
Summary Compensation Table Total	2,343,695	2,180,790	2,228,169
Less: Aggregate grant date fair value of restricted stock and performance shares granted in the applicable year as calculated in accordance with FASB ASC Top 718	(776,747)	(834,774)	(879,657)
Less: Aggregate grant date fair value of SARs granted in the applicable year as calculated in accordance with FASB ASC Top 718	(254,992)	(273,441)	(253,122)
Plus: The fair value as of the end of the fiscal year of unvested equity awards granted in that year	1,845,901	1,709,616	1,226,859
Plus: The change in fair value during the year of equity awards granted in prior years that remained outstanding and unvested at the end of the year	623,409	884,446	(87,273)
Plus: The change in fair value during the year through the vesting date of equity awards granted in prior years that vested during that year	326,729	257,388	135,936
Plus: Dividends or other earnings paid in stock or option awards in the covered fiscal year prior to the vesting date that are not otherwise included in the total compensation for the covered fiscal year	—	—	—
Plus: Awards that are granted and vest in the same year, the fair value as of the vesting date	—	—	—
Less: Aggregate change in the actuarial present value of accumulated benefit under the retirement plans in which they participate	—	—	(50,684)
Less: Awards granted in any prior fiscal year that fail to meet the applicable vesting conditions during the covered fiscal year, the amount equal to the fair value at the end of the prior fiscal year	—	—	—
Plus: Service costs, or the actuarial present value of applicable benefit under all such plans attributable to services rendered during the applicable fiscal year and any prior service costs, where applicable	—	—	—
Compensation Actually Paid to PEO 2	4,107,995	3,924,025	2,320,228

(3) *Dollar values assume $100 was invested for the cumulative period from December 31, 2019 through December 31, 2022, in either the Company or the peer group, and reinvestment of the pre-tax value of dividends paid. Historical stock performance is not necessarily indicative of future stock performance.*

(4) *For purposes of this disclosure, the peer group used is the Dow Jones U.S. Electrical Components & Equipment Index.*

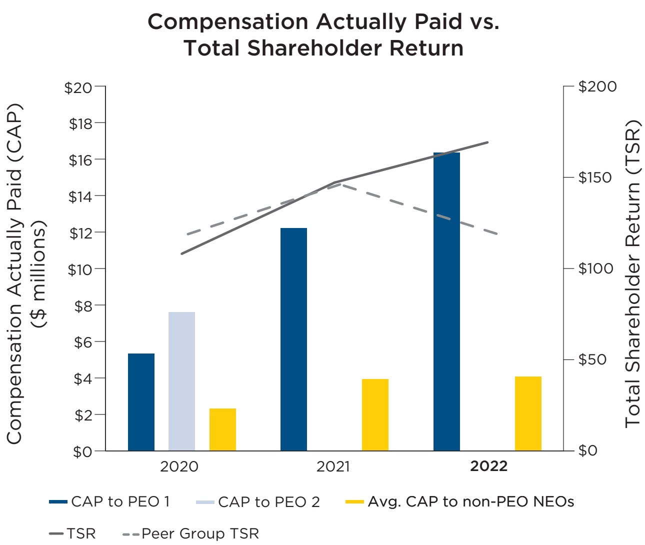
(5) *"Adjusted Diluted EPS" was determined to be the "most important" financial performance metric used to link performance to CAP for 2022. Adjusted Diluted EPS is a non-GAAP financial measure. A reconciliation to the comparable GAAP financial measure can be found in Management's Discussion and Analysis of Financial Condition and Results of Operations in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023.*

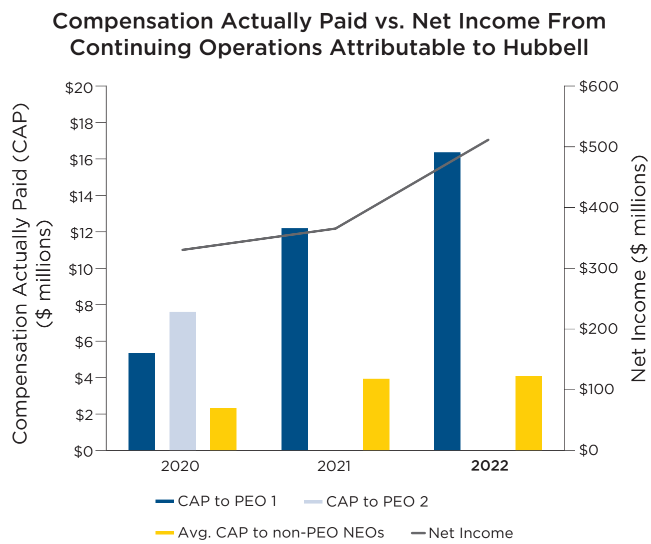
Most Important Measures to Determine CAP for the fiscal year ended December 31, 2022

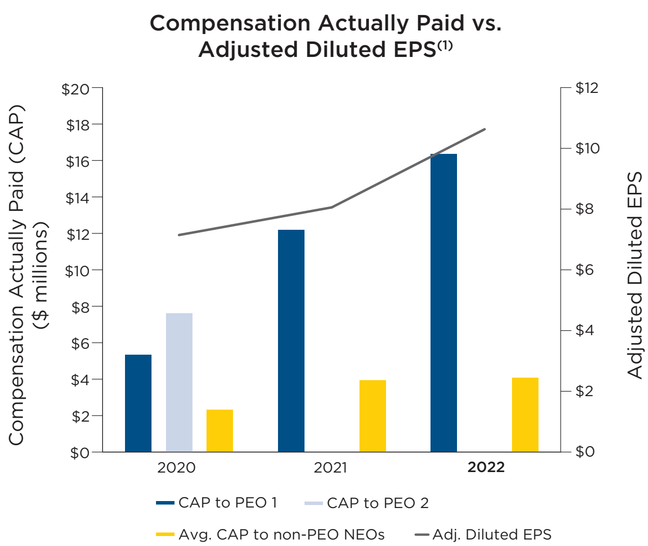
The four items listed in the table below represent the most important metrics we used to determine CAP for the fiscal year ended December 31, 2022, as further described in the CD&A section beginning on page 34. The table below explains why each measure is important to us.

Most Important Measures
Adjusted Diluted Earnings Per Share (EPS)[(1)]
Relative Sales Growth
Adjusted Operating Profit Margin[(1)]
Relative Total Shareholder Return

The following is a graphic illustration of the connection between pay and performance:







(1) Adjusted diluted earnings per share and adjusted operating profit margin are non-GAAP financial measures. A reconciliation to the comparable GAAP financial measures can be found in Management's Discussion and Analysis of Financial Condition and Results of Operation in our Annual Report on Form 10-K for the year ended December 31, 2022, filed with the SEC on February 9, 2023.

Proposal 4 Ratification of the Selection of Independent Registered Public Accounting Firm

The Audit Committee of the Board of Directors, which consists entirely of independent Directors, is responsible for the appointment, compensation, retention, evaluation and termination of the Company's independent registered public accounting firm (independent auditor). The Audit Committee is also responsible for overseeing the negotiation of the audit fees associated with the retention of the independent auditor.

The Audit Committee has appointed PricewaterhouseCoopers LLP as the Company's independent auditor for 2023. In executing its responsibilities, the Audit Committee engages in an annual evaluation of the independent auditor's qualifications, performance and independence. The Audit Committee regularly meets with the lead audit partner without members of management present which provides the opportunity for continuous assessment of the independent auditor's effectiveness and independence and for consideration of rotating audit firms.

Although ratification of our selection of independent auditors is not required, we value the opinions of our shareholders and wish to submit the matter to a vote at the 2023 Annual Meeting as a matter of sound corporate governance.

PricewaterhouseCoopers LLP has served as the Company's independent auditors since at least 1961. The Audit Committee periodically takes into consideration whether there should be a regular rotation of the independent auditor.

In accordance with SEC rules, the independent auditor's lead engagement partner rotates every five years. The Audit Committee is directly involved in the selection of the independent auditor's lead engagement partner.

The Audit Committee and Hubbell's Board of Directors believe that the continued retention of PricewaterhouseCoopers LLP to serve as the Company's independent external audit firm for 2023 is in the best interests of the Company and its shareholders. We have been advised that a representative of PricewaterhouseCoopers LLP will attend the 2023 Annual Meeting of Shareholders to respond to appropriate questions and will be afforded the opportunity to make a statement if desired.

In the event the selection of PricewaterhouseCoopers LLP is not ratified by the shareholders, the Audit Committee would reconsider the selection of PricewaterhouseCoopers LLP as the Company's independent auditor. Even if the selection of independent auditors is ratified, the Audit Committee still retains the discretion to select a different independent auditor at any time if it determines that such a change would be in the best interests of the Company and our shareholders.

The affirmative vote of a majority of the votes cast by the holders of our Common Stock is required to ratify the selection of PricewaterhouseCoopers LLP as the independent registered public accounting firm of the Company. Majority of votes cast means that the number of votes cast "FOR" the proposal exceed the number of votes cast "AGAINST" the proposal. Abstentions and broker non-votes are not considered to be votes cast and therefore will not affect the voting results. Brokers have the discretionary authority to vote on the ratification of auditors and therefore we do not expect any broker non-votes in connection with the ratification.

THE BOARD UNANIMOUSLY RECOMMENDS A VOTE ✓ FOR THE RATIFICATION OF THE SELECTION OF PRICEWATERHOUSECOOPERS LLP.

Independent Accounting Firm Fees

PricewaterhouseCoopers LLP provided the following audit and other services during 2021 and 2022.

	2021	2022	
Audit Fees	$ 4,803,500	$ 3,892,750	• Audit Fees consist primarily of the annual integrated audit of the Company's annual consolidated financial statements, and internal control over financial reporting, review of the interim consolidated financial statements included in quarterly reports and services that are normally provided by PricewaterhouseCoopers LLP in connection with statutory and regulatory filings or engagements. Audit Fees also include the cost of carve-out audits associated with business dispositions.
Audit Related Fees	$ 699,500	$ 212,000	• Audit Related Fees primarily include accounting advisory services as well as quality of earnings support associated with acquisition and divestiture related activity. In addition, Audit Related Fees include assurance and related services that are reasonably related to performance of the audit of the Company's consolidated financial statements and are not reported under Audit Fees.
All Other Fees	$ 6,900	$ 6,900	• All Other Fees are primarily for products and services other than the services reported above. These services are related to subscription services purchased from the independent registered public accounting firm.
TOTAL FEES	**$ 5,509,900**	**$ 4,111,650**	

Audit and Non-Audit Services Pre-Approval Policy

The Company's Audit and Non-Audit Services Pre-Approval Policy (the "Services Policy") sets forth the policies and procedures by which the Audit Committee reviews and approves all services to be provided by the independent auditors prior to their engagement. The Services Policy underscores the need to ensure the independence of the independent auditor while recognizing that the independent auditor may possess the expertise on certain matters that best position it to provide the most effective and efficient services on certain matters unrelated to accounting and auditing.

The Audit Committee will only pre-approve the services that it believes enhance the Company's ability to manage or control risk. The Audit Committee is also mindful of the relationship between fees for audit and non-audit services in deciding whether to pre-approve any such services. The Services Policy provides the Audit Committee with a description of services that can be performed such as audit, audit-related, tax and other permissible non-audit services. The Audit Committee periodically monitors the services rendered and actual fees paid to the independent auditors. Any proposed services exceeding pre-approved amounts also require pre-approval by the Audit Committee. In the interim periods during which the Audit Committee is not scheduled to meet, the Chair of the Audit Committee can authorize spending which exceeds pre-approved levels. As part of the process, the Audit Committee shall consider whether such services are consistent with SEC rules and regulations on auditor independence.

During 2022, all audit services, audit related services, and other services provided by PricewaterhouseCoopers LLP were pre-approved by the Audit Committee.

Audit Committee Report

The Audit Committee of the Board of Directors is comprised of independent Directors functioning in accordance with a written charter last revised, adopted and approved by the Board of Directors effective May 4, 2021, which Charter is then reviewed annually by the Audit Committee. As provided in the Charter, the Audit Committee assists the Company's Directors in fulfilling their responsibilities relating to corporate accounting, the quality and integrity of the Company's financial reports, and the Company's reporting practices. The functions of the Audit Committee are further described in the "Corporate Governance" section on page 18.

In connection with the discharge of its responsibilities, the Audit Committee has taken a number of actions, including, but not limited to, the following:

- The Audit Committee reviewed and discussed with management and the independent registered public accounting firm the Company's audited financial statements.
- The Audit Committee discussed with the independent registered public accounting firm the matters required to be discussed per applicable requirements of the Public Company Accounting Oversight Board and the SEC.
- The Audit Committee received from the independent registered public accounting firm the written disclosures and letter required by applicable requirements of the Public Company Accounting Oversight Board regarding the independent registered public accounting firm's communications with the Audit Committee concerning independence, discussed their independence with them and satisfied itself as to the independence of the independent registered public accounting firm.

Based on the foregoing reviews and discussions, the Audit Committee recommended to the Company's Board of Directors that the audited financial statements be included in the Company's Annual Report on Form 10-K for the year ended December 31, 2022 filed with the SEC.

Audit Committee

Bonnie C. Lind, Chair
Rhett A. Hernandez
John F. Malloy
Jennifer M. Pollino

Additional Information

Solicitation Expenses

The Company will pay the cost of soliciting proxies for the 2023 Annual Meeting. Original solicitation of proxies may be supplemented by telephone, facsimile, electronic mail or personal solicitation by the Company's Directors, officers or employees. No additional compensation will be paid to the Company's Directors, officers or employees for such services. The Company has retained MacKenzie Partners, Inc. to assist in the solicitation of proxies at an estimated cost of $20,000, plus reasonable expenses.

Stock Ownership Information

Five Percent Owners Of Company Stock

The Company has a single class of Common Stock and each share of Common Stock is entitled to one vote. On March 3, 2023, the Company had outstanding 53,578,419 shares of Common Stock. As of that date, the Company had 1,203 Common Stock holders of record. The following table sets forth as of March 3, 2023 the beneficial owners of more than 5% of the Company's Common Stock:

Title of Class	Name and Address of Beneficial Owner	Amount and Nature of Beneficial Ownership	Percent of Class
Common Stock	The Vanguard Group 100 Vanguard Blvd. Malvern, PA 19355	5,635,364(1)	10.5%
Common Stock	BlackRock, Inc. 55 East 52nd Street New York, NY 10055	5,424,991(2)	10.1%
Common Stock	T. Rowe Price Associates, Inc. 100 E. Pratt Street Baltimore, MD 21202	3,518,326(3)	6.6%

(1) The Company received a copy of Schedule 13G/A filed with the SEC on February 9, 2023, by The Vanguard Group ("Vanguard") reporting ownership of these shares as of December 30, 2022. According to the Schedule 13G/A, Vanguard has sole voting power as to none of these shares, sole dispositive power as to 5,570,014 of these shares, shared voting power as to 29,894 of these shares, and shared dispositive power as to 65,350 of these shares.

(2) The Company received a copy of Schedule 13G/A filed with the SEC on February 9, 2023, by BlackRock, Inc. ("BlackRock") reporting ownership of these shares as of January 31, 2023. According to the Schedule 13G/A, BlackRock has sole voting power as to 5,029,710 of these shares and sole dispositive power with respect to 5,424,991 of these shares. The shares were acquired by the following subsidiaries of BlackRock: BlackRock Life Limited, BlackRock Advisors, LLC, BlackRock (Netherlands) B.V., BlackRock Fund Advisors, Aperio Group, LLC, BlackRock Institutional Trust Company, National Association, BlackRock Asset Management Ireland Limited, BlackRock Financial Management, Inc., BlackRock Japan Co., Ltd., BlackRock Asset Management Schweiz AG, BlackRock Investment Management, LLC, BlackRock Investment Management (UK) Limited, BlackRock Asset Management Canada Limited, BlackRock (Luxembourg) S.A., BlackRock Investment Management (Australia) Limited, BlackRock Advisors (UK) Limited, BlackRock Asset Management North Asia Limited, BlackRock (Singapore) Limited, BlackRock Fund Managers Ltd. BlackRock Fund Advisors beneficially owns 5% or greater of the outstanding shares of the security class reported on the Schedule 13G/A, as amended, filed with the SEC on February 9, 2023.

(3) The Company received a copy of Schedule 13G/A filed with the SEC on February 14, 2023, by T. Rowe Price Associates, Inc. ("T. Rowe Price") reporting ownership of these shares as of December 31, 2022. According to the Schedule 13G/A, T. Rowe Price has sole voting power as to 1,312,632 of these shares, and sole dispositive power as to 3,518,326 of these shares.

Stock Ownership Of Directors And Executive Officers

Hubbell's Corporate Governance Guidelines for directors and Stock Ownership Policy for officers aligns their interests with our shareholders.

Directors are subject to our Stock Ownership Policy and are **required to own Company stock** equal in value to five times their average annual base cash retainer no later than the fifth (5th) anniversary of the date on which such Director receives their first annual restricted share grant. Until a Director meets their ownership minimum, the Director must retain all Company shares they directly or indirectly obtain. **All Directors are in compliance with this policy**. The Guidelines further describe Director stock ownership requirements.

The Stock Ownership Policy section on page 52 details stock ownership requirements for the NEOs and executive officers of the Company. The Guidelines and the Stock Ownership Policy can both be viewed on the Company's website at **www.hubbell.com**. **All Executive Officers, including all current NEOs, are in compliance with the Stock Ownership Policy.**

The following table sets forth as of March 3, 2023 information regarding the beneficial ownership of the Company's Common Stock by each Director, each of the NEOs, and by all Directors and current executive officers of the Company as a group.

In addition to the shares of Common Stock reflected in the Total Beneficial Ownership column below, our Directors hold stock units and restricted stock units, as applicable, under the Deferred Plan for Directors. These deferred stock units are reflected in footnotes (2) and (3) in the table below and are further detailed in the Deferred Compensation Plan section on page 30. To our knowledge, except as indicated in the footnotes to this table and pursuant to applicable community property laws, the persons listed in the table have sole investment and voting power with respect to all Company securities owned by them.

Name and Title of Class	Common Stock	Shares Obtainable Upon Exercise of Options/SARs(1)	Total Beneficial Ownership	Aggregate No. of Stock Units Held(2)	Aggregate No. of Restricted Stock Units Held(3)	Total Ownership
Carlos M. Cardoso	1,744	—	1,744(4)	2,310	7,665	11,719
Anthony J. Guzzi	6,490	—	6,490	30,897	13,231	50,618
Rhett A. Hernandez	1,493	—	1,493(4)	—	—	1,493
Neal J. Keating	8,071	—	8,071	7,053	13,231	28,355
Bonnie C. Lind	600	—	600	1,747	3,780	6,127
John F. Malloy	16,599	—	16,599(4)	1,739	1,786	20,124
Jennifer M. Pollino	1,493	—	1,493(4)	—	—	1,493
John G. Russell	6,911	—	6,911(4)	6,139	6,915	19,965
Gerben W. Bakker	28,617	132,949	161,566(5)	—	—	161,566
William R. Sperry	43,392	19,006	62,398(5)	—	—	62,398
Allan J. Connolly	5,062	28,047	33,109(5)	—	—	33,109
Peter J. Lau	1,695	—	1,695(5)	—	—	1,695
Katherine A. Lane	4,943	28,062	33,005(5)	—	—	33,005
Alyssa R. Flynn	3,155	8,869	12,024(5)	—	—	12,024
All Directors and current executive officers as a group (14 persons)						
Common Stock	127,694	225,792	353,486(5)(6)	—	—	353,486

(1) Represents shares of Common Stock obtainable upon the exercise of stock appreciation rights under the Equity Plan. See the "Outstanding Equity Awards at 2022 Fiscal Year End" section on page 60.

(2) Represents stock units (each stock unit consisting of one share of Common Stock) held under the Company's Deferred Plan for Directors, as of March 3, 2023. See the section "Deferred Compensation Plan" on page 30.

(3) Represents vested and unvested restricted stock units ("RSUs") (each RSU consisting of the right to receive one share of Common Stock) held under the Company's Deferred Plan for Directors, as of March 3, 2023. See the "Deferred Compensation Plan" section on page 30.

(4) Includes 744 shares of Common Stock granted as restricted stock under the Equity Plan, on May 3, 2022 which vest on the date of the 2023 Annual Meeting of Shareholders if the Director is still serving (or earlier, upon death or a change in control).

(5) Does not include the following shares of Common Stock granted as restricted stock under the Equity Plan which vest on the following terms, as applicable: (i) three equal annual installments on the anniversary of the grant date; or (ii) at the end of a three-year performance period subject to achievement of certain performance goals. Mr. Bakker - 18,387, Mr. Sperry - 7,122, Mr. Connolly - 4,190 Ms. Lane - 3,353 and Ms. Flynn - 1,321; and all executive officers as a group 35,085 shares. See the "Outstanding Equity Awards at 2022 Fiscal Year End" section on page 60.

(6) Includes 100,000 shares of Common Stock held by The Hubbell Foundation of which two corporate officers and two senior employees of the Company are co-trustees and have shared voting and investment power.

Compensation Committee Interlocks and Insider Participation

Throughout 2022, no member of the Compensation Committee was an employee, officer or former officer of the Company, or had any relationship requiring disclosure under Item 407 of Regulation S-K. None of our executive officers served on the board or compensation committee of any entity in 2022 that had an executive officer serving as a member of our Board of Directors or Compensation Committee.

Review and Approval of Related Person Transactions

The Board of Directors has adopted a written related person transaction policy. The NCGC administers the policy, which applies to all transactions in which the Company is or will be a participant and the amount exceeds $100,000 and in which any related person was or will be a participant or had, or will have a direct or indirect material interest. A related person includes any person who is or was since the beginning of the last fiscal year a Director, executive officer, nominee for Director or beneficial owner of more than 5% of the Company's Common Stock, or any of his or her immediate family members. The NCGC will determine, based on the facts and circumstances it deems appropriate, whether such related person transaction should be approved. As required under SEC rules, transactions that are determined to be directly or indirectly material to the Company or a related person are disclosed in the Company's Proxy Statement. For fiscal year 2022, the Company had no related person transactions that were required to be disclosed in the Company's Proxy Statement, under Item 404 of Regulation S-K. See the discussion under "Director Independence" on page 20.

Shareholder Proposals and Nominations for Director

Director Nominations Intended for Inclusion in our 2024 Proxy Materials (Proxy Access)

The proxy access provision of the Company's By-Laws permits a shareholder, or a group of up to 20 shareholders, owning 3% or more of the Company's outstanding common stock continuously for at least three years to nominate and include in the Company's proxy materials for an annual meeting director candidates constituting up to the greater of two individuals or 20% of the number of members then serving on our Board, if the nominating shareholder(s) and the nominee(s) satisfy the requirements specified in the Company's By-Laws. Assuming that our 2024 annual meeting is not advanced by more than 20 days or delayed by more than 70 days from the first anniversary of the date of the 2023 annual meeting, we must receive the notice of a proxy access nomination for the 2024 annual meeting no earlier than February 2, 2024, and no later than February 22, 2024, in order to be considered.

Proposals Intended for Inclusion in the 2024 Proxy Materials

Shareholder proposals to be considered for inclusion in the Company's proxy materials related to the 2024 Annual Meeting of Shareholders pursuant to Rule 14a-8 under the Securities Exchange Act of 1934, as amended, must be received by the Company no later than November 21, 2023.

Proposals Not Intended for Inclusion in the 2024 Proxy Materials

The Company's By-Laws set forth specific procedures and requirements in order to nominate a Director or submit a proposal to be considered at the 2024 Annual Meeting of Shareholders. These procedures require that any nominations or proposals must be received by the Company no earlier than February 2, 2024, and no later than February 22, 2024, in order to be considered.

If, however, the date of the 2024 Annual Meeting is more than 20 days before or more than 70 days after May 2, 2024, shareholders must submit such nominations or proposals not earlier than the 90th day prior to the meeting and not later than the close of business on the later of the 70th day prior to the meeting or the 10th day following the day on which public announcement of the date of the meeting is first made by us. In addition, with respect to nominations for Directors, if the number of Directors to be elected at the 2024 Annual Meeting is increased and there is no public announcement by us naming all of the nominees for Director or specifying the size of the increased Board at least 80 days prior to May 2, 2024, notice will also be considered timely, but only with respect to nominees for any new positions created by such increase, if it is delivered to the Secretary at our principal executive offices not later than the close of business on the 10th day following the day on which such public announcement is first made by us.

A shareholder’s notice to nominate a Director or bring any other business before the 2024 Annual Meeting must set forth certain information specified in our By-Laws. For additional information on the time limitations and requirements related to Director nominations or other shareholder proposals, see the Company’s By-Laws at **www.hubbell.com** in the Corporate Governance section.

In addition to satisfying the foregoing notice requirements under our By-Laws, to comply with the universal proxy rules under the Exchange Act, shareholders who intend to solicit proxies in support of director nominees other than the Company’s nominees must provide notice that sets forth the information required by Rule 14a-19 under the Exchange Act no later than March 4, 2024.

Proposals and other items of business should be directed to Hubbell Incorporated c/o Katherine A. Lane, Senior Vice President, General Counsel and Secretary, 40 Waterview Drive, Shelton, Connecticut 06484.

Eliminating Duplicative Proxy Materials (“Householding”)

A single annual report and proxy statement or notice of internet availability of proxy materials may be delivered to multiple shareholders sharing an address unless contrary instructions have been received from the affected shareholders. If at any time, a shareholder no longer wishes to participate in “householding” and would prefer to receive such shareholder's own separate copy of the 2023 proxy statement and 2022 annual report, or notice of internet availability of proxy materials and/or wishes to receive separate copies of these documents in the future, or if at any time, shareholders who share an address and receive separate copies of the 2023 proxy statement and 2022 annual report, or notice of internet availability of proxy materials would like to receive a single copy of these documents in the future, such shareholder or shareholders may (1) notify their broker or (2) direct their written or oral request to our transfer agent, Computershare, via regular mail to, Computershare, PO Box 43078, Providence, RI 02940-3078, or via phone, toll-free 800-874-1136. Upon written or oral request of shareholders at a shared address to which a single copy of the 2023 proxy statement, notice of internet availability of proxy materials, or 2022 annual report was delivered, our transfer agent will deliver promptly separate copies of these documents.

Availability of Annual Report on Form 10-K

Copies of our Annual Report on Form 10-K for the fiscal year ended December 31, 2022 (without exhibits or documents incorporated by reference therein) are available without charge to shareholders upon written request to Hubbell Incorporated c/o Katherine A. Lane, Senior Vice President, General Counsel and Secretary, 40 Waterview Drive, Shelton, Connecticut 06484, or by calling (475) 882-4144, by first class mail or other equally prompt means within one (1) business day of receipt of such request, or via the Internet at **www.hubbell.com**.

2022
Form 10K

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, DC 20549

FORM 10-K

☑ ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(D) OF THE SECURITIES EXCHANGE ACT OF 1934
FOR THE FISCAL YEAR ENDED DECEMBER 31, 2022

☐ TRANSITION REPORT PURSUANT TO SECTION 13 OR 15(D) OF THE SECURITIES EXCHANGE ACT OF 1934
Commission File Number 1-2958

HUBBELL INCORPORATED

(Exact name of registrant as specified in its charter)

CONNECTICUT	**06-0397030**
(State or other jurisdiction of incorporation or organization)	*(I.R.S. Employer Identification No.)*
40 Waterview Drive Shelton CT	**06484**
(Address of principal executive offices)	*(Zip Code)*

(475) 882-4000
(Registrant's telephone number, including area code)

SECURITIES REGISTERED PURSUANT TO SECTION 12(b) OF THE ACT:		
Title of each Class	Trading Symbol(s)	Name of Exchange on which Registered
Common Stock — par value $0.01 per share	**HUBB**	**New York Stock Exchange**

SECURITIES REGISTERED PURSUANT TO SECTION 12(g) OF THE ACT:
NONE

Indicate by check mark	YES	NO
• **if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act.**	☑	☐
• **if the registrant is not required to file reports pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934.**	☐	☑
• **whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such report), and (2) has been subject to such filing requirements for the past 90 days.**	☑	☐
• **whether the registrant has submitted electronically every Interactive Data File required to be submitted and posted pursuant to Rule 405 of Regulation S-T (§232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files).**	☑	☐
• **whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company or an emerging growth company. See the definitions of "large accelerated filer," "accelerated filer", "smaller reporting company" and "emerging growth company" in Rule 12b-2 of the Exchange Act.**		
Large accelerated filer ☑ Accelerated filer ☐ Non-accelerated filer ☐ Smaller reporting company ☐ Emerging growth company ☐		
• **If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standard provided pursuant to Section 13(a) of the Exchange Act.**		☐
• **whether the registrant has filed a report on and attestation to its management's assessment of the effectiveness of its internal control over financial reporting under Section 404(b) of the Sarbanes-Oxley Act (15 U.S.C. 7262(b)) by the registered public accounting firm that prepared or issued its audit report.**		☑
• **whether the financial statements of the registrant included in the filing reflect the correction of an error to previously issued financial statements.(1)**		☐
• **whether any of those error corrections are restatements that required a recovery analysis of incentive-based compensation received by any of the registrant's executive officers during the relevant recovery period pursuant to §240.10D-1(b).(1)**		☐
• **whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act).**	☐	☑

(1) *Per SEC guidance, this blank checkbox is included on this cover page but no disclosure with respect thereto shall be made until the adoption and effectiveness of related stock exchange listing standards.*

The aggregate market value of the voting and non-voting stock held by non-affiliates of the registrant as of June 30, 2022 was $9,535,164,630*. The number of shares outstanding of Hubbell Common Stock as of February 3, 2023 is 53,600,592.

DOCUMENTS INCORPORATED BY REFERENCE

Portions of the definitive proxy statement for the registrant's 2023 annual meeting of shareholders to be filed with the Securities and Exchange Commission (the "SEC"), are incorporated by reference in answer to Part III of this Form 10-K.

* *Calculated by excluding all shares held by Executive Officers and Directors of registrant without conceding that all such persons or entities are "affiliates" of registrant for purpose of the Federal Securities Laws.*

Table of **Contents**

PART I

Item 1 Business

Hubbell Incorporated (herein referred to as “Hubbell”, the “Company”, the “registrant”, “we”, “our” or “us”, which references shall include its divisions and subsidiaries as the context may require) was founded as a proprietorship in 1888, and was incorporated in Connecticut in 1905. Recognized for our innovation, quality, and deep commitment to serving our customers for over 130 years, Hubbell is a world-class manufacturer of electrical and utility solutions, with more than 75 brands used around the world. We provide utility and electrical solutions that enable our customers to operate critical infrastructure reliably and efficiently, and we empower and energize communities through innovative solutions supporting energy infrastructure In Front of the Meter, on The Edge, and Behind the Meter. In Front of the Meter is where utilities transmit and distribute energy to their customers. The Edge connects utilities with owner/operators and allows energy and data to be distributed back and forth. Behind the Meter is where owners and operators of building and other critical infrastructure consume energy.

Our products are either sourced complete, manufactured or assembled by subsidiaries in the United States, Canada, Puerto Rico, Mexico, the People’s Republic of China (“China”), the United Kingdom (“UK”), Brazil, Australia, Spain and Ireland. Hubbell also participates in joint ventures in Hong Kong and the Philippines, and maintains offices in Singapore, Italy, China, India, Mexico, South Korea, Chile, and countries in the Middle East.

The Company’s reporting segments consist of the Utility Solutions segment and the Electrical Solutions segment.

The Company’s annual report on Form 10-K, quarterly reports on Form 10-Q, current reports on Form 8-K, and all amendments to those reports are made available free of charge through the Investor Relations section of the Company’s website at *http://www.hubbell.com* as soon as practicable after such material is electronically filed with, or furnished to, the SEC. The information contained on the Company’s website or connected to our website is not incorporated by reference into this Annual Report on Form 10-K and should not be considered part of this report.

Utility Solutions Segment

Hubbell Utility Solutions has leading positions In Front of the Meter and at The Edge. The Utility Solutions segment (58% of consolidated revenues in 2022, 56% in 2021 and 56% in 2020) consists of businesses that design, manufacture, and sell a wide variety of electrical distribution, transmission, substation, and telecommunications products, which support applications In Front of the Meter. This includes utility transmission & distribution (T&D) components such as arresters, insulators, connectors, anchors, bushings, enclosures, cutoffs and switches. The Utility Solutions segment also offers solutions that serve The Edge of the utility infrastructure, including smart meters, communications systems, and protection and control devices. Hubbell Utility Solutions supports the electrical distribution, electrical transmission, water, gas distribution, telecommunications, and solar and wind markets. While Hubbell believes its sales in this area are not materially dependent upon any customer or group of customers, a substantial variability in purchases by electrical utilities would affect this segment.

Products of the Utility Solutions segment are sold under the following brands and/or trademarks:

- Aclara®
- Fargo®
- Quazite®
- Electro Composites®
- Hot Box®
- EMC™
- Reliaguard®
- Continental®
- Ripley®
- Chance®
- Hubbell®
- Quadri*sil®
- USCO™
- PCORE®
- Longbow™
- Greenjacket®
- R.W. Lyall™
- Anderson®
- Polycast®
- Trinetics®
- CDR™
- Delmar™
- Ohio Brass®
- Armorcast®
- Gas Breaker®
- PenCell®
- Opti-loop Design®
- Reuel®
- RFL Design®
- Turner Electric®
- Meramec®
- Beckwith Electric™
- AEC™

Electrical Solutions Segment

Hubbell Electrical Solutions is positioned Behind the Meter, providing key components to building operators and industrial customers that enable them to manage their energy and operate critical infrastructure more efficiently and effectively. The Electrical Solutions segment (42% of consolidated revenues in 2022, 44% in 2021 and 44% in 2020) comprises businesses that sell stock and custom products including standard and special application wiring device products, rough-in electrical products, connector and grounding products, and lighting fixtures, as well as other electrical equipment.

Products of the Electrical Solutions segment have applications in the light industrial, non-residential, wireless communications, transportation, data center, and heavy industrial markets. Electrical Solutions segment products are typically used in and around industrial, commercial and institutional facilities by electrical contractors, maintenance personnel, electricians, utilities, and telecommunications companies. In addition, certain of our businesses design and manufacture industrial controls and communication systems used in the non-residential and industrial markets. Many of these products are designed such that they can also be used in harsh and hazardous locations where a potential for fire and explosion exists due to the presence of flammable gasses and vapors. Harsh and hazardous products are primarily used in the oil and gas (onshore and offshore) and mining industries. We also offer a variety of lighting fixtures, wiring devices and electrical products that have residential and utility applications, including residential products with Internet-of-Things ("IoT") enabled technologies.

These products are sold under various brands and/or trademarks and are primarily sold through electrical and industrial distributors, home centers, retail and hardware outlets, lighting showrooms and residential product oriented internet sites. Special application products are primarily sold through wholesale distributors to contractors, industrial customers and original equipment manufacturers ("OEMs"). Brands and/or trademarks of products of the Electrical Solutions segment include:

• Hubbell®	• Bell®	• Raco®	• Gleason Reel®	• ACME Electric®
• Kellems®	• TayMac®	• Hipotronics®	• Powerohm®	• EC&M Design®
• Bryant®	• Wiegmann®	• AccelTex Solutions™	• iDevices®	• Progress Lighting Design®
• Burndy®	• Killark®	• GAI-Tronics®	• Connector Products™	• Austdac™
• CMC®	• Hawke™	• Chalmit™	• PCX™	

Information Applicable to Our Business

International Operations

The Company has several operations located outside of the United States. These operations manufacture, assemble and/or procure and market Hubbell products and services for both the Utility Solutions and Electrical Solutions segments.

See Note 21 — Industry Segments and Geographic Area Information in the Notes to Consolidated Financial Statements and Item 1A. Risk Factors relating to manufacturing in and sourcing from foreign countries.

Customers

We have an extensive customer base of distributors, wholesalers, electric utilities, OEMs, electrical contractors, telecommunications companies and retail and hardware outlets. We are not dependent on a single customer, however, our top ten customers account for approximately 43% of our Net sales.

Raw Materials

Raw materials used in the manufacture of Hubbell products primarily include steel, aluminum, brass, copper, bronze, zinc, nickel, plastics, phenolics, elastomers and petrochemicals. Hubbell also purchases certain electrical and electronic components, including solenoids, lighting ballasts, printed circuit boards, integrated circuit chips and cord sets, from a number of suppliers. Hubbell is not materially dependent upon any one supplier for raw materials used in the manufacture of its products and equipment however the cost and supply of these materials may be affected by disruptions in availability of raw materials, components or sourced finished goods. See also Item 7A. Quantitative and Qualitative Disclosures about Market Risk.

Patents

Hubbell has approximately 3,000 active United States and foreign patents covering a portion of its products, which expire at various times. While Hubbell deems these patents to be of value, it does not consider its business to be dependent upon patent protection. Hubbell also licenses products under patents owned by others, as necessary, and grants licenses under certain of its patents.

Working Capital

Inventory, accounts receivable and accounts payable levels, payment terms and, where applicable, return policies are in accordance with the general practices of the electrical products industry and standard business procedures. See also Item 7. Management's Discussion and Analysis of Financial Condition and Results of Operations.

Backlog

Substantially all of the backlog existing at December 31, 2022 in the Electrical Solutions segment is expected to be shipped to customers in 2023. In the Utility Solutions segment, the backlog existing at December 31, 2022 includes backlog expected to be shipped during 2023, along with $320 million of backlog of contracts that span multiple years, primarily related to long-term contracts of the Aclara business to deliver and install meters and grid monitoring sensor technology. The backlog of orders believed to be firm at December 31, 2022 was $2,463.4 million compared to $1,848.0 million at December 31, 2021. Although this backlog is important, the majority of Hubbell's revenues result from sales of inventoried products or products that have short periods of manufacture.

Competition

Hubbell experiences substantial competition in all categories of its business, but does not compete with the same companies in all of its product categories. The number and size of competitors vary considerably depending on the product line. Hubbell cannot specify with precision the number of competitors in each product category or their relative market position. However, some of its competitors are larger companies with substantial financial and other resources. Hubbell considers product performance, reliability, quality and technological innovation as important factors relevant to all areas of its business and considers its reputation as a manufacturer of quality products to be an important factor in its business. In addition, product price, service levels and other factors can affect Hubbell's ability to compete.

Environment

The Company is subject to various federal, state and local government requirements relating to the protection of employee health and safety and the environment. The Company believes that, as a general matter, its policies, practices and procedures are properly designed to prevent unreasonable risk of environmental damage and personal injury to its employees and its customers' employees and that the handling, manufacture, use and disposal of hazardous or toxic substances are in accordance with environmental laws and regulations.

Like other companies engaged in similar businesses, the Company has incurred or acquired through business combinations, remedial response and voluntary cleanup costs for site contamination, and is a party to product liability and other lawsuits and claims associated with environmental matters, including past production of products containing toxic substances. Additional lawsuits, claims and costs involving environmental matters are likely to continue to arise in the future. However, considering past experience and reserves, the Company does not anticipate that these matters will have a material adverse effect on earnings, capital expenditures, financial condition or competitive position. See also Item 1A. Risk Factors and Note 16 — Commitments and Contingencies in the Notes to Consolidated Financial Statements.

Human Capital

Our commitment to developing our employees is one of four pillars that guide Hubbell as a company. We recruit, hire, and develop talent that meets and anticipates the ever-changing needs of our enterprise, while fostering an inclusive and diverse workplace. Hubbell provides market competitive compensation, health and well-being programs, and retirement benefits based on the countries and markets in which we operate to motivate market-leading performance.

As of December 31, 2022, Hubbell had approximately 16,300 salaried and hourly employees of whom approximately 9,800, or 60% are located in the United States. Approximately 1,800 of these U.S. employees are represented by 8 labor unions. Hubbell considers its labor relations to be satisfactory and regularly engages with its labor unions.

Hubbell is committed to fostering an environment that respects and encourages individual differences, diversity of thought, and talent. We strive to create a workplace where employees feel that their contributions are welcomed and valued, allowing them to fully engage their talents and training in their work, while generating personal satisfaction in their role within Hubbell. Hubbell has created a multi-year, enterprise-wide strategy dedicated to evolving our inclusive culture while addressing underrepresentation where it exists across our company. As of December 31, 2022, 32% of our employees identify as female, and within the United States, 30% identify as female and 45% are racially diverse.

Across the enterprise, there are a variety of ways we invest in our people to learn - on the job, in the classroom, through self-directed learning, or through leadership programs. We have expanded our learning management system (known as Hubbell University) to make new content and training available to our employees. The Company has also expanded leadership development programs to provide career development to employees at all levels and continues to expand its Campus Programs to foster a pipeline of early career talent at Hubbell.

The Company also fosters and encourages its employees to give back to their communities. The Company supports employees' spirit of volunteerism in their communities throughout the year with its Volunteer Paid Time Off policy, which provides all employees with up to 8 hours of paid time off a year to volunteer with an eligible 501(c)(3) charity of their choice.

As a manufacturing company we focus on protecting the health and safety of our employees. We dedicate resources to track and monitor safety and recordable incidents using an enterprise-wide data management system. Through the Company's myLife program, the Company provides comprehensive, competitive benefits that retain and support our employees supporting their health, wealth and peace of mind.

In October 2022, as a showing of appreciation to our employees continued excellence, the Company provided all employees globally with a Global Recharge Day. This paid day off provided all employees an opportunity to relax, refresh and recharge.

In 2022, Hubbell conducted an enterprise-wide employee survey, the Elevate Employee Experience Survey to better understand the voices of our employees worldwide. Elevate was the largest survey conducted by the Company and over 80% of Hubbell's employees responded, providing insights that the Company is translating into action plans.

Information about our Executive Officers

Name[1]	Age	Present Position	Business Experience
Gerben W. Bakker	58	Chairman of the Board, President and Chief Executive Officer	Present position since May 4, 2021; previously President and Chief Executive Officer since October 1, 2020; previously, President and Chief Operating Officer June 6, 2019 to October 1, 2020; Group President, Power Systems February 1, 2014 to June 6, 2019; Division Vice President, Hubbell Power Systems, Inc. ("HPS") August 2009 - February 2014; President, HPS Brazil June 2005 - July 2009; Vice President, Sourcing, HPS March 2004 - May 2005.
William R. Sperry	60	Executive Vice President, Chief Financial Officer	Present position since May 5, 2020; previously, Executive Vice President, Chief Financial Officer and Treasurer June 6, 2019 to May 2020; Senior Vice President and Chief Financial Officer June 6, 2012 to June 6, 2019; Vice President, Corporate Strategy and Development August 15, 2008 to June 6, 2012; Managing Director, Lehman Brothers August 2006 to April 2008; various positions, including Managing Director, of J.P. Morgan and its predecessor institutions, 1994-2006; also a member of the board of directors of MSA Safety Incorporated since February 2019.
Jonathan M. Del Nero	51	Vice President, Controller	Present position since January 15, 2021; previously, Assistant Controller June 14, 2014, to January 15, 2021; Executive Director, Financial Reporting, Aetna June 2011 to June 2014; Senior Manager, Technical Accounting, Stanley Black and Decker June 2009 to June 2011; Manager of Accounting Policy, The Hartford September 2008 to June 2009; various positions at CIGNA March 2003 to September 2008.
Allan J. Connolly	55	President, Utility Solutions Segment	Present position since July 1, 2019 (the Utility Solutions Segment was formerly known as the Power Systems Group); previously, President, Aclara February 2018 to June 28, 2019; President and Chief Executive Officer of Aclara May 2014 to February 2018; Chief Operating Officer of Culligan International July 2012 to January 2014; Executive Vice President of Operations, Engineering and N.A. Industrial of Culligan International November 2006 to July 2012; Vice President of Research, Development & Engineering of Culligan International April 2006 to November 2006; General Manager Technology; GE Power & Water March 2003 to April 2006.
Alyssa R. Flynn	51	Chief Human Resources Officer	Present position since February 15, 2022; previously Vice President, Compensation, Benefits & HR Systems from February 2014 to February 2022; Chief of Staff to the Chief Executive Officer from June 2021 to February 2022; various positions, including Vice President, Human Resources, at PepsiCo from 1996 to 2014.
Katherine A. Lane	45	Senior Vice President, General Counsel and Secretary	Present position since May 4, 2021; previously Vice President, General Counsel and Secretary since June 6, 2019; previously, Vice President, Acting General Counsel and Secretary March 2019 to June 6, 2019; Vice President, Associate General Counsel June 2017 to March 2019; Vice President, Legal, Hubbell Commercial & Industrial September 2015 to June 2017; Senior Counsel, Hubbell Electrical Systems May 2014 to September 2015; Corporate General Attorney August 2010 to May 2014. Previously, various positions in private practice in law firms based in Massachusetts and Connecticut.

(1) As of February 9, 2023, there are no family relationships among any of the above executive officers and any of our directors. For information related to our Board of Directors, refer to Item 10. Directors, Executive Officers and Corporate Governance.

Item 1A Risk Factors

Our business, operating results, financial condition, and cash flows may be affected by a number of factors including, but not limited to those set forth below. Any one of these factors could cause our actual results to vary materially from recent results or future anticipated results. See also Item 7. Management's Discussion and Analysis — "Executive Overview of the Business" and "Results of Operations".

COVID-19 Pandemic Risks

Our business and operations, and the operations of our suppliers, have been, and may in the future be adversely affected by epidemics or pandemics such as the COVID-19 pandemic outbreak

We may face risks related to health epidemics and pandemics or other outbreaks of communicable diseases.

A public health epidemic or pandemic, such as the COVID-19 pandemic, poses the risk that our employees, contractors, suppliers, customers and other business partners may be prevented from conducting business activities for an indefinite period of time, including due to shutdowns that may be requested or mandated by governmental authorities, or that such epidemic may otherwise interrupt or impair business activities.

The COVID-19 pandemic continues to cause disruption to the global economy, including in all of the regions in which we, our suppliers, distributors, business partners, and customers do business. We continue to monitor the pandemic, and while periodic local increases and decreases in COVID-19 cases are likely, generally the restrictions due to and in response to the pandemic continue to relax in most locations. However, the COVID-19 pandemic and efforts to manage it, including those by governmental authorities, have had, and could continue to have, an adverse effect on the economy and our business in many ways. This includes, but is not limited to, global supply chain shortages for materials and component parts used in our products and associated escalating prices. In addition to supply shortages, constrained transportation capacities have led to significant price increases in transportation costs. We expect to continue to be affected by supply chain issues due to factors largely beyond our control, including, a global shortage of semi-conductors, chips and components used in our products, a strain on raw materials and cost inflation, all of which could escalate in future quarters.

Although economic conditions have generally improved since the height of the pandemic, the strength of the economic recovery is uncertain and may vary across industries, customers and from country to country. The ultimate extent and robustness of any economic recovery from the impact of the pandemic imposes a significant degree of uncertainty and complexity, and may adversely affect our operations, customer demand and our costs of production. Failure of economic recovery to continue and adverse or weakening economic conditions may also result in deterioration in the collection of customer accounts receivable, as well as a reduction in sales.

Industry and Economic Risks

Inflation and other adverse conditions may adversely affect our business results of operations and financial condition

Our operating results can be sensitive to changes in general economic conditions, inflation, economic slowdowns, stagflation and recessions. Our sales are subject to market conditions that may cause customer demand for our products to be volatile and unpredictable, particularly in our Electrical Solutions segment. Product demand can be affected by fluctuations in domestic and international economic conditions, as well as currency fluctuations, commodity costs, and a variety of other factors.

We have recently experienced significant inflationary pressure across much of our business. Global supply chains continue to struggle to keep up with increasing demand due to the lingering impact of the COVID-19 pandemic. The resulting supply chain issues and increased demand have also led to increased freight, labor and commodity costs. In addition, various factors, including the level of economic activity in China and the conflict in Ukraine, has added to the volatility in energy costs. We have had to take various pricing actions to cover the higher costs and protect our margin profile. There can be no assurance that we will be able to maintain our margins in response to further changes in inflationary pressures.

In addition, macroeconomic effects such as increases in interest rates and other measures taken by central banks and other policy makers could have a negative effect on overall economic activity that could reduce our customers' demand for our products. Adverse changes in demand could impact our business, collection of accounts receivable and our expected cash flow generation from current and acquired businesses, which may adversely impact our financial condition and results of operations.

We operate in markets that are subject to competitive pressures that could affect selling prices or demand for our products

We compete on the basis of product performance, quality, service and/or price. Competitors' behavior related to these areas could potentially have significant impacts on our financial results. Our competitive strategy is to design and manufacture high quality products at the lowest possible cost. Our strategy is to also increase selling prices to offset rising costs of raw materials and components. Competitive pricing pressures may not allow us to offset some or all of our increased costs through pricing actions. Alternatively, if raw material and component costs decline, the Company may not be able to maintain current pricing levels. Competition could also affect future selling prices or demand for our products which could have an adverse impact on our results of operations, financial condition and cash flows.

Volatility in currency exchange rates may adversely affect our financial condition, results of operations and cash flows

Our international operations accounted for approximately 8% of our Net sales in 2022. We are exposed to the effects (both positive and negative) that fluctuating exchange rates have on translating the financial statements of our international operations, most of which are denominated in local currencies, into the U.S. dollar. Fluctuations in exchange rates may affect product demand and reported profits in our international operations. In addition, currency fluctuations may affect the prices we pay suppliers for materials used in our products, along with other local costs incurred in foreign countries for foreign entities with U.S. dollar functional currency. As a result, fluctuating exchange rates may adversely impact our results of operations and cash flows.

Uncertainty about the future of the London Interbank Offer Rate ("LIBOR") may adversely affect our business and financial results

Our 2021 Credit Facility uses LIBOR as a reference rate, such that the interest due pursuant to such borrowings may be calculated using LIBOR plus an applicable margin (determined by reference to a ratings based grid) or the alternate base rate. In March 2021, the UK's Financial Conduct Authority, which regulates LIBOR, announced that for most tenors of the USD LIBOR, rates would cease to be published after June 30, 2023, and one-week and two-month LIBOR ceased being published as of December 31, 2021. It is not possible to predict the effect of this announcement, including what alternative reference rates may replace LIBOR in use going forward, and how LIBOR will be determined for purposes of loans, securities and derivative instruments currently referencing it when it ceases to exist. Once LIBOR is no longer available, if lenders have increased costs due to such changes, we may suffer from potential increases in interest rates on our floating rate debt. These uncertainties or their resolution also could negatively impact our funding costs, loan and other asset values, asset-liability management strategies, and other aspects of our business and financial results.

Business and Operational Risks

Our ability to effectively develop and introduce new products could adversely affect our ability to compete

New product introductions and enhancement of existing products and services are key to the Company's competitive strategy. The success of new product introductions is dependent on a number of factors, including, but not limited to, timely and successful development of new products, including software development, market acceptance of these products and the Company's ability to manage the risks associated with these introductions. These risks include development and production capabilities, management of inventory levels to support anticipated demand, the risk that new products may have quality defects in the early stages of introduction, and obsolescence risk of existing products. The Company cannot predict with certainty the ultimate impact new product introductions could have on our results of operations, financial condition or cash flows.

We manufacture and source products and materials from various countries throughout the world. A disruption in the availability, price or quality of these products or materials could adversely affect our operating results

Our business is subject to risks associated with global manufacturing and sourcing. We use a variety of raw materials in the production of our products including steel, aluminum, brass, copper, bronze, zinc, nickel, plastics, phenolics, elastomers and petrochemicals. We also purchase certain electrical and electronic components, including solenoids, lighting ballasts, printed circuit boards, integrated circuit chips and cord sets from a number of suppliers. Significant shortages in the availability of these materials or significant price increases could increase our operating costs and adversely impact the competitive positions of our products, which could adversely impact our results of operations. See also Risk Factor, "*Significant developments from the recent and potential changes in U.S. trade policies could have a material adverse effect on us*."

We rely on materials, components and finished goods that are sourced from or manufactured in foreign countries including Mexico, China, and other international countries. Political instability in any country where we do business could have an adverse impact on our results of operations.

We rely on our suppliers to produce high quality materials, components and finished goods according to our specifications, including timely delivery. There is a risk that products may not meet our quality control procedure specifications which could adversely affect our ability to ship quality products to our customers on a timely basis and, could adversely affect our results of operations.

We may be required to recognize impairment charges for our goodwill and other intangible assets

As of December 31, 2022, the net carrying value of our goodwill and other intangible assets totaled approximately $2,640.4 million. As required by generally accepted accounting principles, we periodically assess these assets to determine if they are impaired. Impairment of intangible assets may be triggered by developments both within and outside the Company's control. Deteriorating economic conditions, technological changes, disruptions to our business, inability to effectively integrate acquired businesses, unexpected significant changes or planned changes in use of the assets, intensified competition, divestitures, market capitalization declines and other factors may impair our goodwill and other intangible assets. Any charges relating to such impairments could adversely affect our results of operations in the periods an impairment is recognized.

We engage in acquisitions and strategic investments and may encounter difficulty in obtaining appropriate acquisitions and in integrating these businesses

Part of the Company's growth strategy involves acquisitions. We have pursued and will continue to seek acquisitions and other strategic investments to complement and expand our existing businesses. The rate and extent to which acquisitions become available may affect our growth rate. The success of these transactions will depend on our ability to integrate these businesses into our operations and realize the planned synergies. We may encounter difficulties in integrating acquisitions into our operations and in managing strategic investments and foreign acquisitions and joint ventures may also present additional risk related to the integration of operations across different cultures and languages. Failure to effectively complete or manage acquisitions may adversely affect our existing businesses as well as our results of operations, financial condition and cash flows.

We may not be able to successfully implement initiatives, including our restructuring activities that improve productivity and streamline operations to control or reduce costs

Achieving our long-term profitability goals depends significantly on our ability to control or reduce our operating costs. Because many of our costs are affected by factors completely, or substantially outside our control, we generally must seek to control or reduce costs through productivity initiatives. If we are not able to identify and implement initiatives that control or reduce costs and increase operating efficiency, or if the cost savings initiatives we have implemented to date do not generate expected cost savings, our financial results could be adversely affected. Our efforts to control or reduce costs may include restructuring activities involving workforce reductions, facility consolidations and other cost reduction initiatives. If we do not successfully manage our current restructuring activities, or any other restructuring activities that we may undertake in the future, expected efficiencies and benefits may be delayed or not realized, and our operations and business could be disrupted, which could have an adverse effect on our results of operations, financial condition and cash flows.

We are subject to risks surrounding our information technology systems failures, network disruptions, breaches in data security and compliance with data privacy laws or regulations

We are highly dependent on various software and information technology systems to record and process operational, human resources and financial transactions. The proper functioning of Hubbell's information technology systems is critical to the successful operation of our business. Our information technology systems are susceptible to cyber threats, malware, phishing attacks, break-ins and similar events, breaches of physical security or tampering and manipulation of these systems by employees or unauthorized third parties. Information security risks also exist with respect to the use of portable electronic devices, such as smartphones and laptops, which are particularly vulnerable to loss and theft. Hubbell may also be subject to disruptions of any of our systems and our vendor's systems arising from events that are wholly or partially beyond our control, such as natural disasters, acts of terrorism, cyber-attacks, computer viruses, and electrical/telecommunications outages or failures. All of these risks are also applicable where Hubbell relies on outside vendors to provide services, which may operate in an online, or "cloud," environment. A failure of our information technology systems could adversely affect our ability to process orders, maintain proper levels of inventory, collect accounts receivable and pay expenses; all of which could have an adverse effect on our results of operations, financial condition and cash flows. In addition, security breaches could result in unauthorized disclosure of confidential information that may result in financial or reputational damage to the Company, as well as expose the Company to litigation and regulatory enforcement actions.

Hubbell also provides customers with solutions that include software components that allow for the control and/or the communication of data from those solutions to Hubbell or customer systems. In addition to the risks noted above, there are other risks associated with these solutions. For example, control and/or data from these solutions may be integral to a customer's operations. A failure of our technology to operate as designed or as a result of cyber threats could impact those operations, including by loss or destruction of data. Likewise, a customer's failure to properly configure its own network are outside of the Company's control and could result in a failure in functionality or security of our technology.

Hubbell is also subject to an increasing number of evolving data privacy and security laws and regulations that impose requirements on the Company and our technology prior to certain use or transfer, storing, processing, disclosure, and protection of data and prior to sale or use of certain technologies. Failure to comply with such laws and regulations could result in the imposition of fines, penalties and other costs. For example, the European Union's implementation of the General Data Protection Regulation in 2018, the European Union's pending ePrivacy Regulation and the implementation of the ePrivacy Directive by the various European Union member states, and California's implementation of its Consumer Privacy Act of 2018 and Connected Device Privacy Act of 2018, as well as data privacy statutes implemented by other states, could all disrupt our ability to sell products and solutions or use and transfer data because such activities may not be in compliance with applicable law in certain jurisdictions.

We have continued to work on improving our utilization of our enterprise resource planning system, expanding standardization of business processes and performing implementations at our remaining businesses, as well as acquired businesses. We expect to incur additional costs related to future implementations, process reengineering efforts as well as enhancements and upgrades to the system. These system modifications and implementations could result in operating inefficiencies which could adversely impact our operating results and/or our ability to perform necessary business transactions.

System failures, ineffective system implementation or disruptions, failure to comply with data privacy and security laws or regulations, IT system risk arising from the Company's acquisition activity or the compromise of security with respect to internal or external systems or portable electronic devices could damage the Company's systems or infrastructure, subject us to liability claims, or regulatory fines, penalties, or intervention, harm our reputation, interrupt our operations, disrupt customer operations, and adversely affect the Company's internal control over financial reporting, business, financial condition, results of operations, or cash flows.

Our ability to access capital markets or failure to maintain our credit ratings may adversely affect our business

Our ability to invest in our business and make strategic acquisitions may require access to the capital markets. If general economic and capital market conditions deteriorate significantly, it could impact our ability to access capital. Failure to maintain our credit ratings could also impact our ability to access credit markets and could increase our cost of borrowing. The capital and credit markets could deteriorate and market conditions could make it more difficult for us to access capital to finance our investments and acquisitions, which could adversely affect our results of operations, financial condition and cash flows.

Deterioration in the credit quality of our customers could have a material adverse effect on our operating results and financial condition

We have an extensive customer base of distributors, wholesalers, electric utilities, OEMs, electrical contractors, telecommunications companies and retail and hardware outlets. We are not dependent on a single customer, however, our top ten customers account for approximately 43% of our Net sales. Deterioration in the credit quality of several major customers could adversely affect our results of operations, financial condition and cash flows.

We have outstanding indebtedness; our indebtedness will increase if we incur additional indebtedness in the future and do not retire existing indebtedness

We have outstanding indebtedness and other financial obligations and significant unused borrowing capacity. Our indebtedness level and related debt service obligations could have negative consequences, including (i) requiring us to dedicate significant cash flow from operations to the payment of principal and interest on our indebtedness, which would reduce the funds we have available for other purposes, (ii) reducing our flexibility in planning for or reacting to changes in our business and market conditions and (iii) exposing us to interest rate risk since a portion of our debt obligations are at variable rates.

We may incur significantly more indebtedness in the future. If we add new indebtedness and do not retire existing indebtedness, the risks described above could increase.

If the underlying investments of our defined benefit plans do not perform as expected, we may have to make additional contributions to these plans

We sponsor certain pension and other postretirement defined benefit plans. The performance of the financial markets and interest rates impact these plan expenses and funding obligations. Significant changes in market interest rates, investment losses on plan assets and reductions in discount rates may increase our funding obligations and could adversely impact our results of operations, cash flows, and financial condition. Furthermore, there can be no assurance that the value of the defined benefit plan assets will be sufficient to meet future funding requirements.

Legal, Tax and Regulatory Risks

Changes in tax law relating to multinational corporations could adversely affect our tax position

Government agencies, and the Organisation for Economic Co-operation and Development ("OECD") have focused on issues related to the taxation of multinational corporations. One example is in the area of "base erosion and profit shifting," for which the OECD has released several components of its comprehensive plan that have been adopted and expanded by many taxing authorities to address perceived tax abuse and inconsistencies between tax jurisdictions. As a result, the tax laws in countries in which we do business could change on a prospective or retroactive basis, and any such changes could adversely affect our business and financial statements.

Because tax laws and regulations are subject to interpretation and uncertainty, tax payments may ultimately differ from amounts currently recorded by the Company

We are subject to income taxes as well as non-income based taxes, in both the United States and numerous foreign jurisdictions. The determination of the Company's worldwide provision for income taxes and other tax liabilities requires judgment and is based on diverse legislative and regulatory structures that exist in the various jurisdictions where the company operates. The ultimate tax outcome may differ from the amounts recorded in the Company's financial statements and may adversely affect the Company's financial results for the period when such determination is made. We are subject to ongoing tax audits in various jurisdictions. Tax authorities may disagree with certain positions we have taken and assess additional taxes. We regularly assess the likely outcomes of these audits in order to determine the appropriateness of our tax provisions. However, there can be no assurance that we will accurately predict the outcomes of these audits, and the future outcomes of these audits could adversely affect our results of operations, financial condition and cash flows.

Significant developments from the recent and potential changes in U.S. trade policies could have a material adverse effect on us

Over the last five years, the U.S. government has announced and, in some cases, implemented a new approach to trade policy, including renegotiating, or potentially terminating, certain existing bilateral or multi-lateral trade agreements, such as the North American Free Trade Agreement ("NAFTA"), which was replaced by the U.S.-Mexico-Canada Agreement, on July 1, 2020, and proposed trade agreements, like the Trans-Pacific Partnership ("TPP"), from which the United States has formally withdrawn, as well as implementing the imposition of additional tariffs on certain foreign goods, including finished products and raw materials such as steel and aluminum. Changes in the U.S. trade policy, U.S. social, political, regulatory and economic conditions or in laws and policies governing foreign trade, manufacturing, development and investment in the territories and countries where we currently manufacture and sell products, and any resulting negative sentiments towards the United States as a result of such changes, could have an adverse effect on our business. In addition, we cannot predict what changes to trade policy will be made by the current presidential administration and Congress, including whether existing tariff policies will be maintained or modified or whether the entry into new bilateral or multilateral trade agreements will occur, nor can we predict the effects that any conceivable changes would have on our business.

We rely on materials, components and finished goods, such as steel and aluminum, that are sourced from or manufactured in foreign countries, including China and Mexico. Import tariffs and potential import tariffs have resulted or may result in increased prices for these imported goods and materials and, in some cases, may result or have resulted in price increases for domestically sourced goods and materials. Changes in U.S. trade policy have resulted and could result in additional reactions from U.S. trading partners, including adopting responsive trade policies making it more difficult or costly for us to export our products or import goods and materials from those countries. These measures could also result in increased costs for goods imported into the U.S. or may cause us to adjust our worldwide supply chain. Either of these could require us to increase prices to our customers which may reduce demand, or, if we are unable to increase prices, result in lowering our margin on products sold.

In recent years, various countries, and regions, including, without limitation, China, Mexico, Canada and Europe, have announced plans or intentions to impose or have imposed tariffs on a wide range of U.S. products in retaliation for new U.S. tariffs. These actions could, in turn, result in additional tariffs being adopted by the U.S. These conditions and future actions could have a significant adverse effect on world trade and the world economy. To the extent that trade tariffs and other restrictions imposed by the United States increase the price of, or limit the amount of, raw materials and finished goods imported into the United States, the costs of our raw materials may be adversely affected and the demand from our customers for products and services may be diminished, which could adversely affect our revenues and profitability.

We cannot predict future trade policy or the terms of any renegotiated trade agreements and their impacts on our business. The adoption and expansion of trade restrictions, the occurrence of a trade war, or other governmental action related to tariffs or trade agreements or policies has the potential to adversely impact demand for our products, our costs, our customers, our suppliers, and the U.S. economy, which in turn could adversely impact our business, financial condition and results of operations.

Our business and results of operations may be materially adversely effected by compliance with import and export laws

We must comply with various laws and regulations relating to the import and export of products, services and technology from the U.S. and other countries having jurisdiction over our operations, which may affect our transactions with certain customers, business partners and other persons. In certain circumstances, export control and economic sanctions regulations may prohibit the export of certain products, services and technologies and in other circumstances, we may be required to obtain an export license before exporting a controlled item. The length of time required by the licensing processes can vary, potentially delaying the shipment of products or performance of services and the recognition of the corresponding revenue. In addition, failure to comply with any of these regulations could result in civil and criminal, monetary and non-monetary penalties, disruptions to our business, limitations on our ability to import and export products and services and damage to our reputation. Moreover, any changes in export control or sanctions regulations may further restrict the export of our products or services, and the possibility of such changes requires constant monitoring to ensure we remain compliant. Any restrictions on the export of our products or product lines could have a material adverse effect on our competitive position, results of operations, cash flows or financial condition.

The uncertainty surrounding the implementation and effect of Brexit and related negative developments in the European Union and elsewhere could adversely affect our business, financial condition and results of operations

In 2020, the United Kingdom exited the European Union ("EU") (commonly referred to as "Brexit"). The long-term effects of Brexit, including the UK's relationship with the EU and other countries, including the U.S., remains unclear. We conduct business in both the UK and EU and shipments from our UK subsidiaries represented 3% of our total Net sales in both 2022 and 2021. Brexit could adversely affect European or worldwide political, regulatory, economic or market conditions and could contribute to instability in political institutions and regulatory agencies. Brexit could also have the effect of disrupting the free movement of goods, services, and people between the UK, the EU and elsewhere. There can be no assurance that any or all of these events, or others that we cannot anticipate at this time, will not have a material adverse effect on our business, financial condition and results of operations.

We could incur significant and/or unexpected costs in our efforts to successfully avoid, manage, defend and litigate intellectual property matters

The Company relies on certain patents, trademarks, copyrights, trade secrets and other intellectual property of which the Company cannot be certain that others have not and will not infringe upon. Intellectual property litigation could be costly and time consuming and the Company could incur significant legal expenses pursuing these claims against others.

From time to time, we receive notices from third parties alleging intellectual property infringement. Any dispute or litigation involving intellectual property could be costly and time-consuming due to the complexity and the uncertainty of intellectual property litigation. Our intellectual property portfolio may not be useful in asserting a counterclaim, or negotiating a license, in response to a claim of infringement or misappropriation. In addition, as a result of such claims, the Company may lose its rights to utilize critical technology or may be required to pay substantial damages or license fees with respect to the infringed rights or be required to redesign our products at a substantial cost, any of which could negatively impact our operating results. Even if we successfully defend against claims of infringement, we may incur significant costs that could adversely affect our results of operations, financial condition and cash flow. See Item 3 “Legal Proceedings” for a discussion of our legal proceedings.

We are subject to litigation and environmental regulations that may adversely impact our operating results

We are a party to a number of legal proceedings and claims, including those involving product liability, intellectual property and environmental matters, which could be significant. It is not possible to predict with certainty the outcome of every claim and lawsuit. In the future, we could incur judgments or enter into settlements of lawsuits and claims that could have a materially adverse effect on our results of operations, cash flows, and financial condition. In addition, we maintain insurance coverage with respect to certain claims, which insurance may not provide adequate coverage against such claims. We establish reserves based on our assessment of contingencies, including contingencies related to legal claims asserted against us. Subsequent developments in legal proceedings may affect our assessment and estimates of the loss contingency recorded as a reserve and require us to make additional payments, which could have a materially adverse effect on our results of operations, financial condition and cash flow.

We are also subject to various laws and regulations relating to environmental protection and the discharge of materials into the environment, and we could incur substantial costs as a result of the noncompliance with or liability for clean up or other costs or damages under environmental laws. In addition, we could be affected by future laws or regulations, including those imposed in response to climate change concerns. Environmental laws and regulations have generally become stricter in recent years. Compliance with any future laws and regulations could result in a materially adverse effect on our business and financial results. See Item 3 “Legal Proceedings” for a discussion of our legal proceedings.

Our reputation and our ability to conduct business may be impaired by improper conduct by any of our employees, agents or business partners

We cannot provide absolute assurance that our internal controls and compliance systems will always protect us from acts committed by our employees, agents or business partners that would violate U.S. and/or non-U.S. laws, including the laws governing payments to government officials, bribery, fraud, anti-kickback and false claims rules, competition, export and import compliance, money laundering and data privacy. In particular, the U.S. Foreign Corrupt Practices Act, the U.K. Bribery Act, and similar anti-bribery laws in other jurisdictions generally prohibit companies and their intermediaries from making improper payments to government officials for the purpose of obtaining or retaining business, and we operate in parts of the world that have experienced governmental corruption to some degree. Despite meaningful measures that we undertake to facilitate lawful conduct, which include training and internal control policies, these measures may not always prevent reckless or criminal acts by our employees or agents. Any such improper actions could damage our reputation and subject us to civil or criminal investigation in the United States and in other jurisdictions, could lead to substantial civil and criminal, monetary and non-monetary penalties and could cause us to incur significant legal and investigative fees.

Regulations related to conflict-free minerals may cause us to incur additional expenses and may create challenges with our customers

The Dodd-Frank Wall Street Reform and Consumer Protection Act contains provisions to improve transparency and accountability regarding the use of “conflict” minerals mined from the Democratic Republic of Congo and adjoining countries (“DRC”). The SEC has established annual disclosure and reporting requirements for those companies who use “conflict” minerals sourced from the DRC in their products. These new requirements could limit the pool of suppliers who can provide conflict-free minerals and as a result, we cannot ensure that we will be able to obtain these conflict-free minerals at competitive prices. Compliance with these new requirements may also increase our costs. In addition, we may face challenges with our customers if we are unable to sufficiently verify the origins of the minerals used in our products.

General Risk Factors

We face the potential harms of natural disasters, terrorism, acts of war, international conflicts or other disruptions to our operations

Natural disasters, the economic uncertainty resulting from the spread of global pandemics, acts or threats of war or terrorism, international conflicts, and the actions taken by the United States and other governments in response to such events could cause damage to or disrupt our business operations, our suppliers or our customers, and could create political or economic instability, any of which could have an adverse effect on our business. For example, increases in energy demand and supply disruptions caused by the conflict in Ukraine have resulted in significantly higher energy prices, particularly in Europe. Persistent high energy prices and the potential for further supply disruptions, may have an adverse impact on our business. Although it is not possible to predict such events or their consequences, these events could decrease demand for our products, make it difficult or impossible for us to deliver products, or disrupt our supply chain.

Global economic uncertainty could adversely affect us

During periods of prolonged slow growth, or a downturn in conditions in the worldwide or domestic economies, we could experience reduced orders, payment delays, supply chain disruptions or other factors caused by economic challenges faced by our customers, prospective customers and suppliers. Depending upon their severity and duration, these conditions could have an adverse impact on our results of operations, financial condition and cash flows.

Our success depends on attracting and retaining qualified personnel

Our ability to sustain and grow our business requires us to hire, retain and develop a highly skilled and diverse management team and workforce. Failure to ensure that we have the depth and breadth of personnel with the necessary skill set and experience, or the loss of key employees, could impede our ability to deliver our growth objectives and execute our strategy.

Item 1B Unresolved Staff Comments

None.

Item 2 Properties

As of December 31, 2022, Hubbell's global headquarters are located in leased office space in Shelton, Connecticut. Other principal administrative offices are in Greenville, South Carolina, Manchester, New Hampshire and St. Louis, Missouri. The Utility Solutions segment operates 3 warehouse facilities and 23 manufacturing facilities globally, totaling approximately 4.4 million square feet. The Electrical Solutions segment operates 7 warehouse facilities and 25 manufacturing facilities globally totaling approximately 5.1 million square feet. The Company believes its manufacturing and warehousing facilities are adequate to carry on its business activities.

Item 3 Legal Proceedings

Information required by this item is incorporated herein by reference to the section captioned "Notes to Consolidated Financial Statements, Note 16 — Commitments and Contingencies" of this Form 10-K.

Item 4 Mine Safety Disclosures

Not applicable.

PART II

Item 5 Market for the Registrant's Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities

The Company's Common Stock trades on the New York Stock Exchange under the symbol, "HUBB".

The number of common shareholders of record on February 3, 2023 was 1,205.

Our dividends are declared at the discretion of our Board of Directors. In October 2022, the Company's Board of Directors approved an increase in the common stock dividend rate from $1.05 to $1.12 per share per quarter. The increased quarterly dividend payment commenced with the December 15, 2022 payment made to the shareholders of record on November 30, 2022.

The information required by Item 5 with respect to securities authorized for issuance under equity compensation plans is incorporated herein by reference to Part III, Item 12 of this Form 10-K.

Purchases of Equity Securities

On October 23, 2020 the Board of Directors approved a stock repurchase program (the "October 2020 program") that authorized the repurchase of up to $300 million of common stock and expires in October 2023. At December 31, 2022 our remaining share repurchase authorization under the October 2020 program is $106.7 million. On October 21, 2022 the Board of Directors approved a new stock repurchase program (the "October 2022 program") that authorized the repurchase of up to $300 million of common stock and expires in October 2025. There have been no repurchases under the October 2022 program. The Company repurchased $182.0 million and $11.2 million of shares of Common Stock, in 2022 and 2021, respectively. When combined with the $106.7 million of remaining share repurchase authorization under the October 2020 program, we have a total share repurchase authorization of approximately $406.7 million. Subject to numerous factors, including market conditions and alternative uses of cash, we may conduct discretionary repurchases through open market or privately negotiated transactions, which may include repurchases under plans complying with Rules 10b5-1 and 10b-18 under the Securities Exchange Act of 1934, as amended.

The following table summarizes the Company's repurchase activity of common stock during the quarter ended December 31, 2022:

Period	Total Number of Shares of Common Stock Purchased[(a)] (000s)	Average Price Paid per share of Common Stock	Approximate Value of Shares that May Yet be Purchased Under the plans[(b)] (in millions)	Total number of shares purchased as part of the plans (000s)
BALANCE AS OF SEPTEMBER 30, 2022			$ 138.8	888
October 1, 2022 - October 31, 2022	—	—	$ 438.8	888
November 1, 2022 - November 30, 2022	133	$ 240.14	$ 406.7	1,021
December 1, 2022 - December 31, 2022	—	—	$ 406.7	1,021
TOTAL FOR THE QUARTER ENDED DECEMBER 31, 2022[(a)]	**133**	**$ 240.14**		

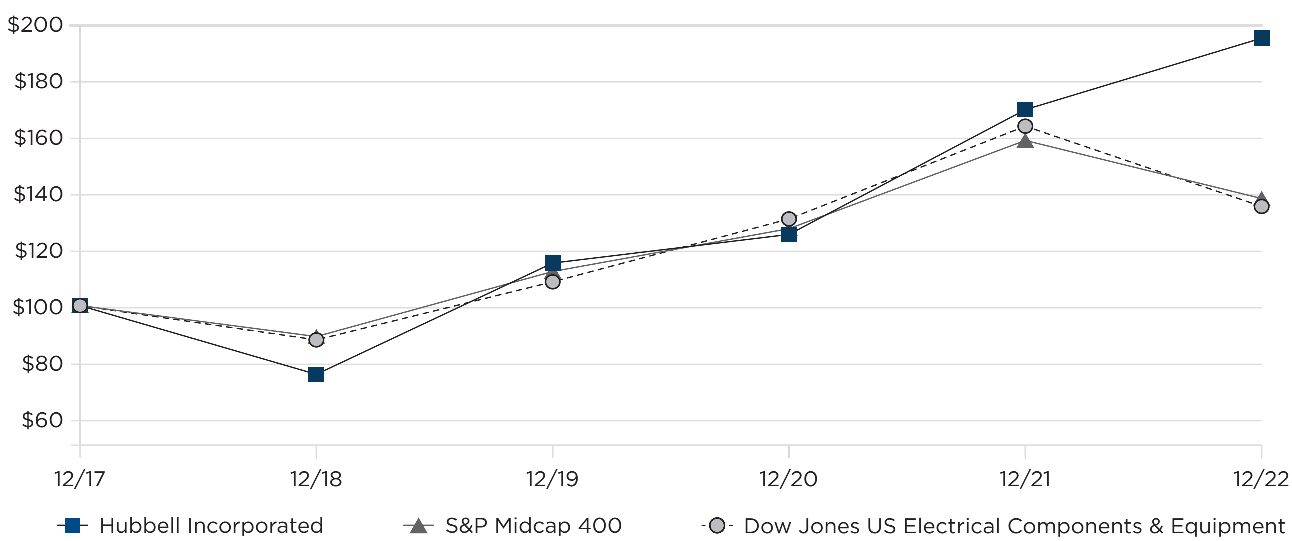
(a) Purchased under our October 2020 share repurchase program authorizing the repurchase of up to $300 million shares of common stock, which was publicly announced on October 23, 2020 and expires in October 2023.

(b) As of December 31, 2022, the remaining amount available for share repurchases includes $106.7 million under our October 2020 program and the full amount under our October 2022 program authorizing the repurchase of up to $300 million shares of common stock, which was publicly announced on October 21, 2022 and expires in October 2025.

Corporate Performance Graph

The following graph compares the total return to shareholders on the Company's common stock during the five years ended December 31, 2022, with a cumulative total return on the (i) Standard & Poor's MidCap 400 ("S&P MidCap 400") and (ii) the Dow Jones U.S. Electrical Components & Equipment Index ("DJUSEC"). The Company is a member of the S&P MidCap 400. The comparison assumes $100 was invested on December 31, 2017 in the Company's Common Stock and in each of the foregoing indices and assumes reinvestment of dividends.

COMPARISON OF 5 YEAR CUMULATIVE TOTAL RETURN
Among Hubbell Incorporated, the S&P MidCap 400 Index
and the Dow Jones US Electrical Components & Equipment Index



	12/17	12/18	12/19	12/20	12/21	12/22
Hubbell, Inc.	100.00	75.39	115.22	125.48	170.14	195.74
S&P Midcap 400	100.00	88.92	112.21	127.54	159.12	138.34
Dow Jones US Electrical Components & Equipment	100.00	87.73	108.51	131.02	164.23	135.50

Item 6 [Reserved]

Item 7 Management's Discussion and Analysis of Financial Condition and Results of Operations

The following discussion should be read in conjunction with the consolidated financial statements and accompanying notes included in Part II, Item 8 of this Annual Report on Form 10-K. This section of this Form 10-K generally discusses 2022 and 2021 items and year-to-year comparisons between 2022 and 2021. Discussions of 2020 items and year-to-year comparisons between 2021 and 2020 are not included in this Form 10-K and can be found in "Management's Discussion and Analysis of Financial Condition and Results of Operations" in Part II, Item 7 of the Company's Annual Report on Form-10-K for the fiscal year ended December 31, 2021 filed with the Securities and Exchange Commission on February 11, 2022.

Executive Overview of the Business

Hubbell is a global manufacturer of quality electrical products and utility solutions for a broad range of customer and end market applications. We provide utility and electrical solutions that enable our customers to operate critical infrastructure reliably and efficiently, and we empower and energize communities through innovative solutions supporting energy infrastructure In Front of the Meter, on The Edge, and Behind the Meter. In Front of the Meter is where utilities transmit and distribute energy to their customers. The Edge connects utilities with owner/operators and allows energy and data to be distributed back and forth. Behind the Meter is where owners and operators of buildings, industrial facilities and other critical infrastructure consume energy. Products are either sourced complete, manufactured or assembled by subsidiaries in the United States, Canada, Puerto Rico, Mexico, China, the UK, Brazil, Australia, Spain and Ireland. The Company also participates in joint ventures in Hong Kong and the Philippines, and maintains offices in Singapore, Italy, China, India, Mexico, South Korea, Chile, and countries in the Middle East. The Company employed approximately 16,300 individuals worldwide as of December 31, 2022.

Our reporting segments consist of the Utility Solutions segment, that has leading position in Front of the Meter and at The Edge and the Electrical Solutions segment that is positioned Behind the Meter.

Our long-term strategy is to serve our customers with reliable and innovative electrical and related infrastructure solutions with desired brands and high-quality service, delivered through a competitive cost structure; to complement organic revenue growth with acquisitions that enhance its product offerings; and to allocate capital effectively to create shareholder value.

Our strategy to complement organic revenue growth with acquisitions is focused on acquiring assets that extend our capabilities, expand our product offerings, and present opportunities to compete in core, adjacent or complementary markets. Our acquisition strategy also provides the opportunity to advance our revenue growth objectives during periods of weakness or inconsistency in our end-markets.

Our strategy to deliver products through a competitive cost structure has resulted in past and ongoing restructuring and related activities. Our restructuring and related efforts include the consolidation of manufacturing and distribution facilities, and workforce actions, as well as streamlining and consolidating our back-office functions. The primary objectives of our restructuring and related activities are to optimize our manufacturing footprint, cost structure, effectiveness and efficiency of our workforce.

Productivity improvement also continues to be a key area of focus for the Company and efforts to drive productivity complement our restructuring and related activities to minimize the impact of rising material costs and other administrative cost inflation. Because material costs are approximately two thirds of our cost of goods sold, volatility in this area can significantly impact profitability. Our goal is to have pricing and productivity programs that offset material and other inflationary cost increases as well as pay for investments in key growth areas.

Productivity programs affect virtually all functional areas within the Company by reducing or eliminating waste and improving processes. We continue to expand our efforts related to global product and component sourcing and supplier cost reduction programs. Value engineering efforts, product transfers and the use of lean process improvement techniques are expected to continue to increase manufacturing efficiency. In addition, we continue to build upon the benefits of our enterprise resource planning system across all functions.

Our sales are also subject to market conditions that may cause customer demand for our products to be volatile and unpredictable, particularly in our Electrical Solutions segment. Product demand can be affected by fluctuations in domestic and international economic conditions, as well as currency fluctuations, commodity costs, and a variety of other factors. We have recently experienced significant inflationary pressure across much of our business. We have had to take various pricing actions to cover the higher costs and protect our margin profile. Because we expect inflation to remain a factor for the foreseeable future, we expect to continue these pricing actions subject, however, to demand and market conditions. Accordingly, there can be no assurance that we will be able to maintain our margins in response to the continuation or worsening of inflationary pressures. In addition, macroeconomic effects such as increases in interest rates and other measures taken by central banks and other policy makers could have a negative effect on overall economic activity that could reduce our customers' demand for our products.

Discontinued Operations

On February 1, 2022, the Company completed the sale of the Commercial and Industrial Lighting business (the "C&I Lighting business") to GE Current, a Daintree Company. The disposal of the C&I Lighting business met the criteria set forth in ASC 205-20 to be presented as a discontinued operation. The C&I Lighting businesses' results of operations and the related cash flows have been reclassified to income from discontinued operations in the Consolidated Statements of Income and cash flows from discontinued operations in the Consolidated Statement of Cash Flows, respectively, for all periods presented. For additional information regarding this transaction and its effect on our financial reporting, see Note 2 — Discontinued Operations, in the accompanying Consolidated Financial Statements, which note is incorporated herein by reference.

Impact of the COVID-19 Pandemic

Notwithstanding a general improvement in conditions and reduction of adverse effects from the COVID-19 pandemic that began in the first quarter of 2020, as of December 31, 2022 there continues to be significant uncertainty around the scope, severity, and duration of the pandemic, as well as the breadth and duration of business disruptions related to it and the overall impact on the U.S., global economies, and our operating results in future periods.

Additionally, as economies have re-opened, global supply chains have struggled to keep up with increasing demand, and the resulting supply chain disruptions have, in certain cases, affected our ability to ship finished products in a timely manner. These supply chain disruptions and the increase in demand have also led to increased freight, labor and commodity costs, which are expected to persist into 2023.

Results of Operations

Our operations are classified into two reportable segments: Utility Solutions and Electrical Solutions. For a complete description of the Company's segments, see Part I, Item 1 of this Annual Report on Form 10-K. Within these segments, Hubbell serves customers in five primary end markets: utility T&D components, utility communications and controls, non-residential, residential, and industrial.

In 2022, Net sales increased by 18.0% or $754 million and organic Net sales[(1)] increased by 17.5% or $732 million on favorable price realization along with higher volumes, as further discussed in segment results below. Operating margin increased in 2022, by 160 basis points and adjusted operating margin[(1)] increased by 140 basis points, driven by price realization that exceeded material cost inflation, higher unit volume and savings from our restructuring and related actions, partially offset by higher freight, logistics and manufacturing costs, as well as other inflationary cost increases in excess of productivity and increased investment in our business. Net income from Continuing Operations attributable to Hubbell increased by 40.1% in 2022 compared to the prior year and diluted earnings per share from Continuing Operations increased by 41.6%. Adjusted net income from continuing operations attributable to Hubbell[(1)] increased by 30.3% in 2022 compared to the prior year and adjusted diluted earnings per share from continuing operations[(1)] increased by 31.9% in 2022.

Free cash flow[(2)] was higher in 2022 at $506.9 million as compared to $423.5 million in the prior year. In 2022 we paid $229.6 million in shareholder dividends, an increase of 5.9% as compared to the prior year, while also repurchasing $182 million of shares in 2022.

(1) Organic Net sales, adjusted operating margin, adjusted net income from continuing operations attributable to Hubbell and adjusted diluted earnings per share from continuing operations are non-GAAP financial measures. See "Adjusted Operating Measures" below for a reconciliation to the comparable GAAP financial measures.

(2) Free cash flow is a non-GAAP financial measure. See "Adjusted Operating Measures" and "Financial Condition, Liquidity and Capital Resources - Cash Flow" below for a reconciliation to the comparable GAAP financial measure.

SUMMARY OF CONSOLIDATED RESULTS (IN MILLIONS, EXCEPT PER SHARE DATA)

	For the Year Ending December 31,			
	2022	% of Net sales	2021	% of Net sales
Net sales	$ 4,947.9		$ 4,194.1	
Cost of goods sold	3,476.3	70.3%	3,042.6	72.5%
Gross profit	1,471.6	29.7%	1,151.5	27.5%
Selling & administrative expenses	762.5	15.4%	619.2	14.8%
Operating income	709.1	14.3%	532.3	12.7%
Net income from continuing operations	516.8	10.4%	371.1	8.8%
Less: Net income from continuing operations attributable to noncontrolling interest	(5.5)	(0.1)%	(6.1)	(0.1)%
Net Income From Continuing Operations Attributable to Hubbell Incorporated	511.3	10.3%	365.0	8.7%
Income from discontinued operations, net of tax	34.6	0.7%	34.5	0.8%
Net income attributable to Hubbell Incorporated	545.9	11.0%	399.5	9.5%
Less: Earnings allocated to participating securities	(1.4)		(1.2)	
Net income available to common shareholders	544.5		398.3	
Average number of diluted shares outstanding	54.1		54.7	
DILUTED EARNINGS PER SHARE - CONTINUING OPERATIONS	**$ 9.43**		**$ 6.66**	
DILUTED EARNINGS PER SHARE - DISCONTINUED OPERATIONS	**$ 0.64**		**$ 0.62**	

Adjusted Operating Measures

In the following discussion of results of operations, we refer to "adjusted" operating measures. We believe those adjusted measures, which exclude the impact of certain costs, gains and losses, may provide investors with useful information regarding our underlying performance from period to period and allow investors to understand our results of operations without regard to items we do not consider a component of our core operating performance.

Adjusted operating measures exclude amortization of all intangible assets associated with our business acquisitions, including inventory step-up amortization associated with those acquisitions. The intangible assets associated with our business acquisitions arise from the allocation of the purchase price using the acquisition method of accounting in accordance with Accounting Standards Codification 805, "Business Combinations." These assets consist primarily of customer relationships, developed technology, trademarks and tradenames, and patents, as reported in Note 7 – Goodwill and Other Intangible Assets, under the heading "Total Definite-Lived Intangibles" within the Notes to Consolidated Financial Statements.

The Company believes that the exclusion of these non-cash expenses (i) enhances management's and investors' ability to analyze underlying business performance, (ii) facilitates comparisons of our financial results over multiple periods, and (iii) provides more relevant comparisons of our results with the results of other companies as the amortization expense associated with these assets may fluctuate significantly from period to period based on the timing, size, nature, and number of acquisitions. Although we exclude amortization of these acquired intangible assets and inventory step-up from our non-GAAP results, we believe that it is important for investors to understand that revenue generated, in part, from such intangibles is included within revenue in determining adjusted net income from continuing operations.

Adjusted operating measures also exclude the following:

- 2022 - Pension settlement charges of $7.0 million.
- 2021 - A $16.8 million pre-tax loss on the early extinguishment of long-term debt from the redemption of all of the Company's outstanding 3.625% Senior Notes due 2022 in the aggregate principal amount of $300 million and a $6.9 million loss on the disposal of a business.
- Income tax effects of the above adjustments which are calculated using the statutory tax rate, taking into consideration the nature of the item and the relevant taxing jurisdiction, unless otherwise noted.

These items are reported in Total other expense (below Operating income) in the Consolidated Statement of Income. The Company excludes these non-core items because we believe it enhances management's and investors' ability to analyze underlying business performance and facilitates comparisons of our financial results over multiple periods. Refer to the reconciliation of non-GAAP measures presented below, Note 4 – Business Acquisitions and Dispositions, Note 12 – Retirement Benefits, and Note 13 – Debt in the Notes to Consolidated Financial Statements, for additional information.

Organic Net sales, a non-GAAP measure, represents Net sales according to U.S. GAAP, less Net sales from acquisitions and divestitures during the first twelve months of ownership or divestiture, respectively, less the effect of fluctuations in Net sales from foreign currency exchange. The period-over-period effect of fluctuations in Net sales from foreign currency exchange is calculated as the difference between local currency Net sales of the prior period translated at the current period exchange rate as compared to the same local currency Net sales translated at the prior period exchange rate. We believe this measure provides management and investors with a more complete understanding of the underlying operating results and trends of established, ongoing operations by excluding the effect of acquisitions, dispositions and foreign currency as these activities can obscure underlying trends. When comparing Net sales growth between periods excluding the effects of acquisitions, business dispositions and currency exchange rates, those effects are different when comparing results for different periods. For example, because Net sales from acquisitions are considered inorganic from the date we complete an acquisition through the end of the first year following the acquisition, Net sales from such acquisition are reflected as organic Net sales thereafter.

There are limitations to the use of non-GAAP measures. Non-GAAP measures do not present complete financial results. We compensate for this limitation by providing a reconciliation between our non-GAAP financial measures and the respective most directly comparable financial measure calculated and presented in accordance with GAAP. Because non-GAAP financial measures are not standardized, it may not be possible to compare these financial measures with other companies' non-GAAP financial measures having the same or similar names. These financial measures should not be considered in isolation from, as substitutes for, or alternative measures of, reported GAAP financial results, and should be viewed in conjunction with the most comparable GAAP financial measures and the provided reconciliations thereto. We believe, however, that these non-GAAP financial measures, when viewed together with our GAAP results and related reconciliations, provide a more complete understanding of our business. We strongly encourage investors to review our consolidated financial statements and publicly filed reports in their entirety and not rely on any single financial measure.

The following table reconciles our adjusted financial measures to the directly comparable GAAP financial measure (in millions, except per share amounts):

	For the Year Ended December 31,			
	2022	% of Net sales	2021	% of Net sales
Gross profit (GAAP measure)	$ 1,471.6	29.7%	$ 1,151.5	27.5%
Amortization of acquisition-related intangible assets	30.7		27.5	
Adjusted gross profit	$ 1,502.3	30.4%	$ 1,179.0	28.1%
S&A expenses (GAAP measure)	$ 762.5	15.4%	$ 619.2	14.8%
Amortization of acquisition-related intangible assets	47.9		50.2	
Adjusted S&A expenses	$ 714.6	14.4%	$ 569.0	13.6%
Operating income (GAAP measure)	$ 709.1	14.3%	$ 532.3	12.7%
Amortization of acquisition-related intangible assets	78.6		77.7	
Adjusted operating income	$ 787.7	15.9%	$ 610.0	14.5%
Net income from continuing operations attributable to Hubbell (GAAP measure)	$ 511.3		$ 365.0	
Amortization of acquisition-related intangible assets	78.6		77.7	
Loss on disposition of business	—		6.9	
Loss on extinguishment of debt	—		16.8	
Pension charge	7.0		—	
Total pre-tax adjustments to net income	85.6		101.4	
Income tax effects[(1)]	21.4		24.7	
Adjusted net income from continuing operations attributable to Hubbell	$ 575.5		$ 441.7	
Less: Earnings allocated to participating securities	(1.5)		(1.4)	
Adjusted net income from continuing operations available to common shareholders	$ 574.0		$ 440.3	
Average number of diluted shares outstanding	54.1		54.7	
ADJUSTED DILUTED EARNINGS PER SHARE FROM CONTINUING OPERATIONS	**$ 10.62**		**$ 8.05**	

(1) The income tax effects are calculated using the statutory tax rate, taking into consideration the nature of the item and the relevant taxing jurisdiction, unless otherwise noted.

The following table reconciles our Organic Net sales growth to the directly comparable GAAP financial measure (in millions and percentage change):

	For the Year Ended December 31,			
	2022	Inc/(Dec) %	2021	Inc/(Dec) %
Net sales growth (GAAP measure)	$ 753.8	18.0	$ 511.6	13.9
Impact of acquisitions	41.8	1.0	144.6	3.9
Impact of divestitures	(4.0)	(0.1)	(5.7)	(0.2)
Foreign currency exchange	(16.3)	(0.4)	16.5	0.5
ORGANIC NET SALES GROWTH (NON-GAAP MEASURE)	**$ 732.3**	**17.5**	**$ 356.2**	**9.7**

2022 Compared to 2021

Net Sales

Net sales of $4,947.9 million in 2022 increased by $753.8 million, or 18.0%, compared to 2021 driven by Organic net sales growth of 17.5% due to favorable price realization along with higher unit volume. Net sales also increased by 1.0% from acquisitions, partially offset by 0.4% from foreign exchange.

Cost of Goods Sold

Cost of goods sold was 70.3% of Net sales in 2022 as compared to 72.5% in 2021. The decrease was primarily driven by favorable price realization that was in excess of material cost inflation and higher unit volume, partially offset by higher freight, logistics and manufacturing costs, as well as other inflationary cost increases in excess of productivity and higher investments in our business.

Gross Profit

The gross profit margin in 2022 was 29.7% of Net sales as compared to 27.5% in 2021. Excluding amortization of acquisition-related intangible assets, the adjusted gross profit margin was 30.4% in 2022 as compared to 28.1% in 2021. The increase in gross profit and adjusted gross profit margin was primarily driven by favorable price realization that was in excess of material cost inflation and higher unit volume, partially offset by higher freight, logistics and manufacturing costs, as well as other inflationary cost increases in excess of productivity and higher investments in our business.

Selling & Administrative Expenses

S&A expense in 2022 was $762.5 million and increased by $143.3 million compared to the prior year period. S&A expense as a percentage of Net sales increased by 60 basis points to 15.4% in 2022. Excluding amortization of acquisition-related intangible assets, adjusted S&A expense as a percentage of Net sales increased by 80 basis points to 14.4% in 2022. The increase in S&A expense and adjusted S&A expense as a percentage of Net sales is primarily due to the impact of higher personnel cost and other cost inflation that was partially offset by a benefit from an increase in Net sales volume.

Operating Income

Operating income in 2022 was $709.1 million, an increase of 33.2% compared to 2021, and operating margin increased by 160 basis points to 14.3%. Excluding amortization of acquisition-related intangible assets, adjusted operating income increased by 29.1% in 2022 to $787.7 million and adjusted operating margin increased by 140 basis points to 15.9% in 2022. The increase in operating margin and adjusted operating margin is primarily due to favorable price realization that was in excess of material cost inflation and higher unit volume, partially offset by higher freight, logistics and manufacturing costs, as well as other inflationary cost increases in excess of productivity and higher investments in our business.

Total Other Expense

Total other expense decreased by $20.9 million in 2022 to $52.1 million compared to the prior year, primarily due to a $16.8 million pre-tax loss on the early extinguishment of long-term debt recognized in the second quarter of 2021 from the redemption of the Company's $300 million long-term notes, which were scheduled to mature in 2022, and by a $5.1 million reduction in interest expense.

Income Taxes

The effective tax rate was 21.3% in 2022 as compared to 19.2% in 2021. The increase in the effective tax rate is primarily due to favorable tax effects from stock-based compensation in 2021 that were higher as compared to 2022, as well as increased earnings in higher taxed jurisdictions in 2022.

Net Income From Continuing Operations Attributable to Hubbell and Earnings Per Diluted Share From Continuing Operations

Net income from continuing operations attributable to Hubbell was $511.3 million in 2022 and increased 40.1% as compared to 2021. Adjusted net income from continuing operations attributable to Hubbell was $575.5 million in 2022 and increased 30.3% as compared to 2021. The increase in net income from continuing operations and adjusted net income from continuing operations is primarily the result of higher operating income, driven by higher Net sales, and operation margin expansion, partially offset by an increase in the effective tax rate. As a result, earnings per diluted share from continuing operations in 2022 increased 41.6% compared to 2021. Adjusted earnings per diluted share from continuing operations in 2022 increased 31.9% as compared to 2021.

Income From Discontinued Operations, Net of Tax

The operating results of the Commercial and Industrial Lighting business have been reflected as discontinued operations. Income from discontinued operations, net of tax was $34.6 million in 2022 as compared to income of $34.5 million in 2021. Income from discontinued operations, net of taxes for the year ended December 31, 2022 and December 31, 2021 includes pre-tax transaction and separation costs of $8.8 million and $7.0 million, respectively. The provision for income taxes from discontinued operations in 2021 includes a one-time tax benefit of $25.1 million related to book-to-tax basis differences that was recognized in the period the business was classified as held-for-sale. The provision for income taxes from discontinued operations in 2022 reflects the tax effect of the book gain on sale.

Segment Results

Utility Solutions

	For the Year Ended December 31,	
(in millions)	**2022**	**2021**
Net sales	$ 2,871.1	$ 2,334.4
Operating income	$ 438.2	$ 284.1
Amortization of acquisition-related intangible assets	56.3	64.4
Adjusted operating income	$ 494.5	$ 348.5
Operating margin (GAAP measure)	15.3%	12.2%
Adjusted operating margin	17.2%	14.9%

The following table reconciles our Organic Net sales growth to the directly comparable GAAP financial measure (in millions and percentage change):

	For the Year Ended December 31,			
Utility Solutions	**2022**	**Inc/ (Dec) %**	**2021**	**Inc/ (Dec) %**
Net sales growth (GAAP measure)	$ 536.7	23.0	$ 255.0	12.3
Impact of acquisitions	10.0	0.4	123.3	5.9
Impact of divestitures	(4.0)	(0.2)	(5.7)	(0.2)
Foreign currency exchange	(3.6)	(0.1)	2.9	0.1
ORGANIC NET SALES GROWTH (NON-GAAP MEASURE)	**$ 534.3**	**22.9**	**$ 134.5**	**6.5**

Net sales in the Utility Solutions segment in 2022 were $2.9 billion, an increase of 23.0% as compared to 2021, due to a 22.9% increase in Organic Net sales driven by favorable price realization and higher unit volume, partially offset by the impact of a commercial resolution in the fourth quarter of 2022. Acquisitions, net of divestitures contributed 0.2% to Net sales growth in 2022 and foreign exchange was slightly unfavorable by 0.1%.

Operating income in the Utility Solutions segment in 2022 increased by 54.2% to $438.2 million as compared to 2021. Operating margin in 2022 increased to 15.3% as compared to 12.2% in 2021. Excluding amortization of acquisition-related intangibles the adjusted operating margin in 2022 increased by 230 basis points to 17.2% as compared to the prior year. The year-over-year increase in operating margin and adjusted operating margin was primarily driven by favorable price realization that was in excess of material cost inflation and higher unit volume, partially offset by higher freight, logistics and manufacturing costs, as well as other inflationary costs increases in excess of productivity, higher investments in our business and the impact of a commercial resolution in the fourth quarter of 2022.

Electrical Solutions

	For the Year Ended December 31,	
(in millions)	**2022**	**2021**
Net sales	$ 2,076.8	$ 1,859.7
Operating income (GAAP measure)	$ 270.9	$ 248.2
Amortization of acquisition-related intangible assets	22.3	13.3
Adjusted operating income	$ 293.2	$ 261.5
Operating margin (GAAP measure)	13.0%	13.3%
Adjusted operating margin	14.1%	14.1%

The following table reconciles our Organic Net sales growth to the directly comparable GAAP financial measure (in millions and percentage change):

	For the Year Ended December 31,			
Electrical Solutions	**2022**	**Inc/ (Dec) %**	**2021**	**Inc/ (Dec) %**
Net sales growth (GAAP measure)	$ 217.1	11.7	$ 256.6	16.0
Impact of acquisitions	31.8	1.7	21.3	1.3
Impact of divestitures	—	—	—	—
Foreign currency exchange	(12.7)	(0.6)	13.6	0.9
ORGANIC NET SALES GROWTH (NON-GAAP MEASURE)	**$ 198.0**	**10.6**	**$ 221.7**	**13.8**

Net sales of the Electrical Solutions segment in 2022 were $2.1 billion, an increase of $217.1 million, or 11.7% as compared to 2021. Organic Net sales in 2022 increased by 10.6% as compared to the prior year primarily due to favorable price realization and higher unit volume. Net sales also increased by 1.7% from acquisitions and decreased by 0.6% from foreign exchange.

Operating income of the Electrical Solutions segment in 2022 was $270.9 million and increased approximately 9.1% compared to 2021, while operating margin in 2022 decreased by 30 basis points as compared to the prior year to 13.0%. Excluding amortization of acquisition-related intangibles, adjusted operating margin was 14.1% in 2022, which was flat compared to prior year. Operating margin in 2022 was impacted primarily due to favorable price realization that was in excess of material cost inflation and higher unit volume, partially offset by higher freight, logistics and manufacturing costs, as well as other inflationary costs increases in excess of productivity, and higher intangible amortization expense. Adjusted operating margin in 2022 was impacted primarily due to favorable price realization that was in excess of material cost inflation and higher unit volume, partially offset by higher freight, logistics and manufacturing costs, as well as other inflationary costs increases in excess of productivity.

Financial Condition, Liquidity and Capital Resources

The current and prior period results presented below represent the results of our continuing operations, and exclude the results of the C&I Lighting business which are presented within cash provided by discontinued operations. See Note 2 - Discontinued Operations, in the Notes to the Consolidated Financial Statements for further details.

Cash Flow

	For the Year Ended December 31,	
(in millions)	2022	2021
Net cash provided by (used in):		
Operating activities from continuing operations	$ 636.2	$ 513.7
Investing activities from continuing operations	18.1	(72.1)
Financing activities (used in) from continuing operations	(437.1)	(433.0)
Cash (used in) provided by discontinued operations	(54.7)	24.4
Effect of foreign currency exchange rate changes on cash and cash equivalents	(8.8)	(3.0)
NET CHANGE IN CASH AND CASH EQUIVALENTS	**$ 153.7**	**$ 30.0**

The following table reconciles our cash flows from operating activities to free cash flows for 2022 and 2021:

	For the Year Ended December 31,	
(in millions)	2022	2021
Net cash provided by operating activities - Continuing Operations (GAAP measure)	$ 636.2	$ 513.7
Less: Capital expenditures - Continuing Operations	(129.3)	(90.2)
Free cash flow - Continuing Operations	$ 506.9	$ 423.5
Free cash flow as a percent of net income - continuing operations attributable to Hubbell	99.2%	116.0%

Free cash flow is a non-GAAP measure that we define as cash flow from operations less capital expenditures. Management believes that free cash flow provides useful information regarding Hubbell's ability to generate cash without reliance on external financing. In addition, management uses free cash flow to evaluate the resources available for investments in the business, strategic acquisitions and further strengthening the balance sheet.

2022 Compared to 2021

Cash provided by operating activities from continuing operations was $636.2 million in 2022 compared to $513.7 million in 2021. The increase compared to the prior year is primarily due to higher net income, partially offset by changes in the components of working capital, as we invested in working capital to serve customer demand and growth in our order backlog.

Cash provided by investing activities was $18.1 million in 2022 compared to cash used of $72.1 million in 2021. That change was driven by $332.8 million in net proceeds from the disposal of the C&I Lighting business, partially offset by cash used of $177.1 million to acquire PCX Holdings LLC ("PCX"), Ripley Tools, LLC and Nooks Hill Road, LLC (collectively, "Ripley Tools") and REF Automation Limited and REF Alabama Inc. (collectively "REF") during 2022 and additional capital expenditures as we continue to invest in capacity expansion, automation and productivity initiatives.

Cash used in financing activities was $437.1 million in 2022 as compared to cash used of $433.0 million in 2021. The change in cash flows from financing activities primarily reflects an increase of $170.8 million of the Company's share repurchases in 2022 compared to 2021, partially offset by change in net borrowings.

The unfavorable impact of foreign currency exchange rates on cash was $8.8 million in 2022 as compared to a unfavorable effect of $3.0 million in 2021. The unfavorable impact in 2022 was primarily related to a weaker Canadian Dollar and British Pound compared to the U.S. Dollar.

Investments in the Business

Investments in our business include cash outlays for the acquisition of businesses as well as expenditures to maintain the operation of our equipment and facilities and invest in restructuring activities.

In July 2022, the Company acquired all of the issued and outstanding membership interests of PCX for a cash purchase price of approximately $112.8 million, net of cash acquired. PCX is a leading designer and manufacturer of factory built modular power solutions for applications in the data center market. This business is reported in the Electrical Solutions segment. In July 2022, the Company also acquired all of the issued and outstanding membership interests of Ripley Tools for a cash purchase price of approximately $50.1 million, net of cash acquired. Ripley Tools is a leading manufacturer of cable and fiber prep tools and test equipment that serves both the utility and communications markets. This business is reported in the Utility Solutions segment.

In November 2022, the Company acquired all of the issued and outstanding equity interests of REF for a cash purchase price of $14.1 million. REF designs and manufactures electrical power components utilizing high-volume precision machining, as well as custom fabricated structural products and assemblies for the OEM, industrial and renewables markets. This business is reported in the Electrical Solutions segment.

We continue to invest in restructuring and related programs to maintain a competitive cost structure, to drive operational efficiencies and to mitigate the impact of rising material costs and administrative cost inflation. We expect our investment in restructuring and related activities to continue in 2023 as we continue to invest in previously initiated actions and initiate further footprint consolidation and other cost reduction initiatives.

In connection with our restructuring and related actions, we have incurred restructuring costs as defined by U.S. GAAP, which are primarily severance and employee benefits, asset impairments, accelerated depreciation, as well as facility closure, contract termination and certain pension costs that are directly related to restructuring actions. We also incurred restructuring-related costs, which are costs associated with our business transformation initiatives, including the consolidation of back-office functions and streamlining of our processes, and certain other costs and gains associated with restructuring actions. We refer to these costs on a combined basis as "restructuring and related costs", which is a non-GAAP measure. We believe this non-GAAP measure provides investors with useful information regarding our underlying performance from period to period. Restructuring costs are predominantly settled in cash from our operating activities and are generally settled within one year, with the exception of asset impairments, which are non-cash.

The table below presents the restructuring and related costs incurred in 2022, additional expected costs, and the expected completion date of restructuring actions that have been initiated as of December 31, 2022 and in prior years (in millions):

	Costs Incurred in 2022	Additional Expected Costs	Expected Completion Date
2022 Restructuring Actions	$ 11.2	$ 4.0	2023
2021 and Prior Restructuring Actions	(0.9)	2.6	2023
Restructuring cost (GAAP measure)	**$ 10.3**	**$ 6.6**	
Restructuring-related costs	6.7	1.0	
Restructuring and related costs (Non-GAAP measure)	**$ 17.0**	**$ 7.6**	

During 2022, we invested $129.3 million in capital expenditures, an increase of $39.1 million as compared to 2021 as we increased capital investments to expand capacity, optimize footprint and implement automation and productivity initiatives.

Stock Repurchase Program

On October 23, 2020 the Board of Directors approved a stock repurchase program (the "October 2020 program") that authorized the repurchase of up to $300 million of common stock and expires in October 2023. At December 31, 2022 our remaining share repurchase authorization under the October 2020 program is $106.7 million. On October 21, 2022 the Board of Directors approved a new stock repurchase program that authorized the repurchase of up to $300 million of common stock and expires in October 2025. The Company repurchased $182.0 million and $11.2 million of shares of common stock, in 2022 and 2021, respectively. When combined with the $106.7 million of remaining share repurchase authorization under the October 2020 program, we have a total share repurchase authorization remaining of approximately $406.7 million as of December 31, 2022. Subject to numerous factors, including market conditions and alternative uses of cash, we may conduct discretionary repurchases through open market or privately negotiated transactions, which may include repurchases under plans complying with Rules 10b5-1 and 10b-18 under the Securities Exchange Act of 1934, as amended.

Debt to Capital

At December 31, 2022 and 2021, the Company had $1,437.9 million and $1,435.5 million, respectively, of long-term debt outstanding, net of unamortized discount and the unamortized balance of capitalized debt issuance costs. At December 31, 2022 and December 31, 2021 the Company had no long-term debt with maturities due within the next twelve months.

Borrowings under Revolving Credit Facility

On March 12, 2021, the Company, as borrower, and its subsidiaries Hubbell Power Holdings S.à r.l. and Harvey Hubbell Holdings S.à r.l., each as a subsidiary borrower (collectively, the "Subsidiary Borrowers") entered into a new five-year credit agreement with a syndicate of lenders and JPMorgan Chase Bank, N.A., as administrative agent, that provides a $750 million committed revolving credit facility (the "2021 Credit Facility"). Commitments under the 2021 Credit Facility may be increased to an aggregate amount not to exceed $1.25 billion. The 2021 Credit Facility includes a $50 million sub-limit for the issuance of letters of credit. The sum of the dollar amount of loans and letters of credits to the Subsidiary Borrowers under the 2021 Credit Facility may not exceed $75 million. There were no borrowings outstanding under the 2021 Credit Facility at December 31, 2022 or December 31, 2021.

The interest rate applicable to borrowings under the 2021 Credit Facility is (i) either the alternate base rate (as defined in the 2021 Credit Facility) or (ii) the adjusted LIBOR rate (as defined in the 2021 Credit Facility) plus an applicable margin based on the Company's credit ratings. All revolving loans outstanding under the 2021 Credit Facility will be due and payable on March 12, 2026.

The 2021 Credit Facility contains a financial covenant requiring that, as of the last day of each fiscal quarter, the ratio of total indebtedness to total capitalization shall not be greater than 65%. The Company was in compliance with this covenant as of December 31, 2022.

Unsecured Senior Notes

On March 12, 2021, the Company completed a public offering of $300 million aggregate principal amount of its 2.300% Senior Notes due 2031 (the "2031 Notes" and collectively with those described below, the "Notes"). The net proceeds from the offering were approximately $295.5 million after deducting the underwriting discount and estimated offering expenses payable by the Company. The 2031 Notes bear interest at a rate of 2.300% per annum from March 12, 2021. Interest on the 2031 Notes is payable semi-annually in arrears on March 15 and September 15 of each year, beginning on September 15, 2021. The 2031 Notes will mature on March 15, 2031.

The Company used the net proceeds from the offering of the 2031 Notes, together with cash on hand, on April 2, 2021 to redeem in full all of the Company's outstanding 3.625% Senior Notes due in 2022 for an aggregate principal amount of $300 million, which had a stated maturity date of November 15, 2022, and to pay the premium and accrued interest in respect thereof. The redemption of the 2022 Notes resulted in a $16.8 million loss on extinguishment that was recognized in the second quarter of 2021.

At December 31, 2021 and 2022 respectively, the Company had outstanding unsecured, senior notes in principal amounts of $400 million due in 2026, $300 million due in 2027, $450 million due in 2028 and $300 million due in 2031.

The carrying value of the Notes, net of unamortized discount and the unamortized balance of capitalized debt issuance costs, was $1,437.9 million and $1,435.5 million at December 31, 2022 and December 31, 2021, respectively.

The Notes are callable at any time at specified prices and are only subject to accelerated payment prior to maturity upon customary events of default, or upon a change in control triggering event as defined in the indenture governing the Notes, as supplemented. The Company was in compliance with all covenants (none of which are financial) as of December 31, 2022.

Short-term Debt

At December 31, 2022 and 2021, the Company had no commercial paper borrowings outstanding and had $4.7 million and $9.7 million, respectively, of short-term debt outstanding composed of:

- $2.8 million at December 31, 2022 and $1.6 million at December 31, 2021, respectively, of borrowings to support our international operations in China as well as $1.9 million and $8.1 million of other short term debt at December 31, 2022 and December 31, 2021, respectively, to support other operations.

Net debt, defined as total debt less cash and investments, is a non-GAAP measure that may not be comparable to definitions used by other companies. We consider net debt to be a useful measure of our financial leverage for evaluating the Company's ability to meet its funding needs.

The following table sets forth the reconciliation of net debt at December 31, 2022 and 2021:

	December 31,	
(in millions)	2022	2021
Total Debt (GAAP measure)	$ 1,442.6	$ 1,445.2
Total Hubbell Incorporated Shareholders' Equity	2,360.9	2,229.8
TOTAL CAPITAL (GAAP measure)	**$ 3,803.5**	**$ 3,675.0**
Total Debt to Total Capital (GAAP measure)	38%	39%
Cash and Investments	$ 520.7	$ 364.7
NET DEBT (non-GAAP measure)	**$ 921.9**	**$ 1,080.5**
Net Debt to Total Capital (non-GAAP measure)	24%	29%

Liquidity

We measure liquidity on the basis of our ability to meet short-term and long-term operational funding needs, to fund additional investments, including acquisitions, and to make dividend payments to shareholders. Significant factors affecting the management of liquidity are cash flows from operating activities, capital expenditures, cash dividend payments, stock repurchases, access to bank lines of credit and our ability to attract long-term capital with satisfactory terms.

In 2022, we returned capital to our shareholders through dividends and share repurchases. These activities were funded primarily with cash flows from operations.

- In 2022, cash used for share repurchases was $182.0 million.
- Dividends paid on our Common Stock in 2022 were $229.6 million.

We also require cash outlays to fund our operations, capital expenditures, and working capital requirements to accommodate anticipated levels of business activity, as well as our rate of cash dividends and potential future acquisitions. We have contractual obligations for long-term debt, operating leases, purchase obligations, and certain other long-term liabilities, including defined benefit retirement obligations and other benefits. Refer to Note 13 - Debt and Note 24 - Leases in the Notes to the Consolidated Financial Statements for further details on anticipated cash outflows. As a result of the Tax Cuts and Jobs Act ("TCJA"), we also have an obligation to fund, by annual installments through 2025, the Company's liability for the transition tax on the deemed repatriation of foreign earnings. Contractual purchase obligations for years subsequent to December 31, 2022 include approximately, $590 million in 2023. Contractual purchase obligations beyond 2023 are not significant.

Our purchase obligations include amounts committed under legally enforceable contracts or purchase orders for goods and services with defined terms as to price, quantity, delivery and termination liability. These obligations primarily consist of inventory purchases made in the normal course of business to meet operational requirements and commitments for equipment purchases. As of December 31, 2022, we have $42.1 million of uncertain tax positions reflected in our Consolidated Balance Sheet. We are unable to make a reasonable estimate regarding the timing of settlement of these uncertain tax positions and, as a result, they have been excluded from the disclosure. See Note 14 — Income Taxes in the Notes to Consolidated Financial Statements.

Our sources of funds and available resources to meet these funding needs are as follows:

- Cash flows from operating activities and existing cash resources: In addition to our cash flows from operating activities, we also had $440.5 million of cash and cash equivalents at December 31, 2022, of which approximately 35% was held inside the United States and the remainder held internationally.
- Our 2021 Credit Facility provides a $750.0 million committed revolving credit facility and commitments under the 2021 Credit Facility may be increased (subject to certain conditions) to an aggregate amount not to exceed $1.250 billion. Annual commitment fees to support availability under the 2021 Credit Facility are not material. Although not the principal source of liquidity, we believe our 2021 Credit Facility is capable of providing significant financing flexibility at reasonable rates of interest and is an attractive alternative source of funding in the event that commercial paper markets experience disruption. However, an increase in usage of the 2021 Credit Facility related to growth or a significant deterioration in the results of our operations or cash flows could cause our borrowing costs to increase and/or our ability to borrow could be restricted. We have not entered into any guarantees that could give rise to material unexpected cash requirements. The full $750.0 million of borrowing capacity under the 2021 Credit Facility was available to the Company at December 31, 2022.
- In addition to our commercial paper program and existing revolving credit facility, we also have the ability to obtain additional financing through the issuance of long-term debt. Considering our current credit rating, historical earnings performance, and financial position, we believe that we would be able to obtain additional long-term debt financing on attractive terms.
- The Company also maintains other lines of credit that are primarily used to support the issuance of letters of credit. Interest rates and other terms of borrowing under these lines of credit vary from country to country, depending on local market conditions. At December 31, 2022 and 2021, total availability under these lines was $55.8 million and $30.0 million, respectively, of which $31.7 million and $23.2 million was utilized to support letters of credit and the remaining amount was unused. The annual commitment fees associated with these lines of credit are not material.

Pension Funding Status

We have a number of funded and unfunded non-contributory U.S. and foreign defined benefit pension plans. Benefits under these plans are generally provided based on either years of service and final average pay or a specified dollar amount per year of service. The funded status of our qualified, defined benefit pension plans is dependent upon many factors including future returns on invested pension assets, the level of market interest rates, employee earnings and employee demographics.

In 2022, the Company recognized a settlement loss within continuing operations relating to retirees that elected to receive lump-sum distributions from the Company's defined benefit pension plans of $7.0 million. This charge was the result of lump-sum payments which exceeded the threshold for settlement accounting under U.S. GAAP in such year.

Changes in the value of the defined benefit plan assets and liabilities will affect the amount of pension expense ultimately recognized. Although differences between actuarial assumptions and actual results are no longer deferred for balance sheet purposes, deferral is still permitted for pension expense purposes. Unrecognized gains and losses in excess of an annual calculated minimum amount (the greater of 10% of the projected benefit obligation or 10% of the market value of assets) have been amortized and recognized in net periodic pension cost. Effective January 1, 2020, the amortization of unrecognized gains and losses of all of the Company's qualified defined benefit pension plans is recognized over the remaining life expectancy of participants, as all participants are considered inactive as a result of plan amendments. During 2022 and 2021, we recorded $10.8 million and $10.8 million, respectively, of pension expense related to the amortization of these unrecognized losses.

In 2022 and 2021, we contributed $12.5 million and $0.1 million, respectively, to our qualified foreign and domestic defined benefit pension plans. These contributions have improved the funded status of those plans. Although not required by ERISA and the Internal Revenue Code, the Company may elect to make a voluntary contribution to its qualified domestic defined benefit pension plan in 2023. The anticipated level of pension funding in 2023 is not expected to have a significant impact on our overall liquidity.

Assumptions

The following assumptions were used to determine projected pension and other benefit obligations at the measurement date and the net periodic benefit costs for the year:

	Pension Benefits		Other Benefits	
	2022	2021	2022	2021
Weighted-average assumptions used to determine benefit obligations at December 31,				
Discount rate	5.46%	2.79%	5.50%	2.90%
Rate of compensation increase	0.08%	0.08%	3.93%	3.87%
Weighted-average assumptions used to determine net periodic benefit cost for years ended December 31,				
Discount rate	2.79%	2.47%	2.90%	2.50%
Expected return on plan assets	4.59%	4.66%	N/A	N/A
Rate of compensation increase	0.08%	0.24%	3.87%	3.99%

At the end of each year, we estimate the expected long-term rate of return on pension plan assets based on the strategic asset allocation for our plans. In making this determination, we utilize expected rates of return for each asset class based upon current market conditions and expected risk premiums for each asset class. A one percentage point change in the expected long-term rate of return on pension fund assets would have an impact of approximately $5.2 million on 2023 pretax pension expense. The expected long-term rate of return is applied to the fair market value of pension fund assets to produce the expected return on fund assets that is included in pension expense.

The difference between this expected return and the actual return on plan assets was recognized at December 31, 2022 for balance sheet purposes, but continues to be deferred for expense purposes. The net deferral of past asset gains (losses) ultimately affects future pension expense through the amortization of gains (losses) with an offsetting adjustment to Hubbell shareholders' equity through Accumulated other comprehensive loss.

At the end of each year, we determine the discount rate to be used to calculate the present value of our pension plan liabilities. For our U.S. and Canadian pension plans, this discount rate is determined by matching the expected cash flows associated with our benefit obligations to the expected cash flows of a hypothetical portfolio of high quality, fixed income debt instruments with maturities that closely match the expected funding period of our pension liabilities. As of December 31, 2022, we used a discount rate of 5.50% for our U.S. pension plans compared to a discount rate of 2.90% used in 2021. For our Canadian pension plan, we used a discount rate of 5.01% in 2022, compared to a 2.98% discount rate used in 2021.

For our UK pension plan the discount rate was derived using a full yield curve and uses plan specific cash flows. The derived discount rate is the single discount rate equivalent to discounting these liability cash flows at the term-dependent spot rates of AA corporate bonds. This methodology resulted in a December 31, 2022 discount rate for the UK pension plan of 5.00% as compared to a discount rate of 1.80% used in 2021.

A decrease of one percentage point in the discount rate would increase our 2023 pretax pension expense by approximately $0.3 million. A discount rate increase of one percentage point would decrease our 2023 pretax pension expense by $0.5 million.

In 2021 and 2022 we used the Pri-2012 mortality table to calculate the present value of our pension plan liabilities and adopted the MP-2021 projection scale. The Pri-2012 mortality table with adjustment for collar as appropriate and generational projection from 2012 using Scale MP-2021 was chosen as the best estimate based on the observed and anticipated experience of the plans after considering alternative tables.

Other Post-Employment Benefits ("OPEB")

The Company also has a number of health care and life insurance benefit plans covering eligible employees who reached retirement age while working for the Company. These benefits have been discontinued for substantially all future retirees. These plans are not funded and, therefore, no assumed rate of return on assets is required. We use a similar methodology to derive the discount rate for our post employment benefit plan obligations that we use for our pension plans. As of December 31, 2022, the Company used a discount rate of 5.50% to determine the projected benefit obligation compared to a discount rate of 2.90% used in 2021.

In accordance with the accounting guidance for retirement benefits, we recorded to Accumulated other comprehensive loss, within Hubbell shareholders' equity, a benefit, net of tax, of $5.5 million in 2022 and $3.4 million in 2021, respectively, related to the annual remeasurement of the OPEB plans and the amortization of prior service credits and net actuarial gains.

Off-Balance Sheet Arrangements

Off-balance sheet arrangements are defined as any transaction, agreement or other contractual arrangement to which an entity that is not included in our consolidated results is a party, under which we, whether or not a party to the arrangement, have, or in the future may have: (1) an obligation under a direct or indirect guarantee or similar arrangement, (2) a retained or contingent interest in assets transferred to an unconsolidated entity or similar arrangement that serves as credit, liquidity or market risk support to such entity for such assets, (3) an obligation or liability, including a contingent obligation or liability, under a contract that would be accounted for as a derivative instrument, except that it is excluded from the scope of FASB ASC Topic 815, or (4) an obligation, including a contingent obligation, arising out of a variable interest in an unconsolidated entity that is held by, and material to, the Company, where such entity provides financing, liquidity, market risk or credit risk support to, or engages in leasing, hedging or research and development services with, the Company.

We do not have any off-balance sheet arrangements as defined above which have or are likely to have a current or future material effect on our financial condition, results of operations, liquidity, capital expenditures, capital resources or cash flows.

Critical Accounting Estimates

Note 1 — Significant Accounting Policies in the Notes to Consolidated Financial Statements describes the significant accounting policies used in the preparation of our financial statements.

Use of Estimates

We are required to make assumptions and estimates and apply judgments in the preparation of our financial statements that affect the reported amounts of assets and liabilities, revenues and expenses and related disclosures. We base our assumptions, estimates and judgments on historical experience, current trends and other factors deemed relevant by management, such as projections of future performance. We continually review these estimates and their underlying assumptions to ensure they are appropriate for the circumstances. Changes in estimates and assumptions used by us could have a material impact on our financial results, and actual results could differ significantly from those estimates. We believe that the following estimates are among the most critical in fully understanding and evaluating our reported financial results. These items utilize assumptions and estimates about the effect of future events that are inherently uncertain and are based on our judgment.

Revenue Recognition

The Company recognizes revenue when performance obligations identified under the terms of contracts with its customers are satisfied, which generally occurs, for products, upon the transfer of control in accordance with the contractual terms and conditions of the sale. The majority of the Company's revenue associated with products is recognized at a point in time when the product is shipped to the customer, with a relatively small amount of transactions in the Utility Solutions segment recognized upon delivery of the product at the contractually specified destination. Revenue from service contracts and post-shipment performance obligations is approximately two percent of total annual consolidated net revenue and those service contracts and post-shipment obligations are primarily within the Utility Solutions segment. Revenue from service contracts and post-shipment performance obligations is recognized when or as those obligations are satisfied. The Company primarily offers assurance-type standard warranties that do not represent separate performance obligations and on occasion will separately offer and price extended warranties that are separate performance obligations for which the associated revenue is recognized over-time based on the extended warranty period. The Company records amounts billed to customers for reimbursement of shipping and handling costs within revenue. Shipping and handling costs associated with outbound freight after control over a product has transferred to a customer are accounted for as fulfillment costs and are included in cost of goods sold. Sales taxes and other usage-based taxes are excluded from revenue.

The Company has certain arrangements that require us to estimate at the time of sale the amounts of variable consideration that should not be recorded as revenue as certain amounts are not expected to be collected from customers, as well as an estimate of the value of the product to be returned. The Company principally relies on historical experience, specific customer agreements and anticipated future trends to estimate these amounts at the time of shipment and to reduce the transaction price. These arrangements include sales discounts and allowances based on sales volumes, specific programs and special pricing allowances, and returned goods, as are customary in the electrical products industry. Customer returns have historically been approximately one percent of gross sales.

Inventory Valuation

Inventories in the U.S. are primarily valued at the lower of LIFO cost or market, while non-U.S. inventories are valued at the lower of FIFO cost or market. We routinely evaluate the carrying value of our inventories to ensure they are carried at the lower of LIFO or FIFO cost or market value. Such evaluation is based on our judgment and use of estimates, including sales forecasts, gross margins for particular product groupings, planned dispositions of product lines, technological events and overall industry trends. In addition, the evaluation is based on changes in inventory management practices which may influence the timing of exiting products and method of disposing of excess inventory.

Excess inventory is generally identified by comparing future expected inventory usage to actual on-hand quantities. Inventory values are reduced for on-hand inventory in excess of pre-defined usage forecasts. Forecast usage is primarily determined by projecting historical (actual) sales and inventory usage levels forward to future periods. Changes in these estimates may necessitate future adjustments to inventory values.

Employee Benefits Costs and Funding

We sponsor domestic and foreign defined benefit pension, defined contribution and other postretirement plans. Significant assumptions used in the accounting for these employee benefit plans include the discount rate, expected return on the pension fund assets, rate of increase in employee compensation levels and health care cost increase projections. These assumptions are determined based on Company data and appropriate market indicators, and are evaluated each year as of the plans' measurement dates. Further discussion of the assumptions used in 2022 and 2021 are included above under "Pension Funding Status" and in Note 12 — Retirement Benefits in the Notes to Consolidated Financial Statements.

Taxes

We account for income taxes in accordance with the applicable accounting guidance which requires that deferred tax assets and liabilities be recognized using enacted tax rates for the effect of temporary differences between the book and tax basis of recorded assets and liabilities. Additionally, deferred tax assets are required to be reduced by a valuation allowance if it is more-likely-than-not that some portion or all of a deferred tax asset will not be realized. The factors used to assess the likelihood of realization of deferred tax assets are the forecast of future taxable income, available tax planning strategies that could be implemented to realize the net deferred tax assets, and future reversals of deferred tax liabilities. Failure to achieve forecasted taxable income can affect the ultimate realization of net deferred tax assets.

We operate within multiple taxing jurisdictions and are subject to audit in these jurisdictions. The Internal Revenue Service ("IRS") and other tax authorities routinely review our tax returns. These audits can involve complex issues, which may require an extended period of time to resolve. The Company records uncertain tax positions when it has determined that it is more-likely-than-not that a tax position will not be sustained upon examination by taxing authorities based on the technical merits of the position. The Company uses the criteria established in the accounting guidance to determine whether an item meets the definition of more-likely-than-not. The Company's policy is to recognize these uncertain tax positions when the more-likely-than-not threshold is met, when the statute of limitations has expired or upon settlement. In management's opinion, adequate provision has been made for potential adjustments arising from any examinations. See Note 14 — Income Taxes in the Notes to Consolidated Financial Statements.

Valuation of Long-Lived Assets, Goodwill, and Indefinite-Lived Intangible Assets

Our long-lived assets include land, buildings, equipment, molds and dies, software, goodwill and other intangible assets. Long-lived assets, other than land, goodwill and indefinite-lived intangibles, are depreciated over their estimated useful lives. The assets and liabilities of acquired businesses are recorded under the acquisition method of accounting at their estimated fair values at the dates of acquisition. Goodwill represents purchase price in excess of fair values assigned to the underlying identifiable net assets of acquired businesses. Intangible assets primarily consist of patents, tradenames, developed technology and customer related intangibles.

Goodwill and indefinite-lived intangible assets are reviewed annually for impairment unless circumstances dictate the need for more frequent assessment. We perform our annual goodwill impairment testing as of April 1st of each year. The accounting guidance provides entities an option of performing a qualitative assessment (the "Step-zero" test) before performing a quantitative analysis. If the entity determines, on the basis of certain qualitative factors, that it is more-likely-than-not that the goodwill is not impaired, the entity would not need to proceed to the quantitative goodwill impairment testing process as prescribed in the guidance. If the Company does not elect to complete the qualitative assessment, the Company completes the quantitative assessment whereby the estimated fair value of each reporting unit is compared to its carrying value.

The organizational changes within Electrical Solutions effective January 1, 2022 resulted in a change in the Company's reporting units. As a result, the Company performed an interim goodwill impairment assessment as of January 1, 2022. For the three reporting units within the Electrical Solutions segment, the Company elected to utilize the quantitative goodwill impairment testing process, as permitted in the accounting guidance, by comparing the estimated fair value of the reporting units to their carrying values. The Company did not have any reporting units at risk of failing the quantitative impairment test as the excess of the implied fair value exceeded the carrying value of each of the reporting units. Additionally, the Company did not have any reporting units with zero or negative carrying amounts.

The Company also completed its annual goodwill impairment test as of April 1, 2022. The Company applied the Step-zero test to one of its four reporting units. Based on the qualitative assessment, the Company concluded that it was more likely than not that the fair value of this reporting unit substantially exceeded its carrying value and, therefore, further quantitative analysis was not required. For the other three reporting units, the Company elected to utilize the quantitative goodwill impairment testing process, as permitted in the accounting guidance, by comparing the estimated fair value of the reporting units to their carrying values. As of April 1, 2022, the impairment testing resulted in implied fair values of our reporting units that exceeded the reporting unit's carrying value, including goodwill. The range of fair value in excess of carrying value, including goodwill, of the reporting units was 57% to 308%. The Company did not have any reporting units with zero or negative carrying amounts.

The goodwill impairment test requires judgment, including the identification of reporting units, assigning assets and liabilities to reporting units, and determining the fair value of each reporting unit. Significant judgments required to estimate the fair value of reporting units include estimating future discounted cash flows, determining appropriate discount rates and other assumptions, including assumptions about secular economic and market conditions, such as increases in interest rates, the potential continuing effects of the COVID-19 pandemic, impacts to the supply chain and higher inflation. We use internal discounted cash flow models to estimate fair value. These cash flow estimates are derived from historical experience, third-party end market data, and future long-term business plans and include assumptions of future sales growth, gross margin, operating margin, terminal growth rate, and the application of an appropriate discount rate. Changes in these estimates and assumptions could materially affect the determination of fair value and/or goodwill impairment for each reporting unit. We corroborate the values determined from our discounted cash flow models by reconciling the sum of the estimated fair values of each reporting unit to our market capitalization at the testing date, including consideration of a control premium. We have not recorded any goodwill impairments since the initial adoption of the accounting guidance in 2002.

The identification and measurement of impairment of indefinite-lived intangible assets involves either an assessment of qualitative factors to determine whether events or circumstances indicate that it is more-likely-than-not that an indefinite-lived intangible asset is impaired or a quantitative assessment whereby the estimated fair value of each indefinite-lived intangible asset is compared to its carrying value. If it is more-likely-than-not that the asset is impaired, the fair value of the indefinite lived intangibles will be determined using discounted cash flow estimates. If the carrying value of these assets exceeds the estimated fair value, the carrying value will be reduced to the estimated fair value. For the Company's annual impairment test as of April 1, 2022, the Company elected to utilize the quantitative impairment testing process as permitted in the accounting guidance. The fair value was determined utilizing an income approach (relief from royalty method). Significant judgment is required to estimate the fair value of the indefinite-lived intangible assets including assumptions for future revenues, discount rates, royalty rates, and other assumptions, including assumptions about secular economic and market conditions, such as the potential continuing effects of the COVID-19 pandemic. Significant changes in these estimates and assumptions could affect the determination of fair value and/or impairment for each indefinite-lived intangible asset. As of April 1, 2022, the impairment testing resulted in fair values for each indefinite-lived intangible asset that significantly exceeded the carrying values and there were no indefinite-lived intangible assets at risk of failing the quantitative impairment test. We did not record any impairments related to indefinite-lived intangible assets in 2022, 2021, or 2020.

Forward-Looking Statements

Some of the information included in this Management's Discussion and Analysis of Financial Condition and Results of Operations, and elsewhere in this Form 10-K, contain "forward-looking statements" as defined by the Private Securities Litigation Reform Act of 1995. These include statements about our expected capital resources, liquidity, financial performance, pension funding, and results of operations and are based on our reasonable current expectations. In addition, all statements regarding the expected financial impact of the integration of acquisitions and completion of certain divestitures, adoption of updated accounting standards and any expected effects of such adoption, restructuring plans and expected associated costs and benefits, intent to repurchase shares of common stock, and change in operating results, anticipated market conditions and productivity initiatives are forward looking. Forward-looking statements may be identified by the use of words, such as "believe", "expect", "anticipate", "intend", "depend", "should", "plan", "estimated", "predict", "could", "may", "subject to", "continues", "growing", "prospective", "forecast", "projected", "purport", "might", "if", "contemplate", "potential", "pending," "target", "goals", "scheduled", "will", "will likely be", and similar words and phrases. Discussions of strategies, plans or intentions often contain forward-looking statements. Important factors, among others, that could cause our actual results and future actions to differ materially from those described in forward-looking statements include, but are not limited to:

- The impact of inflation on our business and effectiveness of pricing actions we have taken to cover higher costs and protect our margin profile.
- General economic and business conditions in particular industries, markets or geographic regions, as well the potential for a significant economic slowdown, stagflation or economic recession.
- Effects of unfavorable foreign currency exchange rates and the potential use of hedging instruments to hedge the exposure to fluctuating rates of foreign currency exchange on inventory purchases.
- The lingering impact of the COVID-19 pandemic, including supply chain disruptions and availability, costs and quantity of raw materials, purchased components, energy and freight.
- The resurgence of the COVID-19 pandemic and its potential impact on global economic systems, our employees, sites, operations, and customers.
- Changes in demand for our products, market conditions, product quality, or product availability adversely affecting sales levels.
- Ability to effectively develop and introduce new products.
- Changes in markets or competition adversely affecting realization of price increases.
- Failure to achieve projected levels of efficiencies, cost savings and cost reduction measures, including those expected as a result of our lean initiatives and strategic sourcing plans.
- Impacts of trade tariffs, import quotas or other trade restrictions or measures taken by the U.S., U.K. and other countries, including the recent and potential changes in U.S. trade policies.
- Failure to comply with import and export laws.
- Changes relating to impairment of our goodwill and other intangible assets.
- Inability to access capital markets or failure to maintain our credit ratings.

- Changes in expected or future levels of operating cash flow, indebtedness and capital spending.
- General economic and business conditions in particular industries, markets or geographic regions, as well as inflationary trends.
- Regulatory issues, changes in tax laws including multijurisdictional implementation of the OECD's comprehensive base erosion and profit shifting plan, or changes in geographic profit mix affecting tax rates and availability of tax incentives.
- A major disruption in one or more of our manufacturing or distribution facilities or headquarters, including the impact of plant consolidations and relocations.
- Changes in our relationships with, or the financial condition or performance of, key distributors and other customers, agents or business partners which could adversely affect our results of operations.
- Impact of productivity improvements on lead times, quality and delivery of product.
- Anticipated future contributions and assumptions including increases in interest rates and changes in plan assets with respect to pensions and other retirement benefits, as well as pension withdrawal liabilities.
- Adjustments to product warranty accruals in response to claims incurred, historical experiences and known costs.
- Unexpected costs or charges, certain of which might be outside of our control.
- Changes in strategy due to economic conditions or other conditions outside of our control affecting anticipated future global product sourcing levels.
- Ability to carry out future acquisitions and strategic investments in our core businesses as well as the acquisition related costs.
- Ability to successfully execute, manage and integrate key acquisitions, mergers, and other transactions, such as the recent acquisition of PCX, Ripley Tools and REF, as well as the failure to realize expected synergies and benefits anticipated when we make an acquisition.
- The impact of certain divestitures, including the benefits and costs of the sale of the C&I Lighting business to GE Current, a Daintree Company.
- The ability to effectively implement Enterprise Resource Planning systems without disrupting operational and financial processes.
- The ability of government customers to meet their financial obligations.
- Political unrest and military actions in foreign countries, particularly the armed conflict in Ukraine, as well as the impact on world markets and energy supplies resulting therefrom.
- The impact of world economic and political issues, including the long-term effects of Brexit.
- The impact of potential natural disasters or additional public health emergencies on our financial condition and results of operations.
- Failure of information technology systems, security breaches, cyber threats, malware, phishing attacks, break-ins and similar events resulting in unauthorized disclosure of confidential information or disruptions or damage to information technology systems that could cause interruptions to our operations or adversely affect our internal control over financial reporting.
- Incurring significant and/or unexpected costs to avoid manage, defend and litigate intellectual property matters.
- Future repurchases of common stock under our common stock repurchase program.
- Changes in accounting principles, interpretations, or estimates.
- Failure to comply with any laws and regulations, including those related to data privacy and information security, environmental and conflict-free minerals.
- The outcome of environmental, legal and tax contingencies or costs compared to amounts provided for such contingencies, including contingencies or costs with respect to pension withdrawal liabilities.
- Improper conduct by any of our employees, agents or business partners that damages our reputation or subjects us to civil or criminal liability.
- Our ability to hire, retain and develop qualified personnel.
- Completion of the transition from LIBOR to a replacement alternative reference rate.
- Other factors described in our Securities and Exchange Commission filings, including the "Business", "Risk Factors", "Management's Discussion and Analysis of Financial Condition and Results of Operations," and "Quantitative and Qualitative Disclosures about Market Risk" sections in the Company's Annual Report on Form 10-K for the year ended December 31, 2022.

Any such forward-looking statements are not guarantees of future performances and actual results, developments and business decisions may differ from those contemplated by such forward-looking statements. The Company disclaims any duty to update any forward-looking statement, all of which are expressly qualified by the foregoing, other than as required by law.

Item 7A Quantitative and Qualitative Disclosures about Market Risk

In the operation of our business, we have various exposures to areas of risk related to factors within and outside the control of management. Significant areas of risk and our strategies to manage the exposure are discussed below.

In 2022, we manufactured and/or assembled products in the United States, Canada, Puerto Rico, Mexico, China, the UK, Brazil, Spain and Australia and sold products in those markets as well as through offices in Singapore, Italy, China, Mexico, and South Korea and countries in the Middle East. In 2022, Hubbell also participated in joint ventures in Hong Kong and the Philippines. As a percentage of the Company's total Net sales, shipments from foreign operations directly to third parties were 8% in 2022, 9% in 2021 and 9% in 2020, with the Canadian and UK operations representing approximately 32% and 31%, respectively, of 2022 total international Net sales. As such, our operating results could be affected by changes in foreign currency exchange rates or weak economic conditions in the foreign markets in which we sell our products. To manage this exposure, we closely monitor the working capital requirements of our international units and may enter into forward foreign exchange contracts.

Product purchases representing approximately 15% of our Net sales are sourced from unaffiliated suppliers located outside the United States, primarily in Mexico, China and other Asian countries, Europe, India and Brazil. Foreign sourcing of products may result in unexpected fluctuations in product cost or increased risk of business interruption due to lack of product or component availability due to any one of the following:

- Political or economic uncertainty in the source country
- Fluctuations in the rate of exchange between the U.S. dollar and the currencies of the source countries
- Changes in U.S. laws and policies governing foreign trade
- Increased logistical complexity including supply chain interruption or delay, port of departure or entry disruption and overall time to market
- Loss of proprietary information
- Product quality issues outside the control of the Company

We have developed plans that address many of these risks. Such actions include careful selection of products to be outsourced and the suppliers selected; ensuring multiple sources of supply; limiting concentrations of activity by port, broker, freight forwarder, etc.; processes related to quality control; and maintaining control over operations, technologies and manufacturing deemed to provide a competitive advantage. Many of our businesses have a dependency on certain basic raw materials needed to produce their products including steel, aluminum, brass, copper, bronze, zinc, nickel, plastics, phenols, elastomers and petrochemicals as well as purchased electrical and electronic components. Our financial results could be affected by the availability and changes in prices of these materials and components.

Certain of these materials are sourced from a limited number of suppliers. These materials are also key source materials for many other companies in our industry and within the universe of industrial manufacturers in general. As such, in periods of rising demand for these materials, we may experience both increased costs and/or limited supply. These conditions can potentially result in our inability to acquire these key materials on a timely basis to produce our products and satisfy our incoming sales orders. Similarly, the cost of these materials can rise suddenly and result in materially higher costs of producing our products. We believe we have adequate primary and secondary sources of supply for each of our key materials and that, in periods of rising prices, we expect to recover a majority of the increased cost in the form of higher selling prices. However, recoveries typically lag the effect of cost increases due to the nature of our markets.

Our financial results are subject to interest rate fluctuations to the extent there is a difference between the amount of our interest-earning assets and the amount of interest-bearing liabilities. The principal objectives of our investment management activities are to preserve capital while earning net investment income that is commensurate with acceptable levels of interest rate, default and liquidity risk taking into account our funding needs. As part of our investment management strategy, we may use derivative financial products such as interest rate hedges and interest rate swaps.

From time to time or when required, we issue commercial paper, which exposes us to changes in interest rates. Our cash position includes amounts denominated in foreign currencies. We manage our worldwide cash requirements by considering available funds held by our subsidiaries and the cost effectiveness with which these funds can be accessed.

As of December 31, 2022, the long-term debt outstanding related to the fixed-rate senior notes was $1,450.0 million. The senior notes are not exposed to interest rate risk as the bonds are at a fixed-rate until maturity.

We continually evaluate risk retention and insurance levels for product liability, property damage and other potential exposures to risk. We devote significant effort to maintaining and improving safety and internal control programs, which are intended to reduce our exposure to certain risks. We determine the level of insurance coverage and the likelihood of a loss and believe that the current levels of risk retention are consistent with those of comparable companies in the industries in which we operate. There can be no assurance that we will not incur losses beyond the limits of our insurance. However, our liquidity, financial position and profitability are not expected to be materially affected by the levels of risk retention that we accept.

The following table presents cost and weighted average interest rate information related to financial instruments that are sensitive to changes in interest rates, by maturity at December 31, 2022 (dollars in millions):

	2023	2024	2025	2026	2027	Thereafter	Total	Fair Value 12/31/22
ASSETS								
Available-for-sale investments	$ 14.4	$ 17.0	$ 10.2	$ 8.6	$ 2.3	$ 10.1	$ 62.6	$ 61.4
Avg. interest rate	4.38%	3.95%	3.73%	4.88%	4.57%	3.28%		
LIABILITIES								
Senior Notes	$ —	$ —	$ —	$ 400.0	$ 300.0	$ 750.0	$ 1,450.0	$ 1,306.5
Avg. interest rate	—	—	—	3.35%	3.15%	3.02%		

We use derivative financial instruments only if they are matched with a specific asset, liability, or proposed future transaction. We do not speculate or use leverage when trading a financial derivative product.

Item 8 Financial Statements and Supplementary Data

All other schedules are omitted because they are not applicable or the required information is shown in the consolidated financial statements or notes thereto.

Reports of Management

Report on Management's Responsibility for Financial Statements

Our management is responsible for the preparation, integrity and fair presentation of our published financial statements. The financial statements have been prepared in accordance with accounting principles generally accepted in the United States of America and include amounts based on informed judgments made by management.

We believe it is critical to provide investors and other users of our financial statements with information that is relevant, objective, understandable and timely, so that they can make informed decisions. As a result, we have established and maintain systems and practices and internal control processes designed to provide reasonable, but not absolute, assurance that transactions are properly executed and recorded and that our policies and procedures are carried out appropriately. Management strives to recruit, train and retain high quality people to ensure that controls are designed, implemented and maintained in a high-quality, reliable manner.

Our independent registered public accounting firm audited our financial statements and the effectiveness of our internal control over financial reporting in accordance with standards established by the Public Company Accounting Oversight Board (United States). Their report appears on the next page within this Annual Report on Form 10-K.

Our Board of Directors normally meets at least eight times per year to provide oversight, to review corporate strategies and operations, and to assess management's conduct of the business. The Board of Directors also schedules additional meetings on an as needed basis. The Audit Committee of our Board of Directors is composed of at least three individuals all of whom must be "independent" under current New York Stock Exchange listing standards and regulations adopted by the SEC under the federal securities laws. The Audit Committee meets regularly with our internal auditors and independent registered public accounting firm, as well as, management to review, among other matters, accounting, auditing, internal controls and financial reporting issues and practices. Both the internal auditors and independent registered public accounting firm have full, unlimited access to the Audit Committee.

Management's Annual Report on Internal Control over Financial Reporting

Management is responsible for establishing and maintaining adequate systems of internal control over financial reporting as defined by Rules 13a-15(f) and 15d-15(f) under the Securities Exchange Act of 1934, as amended. Our internal control over financial reporting is designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external reporting purposes in accordance with generally accepted accounting principles in the United States of America. Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Management has assessed the effectiveness of our internal control over financial reporting as of December 31, 2022.

During the year ended December 31, 2022, the Company acquired PCX Holdings LLC, Ripley Tools, LLC and Nooks Hill Road, LLC, and REF Automation Limited and REF Alabama Inc. for an aggregate purchase price of $177.1 million. Because the Company has not yet fully incorporated the internal controls and procedures of the acquired entities into the Company's internal control over financial reporting, management excluded these businesses from its assessment of the effectiveness of internal control over financial reporting as of December 31, 2022. These entities accounted for 2% of the Company's total assets excluding intangibles and goodwill as of December 31, 2022 and less than 1% of the Company's net sales for the year then ended December 31, 2022.

In making this assessment, management used the criteria set forth in Internal Control-Integrated Framework (2013 framework) issued by the Committee of Sponsoring Organizations of the Treadway Commission ("COSO"). Based on this assessment, management concluded that our internal control over financial reporting was effective at a reasonable assurance level as of December 31, 2022.

The effectiveness of our internal control over financial reporting as of December 31, 2022 has been audited by PricewaterhouseCoopers LLP, our independent registered public accounting firm as stated in their report which is included below within this Annual Report on Form 10-K.

/s/ GERBEN W. BAKKER

Gerben W. Bakker

Chairman of the Board, President and Chief Executive Officer

/s/ WILLIAM R. SPERRY

William R. Sperry

Executive Vice President and Chief Financial Officer

Report of Independent Registered Public Accounting Firm

To the Board of Directors and Shareholders of Hubbell Incorporated

Opinions on the Financial Statements and Internal Control over Financial Reporting

We have audited the accompanying consolidated balance sheets of Hubbell Incorporated and its subsidiaries (the "Company") as of December 31, 2022 and 2021, and the related consolidated statements of income, of comprehensive income, of changes in equity and of cash flows for each of the three years in the period ended December 31, 2022, including the related notes and schedule of valuation and qualifying accounts for each of the three years in the period ended December 31, 2022 appearing under Item 15 (collectively referred to as the "consolidated financial statements"). We also have audited the Company's internal control over financial reporting as of December 31, 2022, based on criteria established in Internal Control - Integrated Framework (2013) issued by the Committee of Sponsoring Organizations of the Treadway Commission (COSO).

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of the Company as of December 31, 2022 and 2021, and the results of its operations and its cash flows for each of the three years in the period ended December 31, 2022 in conformity with accounting principles generally accepted in the United States of America. Also in our opinion, the Company maintained, in all material respects, effective internal control over financial reporting as of December 31, 2022, based on criteria established in *Internal Control* - *Integrated Framework* (2013) issued by the COSO.

Basis for Opinions

The Company's management is responsible for these consolidated financial statements, for maintaining effective internal control over financial reporting, and for its assessment of the effectiveness of internal control over financial reporting, included in Management's Annual Report on Internal Control over Financial Reporting appearing under Item 8. Our responsibility is to express opinions on the Company's consolidated financial statements and on the Company's internal control over financial reporting based on our audits. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB.

We conducted our audits in accordance with the standards of the PCAOB. Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the consolidated financial statements are free of material misstatement, whether due to error or fraud, and whether effective internal control over financial reporting was maintained in all material respects.

Our audits of the consolidated financial statements included performing procedures to assess the risks of material misstatement of the consolidated financial statements, whether due to error or fraud, and performing procedures that respond to those risks. Such procedures included examining, on a test basis, evidence regarding the amounts and disclosures in the consolidated financial statements. Our audits also included evaluating the accounting principles used and significant estimates made by management, as well as evaluating the overall presentation of the consolidated financial statements. Our audit of internal control over financial reporting included obtaining an understanding of internal control over financial reporting, assessing the risk that a material weakness exists, and testing and evaluating the design and operating effectiveness of internal control based on the assessed risk. Our audits also included performing such other procedures as we considered necessary in the circumstances. We believe that our audits provide a reasonable basis for our opinions.

As described in Management's Annual Report on Internal Control over Financial Reporting, management has excluded PCX Holdings LLC, Ripley Tools, LLC and Nooks Hill Road, LLC, and REF Automation Limited and REF Alabama Inc. from its assessment of internal control over financial reporting as of December 31, 2022 because they were acquired by the Company in a purchase business combination during 2022. We have also excluded PCX Holdings LLC, Ripley Tools, LLC and Nooks Hill Road, LLC, and REF Automation Limited and REF Alabama Inc. from our audit of internal control over financial reporting. PCX Holdings LLC, Ripley Tools, LLC and Nooks Hill Road, LLC, and REF Automation Limited and REF Alabama Inc. are wholly-owned subsidiaries whose total assets and total revenues excluded from management's assessment and our audit of internal control over financial reporting represent 2% and 1%, respectively, of the related consolidated financial statement amounts as of and for the year ended December 31, 2022.

Definition and Limitations of Internal Control over Financial Reporting

A company's internal control over financial reporting is a process designed to provide reasonable assurance regarding the reliability of financial reporting and the preparation of financial statements for external purposes in accordance with generally accepted accounting principles. A company's internal control over financial reporting includes those policies and procedures that (i) pertain to the maintenance of records that, in reasonable detail, accurately and fairly reflect the transactions and dispositions of the assets of the company; (ii) provide reasonable assurance that transactions are recorded as necessary to permit preparation of financial statements in accordance with generally accepted accounting principles, and that receipts and expenditures of the company are being made only in accordance with authorizations of management and directors of the company; and (iii) provide reasonable assurance regarding prevention or timely detection of unauthorized acquisition, use, or disposition of the company's assets that could have a material effect on the financial statements.

Because of its inherent limitations, internal control over financial reporting may not prevent or detect misstatements. Also, projections of any evaluation of effectiveness to future periods are subject to the risk that controls may become inadequate because of changes in conditions, or that the degree of compliance with the policies or procedures may deteriorate.

Critical Audit Matters

The critical audit matter communicated below is a matter arising from the current period audit of the consolidated financial statements that was communicated or required to be communicated to the audit committee and that (i) relates to accounts or disclosures that are material to the consolidated financial statements and (ii) involved our especially challenging, subjective, or complex judgments. The communication of critical audit matters does not alter in any way our opinion on the consolidated financial statements, taken as a whole, and we are not, by communicating the critical audit matter below, providing a separate opinion on the critical audit matter or on the accounts or disclosures to which it relates.

Goodwill Impairment Assessments - One of the Reporting Units Subject to a Quantitative Assessment

As described in Notes 1 and 7 to the consolidated financial statements, the Company's consolidated goodwill balance was $1,970.5 million as of December 31, 2022. Goodwill represents purchase price in excess of fair values of the underlying net assets of acquired companies. Goodwill is subject to annual impairment testing. Management performs its goodwill impairment testing as of April 1st of each year, unless circumstances dictate the need for more frequent assessments. On January 1, 2022, the Company reorganized certain businesses within the Electrical Solutions segment to simplify the organization structure and align the organization to better serve their customers. As a result of the change in reporting units, management performed an interim goodwill impairment assessment prior to the change, for reporting units within the Electrical Solutions segment. As disclosed by management, management also completed its annual goodwill impairment assessment as of April 1, 2022. For three of its reporting units, management elected to utilize the quantitative goodwill impairment testing process, as permitted in the accounting guidance, by comparing the estimated fair value of the Company's reporting units to their carrying values for both assessments. If the estimated fair value of the reporting unit exceeds its carrying value, no impairment exists. Goodwill impairment testing requires judgment by management, including the identification of reporting units, assigning assets and liabilities to reporting units and determining the fair value of each reporting unit. Management uses internal discounted cash flow models to estimate fair value. Significant judgments required by management to estimate the fair value of reporting units include estimating future cash flows, determining appropriate discount rates and other assumptions, including assumptions about secular economic and market conditions, such as the potential continuing effects of the COVID-19 pandemic, impacts to the supply chain and higher inflation. These cash flow estimates are derived from historical experience, third party end market data, and future long-term business plans and include assumptions of future sales growth, gross margin, operating margin, terminal growth rate and the application of an appropriate discount rate.

The principal considerations for our determination that performing procedures relating to the goodwill impairment assessment for one of the reporting units subject to a quantitative assessment is a critical audit matter are (i) the significant judgment by management when estimating the fair value of the reporting unit and (ii) the high degree of auditor judgment, subjectivity, and effort in performing procedures and evaluating management's significant assumptions related to future sales growth, gross margin, and operating expenses.

Addressing the matter involved performing procedures and evaluating audit evidence in connection with forming our overall opinion on the consolidated financial statements. These procedures included testing the effectiveness of controls relating to management's quantitative goodwill impairment assessment, including controls over the estimation of the fair value of the reporting unit. These procedures also included, among others, (i) testing management's process for estimating the fair value of the reporting unit; (ii) evaluating the appropriateness of the discounted cash flow model; (iii) testing the completeness and accuracy of the underlying data used in the model; and (iv) evaluating the reasonableness of significant assumptions used by management related to future sales growth, gross margin, and operating expenses. Evaluating management's assumptions related to the future sales growth, gross margin, and operating expenses involved evaluating whether the assumptions used by management were reasonable considering (i) the current and past performance of the reporting unit; (ii) the consistency with industry and third party data; and (iii) whether these assumptions were consistent with evidence obtained in other areas of the audit.

/s/ PricewaterhouseCoopers LLP

Hartford, Connecticut
February 9, 2023

We have served as the Company's auditor since at least 1961. We have not been able to determine the specific year we began serving as auditor of the Company.

Consolidated Statement of Income

(in millions, except per share amounts)		Year Ended December 31, 2022		2021		2020
Net sales	**$**	**4,947.9**	**$**	**4,194.1**	**$**	**3,682.5**
Cost of goods sold		3,476.3		3,042.6		2,596.7
Gross profit		**1,471.6**		**1,151.5**		**1,085.8**
Selling & administrative expenses		762.5		619.2		591.3
Operating income		**709.1**		**532.3**		**494.5**
Loss on disposition of business (Note 4)		—		(6.9)		—
Loss on extinguishment of debt (Note 13)		—		(16.8)		—
Pension charge (Note 12)		(7.0)		—		(7.6)
Interest expense, net		(49.6)		(54.7)		(60.1)
Other income (expense), net		4.5		5.4		(2.3)
Total other expense		**(52.1)**		**(73.0)**		**(70.0)**
Income from continuing operations before income taxes		**657.0**		**459.3**		**424.5**
Provision for income taxes		140.2		88.2		89.8
Net income from continuing operations		**516.8**		**371.1**		**334.7**
Less: Net income from continuing operations attributable to noncontrolling interest		(5.5)		(6.1)		(4.7)
NET INCOME FROM CONTINUING OPERATIONS ATTRIBUTABLE TO HUBBELL INCORPORATED		**511.3**		**365.0**		**330.0**
Income from discontinued operations, net of tax (Note 2)		34.6		34.5		21.2
Net income attributable to Hubbell Incorporated	**$**	**545.9**	**$**	**399.5**	**$**	**351.2**
Earnings per share						
Basic earnings per share from continuing operations	$	9.49	$	6.70	$	6.07
Basic earnings per share from discontinued operations	$	0.64	$	0.63	$	0.39
Basic earnings per share	$	10.13	$	7.33	$	6.46
Diluted earnings per share from continuing operations	$	9.43	$	6.66	$	6.04
Diluted earnings per share from discontinued operations	$	0.64	$	0.62	$	0.39
Diluted earnings per share	$	10.07	$	7.28	$	6.43

See notes to consolidated financial statements.

Consolidated Statement of Comprehensive Income

	Year Ended December 31,		
(in millions)	**2022**	**2021**	**2020**
Net income	$ 551.4	$ 405.6	$ 355.9
Other comprehensive income (loss):			
Currency translation adjustment:			
Foreign currency translation adjustments	(27.9)	(11.5)	12.3
Reclassification of currency translation gains included in net income	0.5	—	—
Defined benefit pension and post-retirement plans, net of taxes of \$(4.8), \$(3.2) and \$2.9	14.2	9.2	(8.8)
Unrealized gain (loss) on investments, net of taxes of \$0.4, \$0.1 and \$(0.1)	(1.4)	(0.4)	0.4
Unrealized gains (losses) on cash flow hedges, net of taxes of \$(0.1), \$(0.4) and \$0.5	0.2	1.1	(0.2)
Other comprehensive (loss) income	**(14.4)**	**(1.6)**	**3.7**
Comprehensive income	**537.0**	**404.0**	**359.6**
Less: Comprehensive income attributable to noncontrolling interest	5.5	6.1	4.7
COMPREHENSIVE INCOME ATTRIBUTABLE TO HUBBELL	**$ 531.5**	**$ 397.9**	**$ 354.9**

See notes to consolidated financial statements.

Consolidated Balance Sheet

	At December 31,	
(in millions, except per share amounts)	2022	2021
ASSETS		
Current Assets		
Cash and cash equivalents	$ 440.5	$ 286.2
Short-term investments	14.3	9.4
Accounts receivable (net of allowances of $14.3 and $10.6)	741.6	675.3
Inventories, net	740.7	662.1
Other current assets	84.3	66.8
Assets held for sale - current	—	179.5
Total Current Assets	2,021.4	1,879.3
Property, Plant, and Equipment, net	**528.0**	**459.5**
Other Assets		
Investments	65.9	69.1
Goodwill	1,970.5	1,871.3
Other intangible assets, net	669.9	681.5
Other long-term assets	146.9	143.7
Assets held for sale - non-current	—	177.1
TOTAL ASSETS	**$ 5,402.6**	**$ 5,281.5**
LIABILITIES AND EQUITY		
Current Liabilities		
Short-term debt and current portion of long-term debt	$ 4.7	$ 9.7
Accounts payable	529.9	532.8
Accrued salaries, wages and employee benefits	144.2	94.7
Accrued insurance	75.6	73.3
Other accrued liabilities	334.1	263.4
Liabilities held for sale - current	—	91.3
Total Current Liabilities	1,088.5	1,065.2
Long-term Debt	**1,437.9**	**1,435.5**
Other Non-Current Liabilities	**505.6**	**521.3**
Liabilities held for sale - non-current	—	18.8
TOTAL LIABILITIES	**$ 3,032.0**	**$ 3,040.8**
Commitments and Contingencies (see Note 16)		
Hubbell Incorporated Shareholders' Equity		
Common stock, par value $0.01		
Common stock - Authorized 200,000,000 shares, outstanding 53,689,539 and 54,518,047 shares	$ 0.6	$ 0.6
Additional paid-in capital	—	—
Retained earnings	2,705.5	2,560.0
Accumulated other comprehensive loss	(345.2)	(330.8)
Total Hubbell Incorporated Shareholders' Equity	2,360.9	2,229.8
Noncontrolling interest	9.7	10.9
TOTAL EQUITY	**2,370.6**	**2,240.7**
TOTAL LIABILITIES AND EQUITY	**$ 5,402.6**	**$ 5,281.5**

See notes to consolidated financial statements.

Consolidated Statement of Cash Flows

	Year Ended December 31,		
(in millions)	**2022**	**2021**	**2020**
Cash Flows from Operating Activities of Continuing Operations			
Net income from continuing operations	$ 516.8	$ 371.1	$ 334.7
Adjustments to reconcile net income from continuing operations to net cash provided by operating activities, net of acquisitions:			
Depreciation and amortization	148.5	149.1	144.5
Deferred income taxes	(27.8)	9.2	1.4
Stock-based compensation	24.5	17.5	21.9
Provision for bad debt expense	7.4	1.3	6.7
Loss on disposition of business	—	6.9	—
Loss on extinguishment of debt	—	16.8	—
Pension charge	7.0	—	7.6
Loss (gain) on sale of assets	3.5	(4.7)	0.2
Changes in assets and liabilities, net of acquisitions:			
(Increase) decrease in accounts receivable	(74.2)	(124.8)	41.7
(Increase) decrease in inventories	(66.5)	(138.9)	45.8
(Decrease) increase in accounts payable	(15.3)	195.1	20.7
Increase (decrease) in current liabilities	108.3	27.6	(26.9)
Changes in other assets and liabilities, net	13.2	(14.9)	19.2
Contributions to qualified defined benefit pension plans	(12.5)	(0.1)	(23.2)
Other, net	3.3	2.5	8.6
NET CASH PROVIDED BY OPERATING ACTIVITIES FROM CONTINUING OPERATIONS	**636.2**	**513.7**	**602.9**
Cash Flows from Investing Activities of Continuing Operations			
Capital expenditures	(129.3)	(90.2)	(82.8)
Acquisitions, net of cash acquired	(177.1)	0.1	(239.6)
Proceeds from disposal of business, net of cash	332.8	8.5	—
Purchases of available-for-sale investments	(33.7)	(11.4)	(35.1)
Proceeds from sales of available-for-sale investments	23.0	11.5	28.9
Other, net	2.4	9.4	5.3
NET CASH PROVIDED (USED) IN INVESTING ACTIVITIES FROM CONTINUING OPERATIONS	**18.1**	**(72.1)**	**(323.3)**
Cash Flows from Financing Activities of Continuing Operations			
Issuance of long-term debt	—	298.7	225.0
Payment of long-term debt	—	(300.0)	(331.3)
Issuance of short-term debt	—	8.1	125.5
Payment of short-term debt	(4.8)	(151.6)	(3.6)
Payment of dividends	(229.6)	(216.9)	(201.4)
Make whole payment for retirement of long-term debt	—	(16.0)	—
Debt issuance cost	—	(4.5)	—
Acquisition of common shares	(182.0)	(11.2)	(41.3)
Other	(20.7)	(39.6)	(17.1)

(in millions)	Year Ended December 31, 2022	2021	2020
NET CASH USED IN FINANCING ACTIVITIES FROM CONTINUING OPERATIONS	**(437.1)**	**(433.0)**	**(244.2)**
Discontinued Operations:			
Cash (used) provided by operating activities	(53.0)	30.1	45.1
Cash used by investing activities	(1.7)	(5.7)	(5.5)
Cash (used) provided by discontinued operations	(54.7)	24.4	39.6
Effect of foreign currency exchange rate changes on cash and cash equivalents	(8.8)	(3.0)	2.6
Increase in cash, cash equivalents, and restricted cash	**153.7**	**30.0**	**77.6**
Cash and cash equivalents, beginning of year	286.2	258.6	179.8
Cash and cash equivalents within assets held for sale, beginning of year	0.7	1.0	2.2
Restricted cash, included in other assets, beginning of year	2.7	—	—
Less: Restricted cash, included in Other Assets	2.8	2.7	—
Less: Cash and cash equivalents within assets held for sale, end of year	—	0.7	1.0
Cash and cash equivalents, end of year	$ 440.5	$ 286.2	$ 258.6

See notes to consolidated financial statements.

Consolidated Statement of Changes in Equity

(in millions, except per share amounts)	Common Stock	Additional Paid-in Capital	Retained Earnings	Accumulated Other Comprehensive Income (Loss)	Total Hubbell Shareholders' Equity	Non-controlling interest
BALANCE AT DECEMBER 31, 2019	**$ 0.6**	**$ —**	**$ 2,279.4**	**$ (332.9)**	**$ 1,947.1**	**$ 13.4**
Net income	—	—	351.2	—	351.2	4.7
Other comprehensive (loss) income	—	—	—	3.7	3.7	—
Stock-based compensation	—	23.9	—	—	23.9	—
Acquisition/surrender of common shares(1)	—	(17.8)	(34.1)	—	(51.9)	—
Cash dividends declared ($3.71 per share)	—	—	(201.8)	—	(201.8)	—
Dividends to noncontrolling interest	—	—	—	—	—	(2.7)
Directors deferred compensation	—	(1.2)	—	—	(1.2)	—
Cumulative effect from adoption of CECL accounting standard	—	—	(1.0)	—	(1.0)	—
BALANCE AT DECEMBER 31, 2020	**$ 0.6**	**$ 4.9**	**$ 2,393.7**	**$ (329.2)**	**$ 2,070.0**	**$ 15.4**
Net income	—	—	399.5	—	399.5	6.1
Other comprehensive (loss) income	—	—	—	(1.6)	(1.6)	—
Stock-based compensation	—	18.6	—	—	18.6	—
Acquisition/surrender of common shares(1)	—	(24.2)	(15.8)	—	(40.0)	—
Cash dividends declared ($3.99 per share)	—	—	(217.4)	—	(217.4)	—
Dividends to noncontrolling interest	—	—	—	—	—	(10.6)
Directors deferred compensation	—	0.7	—	—	0.7	—
BALANCE AT DECEMBER 31, 2021	**$ 0.6**	**$ —**	**$ 2,560.0**	**$ (330.8)**	**$ 2,229.8**	**$ 10.9**
Net income	—	—	545.9	—	545.9	5.5
Other comprehensive (loss) income	—	—	—	(14.4)	(14.4)	—
Stock-based compensation	—	24.5	—	—	24.5	—
Acquisition/surrender of common shares(1)	—	(23.1)	(170.5)	—	(193.6)	—
Cash dividends declared ($4.27 per share)	—	—	(229.9)	—	(229.9)	—
Dividends to noncontrolling interest	—	—	—	—	—	(6.7)
Directors deferred compensation	—	(1.4)	—	—	(1.4)	—
BALANCE AT DECEMBER 31, 2022	**$ 0.6**	**$ —**	**$ 2,705.5**	**$ (345.2)**	**$ 2,360.9**	**$ 9.7**

See notes to consolidated financial statements.

(1) For accounting purposes, the Company treats repurchased shares as constructively retired when acquired and accordingly charges the purchase price against Common Stock par value, Additional paid-in capital, to the extent available, and Retained earnings. The change in Retained earnings of $170.5 million, $15.8 million and $34.1 million in 2022, 2021 and 2020, respectively, reflects this accounting treatment.

Notes to Consolidated Financial Statements

NOTE 1 Significant Accounting Policies

Basis of Presentation

The accompanying consolidated financial statements of the Company have been prepared in accordance with accounting principles generally accepted in the United States of America (“GAAP”).

On February 1, 2022, the Company completed the sale of the Commercial and Industrial Lighting business (the “C&I Lighting business”) to GE Current, a Daintree Company, for total net cash consideration of $332.8 million. The C&I Lighting business had sales of $509.4 million in 2021 as part of the Electrical Solutions segment and designs, manufactures, and sells LED lighting and control solutions for commercial and industrial customers. As a result of the agreement, the C&I Lighting business met the criteria set forth in ASC 205-20 to be presented as a discontinued operation. The C&I Lighting business’ results of operations and the related cash flows have been presented as income from discontinued operations in the Consolidated Statements of Income and cash flows from discontinued operations in the Consolidated Statements of Cash Flows, respectively, for all periods presented. See Note 2, Discontinued Operations, to the Consolidated Financial Statements for further information.

Principles of Consolidation

The Consolidated Financial Statements include all wholly owned subsidiaries. All significant intercompany balances and transactions have been eliminated. The Company participates in two joint ventures that have been consolidated in accordance with the consolidation accounting guidance. An analysis is performed to determine which reporting entity, if any, has a controlling financial interest in a variable interest entity (“VIE”) with a primarily qualitative analysis. The qualitative analysis is based on identifying the party that has both the power to direct the activities that most significantly impact the VIE’s economic performance (the “power criterion”) and the obligation to absorb losses from or the right to receive benefits of the VIE that could potentially be significant to the VIE (the “losses/benefit criterion”). The party that meets both these criteria is deemed to have a controlling financial interest. The party with the controlling financial interest is considered to be the primary beneficiary and as a result is required to consolidate the VIE. The Company has a 50% interest in a joint venture in Hong Kong, established as Hubbell Asia Limited (“HAL”). The principal objective of HAL is to manage the operations of its wholly-owned manufacturing company in China. Under the accounting guidance, the Company is the primary beneficiary of HAL and as a result consolidates HAL. This determination is based on the fact that HAL’s sole business purpose is to manufacture product exclusively for the Company (the power criterion) and the Company is financially responsible for ensuring HAL maintains a fixed operating margin (the losses/benefit criterion). The consolidation of HAL is not material to the Company’s consolidated financial statements.

Use of Estimates

The preparation of financial statements in accordance with GAAP requires management to make estimates and assumptions that affect the reported amounts in the Consolidated Financial Statements and accompanying Notes to Consolidated Financial Statements. Actual results could differ from the estimates that are used.

Impact of the COVID-19 Pandemic

During March 2020, a global pandemic was declared by the World Health Organization related to the rapidly growing outbreak of a novel strain of coronavirus (COVID-19). The pandemic has had, and may continue to have, a significant effect on global economic conditions. U.S. Federal, state, local, and foreign governments have reacted to the public health crisis with mitigation measures, creating significant uncertainties in the U.S. and global economies. The extent to which the coronavirus pandemic will continue to affect our business, operations, supply chains, and our financial results will depend on numerous evolving factors that we may not be able to accurately predict and which may cause the actual results to differ from the estimates and assumptions we are required to make in the preparation of financial statements according to GAAP.

Assets and Liabilities Held for Sale

The Company classifies assets and liabilities (disposal groups) to be sold as held for sale in the period in which all of the following criteria are met: management, having the authority to approve the action, commits to a plan to sell the disposal group; the disposal group is available for immediate sale in its present condition subject only to terms that are usual and customary for sales of such disposal groups; an active program to locate a buyer and other actions required to complete the plan to sell the disposal group have been initiated; the sale of the disposal group is probable, and transfer of the disposal group is expected to qualify for recognition as a completed sale within one year, except if events or circumstances beyond the Company’s control extend the period of time required to sell the disposal group beyond one year; the disposal group is being actively marketed for sale at a price that is reasonable in relation to its current fair value; and actions required to complete the plan indicate that it is unlikely that significant changes to the plan will be made or that the plan will be withdrawn.

The Company initially measures a disposal group that is classified as held for sale at the lower of its carrying value or fair value less any costs to sell. Any loss resulting from this measurement is recognized in the period in which the held for sale criteria are met. Conversely, gains are not recognized on the sale of a disposal group until the date of sale. The Company assesses the fair value of a disposal group, less any costs to sell, each reporting period it remains classified as held for sale and reports any subsequent changes as an adjustment to the carrying value of the disposal group, as long as the new carrying value does not exceed the carrying value of the disposal group at the time it was initially classified as held for sale.

Upon determining that a disposal group meets the criteria to be classified as held for sale, the Company reports the assets and liabilities of the disposal group, if material, in the line items assets held for sale and liabilities held for sale in the consolidated statements of financial position. Refer to Note 2, "Discontinued Operations," of the notes to Consolidated Financial Statements for further information. In conjunction with the C&I Lighting Business being classified as held for sale, depreciation and amortization ceased.

Revenue Recognition

The Company recognizes revenue when performance obligations identified under the terms of contracts with its customers are satisfied, which generally occurs, for products, upon the transfer of control in accordance with the contractual terms and conditions of the sale. The majority of the Company's revenue associated with products is recognized at a point in time when the product is shipped to the customer, with a relatively small amount of transactions in the Utility Solutions segment recognized upon delivery of the product at the contractually specified destination. Revenue from service contracts and post-shipment performance obligations is approximately two percent of total annual consolidated net revenue and those service contracts and post-shipment obligations are primarily within the Utility Solutions segment. Revenue from service contracts and post-shipment performance obligations is recognized when or as those obligations are satisfied. The Company primarily offers assurance-type standard warranties that do not represent separate performance obligations and on occasion will separately offer and price extended warranties that are separate performance obligations for which the associated revenue is recognized over-time based on the extended warranty period. The Company records amounts billed to customers for reimbursement of shipping and handling costs within revenue. Shipping and handling costs associated with outbound freight after control over a product has transferred to a customer are accounted for as fulfillment costs and are included in cost of goods sold. Sales taxes and other usage-based taxes are excluded from revenue.

Within the Electrical Solutions segment, certain businesses require a portion of the transaction price to be paid in advance of transfer of control. Advance payments are not considered a significant financing component as they are received less than one year before the related performance obligations are satisfied. In addition, in the Utility Solutions segment, certain businesses offer annual maintenance service contracts that require payment at the beginning of the contract period. These payments are treated as a contract liability and are classified in Other accrued liabilities in the Consolidated Balance Sheet. Once control transfers to the customer and the Company meets the revenue recognition criteria, the deferred revenue is recognized in the Consolidated Statement of Income. The deferred revenue relating to the annual maintenance service contracts is recognized in the Consolidated Statement of Income on a straight line basis over the expected term of the contract.

The Company has certain arrangements that require us to estimate at the time of sale the amounts of variable consideration that should not be recorded as revenue as certain amounts are not expected to be collected from customers, as well as an estimate of the value of the product to be returned. The Company principally relies on historical experience, specific customer agreements and anticipated future trends to estimate these amounts at the time of shipment and to reduce the transaction price. These arrangements include sales discounts and allowances based on sales volumes, specific programs and special pricing allowances, and returned goods, as are customary in the electrical products industry. Customer returns have historically been approximately 1% of gross sales.

Shipping and Handling Costs

The Company records shipping and handling costs as part of Cost of goods sold in the Consolidated Statement of Income.

Foreign Currency Translation

The assets and liabilities of international subsidiaries are translated to U.S. dollars at exchange rates in effect at the end of the year, and income and expense items are translated at average exchange rates in effect during the year. The effects of exchange rate fluctuations on the translated amounts of foreign currency assets and liabilities are included as translation adjustments in Accumulated other comprehensive loss within Hubbell shareholders' equity. Gains and losses from foreign currency transactions are included in results of operations.

Cash and Cash Equivalents

The carrying value of cash equivalents approximates fair value. Cash equivalents consist of highly liquid investments with original maturities to the Company of three months or less.

Investments

Investments in debt and equity securities are classified by individual security as available-for-sale, held-to-maturity or trading securities. Our available-for-sale securities, consisting of municipal bonds, are carried on the balance sheet at fair value with current period adjustments to carrying value recorded in Accumulated other comprehensive loss within Hubbell shareholders' equity, net of tax. Realized gains and losses are recorded in income in the period of sale. The Company's trading securities are carried on the balance sheet at fair value and consist primarily of debt and equity mutual funds. Gains and losses associated with these trading securities are reflected in the results of operations. The Company did not have any investments classified as held-to-maturity as of December 31, 2022 and 2021.

Accounts Receivable and Allowances

Trade accounts receivable are recorded at the invoiced amount and generally do not bear interest. The allowance for doubtful accounts is based on an estimated amount of probable credit losses in existing accounts receivable. The allowance is calculated based upon a combination of historical write-off experience, fixed percentages applied to aging categories and specific identification based upon a review of past due balances and problem accounts. Account balances are charged off against the allowance when it is determined that internal collection efforts should no longer be pursued. The Company also maintains a reserve for credit memos and cash discounts which are principally calculated based upon historical experience, specific customer agreements, as well as anticipated future trends.

Inventories

Inventories are stated at the lower of cost or market value. Approximately 60% of total net inventory value is determined utilizing the last-in, first-out (LIFO) method of inventory accounting. The cost of foreign inventories and certain domestic inventories is determined utilizing average cost or first-in, first-out (FIFO) methods of inventory accounting. Reserves for excess and obsolete inventory are provided based on current assessments about future demand compared to on-hand quantities.

Property, Plant, and Equipment

Property, plant, and equipment values are stated at cost less accumulated depreciation. Maintenance and repair expenditures that do not significantly increase the life of an asset are charged to expense when incurred. Property, plant, and equipment placed in service prior to January 1, 1999 are depreciated over their estimated useful lives, principally, using accelerated methods. Assets placed in service subsequent to January 1, 1999 are depreciated over their estimated useful lives, using straight-line methods. Leasehold improvements are amortized over the shorter of their economic lives or the lease term. Gains and losses arising on the disposal of property, plant and equipment are included in Operating income in the Consolidated Statement of Income.

Capitalized Computer Software Costs

Capitalized computer software costs, net of amortization, were \$7.0 million and \$10.8 million at December 31, 2022 and 2021, respectively. This balance is reflected in Other long-term assets in the Consolidated Balance Sheet. Capitalized computer software is for internal use and costs primarily consist of purchased materials, external services and salary costs for personnel dedicated to the projects. Software is amortized on a straight-line basis over appropriate periods, generally between three and five years. The Company recorded amortization expense of \$6.6 million in 2022, \$9.6 million in 2021 and \$10.0 million in 2020 relating to capitalized computer software.

Goodwill and Other Intangible Assets

Goodwill represents purchase price in excess of fair values of the underlying net assets of acquired companies. Indefinite-lived intangible assets and goodwill are subject to annual impairment testing using the specific guidance and criteria described in the accounting guidance. The Company performs its goodwill impairment testing as of April 1st of each year, unless circumstances dictate the need for more frequent assessments. The accounting guidance provides entities an option of performing a qualitative assessment (a "step-zero" test) before performing a quantitative analysis. If the entity determines, on the basis of certain qualitative factors, that it is more-likely-than-not that the goodwill is not impaired, the entity would not need to proceed to quantitative goodwill impairment testing process as prescribed in the guidance. The Company applied the "step-zero" test to one of its four reporting units. Based on that qualitative assessment, the Company concluded it was more-likely-than-not that the fair value of this reporting unit exceeded its carrying value and therefore, further quantitative analysis was not required. For the other three reporting units the Company has elected to utilize the quantitative goodwill impairment testing process as permitted in the accounting guidance, by comparing the estimated fair value of the Company's reporting units to their carrying values. If the fair value of the reporting unit exceeds its carrying value, no impairment exists.

Goodwill impairment testing requires judgment, including the identification of reporting units, assigning assets and liabilities to reporting units and determining the fair value of each reporting unit. Significant judgments required to estimate the fair value of reporting units include estimating future discounted cash flows, determining appropriate discount rates and other assumptions, including assumptions about secular economic and market conditions, such as the potential continuing effects of the COVID-19 pandemic, impacts to the supply chain and higher inflation. We use internal discounted cash flow models to estimate fair value. These cash flow estimates are derived from historical experience, third party end market data, and future long-term business plans and include assumptions on future sales growth, gross margin, operating margin, terminal growth rate, and the application of an appropriate discount rate. Changes in these estimates and assumptions could affect the determination of fair value and/or goodwill impairment for each reporting unit. The Company believes that its estimated aggregate fair value of its reporting units is reasonable when compared to the Company's market capitalization on the valuation date.

On January 1, 2022, we internally reorganized certain businesses within our Electrical Solutions segment to simplify the organization structure and align the organization to better serve our customers. This change had no impact to our reportable segments. As a result of the change in reporting units, the Company performed an interim goodwill impairment assessment prior to the change, for the reporting units within the Electrical Solutions segment. Because the changes did not affect the Utility Solutions segment, no interim goodwill impairment assessment was required for that segment.

As of April 1, 2022, the impairment testing resulted in implied fair values of our reporting units that exceeded the reporting unit's carrying value, including goodwill. The range of fair value in excess of carrying value, including goodwill, of the reporting units was 57% to 308%. Additionally, the Company did not have any reporting units with zero or negative carrying amounts. The Company has not recorded any goodwill impairments since the initial adoption of the accounting guidance in 2002.

The Company's intangible assets consist primarily of customer relationships, tradenames, developed technology and patents. Intangible assets with definite lives are amortized over periods generally ranging from 5-30 years. The Company amortizes intangible assets with definite lives using either an accelerated method that reflects the pattern in which economic benefits of the intangible assets are consumed and results in higher amortization in the earlier years of the assets' useful life, or using a straight line method. Approximately 80% of the gross value of definite-lived intangible assets follow an accelerated amortization method. These definite lived intangibles are tested for impairment whenever events or circumstances indicate that the carrying amount of an asset (asset group) may not be recoverable. An impairment loss is recognized when the carrying amount of an asset exceeds the estimated undiscounted cash flows used in determining the fair value of the asset. The Company did not record any material impairments related to its definite lived intangible assets in 2022, 2021 or 2020. The Company also has some tradenames that are considered to be indefinite-lived intangible assets. These indefinite-lived intangible assets are not amortized and are tested for impairment annually, unless circumstances dictate the need for more frequent assessment.

The identification and measurement of impairment of indefinite-lived intangible assets involves either an assessment of qualitative factors to determine whether events or circumstances indicate that it is more-likely-than-not that an indefinite-lived intangible asset is impaired or a quantitative assessment whereby the estimated fair value of each indefinite-lived intangible asset is compared to its carrying value. If it is more-likely-than-not that the asset is impaired, the fair value of the indefinite lived intangibles will be determined using discounted cash flow estimates. If the carrying value of these assets exceeds the estimated fair value, the carrying value will be reduced to the estimated fair value. For the Company's annual impairment test as of April 1, 2022, the Company elected to utilize the quantitative impairment testing process as permitted in the accounting guidance. The fair value was determined utilizing an income approach (relief from royalty method). Significant judgment is required to estimate the fair value of the indefinite-lived intangible assets including assumptions for future revenues, discount rates, royalty rates, and other assumptions, including assumptions about secular economic and market conditions, such as the potential continuing effects of the COVID-19 pandemic. Significant changes in these estimates and assumptions could affect the determination of fair value and/or impairment for each indefinite-lived intangible asset. As of April 1, 2022, the impairment testing resulted in fair values for each indefinite-lived intangible asset that significantly exceeded the carrying values and there were no indefinite-lived intangible assets at risk of failing the quantitative impairment test. The Company did not record any impairments related to indefinite-lived intangible assets in 2022, 2021 and 2020.

Other Long-Lived Assets

The Company reviews depreciable long-lived assets for impairment whenever events or changes in circumstances indicate that the carrying amount may not be fully recoverable. If such a change in circumstances occurs, the related estimated future undiscounted cash flows expected to result from the use of the asset group and its eventual disposition is compared to the carrying amount. If the sum of the expected cash flows is less than the carrying amount, an impairment charge is recorded. The impairment charge is measured as the amount by which the carrying amount exceeds the fair value of the asset. The fair value of impaired assets is determined using expected cash flow estimates, quoted market prices when available and appraisals as appropriate. The Company did not record any material impairment charges in 2022, 2021 or 2020.

Leases

We determine if an arrangement is a lease at inception. Operating leases are included as ROU assets within other long-term assets, other accrued liabilities, and other non-current liabilities in our Consolidated Balance Sheets. Finance leases are included in property, plant, and equipment, net, other accrued liabilities, and other non-current liabilities. The Company's finance leases are immaterial.

ROU assets represent our right to use an underlying asset for the lease term and lease liabilities represent our obligation to make lease payments arising from the lease. ROU assets and liabilities are recognized at the lease commencement date based on the present value of lease payments over the lease term. As most of our leases do not provide an implicit rate, we use our incremental borrowing rate based on the information available at the commencement date in determining the present value of lease payments. We use an implicit rate when readily determinable. For leases existing as of January 1, 2019, we have elected to use the remaining lease term as of the adoption date in determining the incremental borrowing rate. Our determination of the lease term may include options to extend or terminate the lease when it is reasonably certain that we will exercise that option.

We have lease agreements with lease and non-lease components, which are generally accounted for separately. Additionally, for our vehicle leases, we apply a portfolio approach regarding the assumed lease term.

Accrued Insurance

The Company retains a significant portion of the risks associated with workers' compensation, medical, automobile and general liability insurance. The Company estimates self-insurance liabilities using a number of factors, including historical claims experience, demographic factors, and other actuarial assumptions. The accrued liabilities associated with these programs are based on the Company's estimate of the ultimate costs to settle known claims as well as claims incurred but not reported as of the balance sheet date. The Company periodically reviews the assumptions with a third party actuary to determine the adequacy of these self-insurance reserves.

Accrued Warranty

The Company offers product warranties which cover defects on most of its products. These warranties primarily apply to products that are properly installed, maintained and used for their intended purpose. The Company accrues estimated warranty costs at the time of sale. Estimated warranty expenses, recorded in cost of goods sold, are based upon historical information such as past experience, product failure rates, or the estimated number of units to be repaired or replaced. Adjustments are made to the product warranty accrual as claims are incurred, additional information becomes known or as historical experience indicates.

Income Taxes

The Company operates within multiple taxing jurisdictions and is subject to audit in these jurisdictions. The IRS and other tax authorities routinely examine the Company's tax returns. These audits can involve complex issues which may require an extended period of time to resolve. The Company makes adequate provisions for best estimates of exposures on previously filed tax returns. Deferred income taxes are recognized for the tax consequence of differences between financial statement carrying amounts and the tax basis of assets and liabilities by applying the currently enacted statutory tax rates in accordance with the accounting guidance for income taxes. The effect of a change in statutory tax rates is recognized in the period that includes the enactment date. Additionally, deferred tax assets are required to be reduced by a valuation allowance if it is more-likely-than-not that a portion or all of the deferred tax asset will not be realized. The Company uses factors to assess the likelihood of realization of deferred tax assets such as the forecast of future taxable income and available tax planning that could be implemented to realize the deferred tax assets.

In addition, the accounting guidance prescribes a recognition threshold and measurement attribute for the financial statement recognition and measurement of the tax position taken or expected to be taken in a tax return. For any amount of benefit to be recognized, it must be determined that it is more-likely-than-not that a tax position will be sustained upon examination by taxing authorities based on the technical merits of the position. The amount of benefit to be recognized is based on the Company's assertion of the most likely outcome resulting from an examination, including resolution of any related appeals or litigation processes. Companies are required to reflect only those tax positions that are more-likely-than-not to be sustained. See Note 14 — Income Taxes for additional information.

Research and Development

Research and development expenditures represent costs to discover and/or apply new knowledge in developing a new product, process, or in bringing about a significant improvement to an existing product or process. Research and development expenses are recorded as a component of Cost of goods sold. Expenses for research and development were approximately 2% of Net Sales in each of 2022 and 2021 and 3% in 2020.

Government Assistance

We have adopted Accounting Standards Update ("ASU") 2021-10, Government Assistance (Topic 832) Disclosures by Business Entities about Government Assistance, which requires footnote disclosure of assistance received from government entities. We record amounts received from government entities as a reduction of the associated expense. Amounts received related to depreciable assets are recognized as a reduction to depreciation expense. The total impact of government assistance was not material to the Company in 2022, and prior periods presented.

Retirement Benefits

The Company maintains various defined benefit pension plans for some of its U.S. and foreign employees. The accounting guidance for retirement benefits requires the Company to recognize the funded status of its defined benefit pension and postretirement plans as an asset or liability in the Consolidated Balance Sheet. Gains or losses, prior service costs or credits, and transition assets or obligations that have not yet been included in net periodic benefit cost as of the end of the year are recognized as components of Accumulated other comprehensive loss, net of tax, within Hubbell shareholders' equity. The Company's policy is to fund pension costs within the ranges prescribed by applicable regulations. In addition to providing defined benefit pension benefits, the Company provides health care and life insurance benefits for some of its active and retired employees. The Company's policy is to fund these benefits through insurance premiums or as actual expenditures are made. See also Note 12 — Retirement Benefits.

Earnings Per Share

Restricted stock granted by the Company is considered a participating security since it contains a non-forfeitable right to dividends. As a result, the earnings per share accounting guidance requires the Company to use the two-class method for calculating earnings per share. The two-class method is an earnings allocation formula that determines earnings per share for common stock and participating securities. Basic earnings per share is calculated as net income available to common shareholders divided by the weighted average number of shares of common stock outstanding. Earnings per diluted share is calculated as net income available to common shareholders divided by the weighted average number of shares outstanding of common stock plus the incremental shares outstanding assuming the exercise of dilutive stock options, stock appreciation rights and performance shares. See also Note 19 — Earnings Per Share.

Stock-Based Compensation

The Company recognizes the grant-date fair value of all stock-based awards on a straight-line basis over their respective requisite service periods (generally equal to an award's vesting period). A stock-based award is considered vested for expense attribution purposes when the retention of the award is no longer contingent on providing subsequent service. Accordingly, the Company generally recognizes compensation cost immediately for awards granted to retirement-eligible individuals or over the period from the grant date to the date retirement eligibility is achieved, if less than the stated vesting period. The expense is recorded in Cost of goods sold and S&A expense in the Consolidated Statement of Income based on the recipients' respective functions within the organization.

The Company records deferred tax assets for awards that will result in deductions on its tax returns, based upon the amount of compensation cost recognized and the statutory tax rate in the jurisdiction in which it will receive a deduction. See also Note 18 — Stock-Based Compensation.

Recently Issued Accounting Pronouncements

In March 2020, the FASB issued ASU No. 2020-04, "Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting", which provides optional expedients and exceptions for applying generally accepted accounting principles to contracts, hedging relationships, and other transactions affected by reference rate reform if certain criteria are met. The amendments are effective for all entities beginning on March 12, 2020 through December 31, 2022. The Company may elect to apply the amendments prospectively through December 31, 2022.

In December 2022, the FASB issued ASU No. 2022-06 Reference Rate Reform (Topic 848): Deferral of the Sunset Date of Topic 848, which extends the temporary accounting rules under Topic 848 to December 31, 2024. The Company is currently assessing the impact of adopting this standard on its financial statements and the timing of adoption.

NOTE 2 Discontinued Operations

On February 1, 2022, the Company completed the sale of the C&I Lighting business to GE Current, a Daintree Company, for total net cash consideration of $332.8 million. We have concluded the divestiture of this business represents a strategic shift that will have a major effect on our operations and financial results, and as a result, is reported as a discontinued operation in our Consolidated Financial Statements for all periods presented. The assets and liabilities of this business are also presented as held for sale in the Consolidated Balance Sheets for the year ended December 31, 2021. The C&I Lighting business was previously included in the Electrical Solutions segment.

Under the terms of the transaction, Hubbell and the buyer entered into a transition services agreement ("TSA"), pursuant to which the Company provides certain administrative and operational services for a period of 12 months or less. Furthermore, we entered into a short-term supply agreement whereby the Company acts as a supplier of finished goods and component parts to the C&I Lighting business after the completion of the sale. Income from the TSA and supply agreement was $13.3 million for the year ended December 31, 2022 and was recorded in Other Income in the Consolidated Financial Statements.

The following table presents the summarized components of income from discontinued operations, net of income taxes, for the Commercial and Industrial Lighting business:

	Year Ended December 31,		
(in millions)	2022	2021	2020
Net sales	**$ 29.1**	**$ 509.4**	**$ 503.5**
Cost of goods sold	27.8	403.4	385.6
Gross profit	**1.3**	**106.0**	**117.9**
Selling & administrative expenses	17.3	88.5	85.1
Operating (Loss) income	**(16.0)**	**17.5**	**32.8**
Gain on disposal of business	73.9	—	—
Other expense	(1.5)	(4.1)	(4.0)
Income from discontinued operations before income taxes	56.4	13.4	28.8
Provision (benefit) for income taxes	21.8	(21.1)	7.6
Income from discontinued operations, net of taxes	**$ 34.6**	**$ 34.5**	**$ 21.2**

Income from discontinued operations, net of taxes for the year ended December 31, 2022 and December 31, 2021 includes pre-tax transaction and separation costs of $8.8 million and $7.0 million, respectively. The provision for income taxes on discontinued operations in 2022 includes a correction of $19 million of income tax expense recognized in the fourth quarter of 2022 that should have been recognized in the first quarter of 2022. The Company evaluated the materiality of the adjustment to prior-period financial statements and concluded the effect of the adjustment was immaterial. In addition, a one-time tax benefit of $25.1 million related to book-to-tax basis differences of the business was recorded in the year ended December 31, 2021.

The following table presents balance sheet information for assets and liabilities held for sale:

	At December 31,
(in millions)	2021
Cash and cash equivalents	$ 0.7
Accounts receivable	83.1
Inventories, net	89.8
Other current assets	5.9
Assets held for sale - current	**$ 179.5**
Property, Plant, and Equipment, net	77.7
Goodwill	50.2
Other Intangible assets, net	37.3
Other long-term assets	11.9
Assets held for sale - non-current	**$ 177.1**
Accounts payable	50.2
Accrued salaries, wages and employee benefits	8.5
Accrued insurance	3.9
Other accrued liabilities	28.7
Liabilities held for sale - current	**$ 91.3**
Other Non-Current Liabilities	18.8
Liabilities held for sale - non-current	**$ 18.8**

NOTE 3 Revenue

The Company recognizes revenue when performance obligations identified under the terms of contracts with its customers are satisfied, which generally occurs, for products, upon the transfer of control in accordance with the contractual terms and conditions of the sale. Approximately three-fourths of the Company's Net sales are to distributors who then sell directly into our end markets. Within the Utility Solutions segment, our businesses sell to distributors, with the majority of sales to the utility end markets and also directly into transmission and distribution utility markets. The majority of the Company's revenue associated with products is recognized at a point in time when the product is shipped to the customer, with a relatively small amount of transactions, primarily in the Utility Solutions segment, recognized upon delivery of the product at the destination. Revenue from service contracts and post-shipment performance obligations is recognized when or as those obligations are satisfied. The Company primarily offers assurance-type standard warranties that do not represent separate performance obligations and on occasion will separately offer and price extended warranties that are separate performance obligations for which the associated revenue is recognized over-time based on the extended warranty period. The Company records amounts billed to customers for reimbursement of shipping and handling costs within revenue. Shipping and handling costs associated with outbound freight after control over a product has transferred to a customer are accounted for as fulfillment costs and are included in cost of goods sold. Sales taxes and other usage-based taxes are excluded from revenue.

Within the Electrical Solutions segment, certain businesses require a portion of the transaction price to be paid in advance of transfer of control. Advance payments are not considered a significant financing component as they are received less than one year before the related performance obligations are satisfied. In addition, in the Utility Solutions segment, certain businesses offer annual maintenance service contracts that require payment at the beginning of the contract period. These payments are treated as a contract liability and are classified in Other accrued liabilities in the Consolidated Balance Sheets. Once control transfers to the customer and the Company meets the revenue recognition criteria, the deferred revenue is recognized in the Consolidated Statements of Income. The deferred revenue relating to the annual maintenance service contracts is recognized in the Consolidated Statements of Income on a straight-line basis over the expected term of the contract.

The following table presents disaggregated revenue by business group. On January 1, 2022, we internally reorganized certain businesses within our Electrical Solutions segment to simplify the organization structure and align the organization to better serve our customers. This change had no impact to our reportable segments. In conjunction with this change, prior period amounts have been reclassified to conform to the organizational changes within the Electrical Solutions segment.

	Twelve Months Ended December 31,		
(in millions)	2022	2021	2020
Net sales			
Utility T&D Components	$ 2,218.8	$ 1,679.8	$ 1,445.1
Utility Communications and Controls	652.3	654.6	634.3
Total Utility Solutions	**$ 2,871.1**	**$ 2,334.4**	**$ 2,079.4**
Electrical Products	902.4	809.6	663.9
Connection and Bonding	608.7	525.3	430.2
Industrial Controls	337.7	257.8	236.2
Retail and Builder	228.0	267.0	272.8
Total Electrical Solutions	**$ 2,076.8**	**$ 1,859.7**	**$ 1,603.1**
TOTAL	**$ 4,947.9**	**$ 4,194.1**	**$ 3,682.5**

The following table presents disaggregated third-party Net sales by geographic location (on a geographic basis, the Company defines "international" as operations based outside of the United States and its possessions):

	Twelve Months Ended December 31,		
(in millions)	2022	2021	2020
Net sales			
United States	$ 2,715.8	$ 2,204.9	$ 1,967.9
International	155.3	129.5	111.5
Total Utility Solutions	**$ 2,871.1**	**$ 2,334.4**	**$ 2,079.4**
United States	1,820.6	1,604.9	1,389.0
International	256.2	254.8	214.1
Total Electrical Solutions	**$ 2,076.8**	**$ 1,859.7**	**$ 1,603.1**
TOTAL	**$ 4,947.9**	**$ 4,194.1**	**$ 3,682.5**

Contract Balances

Our contract liabilities consist of advance payments for products as well as deferred revenue on service obligations and extended warranties. The current portion of deferred revenue is included in Other accrued liabilities and the non-current portion of deferred revenue is included in Other non-current liabilities in the Consolidated Balance Sheet.

Contract liabilities were $45.8 million as of December 31, 2022 compared to $16.7 million as of December 31, 2021. The $29.1 million increase in our contract liabilities balance was primarily due to a $21.8 million net increase in current year deferrals primarily due to timing of advance payments on certain orders and a $20.1 million increase due to acquisitions, partially offset by the recognition of $12.8 million in revenue related to amounts that were recorded in contract liabilities at January 1, 2022. The Company has an immaterial amount of contract assets relating to performance obligations satisfied prior to payment that is recorded in Other long-term assets in the Condensed Consolidated Balance Sheets. Impairment losses recognized on our receivables and contract assets were immaterial in the twelve months ended December 31, 2022. See Note 1 – Significant Accounting Policies in the Notes to Consolidated Financial Statements for additional information.

Unsatisfied Performance Obligations

The Company has elected the practical expedient to disclose only the value of unsatisfied performance obligations for contracts with an original expected length greater than one year. As of December 31, 2022, the Company had approximately $320 million of unsatisfied performance obligations for contracts with an original expected length of greater than one year, primarily relating to long-term contracts of the Aclara business (within the Utility Solutions segment) to deliver and install meters, metering communications and grid monitoring sensor technology. The Company expects that a majority of the unsatisfied performance obligations will be completed and recognized over the next 2 years.

NOTE 4 Business Acquisitions and Dispositions

2022 Acquisitions

In the third quarter of 2022, the Company acquired all of the issued and outstanding membership interests of PCX Holdings LLC ("PCX") for a cash purchase price of approximately $112.8 million, net of cash acquired. PCX is a leading designer and manufacturer of factory built modular power solutions for applications in the data center market. This business is reported in the Electrical Solutions segment. We have recognized intangible assets of $49.1 million and goodwill of $77.4 million as a result of this acquisition. The intangible assets of $49.1 million consist primarily of customer relationships, backlog and a tradename and will be amortized over a weighted average period of approximately 11 years. All of the goodwill is expected to be deductible for tax purposes.

In the third quarter of 2022, the Company also acquired all of the issued and outstanding membership interests of Ripley Tools, LLC and Nooks Hill Road, LLC, collectively referred to as Ripley Tools, for a cash purchase price of approximately $50.1 million, net of cash acquired. Ripley Tools is a leading manufacturer of cable and fiber prep tools and test equipment that services both the utility and communications markets. This business is reported in the Utility Solutions segment. We have recognized intangible assets of $18.2 million and goodwill of $23.8 million as a result of this acquisition. The intangible assets of $18.2 million consist primarily of customer relationships and a tradename, and will be amortized over a weighted average period of approximately 17 years. Substantially all of the goodwill is expected to be deductible for tax purposes.

In the fourth quarter of 2022, the Company also acquired all of the issued and outstanding equity interests of REF Automation Limited and REF Alabama Inc. (collectively "REF") for a cash purchase price of $14.1 million, net of cash acquired, subject to customary purchase price adjustments. REF designs and manufactures electrical power components utilizing high-volume precision machining, as well as custom fabricated structural products and assemblies for the OEM, industrial and renewables markets. This business is reported in the Electrical Solutions segments. We have recognized goodwill of $10.2 million as a result of the acquisition. None of the goodwill associated with this acquisition is expected to be deductible for tax purposes.

These business acquisitions have been accounted for as business combinations and have resulted in the recognition of goodwill. The goodwill relates to a number of factors implied in the purchase prices, including the future earnings and cash flow potential of the businesses as well as the complementary strategic fit and resulting synergies that such business acquisitions bring to the Company's existing operations.

Allocation of Consideration Transferred to Net Assets Acquired

The following table presents the determination of the fair value of identifiable assets acquired and liabilities assumed from the Company's 2022 acquisitions. Fair value estimates are based on a complex series of judgments about future events and uncertainties and rely heavily on estimates and assumptions. The judgments used to determine the estimated fair value assigned to each class of assets acquired and liabilities assumed, as well as asset lives, can materially impact the Company's results of operations.

The following table summarizes the fair values of the assets acquired and liabilities assumed as of the respective date of acquisition for all transactions (in millions):

Tangible assets acquired	$	41.4
Intangible assets		67.3
Goodwill		111.4
Other liabilities assumed		(43.0)
TOTAL ESTIMATE OF CONSIDERATION TRANSFERRED, NET OF CASH ACQUIRED	**$**	**177.1**

The Consolidated Financial Statements include the results of operations of the acquired businesses from their respective dates of acquisition. Net sales and earnings related to these acquisitions for the year ended December 31, 2022 were not significant to the consolidated results. Pro forma information related to these acquisitions has not been included because the impact to the Company's consolidated results of operations was not material.

Dispositions

In June of 2021, the Company completed the sale of the Consumer Analytics Solutions business for $9.8 million. The Consumer Analytics Solutions business was part of Aclara and was previously included in the Utility Solutions segment. Upon disposition, the Consumer Analytics Solutions business had assets of $15.9 million, including definite-lived intangibles of $8.7 million (primarily customer relationships and developed technology), goodwill of $1.9 million and total liabilities of $1.5 million (primarily composed of deferred revenue). As a result of the sale of the Consumer Analytics Solutions business, we recognized a pre-tax loss of $6.9 million that is included in Total other expense in the Consolidated Statement of Income.

NOTE 5 Receivables and Allowances

Receivables consist of the following components at December 31, (in millions):

	2022	2021
Trade accounts receivable	$ 778.0	$ 695.7
Non-trade receivables	22.1	24.9
Accounts receivable, gross	800.1	720.6
Allowance for credit memos, returns and cash discounts	(44.2)	(34.7)
Allowance for doubtful accounts	(14.3)	(10.6)
Total allowances	(58.5)	(45.3)
ACCOUNTS RECEIVABLE, NET	**$ 741.6**	**$ 675.3**

NOTE 6 Inventories

Inventories are classified as follows at December 31, (in millions):

	2022	2021
Raw material	$ 302.8	$ 241.0
Work-in-process	161.7	129.4
Finished goods	463.2	428.6
Subtotal	927.7	799.0
Excess of FIFO over LIFO cost basis	(187.0)	(136.9)
INVENTORIES, NET	**$ 740.7**	**$ 662.1**

NOTE 7 Goodwill and Other Intangible Assets

Changes in the carrying amounts of goodwill for the years ended December 31, 2022 and 2021, by segment, were as follows (in millions):

	Segment		
	Utility Solutions	Electrical Solutions	Total
BALANCE AT DECEMBER 31, 2020	**$ 1,259.4**	**$ 613.7**	**$ 1,873.1**
Prior year acquisitions[1]	6.6	—	6.6
Dispositions[1]	(1.9)	—	(1.9)
Foreign currency translation	(5.3)	(1.2)	(6.5)
BALANCE AT DECEMBER 31, 2021	**$ 1,258.8**	**$ 612.5**	**$ 1,871.3**
Current year acquisitions[1]	23.8	87.6	111.4
Foreign currency translation	(6.7)	(5.5)	(12.2)
BALANCE AT DECEMBER 31, 2022	**$ 1,275.9**	**$ 694.6**	**$ 1,970.5**

(1) Refer to Note 4 – Business Acquisitions and Dispositions for additional information.

In 2022, the Company completed multiple acquisitions. These acquisitions have been accounted for as business combinations and have resulted in the recognition of $111.4 million of goodwill. The Company has not recorded any material goodwill impairments since the initial adoption of the related accounting guidance in 2002.

Identifiable intangible assets are recorded in Other intangible assets, net in the Consolidated Balance Sheet. Identifiable intangible assets are comprised of the following (in millions):

	December 31, 2022		December 31, 2021	
	Gross Amount	Accumulated Amortization	Gross Amount	Accumulated Amortization
Definite-lived:				
Patents, tradenames and trademarks	$ 187.9	$ (75.7)	$ 181.3	$ (67.6)
Customer relationships, developed technology and other	955.3	(437.8)	901.2	(374.0)
TOTAL DEFINITE-LIVED INTANGIBLES	**1,143.2**	**(513.5)**	**1,082.5**	**(441.6)**
Indefinite-lived:				
Tradenames and other	40.2	—	40.6	—
TOTAL OTHER INTANGIBLE ASSETS	**$ 1,183.4**	**$ (513.5)**	**$ 1,123.1**	**$ (441.6)**

Amortization expense associated with these definite-lived intangible assets was $75.7 million, $75.7 million and $72.1 million in 2022, 2021 and 2020, respectively. Amortization expense associated with these intangible assets is expected to be $71.2 million in 2023, $66.0 million in 2024, $63.6 million in 2025, $60.0 million in 2026 and $54.5 million in 2027. The Company amortizes intangible assets with definite lives using either an accelerated method that reflects the pattern in which economic benefits of the intangible assets are consumed and results in higher amortization in the earlier years of the assets' useful life, or using a straight line method. Approximately 80% of the gross value of definite-lived intangible assets follow an accelerated amortization method.

NOTE 8 Investments

At December 31, 2022 and December 31, 2021, the Company held investments classified as available-for-sale and investments classified as trading securities. Investments classified as available-for-sale consisted of municipal bonds with an amortized cost basis of $62.6 million as of December 31, 2022. Investments classified as trading securities were composed primarily of debt and equity mutual funds and are stated at fair market value based on current quotes.

The following table sets forth selected data with respect to the Company's investments at December 31, (in millions):

	2022					2021				
	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value	Carrying Value	Amortized Cost	Gross Unrealized Gains	Gross Unrealized Losses	Fair Value	Carrying Value
Available-for-sale securities	$ 62.6	$ 0.1	$ (1.3)	$ 61.4	$ 61.4	$ 53.3	$ 0.8	$ (0.1)	$ 54.0	$ 54.0
Trading securities	10.2	8.6	—	18.8	18.8	12.2	12.3	—	24.5	24.5
TOTAL INVESTMENTS	**$ 72.8**	**$ 8.7**	**$ (1.3)**	**$ 80.2**	**$ 80.2**	**$ 65.5**	**$ 13.1**	**$ (0.1)**	**$ 78.5**	**$ 78.5**

Contractual maturities of our investments in available-for-sale securities at December 31, 2022 were as follows (in millions):

	Amortized Cost	Fair Value
Available-for-sale securities		
Due within 1 year	$ 14.4	$ 14.3
After 1 year but within 5 years	38.0	37.4
After 5 years but within 10 years	—	—
Due after 10 years	10.2	9.7
TOTAL	**$ 62.6**	**$ 61.4**

The total unrealized gain/(loss) recognized in the year relating to available-for-sale securities, net of tax, was $(1.4) million and $(0.4) million for the year ended December 31, 2022 and 2021, respectively. These net unrealized gains/(losses) are included in Accumulated other comprehensive loss, net of tax. Net unrealized gains relating to trading securities have been reflected in the results of operations. The Company uses the specific identification method when identifying the cost basis used to calculate the gain or loss on these securities. Gains and losses for both available-for-sale and trading securities were not material in 2022, 2021 and 2020.

At December 31, 2022 and December 31, 2021, the Company had $61.4 million and $54.0 million, respectively, of available-for-sale municipal debt securities. These investments had an amortized cost of $62.6 million and $53.3 million, respectively. No allowance for credit losses related to our available-for-sale debt securities was recorded for the twelve months ended December 31, 2022. As of December 31, 2022 and December 31, 2021 the unrealized losses attributable to our available-for-sale debt securities was $1.3 million and $0.1 million, respectively, at each period end. The fair value of available-for-sale debt securities with unrealized losses was $53.7 million at December 31, 2022 and $12.2 million at December 31, 2021.

NOTE 9 Property, Plant, and Equipment

Property, plant, and equipment, carried at cost, is summarized as follows at December 31, (in millions):

	2022	2021
Land	$ 29.8	$ 28.1
Buildings and improvements	212.1	209.7
Machinery, tools, and equipment	905.7	846.6
Construction-in-progress	99.0	69.5
Gross property, plant, and equipment	1,246.6	1,153.9
Less accumulated depreciation	(718.6)	(694.4)
PROPERTY, PLANT, AND EQUIPMENT, NET	**$ 528.0**	**$ 459.5**

Depreciable lives on buildings range between 20-45 years. Depreciable lives on machinery, tools, and equipment range between 3-15 years. The Company recorded depreciation expense of $63.4 million, $61.7 million and $61.7 million for 2022, 2021 and 2020, respectively.

NOTE 10 Other Accrued Liabilities

Other accrued liabilities consist of the following at December 31, (in millions):

	2022	2021
Customer program incentives	$ 87.8	$ 67.3
Accrued income taxes	4.5	4.8
Contract liabilities - deferred revenue	45.8	16.7
Customer refund liability	14.8	16.7
Accrued warranties[1]	20.2	36.7
Current operating lease liabilities	30.5	27.1
Other	130.5	94.1
TOTAL	**$ 334.1**	**$ 263.4**

(1) Refer to Note 22 – Guarantees for additional information regarding warranties.

NOTE 11 Other Non-Current Liabilities

Other non-current liabilities consists of the following at December 31, (in millions):

	2022	2021
Pensions	$ 155.3	$ 189.8
Other post-employment benefits	14.3	17.0
Deferred tax liabilities	113.8	114.7
Accrued warranties long-term[1]	26.0	29.4
Non-current operating lease liabilities	84.9	58.3
Other	111.3	112.1
TOTAL	**$ 505.6**	**$ 521.3**

(1) Refer to Note 22 – Guarantees for additional information regarding warranties.

NOTE 12 Retirement Benefits

The Company has funded and unfunded non-contributory U.S. and foreign defined benefit pension plans. Benefits under these plans are generally provided based on either years of service and final average pay or a specified dollar amount per year of service. The U.S. defined benefit pension plan has been closed to new participants since 2004, while the Canadian and UK defined benefit pension plans have been closed to new entrants since 2006 and 2007, respectively. These U.S., Canadian and UK employees are eligible instead for defined contribution plans.

The Company also has a number of health care and life insurance benefit plans covering eligible employees who reached retirement age while working for the Company. These benefits have been discontinued for substantially all future retirees. The Company anticipates future cost-sharing charges for its discontinued plans that are consistent with past practices. The Company uses a December 31 measurement date for all of its plans.

In 2020 and 2022, the Company recognized a settlement loss in continuing operations relating to retirees that elected to receive lump-sum distributions from the Company's defined benefit pension plans of $7.6 million and $7.0 million, respectively. This charge was the result of lump-sum payments which exceeded the threshold for settlement accounting under U.S. GAAP in each year.

In 2019, the Company approved amendments to one of its domestic qualified defined benefit pension plans, which froze service accruals for nearly all active participants within the plan effective January 1, 2020. As a result of the amendment, the Company recognized a $0.3 million curtailment charge, net of tax. Effective January 1, 2020, the amortization of unrecognized gains and losses of all of the Company's qualified defined benefit pension plans is recognized over the remaining life expectancy of participants, as nearly all participants are considered inactive as a result of plan amendments.

The Company's U.S. defined benefit pension plans were approximately 90% of the $670.8 million total pension benefit obligations at December 31, 2022.

The following table sets forth the reconciliation of beginning and ending balances of the benefit obligations and the plan assets for the Company's defined benefit pension and other benefit plans at December 31, (in millions):

	Pension Benefits		Other Benefits	
	2022	2021	2022	2021
Change in benefit obligation				
Benefit obligation at beginning of year	$ 937.7	$ 994.2	$ 18.9	$ 23.2
Service cost	0.9	1.0	—	—
Interest cost	28.0	23.8	0.5	0.6
Plan participants' contributions	—	—	—	—
Amendments	—	3.6	—	—
Actuarial loss/(gain)	(214.2)	(22.0)	(2.2)	(4.2)
Curtailment gain	—	—	—	—
Settlements	(22.5)	(0.1)	—	—
Currency impact	(10.5)	(0.9)	—	—
Other	(0.5)	(0.3)	—	—
Benefits paid	(48.1)	(61.6)	(1.3)	(0.7)
Benefit obligation at end of year	$ 670.8	$ 937.7	$ 15.9	$ 18.9
Change in plan assets				
Fair value of plan assets at beginning of year	$ 765.6	$ 805.1	$ —	$ —
Actual return on plan assets	(186.6)	15.6	—	—
Employer contributions	19.8	7.9	1.3	0.7
Plan participants' contributions	—	—	—	—
Settlements	(22.5)	(0.1)	—	—
Currency impact	(12.8)	(1.3)	—	—
Benefits paid	(48.1)	(61.6)	(1.3)	(0.7)
Fair value of plan assets at end of year	$ 515.4	$ 765.6	$ —	$ —
FUNDED STATUS	**$ (155.4)**	**$ (172.1)**	**$ (15.9)**	**$ (18.9)**
Amounts recognized in the consolidated balance sheet consist of:				
Prepaid pensions (included in Other long-term assets)	$ 6.8	$ 24.8	$ —	$ —
Accrued benefit liability (short-term and long-term)	(162.2)	(196.9)	(15.9)	(18.9)
NET AMOUNT RECOGNIZED IN THE CONSOLIDATED BALANCE SHEET	**$ (155.4)**	**$ (172.1)**	**$ (15.9)**	**$ (18.9)**
Amounts recognized in Accumulated other comprehensive loss (income) consist of:				
Net actuarial loss (gain)	$ 244.4	$ 263.1	$ (5.5)	$ (3.4)
Prior service cost (credit)	6.3	6.9	—	—
NET AMOUNT RECOGNIZED IN ACCUMULATED OTHER COMPREHENSIVE LOSS	**$ 250.7**	**$ 270.0**	**$ (5.5)**	**$ (3.4)**

The accumulated benefit obligation for all defined benefit pension plans was $670.8 million and $937.7 million at December 31, 2022 and 2021, respectively. Information with respect to plans with accumulated benefit obligations in excess of plan assets is as follows, (in millions):

	2022	2021
Projected benefit obligation	$ 468.0	$ 817.7
Accumulated benefit obligation	$ 468.0	$ 817.7
Fair value of plan assets	$ 305.8	$ 620.7

The following table sets forth the components of pension and other benefit costs for the years ended December 31, (in millions):

	Pension Benefits			Other Benefits		
	2022	2021	2020	2022	2021	2020
Components of net periodic benefit cost:						
Service cost	$ 0.9	$ 1.0	$ 1.2	$ —	$ —	$ —
Interest cost	28.0	23.8	28.0	0.5	0.6	0.7
Expected return on plan assets	(30.8)	(36.5)	(33.9)	—	—	—
Amortization of prior service cost (credit)	0.4	0.2	0.2	—	—	(0.4)
Amortization of actuarial losses (gains)	10.8	10.8	9.8	(0.2)	(0.1)	(0.1)
Curtailment and settlement losses	8.8	—	7.5	—	—	—
Net periodic benefit cost	$ 18.1	$ (0.7)	$ 12.8	$ 0.3	$ 0.5	$ 0.2
Changes recognized in other comprehensive loss (income), before tax:						
Current year net actuarial loss (gain)	$ 2.6	$ (1.4)	$ 28.6	$ (2.2)	$ (4.1)	$ 0.1
Current year prior service credit	—	3.6	—	—	—	—
Amortization of prior service (cost) credit	(0.4)	(0.2)	(0.2)	—	—	0.4
Amortization of net actuarial (losses) gains	(10.8)	(10.8)	(9.8)	0.2	0.1	0.1
Currency impact	(2.0)	(0.2)	0.1	—	—	—
Settlement adjustment	(8.8)	—	(7.6)	—	—	—
Curtailment adjustments	—	—	0.1	—	—	—
Total recognized in other comprehensive loss	(19.4)	(9.0)	11.2	(2.0)	(4.0)	0.6
TOTAL RECOGNIZED IN NET PERIODIC PENSION COST AND OTHER COMPREHENSIVE LOSS	**$ (1.3)**	**$ (9.7)**	**$ 24.0**	**$ (1.7)**	**$ (3.5)**	**$ 0.8**

During 2022, the Company recognized $7.0 million of settlement losses in continuing operations and $1.8 million of settlement losses in discontinued operations. Those settlement losses are the result of lump-sum distributions from the Company's defined benefit pension plans which exceeded the threshold for settlement accounting under U.S. GAAP for the year.

The Company also maintains four primary defined contribution pension plans. The total cost of the Company's defined contribution plans was $25.8 million in 2022, $23.3 million in 2021 and $21.0 million in 2020, excluding the employer match for the 401(k) plan. This cost is not included in the above net periodic benefit cost for the defined benefit pension plans.

In 2020, 2021 and 2022 the Company participated in one multi-employer defined benefit pension plan. The Company's total contributions while participating in this plan was $0.2 million in each of these years.

The risks of participating in multi-employer plans are different from single-employer plans in that assets contributed are pooled and may be used to provide benefits to employees of other participating employers. If a participating employer stops contributing to the plan, the unfunded obligations of the plan may have to be assumed by the remaining participant employers. If we choose to stop participating in a multi-employer plan we may be required to pay those plans a withdrawal liability based on the unfunded status of the plan.

Assumptions

The following assumptions were used to determine the projected benefit obligations at the measurement date and the net periodic benefit cost for the year:

	Pension Benefits			Other Benefits		
	2022	2021	2020	2022	2021	2020
Weighted-average assumptions used to determine benefit obligations at December 31,						
Discount rate	5.46%	2.79%	2.47%	5.50%	2.90%	2.50%
Rate of compensation increase	0.08%	0.08%	0.24%	3.93%	3.87%	3.99%
Weighted-average assumptions used to determine net periodic benefit cost for years ended December 31,						
Discount rate	2.79%	2.47%	3.17%	2.90%	2.50%	3.30%
Expected return on plan assets	4.59%	4.66%	4.69%	N/A	N/A	N/A
Rate of compensation increase	0.08%	0.24%	2.94%	3.87%	3.99%	4.00%

At the end of each year, the Company determines the appropriate expected return on assets for each plan based upon its strategic asset allocation (see discussion below). In making this determination, the Company utilizes expected returns for each asset class based upon current market conditions and expected risk premiums for each asset class.

The Company also determines the discount rate to be used to calculate the present value of pension plan liabilities at the end of each year. The discount rate for the Company's U.S. and Canadian pension plans is determined by matching the expected cash flows associated with its benefit obligations to the expected cash flows of a hypothetical portfolio of high quality, fixed income debt instruments with maturities that closely match the expected funding period of its pension liabilities. As of December 31, 2022, the Company used a discount rate of 5.50% for its U.S. pension plans compared to a discount rate of 2.90% used in 2021. For its Canadian pension plan, the Company used a discount rate of 5.01% as of December 31, 2022 compared to a 2.98% discount rate used in 2021.

For its UK pension plan the discount rate was derived using a full yield curve and uses plan specific cash flows. The derived discount rate is the single discount rate equivalent to discounting these liability cash flows at the term-dependent spot rate of AA corporate bonds. This methodology resulted in a December 31, 2022 discount rate for the UK pension plan of 5.00% as compared to a discount rate of 1.80% used in 2021.

In 2020 we used the Pri-2012 mortality table to calculate the present value of our pension plan liabilities and adopted the MP-2020 projection scale, and in 2021 and 2022 we used the Pri-2012 mortality table and adopted the MP-2021 projection scale The Pri-2012 mortality table with adjustment for collar as appropriate and generational projection from 2012 using Scale MP-2021 was chosen as the best estimate based on the observed and anticipated experience of the plans after considering alternative tables. These changes did not have a material impact to the projected benefit obligation of our U.S. plans upon remeasurement.

The rate of compensation increase assumption reflects the Company's actual experience and best estimate of future increases.

The assumed health care cost trend rates used to determine the projected postretirement benefit obligation are as follows:

	Other Benefits		
	2022	2021	2020
Assumed health care cost trend rates at December 31,			
Health care cost trend assumed for next year	7.0%	6.2%	6.4%
Rate to which the cost trend is assumed to decline	5.0%	5.0%	5.0%
Year that the rate reaches the ultimate trend rate	2031	2028	2028

Plan Assets

The Company's combined targeted 2023 weighted average asset allocation for domestic and foreign pension plans and the actual weighted average asset allocation for domestic and foreign pension plans at December 31, 2022 and 2021 by asset category are as follows:

	Percentage of Plan Assets		
	Target	Actual	
Asset Category	2023	2022	2021
Equity securities	32%	23%	22%
Debt securities & Cash	68%	77%	77%
Alternative Investments	—%	—%	1%
TOTAL	**100%**	**100%**	**100%**

At the end of each year, the Company estimates the expected long-term rate of return on pension plan assets based on the strategic asset allocation for its plans. In making this determination, the Company utilizes expected rates of return for each asset class based upon current market conditions and expected risk premiums for each asset class. The Company has written investment policies and asset allocation guidelines for its domestic and foreign pension plans. In establishing these policies, the Company has considered that its various pension plans are a major retirement vehicle for most plan participants and has acted to discharge its fiduciary responsibilities with regard to the plans solely in the interest of such participants and their beneficiaries. The goal underlying the establishment of the investment policies is to provide that pension assets shall be invested in a prudent manner and so that, together with the expected contributions to the plans, the funds will be sufficient to meet the obligations of the plans as they become due.

To achieve this result, the Company conducts a periodic strategic asset allocation study to form a basis for the allocation of pension assets between various asset categories. Specific policy benchmark percentages are assigned to each asset category with minimum and maximum ranges established for each. The assets are then tactically managed within these ranges. Derivative investments include futures contracts used by the plan to adjust the level of its investments within an asset allocation category. The actual and target percentages reported in the preceding table reflect the economic exposure to each asset category, including the impact of derivative positions. All futures contracts are 100% supported by cash or cash equivalent investments. At no time may derivatives be utilized to leverage the asset portfolio. At December 31, 2022 and 2021, there were no holdings of Company stock in pension plan assets.

The Company's other post-employment benefits are unfunded; therefore, no asset information is reported.

The fair value of the Company's pension plan assets at December 31, 2022 and 2021, by asset category are as follows (in millions):

Asset Category	Total	Quoted Prices in Active Markets for Identical Assets (Level 1)	Quoted Prices in Active Market for Similar Asset (Level 2)	Significant Unobservable Inputs (Level 3)	Investments Priced Using Net Asset Value
Cash and cash equivalents	$ 9.8	$ 3.5	$ 6.3	$ —	$ —
Equity securities:					
Equity Mutual Funds	21.5	21.5	—	—	—
Common Pooled Equity Funds[(a)]	84.5	—	84.5	—	—
Fixed Income Securities:					
U.S. Treasuries	47.2	—	47.2	—	—
State and Local Municipal Bonds	6.4	—	6.4	—	—
Sovereign Debt	4.9	—	4.9	—	—
Corporate Bonds[(b)]	105.5	—	105.5	—	—
Fixed Income Mutual Funds	41.8	41.8	—	—	—
Common Pooled Fixed Income Funds[(c)]	174.2	—	148.7	—	25.5
Alternative Investment Funds[(d)]	2.1	—	—	—	2.1
Common Pooled Funds[(e)]	17.5	0.4	17.1	—	—
BALANCE AT DECEMBER 31, 2022	**$ 515.4**	**$ 67.2**	**$ 420.6**	**$ —**	**$ 27.6**

Asset Category		Total		Quoted Prices in Active Markets for Identical Assets (Level 1)		Quoted Prices in Active Market for Similar Asset (Level 2)		Significant Unobservable Inputs (Level 3)		Investments Priced Using Net Asset Value
Cash and cash equivalents	$	8.9	$	8.9	$	—	$	—	$	—
Equity securities:										
Equity Mutual Funds		31.7		31.7		—		—		—
Common Pooled Equity Funds[(a)]		123.3		—		123.3		—		—
Fixed Income Securities:										
U.S. Treasuries		55.0		—		55.0		—		—
State and Local Municipal Bonds		6.2		—		6.2		—		—
Sovereign Debt		7.1		—		7.1		—		—
Corporate Bonds[(b)]		141.6		—		141.6		—		—
Fixed Income Mutual Funds		55.5		55.5		—		—		—
Common Pooled Fixed Income Funds[(c)]		306.3		—		275.2		—		31.1
Alternative Investment Funds[(d)]		7.1		—		—		—		7.1
Common Pooled Funds[(e)]		22.9		0.5		22.4		—		—
BALANCE AT DECEMBER 31, 2021	**$**	**765.6**	**$**	**96.6**	**$**	**630.8**	**$**	**—**	**$**	**38.2**

(a) Investments in Common Pooled Equity Funds, including funds and fund products investing in various equity securities.
(b) Includes primarily investment grade bonds from diverse industries.
(c) Investments in Common Pooled Fixed Income Funds, including funds and fund products investing in various fixed income investments.
(d) Includes investments in hedge funds, including fund of funds products and open-end mutual funds.
(e) Investments in Common Pooled Funds, consisting of equities and fixed income securities.

Investments priced using Net Asset Value ("NAV") within Alternative Investment Funds and Common Pooled Fixed Income Funds in the preceding tables consist of fund of fund products. These products invest in a number of investment funds managed by a diversified group of third-party investment managers who employ a variety of investment strategies, including relative value, security selection, distressed value, global macro, specialized credit and directional strategies. The objective of these funds is to achieve the desired capital appreciation or fixed income as applicable with lower volatility than either traditional equity or fixed income securities.

Contributions

In 2021, there were no contributions to the Company's U.S. qualified plans required by the Pension Protection Act of 2006. The Company contributed $10.0 million and $2.5 million to its U.S. and foreign qualified plans, respectively, in 2022. The Company entered into a settlement agreement with a multi-employer pension plan in December of 2019 and, pursuant to that agreement, made a $6.0 million cash payment in 2020, and $5.0 million cash payment in 2021, according to the terms of that settlement agreement.

Estimated Future Benefit Payments

The following domestic and foreign benefit payments, which reflect future service, as appropriate, are expected to be paid as follows (in millions):

		Pension Benefits		Other Benefits
2023	$	53.4	$	1.7
2024	$	53.6	$	1.6
2025	$	53.8	$	1.6
2026	$	53.9	$	1.5
2027	$	53.2	$	1.4
2028-2031	$	255.0	$	6.0

NOTE 13 Debt

The following table sets forth the Company's long-term debt at December 31, (in millions):

	Maturity	2022	2021
Senior notes at 3.35%	2026	$ 397.9	$ 397.2
Senior notes at 3.15%	2027	297.5	297.0
Senior notes at 3.50%	2028	446.2	445.5
Senior notes at 2.300%	2031	296.3	295.8
TOTAL LONG-TERM DEBT[(a)]		**$ 1,437.9**	**$ 1,435.5**

(a) Long-term debt is presented net of debt issuance costs and unamortized discounts.

On March 12, 2021, the Company, as borrower, and its subsidiaries Hubbell Power Holdings S.à r.l. and Harvey Hubbell Holdings S.à r.l., each as a subsidiary borrower (collectively, the "Subsidiary Borrowers"), entered into a new five-year credit agreement with a syndicate of lenders and JPMorgan Chase, N.A., as administrative agent, that provides a $750 million committed revolving credit facility (the "2021 Credit Facility"). Commitments under the 2021 Credit Facility may be increased to an aggregate amount not to exceed $1.25 billion. The 2021 Credit Facility includes a $50 million sub-limit for the issuance of letters of credit. The sum of the dollar amount of loans and letters of credits to the Subsidiary Borrowers under the 2021 Credit Facility may not exceed $75 million.

The interest rate applicable to borrowings under the 2021 Credit Facility is either (i) the alternate base rate (as defined in the Revolving Credit Agreement) or (ii) the adjusted LIBOR rate (as defined in the 2021 Credit Facility) plus, in the case of this clause (ii), an applicable margin based on the Company's credit ratings. All revolving loans outstanding under the 2021 Credit Facility will be due and payable on March 12, 2026.

The 2021 Credit Facility contains a financial covenant requiring that, as of the last day of each fiscal quarter, the ratio of total indebtedness to total capitalization shall not be greater than 65%. The Company was in compliance with this covenant as of December 31, 2022. As of December 31, 2022 and December 31, 2021, the 2021 Credit Facility was undrawn.

In connection with entry into the 2021 Credit Facility, the Company terminated all commitments under the existing credit facility dated as of January 31, 2018.

On March 12, 2021, the Company completed a public offering of $300 million aggregate principal amount of its 2.300% Senior Notes due 2031 (the "2031 Notes"). The net proceeds from the offering were approximately $295.5 million after deducting the underwriting discount and estimated offering expenses payable by the Company. The Company used the net proceeds from the offering of the 2031 Notes, together with cash on hand, to redeem in full all of the Company's outstanding 3.625% Senior Notes due 2022 in an aggregate principal amount of $300 million, which had a stated maturity date of November 15, 2022 (the "2022 Notes"), and to pay any premium and accrued interest in respect thereof, which redemption was completed on April 2, 2021. The redemption resulted in a $16.8 million loss on extinguishment of indebtedness that was recognized in the second quarter of 2021. The loss on extinguishment includes a cash premium of $16.0 million paid upon redemption in accordance with the terms of the 2022 Notes.

The 2031 Notes bear interest at a rate of 2.300% per annum from March 12, 2021. Interest on the 2031 Notes is payable semi-annually in arrears on March 15 and September 15 of each year, beginning on September 15, 2021. The 2031 Notes will mature on March 15, 2031.

The 2031 Notes are callable at any time with a make whole premium and are only subject to accelerated payment prior to maturity in the event of a default (including as a result of the Company's failure to meet certain non-financial covenants) under the indenture governing the notes or upon a change in control triggering event as defined in such indenture. The Company was in compliance with all non-financial covenants as of December 31, 2022.

In February 2018, the Company completed a public offering of $450 million of senior, unsecured, notes maturing in February 2028 and bearing interest at a fixed rate of 3.50% (the "2028 Notes"). Net proceeds from the issuance of the 2028 Notes were $442.6 million after deducting the discount on such notes and offering expenses paid by the Company. The 2028 Notes are callable at any time at specified prices and are only subject to accelerated payment prior to maturity upon customary events of a default under the indenture governing the 2028 Notes, as modified by the supplemental indenture creating such notes, or upon a change in control triggering event as defined in such indenture.

In August 2017, the Company completed a public debt offering of $300 million of long-term unsecured, unsubordinated notes maturing in August 2027 and bearing interest at a fixed rate of 3.15% (the "2027 Notes"). Net proceeds from the issuance were $294.6 million after deducting the discount on the notes and offering expenses paid by the Company.

In March 2016, the Company completed a public debt offering of $400 million of long-term unsecured, unsubordinated notes maturing in March 2026 and bearing interest at a fixed rate of 3.35% (the "2026 Notes"). Net proceeds from the issuance were $393.4 million after deducting the discount on the notes and offering expenses paid by the Company.

The 2026 Notes, 2027 Notes, 2028 Notes and 2031 Notes, are all fixed rate indebtedness, are callable at any time with a make whole premium and are only subject to accelerated payment prior to maturity in the event of a default (including as a result of the Company's failure to meet certain non-financial covenants) under the indenture governing the notes, as modified by the supplemental indentures creating such notes, or upon a change in control triggering event as defined in such indenture. The Company was in compliance with all non-financial covenants as of December 31, 2022.

At December 31, 2022 and 2021, the Company had no commercial paper borrowings outstanding and had $4.7 million and $9.7 million, respectively, of short-term debt outstanding composed of:

- $2.8 million at December 31, 2022 and $1.6 million at December 31, 2021, respectively, of borrowings to support our international operations in China as well as $1.9 million and $8.1 million of other short term debt at December 31, 2022 and December 31, 2021, respectively, to support operations.

Other information related to short-term debt at December 31, is summarized below:

	2022	2021
Weighted average interest rate on short-term debt:		
At year end	2.57%	2.98%

The Company also maintains other lines of credit that are primarily used to support the issuance of letters of credit. Interest rates and other terms of borrowing under these lines of credit vary from country to country, depending on local market conditions. At December 31, 2022 and 2021 these lines totaled $55.8 million and $30.0 million, respectively, of which $31.7 million and $23.2 million was utilized to support letters of credit and the remaining amount was unused. The annual commitment fees associated with these lines of credit are not material.

Interest and fees paid related to total indebtedness was $47.5 million, $65.6 million and $54.4 million in 2022, 2021 and 2020, respectively. The $65.6 million paid in 2021 includes $16.0 million related to the make whole payment for the extinguishment of the 2022 Notes.

NOTE 14 Income Taxes

The following table sets forth selected data with respect to the Company's income tax provisions of continuing operations for the years ended December 31, (in millions):

	2022	2021	2020
Income before income taxes:			
United States	$ 528.9	$ 347.5	$ 340.7
International	128.1	111.8	83.8
TOTAL INCOME BEFORE INCOME TAXES	**$ 657.0**	**$ 459.3**	**$ 424.5**
Provision for income taxes — current:			
Federal	$ 120.3	$ 43.3	$ 56.3
State	24.2	13.0	15.1
International	23.5	22.7	17.0
Total provision — current	168.0	79.0	88.4
Provision for income taxes — deferred:			
Federal	(26.2)	8.8	1.5
State	(3.9)	1.9	0.2
International	2.3	(1.5)	(0.3)
Total provision — deferred	(27.8)	9.2	1.4
TOTAL PROVISION FOR INCOME TAXES	**$ 140.2**	**$ 88.2**	**$ 89.8**

Deferred tax assets and liabilities result from differences in the basis of assets and liabilities for tax and financial statement purposes. The components of the deferred tax assets/(liabilities) of continuing operations at December 31, were as follows (in millions):

	2022	2021
Deferred tax assets:		
Inventories	$ 9.6	$ 10.2
Lease liabilities	27.4	20.5
Income tax credits	22.8	22.8
Accrued liabilities	40.8	38.5
Pension	38.9	43.1
Basis difference in subsidiary	—	25.1
Post retirement and post employment benefits	4.5	4.9
Stock-based compensation	6.9	6.7
Loss carryforwards	14.2	17.3
Capitalized research expenditures	18.4	—
Miscellaneous other	16.4	17.0
Gross deferred tax assets	199.9	206.1
Valuation allowance	(32.2)	(32.6)
Total deferred tax assets, net of valuation allowance	167.7	173.5
Deferred tax liabilities:		
Liability on undistributed foreign earnings	(7.0)	(7.9)
Goodwill and intangibles	(185.0)	(205.2)
Right-of-use assets	(26.1)	(19.5)
Property, plant, and equipment	(57.9)	(50.4)
Total deferred tax liabilities	(276.0)	(283.0)
TOTAL NET DEFERRED TAX LIABILITY	**$ (108.3)**	**$ (109.5)**
Deferred taxes are reflected in the Consolidated Balance Sheet as follows:		
Non-current tax assets (included in Other long-term assets)	$ 5.5	$ 5.2
Non-current tax liabilities (included in Other Non-Current Liabilities)	(113.8)	(114.7)
TOTAL NET DEFERRED TAX LIABILITY	**$ (108.3)**	**$ (109.5)**

As of December 31, 2022, the Company had a total of $22.8 million of U.S. federal, state (net of federal benefit) and foreign tax credit carryforwards, available to offset future income taxes. As of December 31, 2022, $1.9 million of the tax credits may be carried forward indefinitely while the remaining $20.9 million will begin to expire at various times in 2023 through 2051. As of December 31, 2022, the Company had recorded tax benefits totaling $14.0 million for U.S. federal, state and foreign net operating loss carryforwards ("NOLs"). As of December 31, 2022, $5.5 million of NOLs may be carried forward indefinitely while the remaining $8.5 million will begin to expire at various times in 2023 through 2052. The tax benefit related to a portion of these NOLs has been adjusted to reflect an "ownership change" pursuant to Internal Revenue Code Section 382, which imposes an annual limitation on the utilization of pre-acquisition operating losses. The Company has recorded a net valuation allowance of $32.2 million on certain deferred tax assets including a portion of foreign and state tax credit carryforwards, capital loss carryforwards and NOLs that the Company anticipates will expire prior to utilization.

During 2022, the Company repatriated certain of its foreign earnings. As of December 31, 2022, the Company also anticipates repatriating certain of its foreign earnings in the future. The accompanying financial statements reflect the income tax expense associated with actual and anticipated remittances related to certain of our outside basis differences. The Company has not provided for the income tax effects of distributing the remaining approximately $400 million of undistributed foreign earnings as those amounts are either permanently reinvested or intended to be reinvested in our international operations. It is not practicable to estimate the tax cost associated with a remittance of such earnings.

Cash payments of income taxes were $168.0 million, $84.0 million and $96.2 million in 2022, 2021, and 2020, respectively.

The Company operates within multiple taxing jurisdictions and is subject to audit in these jurisdictions. The IRS and other tax authorities routinely audit the Company's tax returns. These audits can involve complex issues which may require an extended period of time to resolve. In January 2023 the Company completed its 2018 U.S. federal tax examination with no material adjustments. With few exceptions, the Company is no longer subject to state, local, or income tax examinations by tax authorities for years prior to 2018.

The following tax years, by major jurisdiction, are still subject to examination by taxing authorities:

Jurisdiction	Open Years
United States	2019-2022
UK	2021-2022
Puerto Rico	2018-2022
Canada	2018-2022

A reconciliation of the beginning and ending amount of unrecognized tax benefits is as follows (in millions):

	2022	2021	2020
Unrecognized tax benefits at beginning of year	$ 41.2	$ 47.6	$ 41.9
Additions based on tax positions relating to the current year	12.1	6.1	7.4
Reductions based on expiration of statute of limitations	(4.8)	(10.3)	(6.2)
Additions/(Subtractions) to tax positions relating to previous years	(6.2)	(2.2)	4.5
Settlements	(0.2)	—	—
TOTAL UNRECOGNIZED TAX BENEFITS	**$ 42.1**	**$ 41.2**	**$ 47.6**

Included in the balance at December 31, 2022 are approximately $33.9 million of tax positions which, if in the future are determined to be recognizable, would affect the annual effective income tax rate. Additionally, there are $4.3 million of tax positions for which the ultimate deductibility is highly certain but for which there is uncertainty as to the timing of such deductibility. Because of the impact of deferred tax accounting, other than interest and penalties, the disallowance of the shorter deductibility period would not affect the annual effective tax rate but would accelerate the payment of cash to the applicable taxing authority to an earlier period. It is reasonably possible that in the next twelve months, because of changes in facts and circumstances, the unrecognized tax benefits may increase or decrease.

The Company estimates a possible decrease of approximately $5 million to $11 million within the next twelve months due to the expiration of the statute of limitations and audit resolutions.

The Company's policy is to record interest and penalties associated with the underpayment of income taxes within Provision for income taxes in the Consolidated Statement of Income. The Company recognized (benefit) expense, before federal tax impact, related to interest and penalties of $(1.0) million in 2022, $0.3 million in 2021 and $0.2 million in 2020. The Company had $6.7 million and $7.6 million accrued for the payment of interest and penalties as of December 31, 2022 and December 31, 2021, respectively.

The consolidated effective income tax rate varied from the United States federal statutory income tax rate of continuing operations for the years ended December 31, as follows:

	2022	2021	2020
Federal statutory income tax rate	21.0%	21.0%	21.0%
State income taxes, net of federal benefit	2.4	2.5	2.9
Foreign income taxes	(0.2)	(0.5)	(0.2)
Federal R&D Credit	(0.8)	(1.4)	(1.3)
Other, net	(1.1)	(2.4)	(1.2)
CONSOLIDATED EFFECTIVE INCOME TAX RATE	**21.3%**	**19.2%**	**21.2%**

The foreign income tax benefit shown is primarily due to lower statutory rates in foreign jurisdictions compared to the United States federal statutory income tax rate.

NOTE 15 Financial Instruments and Fair Value Measurement

Financial Instruments

Concentrations of Credit Risk: Financial instruments which potentially subject the Company to significant concentrations of credit risk consist of trade receivables, cash equivalents and investments. The Company grants credit terms in the normal course of business to its customers. Due to the diversity of its product lines, the Company has an extensive customer base including electrical distributors and wholesalers, electric utilities, equipment manufacturers, electrical contractors, telecommunication companies and retail and hardware outlets. We are not dependent on a single customer, however, the Company's top ten customers account for approximately 43% of its Net sales. As part of its ongoing procedures, the Company monitors the credit worthiness of its customers. Bad debt write-offs have historically been minimal. The Company places its cash and cash equivalents with financial institutions and limits the amount of exposure in any one institution.

At December 31, 2022 our accounts receivable balance was $741.6 million, net of allowances of $14.3 million. The allowance for doubtful accounts has not materially changed since December 31, 2021.

Fair Value: The carrying amounts reported in the Consolidated Balance Sheet for cash and cash equivalents, short-term investments, receivables, bank borrowings, accounts payable and accruals approximate their fair values given the immediate or short-term nature of these items. See also Note 8 — Investments.

Fair value measurements

At December 31, 2022 and 2021 the Company had $80.2 million and $78.5 million respectively, of investments carried on the balance sheet at fair value. Fair value is defined as the amount that would be received for selling an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The FASB fair value measurement guidance established a fair value hierarchy that prioritizes the inputs used to measure fair value. Refer to Note 8 — Investments for more information about these investments.

The three broad levels of the fair value hierarchy are as follows:

Level 1 – Quoted prices (unadjusted) in active markets for identical assets or liabilities

Level 2 – Quoted prices for similar assets and liabilities in active markets or inputs that are observable for the asset or liability, either directly or indirectly

Level 3 – Unobservable inputs for which little or no market data exists, therefore requiring a company to develop its own assumptions

The following tables show, by level within the fair value hierarchy, the Company's financial assets and liabilities that are accounted for at fair value on a recurring basis at December 31, 2022 and 2021 (in millions):

Asset (Liability)	Quoted Prices in Active Markets for Identical Assets (Level 1)	Quoted Prices in Active Markets for Similar Assets (Level 2)	Unobservable inputs for which little or no market data exists (Level 3)	Total
Money market funds[a]	$ 147.9	$ —	$ —	$ 147.9
Time Deposits[a]	—	4.8	—	4.8
Available for sale investments	—	61.4	—	61.4
Trading securities	18.8	—	—	18.8
Deferred compensation plan liabilities	(18.8)	—	—	(18.8)
Derivatives:				
Forward exchange contracts-Assets[b]	—	1.1	—	1.1
BALANCE AT DECEMBER 31, 2022	**$ 147.9**	**$ 67.3**	**$ —**	**$ 215.2**
Money market funds[a]	$ 58.5	$ —	$ —	$ 58.5
Available-for-sale investments	—	54.0	—	54.0
Trading securities	24.5	—	—	24.5
Deferred compensation plan liabilities	(24.5)	—	—	(24.5)
Derivatives:				
Forward exchange contracts-Assets[b]	—	0.5	—	0.5
BALANCE AT DECEMBER 31, 2021	**$ 58.5**	**$ 54.5**	**$ —**	**$ 113.0**

(a) Money market funds and time deposits are included in Cash and cash equivalents in the Consolidated Balance Sheet.
(b) Forward exchange contracts-Assets are reflected in Other current assets in the Consolidated Balance Sheet.

The methods and assumptions used to estimate the Level 2 fair values were as follows:

Forward exchange contracts – The fair value of forward exchange contracts were based on quoted forward foreign exchange prices at the reporting date.

Available-for-sale municipal bonds classified in Level 2 – The fair value of available-for-sale investments in municipal bonds is based on observable market-based inputs, other than quoted prices in active markets for identical assets.

Deferred compensation plan

The Company offers certain employees the opportunity to participate in non-qualified deferred compensation plans. A participant's deferrals are invested in a variety of participant-directed debt and equity mutual funds that are classified as trading securities. During 2022 and 2021, the Company purchased $2.2 million and $2.7 million, respectively, of trading securities related to these deferred compensation plans. As a result of participant distributions, the Company sold $4.2 million and $3.6 million of these trading securities in 2022 and 2021 respectively. The unrealized gains and losses associated with these trading securities are directly offset by the changes in the fair value of the underlying deferred compensation plan obligation.

Long-term Debt

As of December 31, 2022 and December 31, 2021, the carrying value of long-term debt, net of unamortized discount and debt issuance costs, was $1,437.9 million and $1,435.5 million, respectively. The estimated fair value of the long-term debt as of December 31, 2022 and December 31, 2021 was $1,306.5 million and $1,524.5 million, respectively, using quoted market prices in active markets for similar liabilities (Level 2).

NOTE 16 Commitments and Contingencies

Legal and Environmental

The Company is subject to various legal proceedings arising in the normal course of its business. These proceedings include claims for damages arising out of use of the Company's products, intellectual property, workers' compensation and environmental matters. The Company is self-insured up to specified limits for certain types of claims, including product liability and workers' compensation, and is fully self-insured for certain other types of claims, including environmental and intellectual property matters. The Company recognizes a liability for any contingency that in management's judgment is probable of occurrence and can be reasonably estimated. We continually reassess the likelihood of adverse judgments and outcomes in these matters, as well as estimated ranges of possible losses based upon an analysis of each matter which includes advice of outside legal counsel and, if applicable, other experts.

The Company is subject to environmental laws and regulations which may require that it investigate and remediate the effects of potential contamination associated with past and present operations as well as those acquired through business combinations. Environmental liabilities are recorded when remedial efforts are probable and the costs can be reasonably estimated. The Company continues to monitor these environmental matters and revalues its liabilities as necessary. Total environmental liabilities were $6.3 million and $6.4 million as of December 31, 2022 and 2021, respectively.

The Company accounts for conditional asset retirement and environmental obligations in accordance with the applicable accounting guidance. The accounting guidance defines "conditional asset retirement obligation" as a legal obligation to perform an asset retirement activity in which the timing and/or method of settlement are conditional on a future event that may or may not be within the control of the Company. Accordingly, an entity is required to recognize a liability for the fair value of a conditional asset retirement obligation if the fair value of the liability can be reasonably estimated. Asset retirement obligations were not material as of December 31, 2022 and 2021.

NOTE 17 Capital Stock

Activity in the Company's common shares outstanding is set forth below for the three years ended December 31, 2022 (in thousands):

	Common Stock
OUTSTANDING AT DECEMBER 31, 2019	**54,514**
Exercise of stock appreciation rights	87
Director compensation arrangements, net	9
Restricted/performance shares activity, net of forfeitures	132
Acquisition/surrender of shares	(359)
OUTSTANDING AT DECEMBER 31, 2020	**54,383**
Exercise of stock appreciation rights	147
Director compensation arrangements, net	7
Restricted/performance shares activity, net of forfeitures	101
Acquisition/surrender of shares	(120)
OUTSTANDING AT DECEMBER 31, 2021	**54,518**
Exercise of stock appreciation rights	62
Director compensation arrangements, net	6
Restricted/performance shares activity, net of forfeitures	86
Acquisition/surrender of shares	(983)
OUTSTANDING AT DECEMBER 31, 2022	**53,689**

For accounting purposes, the Company treats repurchased shares as constructively retired when acquired and accordingly charges the purchase price against Common Stock par value, Additional paid-in capital and Retained earnings to the extent required. Shares may be repurchased through the Company's stock repurchase program, acquired by the Company from employees or surrendered to the Company by employees in settlement of their minimum tax liability on vesting of restricted shares and performance shares under the Hubbell Incorporated 2005 Incentive Award Plan as amended and restated (the "Award Plan").

Shares of the Company's common stock were reserved at December 31, 2022 as follows (in thousands):

	Common Stock
Future grant of stock-based compensation	1,489
Shares reserved under other equity compensation plans	127
TOTAL	**1,616**

NOTE 18 Stock-Based Compensation

As of December 31, 2022, the Company had various stock-based awards outstanding which were issued to executives and other key employees. The Company recognizes the grant-date fair value of all stock-based awards to employees over their respective requisite service periods (generally equal to an award's vesting period), net of estimated forfeitures. A stock-based award is considered vested for expense attribution purposes when the employee's retention of the award is no longer contingent on providing subsequent service. For those awards that vest immediately upon retirement eligibility, the Company recognizes compensation cost immediately for retirement-eligible individuals or over the period from the grant date to the date retirement eligibility is achieved, if less than the stated vesting period.

The Company's long-term incentive program for awarding stock-based compensation includes a combination of restricted stock, stock appreciation rights ("SARs"), and performance shares of the Company's common stock pursuant to the Award Plan. Under the Award Plan, the Company may authorize up to 9.7 million shares of common stock to settle awards of restricted stock, performance shares, or SARs. The Company issues new shares to settle stock-based awards. In 2022, the Company's grant of stock-based awards included restricted stock, SARs and performance shares.

Stock-based compensation expense recognized by the Company was $24.5 million in 2022, $17.5 million in 2021 and $21.9 million in 2020. The total income tax benefit recognized was $3.9 million in 2022, $3.2 million in 2021, and $3.2 million in 2020. The net tax windfall recorded as a result of exercise or vesting (depending on the type of award) was $3.2 million, $6.8 million, and $3.4 million in 2022, 2021 and 2020, respectively. As of December 31, 2022, there was $18.1 million, pretax, of total unrecognized compensation cost related to non-vested share-based compensation arrangements. This cost is expected to be primarily recognized through 2025.

Stock-based compensation expense is recorded in S&A expense as well as Cost of goods sold. Of the total 2022 expense, $23.2 million was recorded to S&A expense and $1.3 million was recorded to Cost of goods sold. In 2021 and 2020, $15.8 million and $20.4 million, respectively, was recorded to S&A expense and $1.7 million and $1.5 million, respectively, was recorded to Cost of goods sold. Stock-based compensation costs capitalized to inventory was $0.4 million in each of 2022, 2021 and 2020.

Each of the compensation arrangements is discussed below.

Restricted Stock

The Company issues various types of restricted stock awards all of which are considered outstanding at the time of grant, as the award holders are entitled to dividends and voting rights. Unvested restricted stock awards are considered participating securities when computing earnings per share. Restricted stock grants are not transferable and are subject to forfeiture in the event of the recipient's termination of employment prior to vesting.

Restricted Stock Issued to Employees - Service Condition

Restricted stock awards that vest based upon a service condition are expensed on a straight-line basis over the requisite service period. These awards generally vest either in three equal installments on each of the first three anniversaries of the grant date or on the third year anniversary of the grant date. The fair value of these awards is measured by the average of the high and low trading prices of the Company's common stock on the most recent trading day immediately preceding the grant date ("measurement date").

Restricted Stock Issued to Non-employee Directors

In 2022, 2021 and 2020, each non-employee director received a restricted stock grant. These grants are made on the date of the annual meeting of shareholders and vest at the following year's annual meeting of shareholders, or upon certain other events. The grant is subject to forfeiture if the director's service terminates prior to the date of the next regularly scheduled annual meeting of shareholders. During 2022, 2021 and 2020, the Company granted 5,952 shares, 6,741 shares, and 7,413 shares, respectively, to non-employee directors.

Restricted Stock Issued to Employees and Non-employee Directors

Activity related to both employee and non-employee restricted stock for the year ended December 31, 2022 is as follows (in thousands, except per share amounts):

	Shares	Weighted Average Grant Date Fair Value/Share
RESTRICTED STOCK AT DECEMBER 31, 2021	**184**	**$ 141.99**
Shares granted	64	187.07
Shares vested	(56)	148.93
Shares forfeited	(13)	163.54
RESTRICTED STOCK AT DECEMBER 31, 2022	**179**	**$ 154.09**

The weighted average fair value per share of restricted stock granted in 2022, 2021 and 2020 was $187.07, $166.46 and $145.48, respectively. The total fair value of restricted stock vested in 2022, 2021 and 2020 was $8.4 million, $12.6 million and $7.8 million, respectively.

Stock Appreciation Rights

SARs grant the holder the right to receive, once vested, the value in shares of the Company's common stock equal to the positive difference between the grant price, as determined using the mean of the high and low trading prices of the Company's common stock on the measurement date, and the fair market value of the Company's common stock on the date of exercise. This amount is payable in shares of the Company's common stock. SARs vest and become exercisable in three equal installments during the first three years following the grant date and expire ten years from the grant date.

Activity related to SARs for the year ended December 31, 2022 is as follows (in thousands, except per share amounts):

	Number of Rights	Weighted Average Exercise Price	Weighted Average Remaining Contractual Term	Aggregate Intrinsic Value
OUTSTANDING AT DECEMBER 31, 2021	**907**	**$ 132.78**		
Granted	143	186.62		
Exercised	(245)	122.49		
Forfeited	(26)	170.12		
Canceled	—	—		
OUTSTANDING AT DECEMBER 31, 2022	**779**	**$ 144.66**	**6.8 years**	**$ 70,146**
EXERCISABLE AT DECEMBER 31, 2022	**452**	**$ 127.44**	**5.7 years**	**$ 48,506**

The aggregated intrinsic value of SARs exercised during 2022, 2021 and 2020 was $21.0 million, $46.8 million and $20.2 million, respectively.

The fair value of each SAR award was measured using the Black-Scholes option pricing model.

The following table summarizes the weighted-average assumptions used in estimating the fair value of the SARs granted during the years 2022, 2021 and 2020:

Grant Date	Expected Dividend Yield	Expected Volatility	Risk Free Interest Rate	Expected Term	Weighted Avg. Grant Date Fair Value of 1 SAR
2022	2.1%	27.4%	1.9%	4.9 years	$ 39.68
2021	2.4%	26.5%	0.6%	5.5 years	$ 29.58
2020	2.5%	23.5%	1.3%	5.5 years	$ 24.52

The expected dividend yield was calculated by dividing the Company's expected annual dividend by the average stock price for the past three months. Expected volatilities are based on historical volatilities of the Company's stock for a period consistent with the expected term. The expected term of SARs granted was based upon historical exercise behavior of SARs. The risk-free interest rate is based on the U.S. Treasury yield curve in effect at the time of grant for the expected term of the award.

Performance Shares

Performance shares represent the right to receive a share of the Company's common stock subject to the achievement of certain market or performance conditions established by the Company's Compensation Committee and measured over a three year period. Partial vesting in these awards may occur after separation from the Company for retirement eligible employees. Shares are not vested until approved by the Company's Compensation Committee.

Performance Shares — Performance and Market Conditions

In February 2020 and December 2018, the Company granted performance share awards with a target payout of 63,868 and 60,008 shares, respectively, that will vest subject to a performance condition and service requirement. The number of shares vested is then modified by a market condition as described below.

Thirty-four percent of the award granted will vest based on Hubbell's compounded annual growth rate of Net sales as compared to that of the companies that comprise the S&P Capital Goods 900 index. Thirty-three percent of the award granted will vest based on achieved operating margin performance as compared to internal targets, and thirty-three percent of the award granted will vest based on achieved trade working capital as a percent of Net sales as compared to internal targets. Each of these performance conditions is measured over the same three-year performance period. The cumulative result of these performance conditions can result in a number of shares earned in the range of 0% - 200% of the target number of shares subject to the award. That cumulative performance achieved is then further modified based on the Company's three year TSR relative to the companies that constitute the S&P Capital Goods 900 index, to potentially increase or reduce the shares earned by a multiple of up to 1.5 or 1.2, depending on the award year.

The fair value of the award was determined based upon a lattice model. The Company expenses these awards on a straight-line basis over the requisite service period which includes an assessment of the performance achieved to date. The weighted average fair value per share was $151.78 for the awards granted in 2020 and $98.80 for the awards granted in 2018.

Grant Date	Shares Outstanding at 12/31/2022		Fair Value	Performance Period		Payout Range
2020	43,949	$	151.78	Jan 2020-Dec 2022	0-200%	+ up to a multiple of 150x
2018	—	$	98.80	Jan 2019-Dec 2021	0-200%	+ up to a multiple of 120x

During 2022, approximately 38,000 shares from the 2018 awards vested as a result of the cumulative achievement of the performance metrics, and the fair value of the awards at vesting was approximately $7.3 million.

Performance Shares — Market Condition

In February 2022 and 2021, the Company granted performance share awards with a target payout of 14,076 and 15,741 shares, respectively, that will vest subject to a market condition and service condition through the performance period. The market condition associated with the awards is the Company's total shareholder return ("TSR") compared to the TSR generated by the companies that comprise the S&P Capital Goods 900 index over a three year performance period. Performance at target will result in vesting and issuance of the number of performance shares subject to the award, equal to 100% payout. Performance below or above target can result in issuance in the range of 0%-200% of the number of shares subject to the award. Expense is recognized irrespective of the market condition being achieved.

The fair value of the performance share awards with a market condition for these grants was determined based upon a lattice model. The following table summarizes the related assumptions used to determine the fair values of the performance share awards with a market condition granted during February 2022 and 2021:

Grant Date		Stock Price on Measurement Date	Dividend Yield	Expected Volatility	Risk Free Interest Rate	Expected Term		Weighted Avg. Grant Date Fair Value
February 2022	$	185.87	2.3%	39.7%	1.6%	2.9 years	$	221.94
February 2021	$	163.26	2.4%	40.6%	0.2%	3 years	$	198.89

Expected volatilities are based on historical volatilities of the Company's and members of the peer group's stock over the expected term of the award. The risk free interest rate is based on the U.S. Treasury yield curve in effect at the time of the grant for the expected term of the award.

Performance Shares — Performance Condition

In February 2022 and 2021, the Company granted performance share awards with a target payout of 28,628 and 31,543 shares, respectively, that will vest subject to an internal Company-based performance condition and service requirement.

Fifty percent of these performance shares subject to the award will vest based on Hubbell's compounded annual growth rate of Net sales as compared to that of the companies that comprise the S&P Capital Goods 900 index. Fifty percent of these performance shares subject to the award will vest based on achieved operating profit margin performance as compared to internal targets. Each of these performance conditions is measured over the same three-year performance period. The cumulative result of these performance conditions can result in a number of shares earned in the range of 0%-200% of the target number of shares subject to the award.

The fair value of the award is measured based upon the average of the high and low trading prices of the Company's common stock on the measurement date reduced by the present value of dividends expected to be paid during the requisite service period. The Company expenses these awards on a straight-line basis over the requisite service period and including an assessment of the performance achieved to date. The weighted average fair value per share was $174.48 and $151.92 for the awards granted in 2022 and 2021, respectively.

Grant Date		Fair Value	Performance Period	Payout Range
February 2022	$	174.48	Jan 2022-Dec 2024	0-200%
February 2021	$	151.92	Jan 2021-Dec 2023	0-200%

NOTE 19 Earnings Per Share

The Company computes earnings per share using the two-class method, which is an earnings allocation formula that determines earnings per share for common stock and participating securities. Restricted stock granted by the Company is considered a participating security since it contains a non-forfeitable right to dividends.

The following table sets forth the computation of earnings per share for the three years ended December 31 (in millions, except per share amounts):

	2022	2021	2020
Numerator:			
Net income from continuing operations attributable to Hubbell Incorporated	$ 511.3	$ 365.0	$ 330.0
Less: Earnings allocated to participating securities	(1.3)	(1.1)	(1.1)
Net income from continuing operations available to common shareholders	$ 510.0	$ 363.9	$ 328.9
Net income from discontinued operations attributable to Hubbell Incorporated	$ 34.6	$ 34.5	$ 21.2
Less: Earnings allocated to participating securities	(0.1)	(0.1)	(0.1)
Net income from discontinued operations available to common shareholders	$ 34.5	$ 34.4	$ 21.1
Net income attributable to Hubbell Incorporated	$ 545.9	$ 399.5	$ 351.2
Less: Earnings allocated to participating securities	(1.4)	(1.2)	(1.2)
Net income available to common shareholders	$ 544.5	$ 398.3	$ 350.0
Denominator:			
Average number of common shares outstanding	53.7	54.3	54.2
Potential dilutive shares	0.4	0.4	0.3
Average number of diluted shares outstanding	54.1	54.7	54.5
Basic earnings per share:			
Basic earnings per share from continuing operations	$ 9.49	$ 6.70	$ 6.07
Basic earnings per share from discontinued operations	$ 0.64	$ 0.63	$ 0.39
Basic earnings per share	$ 10.13	$ 7.33	$ 6.46
Diluted earnings per share:			
Diluted earnings per share from continuing operations	$ 9.43	$ 6.66	$ 6.04
Diluted earnings per share from discontinued operations	$ 0.64	$ 0.62	$ 0.39
Diluted earnings per share	$ 10.07	$ 7.28	$ 6.43

The Company did not have any significant anti-dilutive securities in 2022, 2021 or 2020.

NOTE 20 Accumulated Other Comprehensive Loss

A summary of the changes in Accumulated other comprehensive loss (net of tax) for the three years ended December 31, 2022 is provided below (in millions):

(Debit) credit	Cash Flow Hedge (Loss) Gain	Unrealized Gain (Loss) on Available-for-Sale Securities	Pension and Post Retirement Benefit Plan Adjustment	Cumulative Translation Adjustment	Total
BALANCE AT DECEMBER 31, 2019	**$ (0.5)**	**$ 0.6**	**$ (203.2)**	**$ (129.8)**	**$ (332.9)**
Other comprehensive income (loss) before reclassifications	0.4	0.4	(21.6)	12.3	(8.5)
Amounts reclassified from accumulated other comprehensive loss	(0.6)	—	12.8	—	12.2
Current period other comprehensive income (loss)	(0.2)	0.4	(8.8)	12.3	3.7
BALANCE AT DECEMBER 31, 2020	**$ (0.7)**	**$ 1.0**	**$ (212.0)**	**$ (117.5)**	**$ (329.2)**
Other comprehensive income (loss) before reclassifications	0.4	(0.4)	1.1	(11.5)	(10.4)
Amounts reclassified from accumulated other comprehensive loss	0.7	—	8.1	—	8.8
Current period other comprehensive income (loss)	1.1	(0.4)	9.2	(11.5)	(1.6)
BALANCE AT DECEMBER 31, 2021	**$ 0.4**	**$ 0.6**	**$ (202.8)**	**$ (129.0)**	**$ (330.8)**
Other comprehensive income (loss) before reclassifications	1.2	(1.4)	(0.6)	(27.9)	(28.7)
Amounts reclassified from accumulated other comprehensive loss	(1.0)	—	14.8	0.5	14.3
Current period other comprehensive income (loss)	0.2	(1.4)	14.2	(27.4)	(14.4)
BALANCE AT DECEMBER 31, 2022	**$ 0.6**	**$ (0.8)**	**$ (188.6)**	**$ (156.4)**	**$ (345.2)**

A summary of the gain (loss) reclassifications out of Accumulated other comprehensive loss for the two years ended December 31 is provided below (in millions):

Details about Accumulated Other Comprehensive Loss Components		2022		2021	Location of Gain (Loss) Reclassified into Income
Cash flow hedges gain (loss):					
Forward exchange contracts	$	—	$	(0.1)	Net Sales
		1.2		(0.9)	Cost of goods sold
		1.2		(1.0)	Total before tax
		(0.2)		0.3	Tax (expense) benefit
	$	**1.0**	**$**	**(0.7)**	Gain (loss) net of tax
Amortization of defined benefit pension and post retirement benefit items:					
Prior-service credits	$	(0.4)[a]	$	(0.2)[a]	
Actuarial gains/(losses)		(10.6)[a]		(10.7)[a]	
Settlement and curtailment losses		(8.8)[a]		—[a]	
		(19.8)		(10.9)	Total before tax
		5.0		2.8	Tax benefit (expense)
	$	**(14.8)**	**$**	**(8.1)**	(Loss) gain net of tax
Reclassification of currency translation gain	$	(0.5)	$	—	Gain on disposition of business (Note 2)
		—		—	Tax benefit (expense)
		(0.5)		—	Gain (loss) net of tax
Gains (losses) reclassified into earnings	**$**	**(14.3)**	**$**	**(8.8)**	(Loss) gain net of tax

(a) These accumulated other comprehensive loss components are included in the computation of net periodic pension cost (see Note 12 — Retirement Benefits for additional details).

NOTE 21 Industry Segments and Geographic Area Information

Nature of Operations

Hubbell is a global manufacturer of quality electrical products and utility solutions for a broad range of customer and end-market applications. Products are either sourced complete, manufactured or assembled by subsidiaries in the United States, Canada, Puerto Rico, China, Mexico, the UK, Brazil, Australia, Spain and Ireland. Hubbell also participates in joint ventures in Hong Kong and the Philippines and maintains offices in Singapore, Italy, China, India, Mexico, South Korea, Chile and countries in the Middle East. Each of the above references to manufacturing locations, joint venture participation, and office locations relate to the three year period ending December 31, 2022.

The Company's reporting segments consist of the Utility Solutions segment and the Electrical Solutions segment, as described below.

The Utility Solutions segment consists of businesses that design, manufacture, and sell a wide variety of electrical distribution, transmission, substation, and telecommunications products, which support applications In Front of the Meter. This includes utility transmission & distribution (T&D) components such as arresters, insulators, connectors, anchors, bushings, enclosures cutoffs and switches. The Utility Solutions segment also offers solutions that serve The Edge of the utility infrastructure, including smart meters, communications systems, and protection and control devices. Hubbell Utility Solutions supports the electrical distribution, electrical transmission, water, gas distribution, telecommunications, and solar and wind markets.

Hubbell Electrical Solutions is positioned Behind the Meter, providing key components to building operators and industrial customers that enable them to manage their energy and operate critical infrastructure more efficiently and effectively. The Electrical Solutions segment comprises businesses that sell stock and custom products including standard and special application wiring device products, rough-in electrical products, connector and grounding products, and lighting fixtures, as well as other electrical equipment.

Products of the Electrical Solutions segment have applications in the light industrial, non-residential, wireless communications, transportation, data center, and heavy industrial markets. Electrical Solutions segment products are typically used in and around industrial, commercial and institutional facilities by electrical contractors, maintenance personnel, electricians, utilities, and telecommunications companies. In addition, certain of our businesses design and manufacture industrial controls and communication systems used in the non-residential and industrial markets. Many of these products are designed such that they can also be used in harsh and hazardous locations where a potential for fire and explosion exists due to the presence of flammable gasses and vapors. Harsh and hazardous products are primarily used in the oil and gas (onshore and offshore) and mining industries. We also offer a variety of lighting fixtures, wiring devices and electrical products that have residential and utility applications, including residential products with Internet-of-Things ("IoT") enabled technologies.

These products are sold under various brands and/or trademarks and are primarily sold through electrical and industrial distributors, home centers, retail and hardware outlets, lighting showrooms and residential product oriented internet sites. Special application products are primarily sold through wholesale distributors to contractors, industrial customers and original equipment manufacturers ("OEMs").

Financial Information

Financial information by industry segment, product class and geographic area for each of the three years ended December 31, 2022, 2021 and 2020 is summarized below (in millions). When reading the data the following items should be noted:

- Net sales comprise sales to unaffiliated customers — inter-segment and inter-area sales are not significant.
- Segment operating income consists of Net sales less operating expenses, including total corporate expenses, which are generally allocated to each segment on the basis of the segment's percentage of consolidated Net sales. Interest expense and investment income and other expense, net have not been allocated to segments as these items are centrally managed by the Company.
- General corporate assets not allocated to segments are principally cash, prepaid pensions, investments and deferred taxes. These assets have not been allocated as they are centrally managed by the Company.

INDUSTRY SEGMENT DATA

	2022	2021	2020
Net Sales:			
Utility Solutions	$ 2,871.1	$ 2,334.4	$ 2,079.4
Electrical Solutions	2,076.8	1,859.7	1,603.1
TOTAL NET SALES	**$ 4,947.9**	**$ 4,194.1**	**$ 3,682.5**
Operating Income:			
Utility Solutions	$ 438.2	$ 284.1	$ 305.6
Electrical Solutions	270.9	248.2	188.9
Operating Income	**$ 709.1**	**$ 532.3**	**$ 494.5**
Loss on disposition of business (Note 4)	—	(6.9)	—
Loss on extinguishment of debt (Note 13)	—	(16.8)	—
Pension charge (Note 12)	(7.0)	—	(7.6)
Interest expense, net	(49.6)	(54.7)	(60.1)
Other income (expense), net	4.5	5.4	(2.3)
INCOME BEFORE INCOME TAXES	**$ 657.0**	**$ 459.3**	**$ 424.5**
Assets:			
Utility Solutions	$ 3,011.9	$ 2,823.8	$ 2,812.4
Electrical Solutions	1,972.9	2,142.1	1,984.4
General Corporate	417.8	315.6	288.3
TOTAL ASSETS[1]	**$ 5,402.6**	**$ 5,281.5**	**$ 5,085.1**
Capital Expenditures:			
Utility Solutions	$ 86.9	$ 55.8	$ 55.9
Electrical Solutions	39.5	31.1	25.0
General Corporate	2.9	3.3	1.9
TOTAL CAPITAL EXPENDITURES	**$ 129.3**	**$ 90.2**	**$ 82.8**
Depreciation and Amortization:			
Utility Solutions	$ 99.2	$ 108.5	$ 103.2
Electrical Solutions	49.3	40.6	41.3
TOTAL DEPRECIATION AND AMORTIZATION	**$ 148.5**	**$ 149.1**	**$ 144.5**

GEOGRAPHIC AREA DATA

	2022	2021	2020
Net Sales:			
United States	$ 4,536.4	$ 3,809.8	$ 3,356.9
International	411.5	384.3	325.6
TOTAL NET SALES	**$ 4,947.9**	**$ 4,194.1**	**$ 3,682.5**
Operating Income:			
United States	$ 598.5	$ 439.6	$ 436.3
International	110.6	92.7	58.2
TOTAL OPERATING INCOME	**$ 709.1**	**$ 532.3**	**$ 494.5**
Long-lived Assets:			
United States	$ 2,983.5	$ 3,038.1	$ 3,113.7
International	392.3	359.0	378.7
TOTAL LONG-LIVED ASSETS(1)	**$ 3,375.8**	**$ 3,397.1**	**$ 3,492.4**

(1) Total Assets and Long-lived assets attributable to the Company's formerly owned Commercial and Industrial Lighting business, totaling $356.6 million and $177.1 million were included in total assets held for sale, and noncurrent portion respectively as of December 31, 2021 on the Company's Consolidated Balance Sheets. See Note 2, Discontinued Operations, for further information on the Company's sale of the C&I Lighting business.

On a geographic basis, the Company defines "international" as operations based outside of the United States and its possessions. As a percentage of total Net sales, shipments from foreign operations directly to third parties were 8% in 2022, 9% in 2021 and 9% in 2020, with the UK and Canadian operations representing approximately 32%, and 31% respectively, of 2022 total international Net sales.

Long-lived assets, excluding deferred tax assets, of international subsidiaries were 12% of the consolidated total in 2022, 11% in 2021 and 11% in 2020, with the UK, Spain, and Canada operations representing approximately 26%, 17%, and 16%, respectively, of the 2022 international total. Export sales from United States operations were $253.0 million in 2022, $227.0 million in 2021 and $233.8 million in 2020.

NOTE 22 Guarantees

The Company records a liability equal to the fair value of guarantees in the Consolidated Balance Sheet in accordance with the accounting guidance for guarantees. When it is probable that a liability has been incurred and the amount can be reasonably estimated, the Company accrues for costs associated with guarantees. The most likely costs to be incurred are accrued based on an evaluation of currently available facts and, where no amount within a range of estimates is more likely, the minimum is accrued.

As of December 31, 2022, the fair value and maximum potential payment related to the Company's guarantees were not material.

The Company offers product warranties which cover defects on most of its products. These warranties primarily apply to products that are properly installed, maintained and used for their intended purpose. The Company accrues estimated warranty costs at the time of sale. Estimated warranty expenses, recorded in cost of goods sold, are based upon historical information such as past experience, product failure rates, or the estimated number of units to be repaired or replaced. Adjustments are made to the product warranty accrual as claims are incurred, additional information becomes known or as historical experience indicates.

Changes in the accrual for product warranties in 2022 are set forth below (in millions):

BALANCE AT DECEMBER 31, 2020	**$ 72.7**
Provision	8.8
Expenditures/other	(15.4)
BALANCE AT DECEMBER 31, 2021	**$ 66.1**
Provision	12.7
Expenditures/other	(32.6)
BALANCE AT DECEMBER 31, 2022(a)	**$ 46.2**

(a) Refer to Note 10 – Other Accrued Liabilities and Note 11 – Other Non-Current Liabilities for a breakout of short-term and long-term warranties.

NOTE 23 Restructuring Costs

During 2022, we incurred costs for restructuring actions initiated in 2022 as well as costs relating to restructuring actions initiated in the prior year. Our restructuring actions are associated with cost reduction efforts that include the consolidation of manufacturing and distribution facilities, as well as, workforce reductions and the sale or exit of business units we determine to be non-strategic. Restructuring costs are primarily severance and employee benefits, asset impairments, as well as facility closure, contract termination and certain pension costs that are directly related to restructuring actions. These costs are predominantly settled in cash from our operating activities and are generally settled within one year, with the exception of asset impairments, which are non-cash.

Pre-tax restructuring costs incurred in each of our segments and the location of the costs in the Consolidated Statement of Income for the years ended December 31, 2022, 2021 and 2020 are as follows (in millions):

	Twelve Months Ended December 31, 2022			Twelve Months Ended December 31, 2021			Twelve Months Ended December 31, 2020		
	Utility Solutions	Electrical Solutions	Total	Utility Solutions	Electrical Solutions	Total	Utility Solutions	Electrical Solutions	Total
Restructuring costs									
Cost of goods sold	$ 4.5	$ 5.4	$ 9.9	$ 1.3	$ 1.1	$ 2.4	$ 9.2	$ 7.1	$ 16.3
S&A expense	(0.5)	0.9	0.4	1.1	0.4	1.5	1.2	2.9	4.1
TOTAL RESTRUCTURING COSTS	**$ 4.0**	**$ 6.3**	**$ 10.3**	**$ 2.4**	**$ 1.5**	**$ 3.9**	**$ 10.4**	**$ 10.0**	**$ 20.4**

The following table summarizes the accrued liabilities for our restructuring actions (in millions):

	Beginning Accrued Restructuring Balance 1/1/22	Pre-tax Restructuring Costs	Utilization and Foreign Exchange	Ending Accrued Restructuring Balance 12/31/22
2022 Restructuring Actions				
Severance	$ —	$ 6.9	$ (1.3)	$ 5.6
Asset write-downs	—	0.8	(0.8)	—
Facility closure and other costs	—	3.5	(3.2)	0.3
TOTAL 2022 RESTRUCTURING ACTIONS	**$ —**	**$ 11.2**	**$ (5.3)**	**$ 5.9**
2021 and Prior Restructuring Actions				
Severance	$ 4.1	$ (0.4)	$ (1.8)	$ 1.9
Asset write-downs	—	—	—	—
Facility closure and other costs	0.1	(0.5)	0.5	0.1
TOTAL 2021 AND PRIOR RESTRUCTURING ACTIONS	**$ 4.2**	**$ (0.9)**	**$ (1.3)**	**$ 2.0**
TOTAL RESTRUCTURING ACTIONS	**$ 4.2**	**$ 10.3**	**$ (6.6)**	**$ 7.9**

The actual and expected pre-tax costs for our restructuring actions are as follows (in millions):

	Expected Costs	Costs incurred in 2020	Costs incurred in 2021	Costs incurred in 2022	Remaining costs at 12/31/22
2022 Restructuring Actions					
Utility Solutions	$ 5.0	$ —	$ —	$ 4.7	$ 0.3
Electrical Solutions	10.2	—	—	6.5	3.7
TOTAL 2022 RESTRUCTURING ACTIONS	**$ 15.2**	**$ —**	**$ —**	**$ 11.2**	**$ 4.0**
2021 Restructuring Actions					
Utility Solutions	$ 3.7	$ —	$ 1.8	$ (0.7)	$ 2.6
Electrical Solutions	0.4	—	0.6	(0.2)	—
TOTAL 2021 RESTRUCTURING ACTIONS	**$ 4.1**	**$ —**	**$ 2.4**	**$ (0.9)**	**$ 2.6**
2020 and Prior Restructuring Actions					
Utility Solutions	$ 11.0	$ 10.4	$ 0.6	$ —	$ —
Electrical Solutions	10.9	10.0	0.9	—	—
TOTAL 2020 AND PRIOR RESTRUCTURING ACTIONS	**$ 21.9**	**$ 20.4**	**$ 1.5**	**$ —**	**$ —**
TOTAL RESTRUCTURING ACTIONS	**$ 41.2**	**$ 20.4**	**$ 3.9**	**$ 10.3**	**$ 6.6**

NOTE 24 Leases

Our operating leases primarily consist of office space, certain manufacturing facilities, and vehicles. Our finance leases are not material. The term of our operating leases is generally 10 years or less, in some cases, with options to extend the term for up to 5 years, or options to terminate after one year without penalty. In general, our vehicle lease payments contain a monthly base rent payment which is adjusted based on changes to the LIBOR rate over the lease term. Certain other lease agreements contain variable payments related to a consumer price index or similar metric. Any change in payment amounts as a result of a change in a rate or index are considered variable lease payments and recognized as profit or loss when incurred.

Rent expense for operating leases in the Consolidated Statements of Income for the years ended December 31, 2022, December 31, 2021, and December 31, 2020 were $35.7 million, $34.1 million, and $35.5 million, respectively. Cash paid for operating leases for the year ended December 31, 2022 and December 31, 2021 were $36.3 million and $36.7 million reported as cash outflows from operating activities in the Consolidated Statements of Cash Flows. Right-of-use ("ROU") assets obtained in exchange for lease obligations for the year ended December 31, 2022 and December 31, 2021 were $58.9 million and $17.8 million, respectively, which includes $7.4 million related to acquisitions in 2022.

Amounts recognized for operating leases in the Consolidated Balance Sheets is as follows (in millions):

	December 31, 2022	December 31, 2021
Operating lease right-of-use assets	$ 108.0	$ 81.3
TOTAL ASSETS	**$ 108.0**	**$ 81.3**
Other accrued liabilities	$ 30.5	$ 27.1
Other non-current liabilities	84.9	58.3
TOTAL LIABILITIES	**$ 115.4**	**$ 85.4**

The weighted average remaining lease term as of December 31, 2022 and December 31, 2021 for operating leases were 5.5 and 4 years, respectively. The weighted average discount rate used to measure the ROU asset and lease liability for operating leases was 3.2% as of December 31, 2022 and 2.7% as of December 31, 2021.

Future maturities of our operating lease liabilities as of December 31, 2022 are as follows (in millions):

	2023	2024	2025	2026	2027	Thereafter	Total Payments	Imputed Interest	Total
Operating Leases	33.8	23.9	17.7	14.3	12.3	24.5	126.5	(11.1)	$ 115.4

Future maturities of our operating lease liabilities as of December 31, 2021 are as follows (in millions):

	2022	2023	2024	2025	2026	Thereafter	Total Payments	Imputed Interest	Total
Operating Leases	29.0	22.9	13.6	8.8	6.4	9.2	89.9	(4.5)	$ 85.4

Item 9 Changes in and Disagreements with Accountants on Accounting and Financial Disclosure

Not applicable.

Item 9A Controls and Procedures

The Company maintains disclosure controls and procedures that are designed to ensure that information required to be disclosed in Exchange Act reports is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and forms, and that such information is accumulated and communicated to management, including the Chief Executive Officer and Chief Financial Officer, as appropriate, to allow timely decisions regarding required disclosure. Management necessarily applied its judgment in assessing the costs and benefits of such controls and procedures which, by their nature, can provide only reasonable assurance that the controls and procedures will meet their objectives.

During the year ended December 31, 2022, the Company acquired PCX Holdings LLC, Ripley Tools, LLC and Nooks Hill Road, LLC, and REF Automation Limited and REF Alabama Inc. for an aggregate of $177.1 million. Because the Company has not yet fully incorporated the internal controls and procedures of the acquired entities into the Company's internal control over financial reporting, management excluded these business from its assessment of the effectiveness of internal control over financial reporting as of December 31, 2022. These entities accounted for 2% of the Company's total assets excluding intangibles and goodwill as of December 31, 2022 and less than 1% of the Company's net sales for the year then ended December 31, 2022.

The Company carried out an evaluation, under the supervision and with the participation of management, including the Chief Executive Officer and Chief Financial Officer, of the effectiveness of the design and operation of the Company's disclosure controls and procedures as defined in Exchange Act Rules 13a-15(e) and 15d-15(e), as of the end of the period covered by this report on Form 10-K. Based upon that evaluation, each of the Chief Executive Officer and Chief Financial Officer concluded that the Company's disclosure controls and procedures are effective at a reasonable assurance level. Management's annual report on internal control over financial reporting and the independent registered public accounting firm's audit report on the effectiveness of our internal control over financial reporting as of December 31, 2022 are included in Item 8 of this Annual Report on Form 10-K.

There has been no change in the Company's internal control over financial reporting that occurred during the fiscal year ended December 31, 2022 that have materially affected, or are reasonably likely to materially affect, the Company's internal control over financial reporting.

Item 9B Other Information

Not applicable.

Item 9C Disclosure Regarding Foreign Jurisdictions that Prevent Inspections

Not applicable.

PART III

Item 10 Directors, Executive Officers and Corporate Governance(1)

Item 11 Executive Compensation(2)

Item 12 Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters

Equity Compensation Plan Information

The following table provides information as of December 31, 2022 with respect to the Company's common stock that may be issued under the Company's equity compensation plans (in thousands, except per share amounts):

	A	B	C
Plan Category	Number of Securities to be Issued upon Exercise of Outstanding Options, Warrants and Rights	Weighted Average Exercise Price of Outstanding Options, Warrants and Rights	Number of Securities Remaining Available for Future Issuance Under Equity Compensation Plans (Excluding Securities Reflected in Column A)
Equity Compensation Plans Approved by Shareholders(a)	1,016 (c)(d)	$ 144.66 (e)	1,489 (c)
Equity Compensation Plans Not Requiring Shareholder Approval(b)	53 (c)(f)	—	127 (c)
TOTAL	**1,069**	$ **144.66**	**1,616**

(a) The Company's (1) Stock Option Plan for Key Employees and (2) 2005 Incentive Award Plan as amended and restated.
(b) The Company's Deferred Compensation Plan for Directors as amended and restated. For a description of the material features of the plan, the information is incorporated by reference to the subheading "Deferred Compensation Plan" of the definitive proxy statement for the Company's 2023 annual meeting of shareholders.
(c) Hubbell Common Stock.
(d) Includes approximately 150,000 performance share awards assuming a maximum payout target. The maximum payout target may not be achieved for all of these awards.
(e) Weighted average exercise price excludes performance share awards included in column A.
(f) Represents amount of shares currently deferred under this plan. These shares are not included in the total weighted average exercise price included in column B.

The remaining information required by this item is incorporated by reference to the subheading "Voting Rights and Security Ownership of Certain Beneficial Owners and Management" of the definitive proxy statement for the Company's 2023 annual meeting of shareholders.

(1) Certain of the information required by this item regarding executive officers is included under the subheading "Information about our Executive Officers" at the end of Part I of this Form 10-K and the remaining required information is incorporated by reference from our definitive proxy statement to be filed in connection with the Company's 2023 annual meeting of shareholders.
(2) The information required by this item is incorporated by reference from our definitive proxy statement to be filed in connection with the Company's 2023 annual meeting of shareholders.

Item 13 Certain Relationships and Related Transactions and Director Independence[3]

Item 14 Principal Accountant Fees and Services[4]

(3) *The information required by this item is incorporated by reference from our definitive proxy statement to be filed in connection with the Company's 2023 annual meeting of shareholders.*

(4) *The information required by this item is incorporated by reference from our definitive proxy statement to be filed in connection with the Company's 2023 annual meeting of shareholders.*

PART IV

Item 15 Exhibits and Financial Statement Schedule

1. Financial Statements and Schedule

Financial statements and schedule listed in the Index to Financial Statements and Schedule are filed as part of this Annual Report on Form 10-K.

2. Exhibits

		Incorporated by Reference				
Number	Description	Form	File No.	Exhibit	Filing Date	Filed/ Furnished Herewith
3.1	Amended and Restated Certificate of Incorporation, as amended and restated as of December 23, 2015	8-A12B	001-02958	3.1	12/23/2015	
3.2	Amended and Restated By-Laws of Hubbell Incorporated, as amended on May 7, 2013	8-K	001-02958	3.1	5/10/2013	
4.1	Senior Indenture, dated as of September 15, 1995, between Hubbell Incorporated and The Bank of New York Mellon Trust Company, N.A. (formerly known as The Bank of New York Trust Company, N.A.(successor as trustee to JPMorgan Chase Bank N.A. (formerly known as JPMorgan Chase Bank, formerly known as The Chase Manhattan Bank, formerly known as Chemical Bank))), as trustee	S-4	333-90754	4a	6/18/2002	
4.2	Second Supplemental Indenture, dated as of November 17, 2010, between Hubbell Incorporated and The Bank of New York Mellon Trust Company, N.A. (formerly known as The Bank of New York Trust Company, N.A.(successor as trustee to JPMorgan Chase Bank N.A. (formerly known as JPMorgan Chase Bank, formerly known as The Chase Manhattan Bank, formerly known as Chemical Bank))), as trustee, including the form of 3.625% Senior Notes due 2022	8-K	001-02958	4.2	11/17/2010	
4.3	Third Supplemental Indenture, dated as of March 1, 2016, between Hubbell Incorporated and The Bank of New York Mellon Trust Company, N.A. (formerly known as The Bank of New York Trust Company, N.A. (successor as trustee to JPMorgan Chase Bank, N.A. (formerly known as JPMorgan Chase Bank, formerly known as The Chase Manhattan Bank, formerly known as Chemical Bank))), as trustee	8-K	001-02958	4.2	3/1/2016	
4.4	Form of 3.350% Senior Notes due 2026	8-K	001-02958	4.3	3/1/2016	
4.5	Fourth Supplemental Indenture, dated as of August 3, 2017, between Hubbell Incorporated and The Bank of New York Mellon Trust Company, N.A. (formerly known as The Bank of New York Trust Company, N.A. (successor as trustee to JPMorgan Chase Bank, N.A. (formerly known as JPMorgan Chase Bank, formerly known as The Chase Manhattan Bank, formerly known as Chemical Bank))), as trustee.	8-K	001-02958	4.2	8/3/2017	

		Incorporated by Reference				
Number	Description	Form	File No.	Exhibit	Filing Date	Filed/ Furnished Herewith
4.6	Form of 3.150% Senior Notes due 2027	8-K	001-02958	4.3	8/3/2017	
4.7	Fifth Supplemental Indenture, dated as of February 2, 2018, between Hubbell Incorporated and The Bank of New York Mellon Trust Company, N.A. (formerly known as The Bank of New York Trust Company, N.A. (successor as trustee to JPMorgan Chase Bank, N.A. (formerly known as JPMorgan Chase Bank, formerly known as The Chase Manhattan Bank, formerly known as Chemical Bank))), as trustee.	8-K	001-02958	4.2	2/2/2018	
4.8	Form of 3.500% Senior Notes due 2028	8-K	001-02958	4.3	2/2/2018	
4.9	Sixth Supplemental Indenture, dated as of March 12, 2021, between Hubbell Incorporated and The Bank of New York Mellon Trust Company, N.A. (formerly known as The Bank of New York Trust Company, N.A. (successor as trustee to JPMorgan Chase Bank, N.A. (formerly known as JPMorgan Chase Bank, formerly known as The Chase Manhattan Bank, formerly known as Chemical Bank))), as trustee.	8-K	001-02958	4.2	3/12/2021	
4.10	Form of 2.300% Senior Notes due 2031.	8-K	001-02958	4.2	3/12/2021	
4.11	Description of Registered Securities	10-K	001-02958	4.1	2/14/2020	
10.1†	Hubbell Incorporated Retirement Plan for Directors, as amended and restated effective January 1, 2005	10-Q	001-02958	10i	10/26/2007	
10.2†	Hubbell Incorporated Deferred Compensation Plan for Directors, as amended and restated effective December 23, 2015	S-8POS	333-206898	4.4	12/24/2015	
10.3†	Hubbell Incorporated Executive Deferred Compensation Plan, as amended and restated effective January 1, 2016	10-K	001-02958	10.5	2/18/2016	
10.3(a)†	Amendment 1, dated December 4, 2019, to Hubbell Incorporated Executive Deferred Compensation Plan, as amended and restated effective January 1, 2016	10-K	001-02958	10.4(a)	2/14/2020	
10.4†	Hubbell Incorporated Amended and Restated Top Hat Restoration Plan, as amended and restated effective January 1, 2005	10-Q	001-02958	10w	10/26/2007	
10.4(a)†	Amendment, dated December 28, 2010, to Hubbell Incorporated Amended and Restated Top Hat Restoration Plan, as amended and restated effective January 1, 2005	10-K	001-02958	10w(1)	2/16/2011	
10.4(b)†	Second Amendment, dated January 17, 2017, to Hubbell Incorporated Amended and Restated Top Hat Restoration Plan, as amended and restated effective January 1, 2005	10-K	001-02958	10.5(b)	2/16/2017	
10.4(c)†	Third Amendment, dated December 4, 2019, to Hubbell Incorporated Amended and Restated Top Hat Restoration Plan, as amended and restated effective January 1, 2005	10-K	001-02958	10.5(c)	2/14/2020	
10.5†	Hubbell Incorporated Incentive Compensation Plan, adopted effective January 1, 2002	10-K	001-02958	10z	3/20/2002	
10.5(a)†	First Amendment, dated December 4, 2019, to Hubbell Incorporated Incentive Compensation Plan, adopted effective January 1, 2002	10-K	001-02958	10.6(a)	2/14/2020	
10.6†	Hubbell Incorporated 2005 Incentive Award Plan, as amended and restated effective December 4, 2019	10-K	001-02958	10.7	2/14/2020	
10.7†	Form of Restricted Stock Award Agreement for Directors under the Hubbell Incorporated 2005 Incentive Award Plan, as amended and restated	10-Q	001-02958	10.8	7/19/2013	

		Incorporated by Reference				
Number	Description	Form	File No.	Exhibit	Filing Date	Filed/ Furnished Herewith
10.8†	Form of 2020-2022 Performance Share Award Agreement under the Hubbell Incorporated 2005 Incentive Award Plan, as amended and restated					*
10.9†	Form of 2021-2023 Performance Share Award Agreement under the Hubbell Incorporated 2005 Incentive Award Plan, as amended and restated					*
10.10†	Form of 2022-2024 Performance Share Award Agreement under the Hubbell Incorporated 2005 Incentive Award Plan, as amended and restated					*
10.11†	Form of Restricted Stock Award Agreement under the Hubbell Incorporated 2005 Incentive Award Plan, as amended and restated (cliff)					*
10.12†	Form of Restricted Stock Award Agreement under the Hubbell Incorporated 2005 Incentive Award Plan, as amended and restated (incremental)					*
10.13†	Form of Stock Appreciation Rights Award Agreement under the Hubbell Incorporated 2005 Incentive Award Plan, as amended and restated					*
10.14†	Hubbell Incorporated Defined Contribution Restoration Plan, as amended and restated effective December 8, 2015	10-K	001-02958	10.16	2/18/2016	
10.14(a)†	First Amendment, dated January 17, 2017 and effective as of January 1, 2017, to Hubbell Incorporated Defined Contribution Restoration Plan, as amended and restated effective December 8, 2015	10-K	001-02958	10.14(a)	2/16/2017	
10.14(b)†	Second Amendment, dated December 4, 2019, to Hubbell Incorporated Defined Contribution Restoration Plan, as amended and restated effective December 8, 2015	10-K	001-02958	10.12(b)	2/14/2020	
10.14(c)†	Third Amendment, dated February 10, 2021, to Hubbell Incorporated Defined Contribution Restoration Plan, as amended and restated effective December 8, 2015.	10-Q	001-02958	10.2	4/28/2021	
10.15†	Hubbell Incorporated Policy for Providing Severance Payments to Senior Employees, as amended and restated effective December 4, 2019.	10-K	001-02958	10.14	2/14/2020	
10.16†	Grantor Trust for Senior Management Plans Trust Agreement between Hubbell Incorporated and The Bank of New York, as trustee, as amended and restated effective December 8, 2015	10-K	001-02958	10.18	2/18/2016	
10.17†	Grantor Trust for Non-Employee Director Plans Trust Agreement between Hubbell Incorporated and The Bank of New York, as amended and restated effective December 8, 2015	10-K	001-02958	10.19	2/18/2016	
10.18†	Trust Agreement by and between Hubbell Incorporated and MG Trust Company d/b/a Matrix Trust Company, as Trustee, as amended and restated effective November 6, 2015	10-K	001-02958	10.20	2/18/2016	
10.19†	Amended and Restated Change in Control Severance Agreement, dated as of December 29, 2022, between Hubbell Incorporated and Gerben W. Bakker	8-K	001-02958	10.1	12/30/2022	
10.20†	Change in Control Severance Agreement, dated as of December 29, 2022, between Hubbell Incorporated and Allan J. Connolly	8-K	001-02958	10.2	12/30/2022	

		Incorporated by Reference				
Number	Description	Form	File No.	Exhibit	Filing Date	Filed/ Furnished Herewith
10.21†	Amended and Restated Change in Control Severance Agreement, dated as of December 29, 2022, between Hubbell Incorporated and Katherine A. Lane	8-K	001-02958	10.3	12/30/2022	
10.22†	Amended and Restated Change in Control Severance Agreement, dated as of December 29, 2022, between Hubbell Incorporated and William R. Sperry	8-K	001-02958	10.4	12/30/2022	
10.23	Credit Agreement dated as of January 31, 2018, among Hubbell Incorporated, Hubbell Power Holdings S.à r.l., Harvey Hubbell Holdings S.à r.l., the Lenders party hereto, the Issuing Banks party hereto and JPMorgan Chase Bank, N.A., as Administrative Agent.	8-K	001-02958	99.2	1/31/2018	
10.24	First Amendment, dated as of January 10, 2018, by and among Hubbell Incorporated, Hubbell Power Holdings S.à r.l., and Harvey Hubbell Holdings S.à r.l, the lenders party thereto, and JPMorgan Chase Bank, N.A., as Administrative Agent.	8-K	001-02958	10.1	1/11/2018	
21.1	List of subsidiaries					*
23.1	Consent of PricewaterhouseCoopers LLP					*
31.1	Certification of Chief Executive Officer pursuant to Exchange Act Rule 13a-14(a)/15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002					*
31.2	Certification of Chief Financial Officer pursuant to Exchange Act Rule 13a-14(a)/15d-14(a), as adopted pursuant to Section 302 of the Sarbanes-Oxley Act of 2002					*
32.1	Certification of Chief Executive Officer Pursuant to 18 U.S.C. Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002					**
32.2	Certification of Chief Financial Officer Pursuant to 18 U.S.C Section 1350, as adopted pursuant to Section 906 of the Sarbanes-Oxley Act of 2002					**
101	The following materials from Hubbell Incorporated's Annual Report on Form 10-K for the year ended December 31, 2022 formatted in Inline Extensible Business Reporting Language (iXBRL): (i) the Consolidated Statements of Income, (ii) the Consolidated Statements of Comprehensive Income, (iii) the Consolidated Balance Sheets, (iv) the Consolidated Statements of Cash Flows, (v) the Consolidated Statements of Changes in Equity, and (vi) Notes to the Consolidated Financial Statements.					*
104	The cover page of this Annual Report on Form 10-K for the year end December 31, 2022, formatted in Inline XBRL (included within the Exhibit 101 attachments)					*

† *A management contract or compensatory plan or arrangement required to be filed as an exhibit pursuant to Item 15(a)(3) of Form 10-K.*
†† *Schedules and exhibits have been omitted pursuant to Item 601(b)(2) of Regulation S-K. The Company agrees to furnish supplemental copies of such omitted schedules and exhibits to the Securities and Exchange Commission upon request.*
* *Filed herewith.*
** *Furnished herewith.*

Signatures

Pursuant to the requirements of Section 13 or 15(d) of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

HUBBELL INCORPORATED

By /s/ JONATHAN M. DEL NERO
Jonathan M. Del Nero
Vice President, Controller

By /s/ WILLIAM R. SPERRY
William R. Sperry
Executive Vice President and Chief Financial Officer

Date: February 9, 2023

Pursuant to the requirements of the Securities Exchange Act of 1934, this report has been signed below by the following persons on behalf of the registrant and in the capacities and on the dates indicated.[1]

		Title	Date
By	/s/ G. W. BAKKER **G. W. Bakker**	*Chairman of the Board, President and Chief Executive Officer*	2/9/2023
By	/s/ W. R. SPERRY **W. R. Sperry**	*Executive Vice President and Chief Financial Officer*	2/9/2023
By	/s/ J. M. DEL NERO **J. M. Del Nero**	*Vice President, Controller (Principal Accounting Officer)*	2/9/2023
By	/s/ C. M. CARDOSO **C. M. Cardoso**	*Director*	2/9/2023
By	/s/ A. J. GUZZI **A. J. Guzzi**	*Director*	2/9/2023
By	/s/ R. A. HERNANDEZ **R. A. Hernandez**	*Director*	2/9/2023
By	/s/ N. J. KEATING **N. J. Keating**	*Director*	2/9/2023
By	/s/ B. C. LIND **B. C. Lind**	*Director*	2/9/2023
By	/s/ J. F. MALLOY **J. F. Malloy**	*Director*	2/9/2023
By	/s/ J. M. POLLINO **J. M. Pollino**	*Director*	2/9/2023
By	/s/ J. G. RUSSELL **J. G. Russell**	*Director*	2/9/2023

(1) As of February 9, 2023.

Valuation and Qualifying Accounts and Reserves for the Years Ended December 31, 2020, 2021 and 2022

Reserves deducted in the balance sheet from the assets to which they apply (in millions):

	Balance at Beginning of Year	Additions / (Reversals) Charged to Costs and Expenses	Deductions	Balance at End of Year
Allowances for doubtful accounts receivable:				
Year 2020[(a)]	$ 8.0	$ 4.0	$ (1.4)	$ 10.6
Year 2021	$ 10.6	$ 2.0	$ (2.0)	$ 10.6
Year 2022	$ 10.6	$ 7.2	$ (3.5)	$ 14.3
Allowance for credit memos, returns and cash discounts:				
Year 2020	$ 33.5	$ 267.9	$ (269.5)	$ 31.9
Year 2021	$ 31.9	$ 296.5	$ (293.7)	$ 34.7
Year 2022	$ 34.7	$ 365.1	$ (355.7)	$ 44.1
Valuation allowance on deferred tax assets:				
Year 2020	$ 25.9	$ 3.6	$ —	$ 29.5
Year 2021	$ 29.5	$ 3.1	$ —	$ 32.6
Year 2022	$ 32.6	$ (0.4)	$ —	$ 32.2

(a) The cumulative effect of the adoption of ASC 326 resulted in a $1.2 million increase to the opening balance.

Corporate **Information**

SENIOR LEADERSHIP

Gerben W. Bakker
Chairman, President and Chief Executive Officer

Alexis P. Bernard
Chief Technology Officer

Allan J. Connolly
President, Utility Solutions Segment

Jonathan M. Del Nero
Vice President, Corporate Controller

Alyssa R. Flynn
Chief Human Resources Officer

Katherine A. Lane
Senior Vice President, General Counsel and Secretary

Drew M. Marquardt
Chief Information Officer

Akshay Mittal
Global Operations President

Jonathon B. Murphy
Treasurer

William R. Sperry
Executive Vice President, Chief Financial Officer

Terriel D. Watson
Vice President, Customer Experience

ANNUAL MEETING

The next annual meeting of the shareholders of Hubbell Incorporated will be held at **Hubbell Incorporated, 40 Waterview Drive, Shelton, CT 06484 at 9:00 a.m., Tuesday, May 2, 2023.** A formal notice of the meeting and proxy materials will be available to each shareholder at **www.proxyvote.com**, and will be mailed to any shareholder who requests a printed copy.

SHAREHOLDER SERVICES

As a Hubbell shareholder, you are invited to take advantage of our convenient shareholder services or request more information about Hubbell Incorporated. Computershare, our transfer agent, maintains the records for our registered shareholders and can help you with a variety of shareholder-related services at no charge, including:

- Change of name or address
- Consolidation of accounts
- Duplicate mailings
- Dividend reinvestment enrollment
- Lost stock certificates
- Transfer of stock to another person
- Additional administrative services

Access your investor statements online 24 hours a day, seven days a week. Enrollment is quick and easy. For more information, go to: **www.computershare.com/investor.**

REGISTRAR AND TRANSFER AGENT

Computershare
800-874-1136
www.computershare.com/investor

By Regular Mail:
Computershare
PO Box 43078
Providence, RI 02940-3078

By Overnight Mail:
Computershare
150 Royall St., Suite 101
Canton, MA 02021

MARKET LISTING

Ticker: **HUBB**
The New York Stock Exchange
11 Wall Street
New York, NY 10005

DIVIDEND REINVESTMENT PLAN

A Dividend Reinvestment Plan is available to shareholders of Hubbell Incorporated.
For details, contact:

Corporate Secretary
Hubbell Incorporated
40 Waterview Drive, Shelton, CT 06484

HUBBELL INCORPORATED
40 WATERVIEW DRIVE
SHELTON, CT 06484
HUBBELL.COM

Jackson Purchase Energy Cooperative

ACLARA RF AMI SHORTLIST INTERVIEW

June 28, 2023

Proprietary and Confidential
Not for Distribution

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Today's Agenda

	Topic	Time	Who
	Introductions	Larry, All	10 minutes
	Brownstown Electric Supply	Jon	10 Minutes
	Company Overview	Larry	10 minutes
	Aclara RF Technology – Strategic Importance: Direction, Investment	Terry	10 minutes
	Aclara RF Network Overview	Terry	60 minutes
BREAK			**15 minutes**
	AclaraONE Overview	Jeff	20 minutes
	Demo/screenshots of New Functionality	Don	20 minutes
	Project Implementation	Arvind	30 minutes
	Technical Support	Larry	10 minutes
	Installation Services	Jeff	15 minutes
	Questions, Next Steps	Larry	5 minutes

©2023 HUBBELL | ACLARA –

INTRODUCTIONS

Meet your hand-picked team

On-site

Larry Rygiel
Team Leader, Regional Sales Directors - Electric

Terry Van Olst
Director, AMI Product Management

Jeff Little
Director, Software Product Management

Don Small
Team Leader, Technical Application Engineering

Extended

Arvind Somakumar
Director, Portfolio Management

Rob Wolf
Grid Automation Solution Architect

John Gedris
Director, Technical Support

Madeline Foss
Technical Manager, Commercial Operations

Sylvester Moshiro
Director, Solution Development and Integrations

Mark Fredebaugh
Manager, Educational Services

Brian Walters
Director, Solution Performance and Network Design

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Distribution and Installation Services

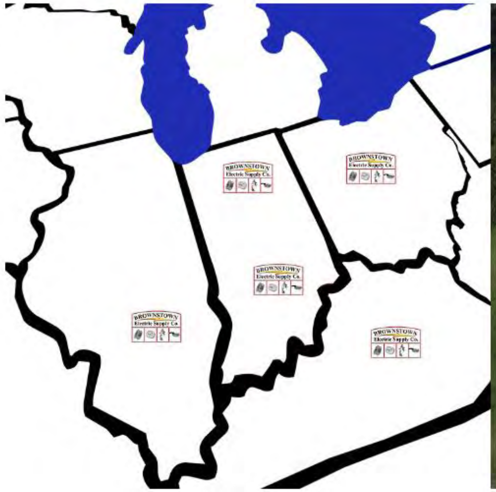
Jon Mars - Brownstown Electric Supply Co.
TSD - Outside Sales
M. 217.273.3119
jmars@brownstown.com

Dennis West – Brownstown Electric Supply Co.
Manager – Technical Services Division
O. 812.358.4557
dwest@brownstown.com

Jeff Marsh – Advanced Meter Services
M. 859.983.3374
jmarsh@advancedmeterservices.com

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

BROWNSTOWN ELECTRIC SUPPLY CO.



WHATEVER IT TAKES | 100% SATISFACTION GUARANTEED | SERVICE YOU CAN TRUST

Brownstown Electric Supply Company was started in 1970 by Mr. Carl Shake and a long time friend and industry associate Mr. Earl Hobbs, who had been in the line construction contracting work since 1956. Carl came from a long history in the electric utility business, starting as a lineman for Northern Indiana Power Service (NIPSCO), Public Service Indiana (PSI) and then working for General Electric in their supply divisions (GESCO) in the cities of Terre Haute and Indianapolis, Indiana, before starting Brownstown Electric Supply Company in 1970.

Incorporated in the State of Indiana in 1970, Brownstown Electric grew from a sales area that served the southern Indiana area, to a company with five locations, serving a four state region including the States of Indiana, Illinois, Kentucky and Ohio. Today Brownstown Electric operates from their five locations in the States of Indiana, Illinois, Kentucky and Ohio.

We are a "utility only" supplier serving the utilities in the region we call home at the Municipal, Cooperative and Investor Owned utility levels. This region consists of the States of Indiana, Kentucky, Illinois and Ohio. Brownstown Electric Supply Company is a closely held, privately owned corporation. We feel this gives us the versatility we need to be able to serve our customers to the best of our abilities without the constraints of a large distant national corporate directive.

Brownstown Electric has a sales staff with extensive electric utility experience with backgrounds in line construction, engineering (EE & PE), safety, purchasing and a first class technical and metering department that offers metering training.
We offer a full line of services to our utility friends with the versatility to modify any of our processes, to mold a procurement process that best suits the utilities needs, be they Cooperative, Municipal or Investor-Owned Utility.

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Topics to be covered in this section…

1. General Overview

2. Electric AMI revenue as % of overall revenue?
    - 70%-75% per year

©2023 HUBBELL | ACLARA — ALL RIGHTS

Hubbell® Incorporated

Vision, Mission & Values

HUBBELL®

Vision

to be an exceptional customer partner, inclusive organization, and valued investment

Mission

powered by One Hubbell, outperform our peers by delivering Reliable | Energy | Solutions

Values

Accountability	Performance	Inclusion
Ethics	Quality	Safety

Our commitment is underscored by the four pillars that guide us a company.

Serve Our Customers

Operate With Discipline

Grow The Enterprise

Develop Our People

Hubbell Utility Solutions

Hubbell Power Systems

Gas Utility Solutions

Aclara

Grid Automation

Hubbell Electrical Solutions

Electrical Products

Retail & Builder

Light Industrial

Harsh & Heavy

Solutions

HUBBELL UTILITY SOLUTIONS				HUBBELL ELECTRICAL SOLUTIONS	
UTILITY	TRANSMISSION	DISTRIBUTION	COMMUNICATIONS AND CONTROLS	DIVERSIFIED APPLICATIONS	OWNER/OPERATOR

IN FRONT OF THE METER

In Front of the Meter is where utilities transmit and distribute energy to their customers. This is the backbone of the grid.

ON THE EDGE

The Edge consists of smart meters and communication systems which connect utilities with owner / operators and allow energy and data to be distributed back and forth.

BEHIND THE METER

Behind the Meter is where owners and operators of buildings and other critical infrastructure consume energy.

©202 LL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

ESG

HUBBELL

SUSTAINABILITY

PUBLISHED GOALS OF **10%** REDUCTION IN OUR GREENHOUSE GAS EMISSIONS AND WATER USAGE BY 2025

DIVERSITY

JOINED THE NATIONAL MINORITY SUPPLIER DIVERSITY COUNCIL & INVESTED IN ADDITIONAL UNCONSCIOUS BIAS TRAINING

SAFETY

IMPROVED SAFETY RECORD BY DECREASING THE TOTAL RECORDABLE INCIDENT RATE (TRIR) **BY 42%** SINCE 2015

COMMUNITY

180+ CHARITIES AND NON-PROFITS THAT EMPLOYEES, DIRECTORS, AND THE COMPANY DONATED TO OR VOLUNTEERED FOR IN 2020

2022 WORLD'S MOST ETHICAL COMPANIES® ™

WWW.ETHISPHERE.COM

2-TIME HONOREE

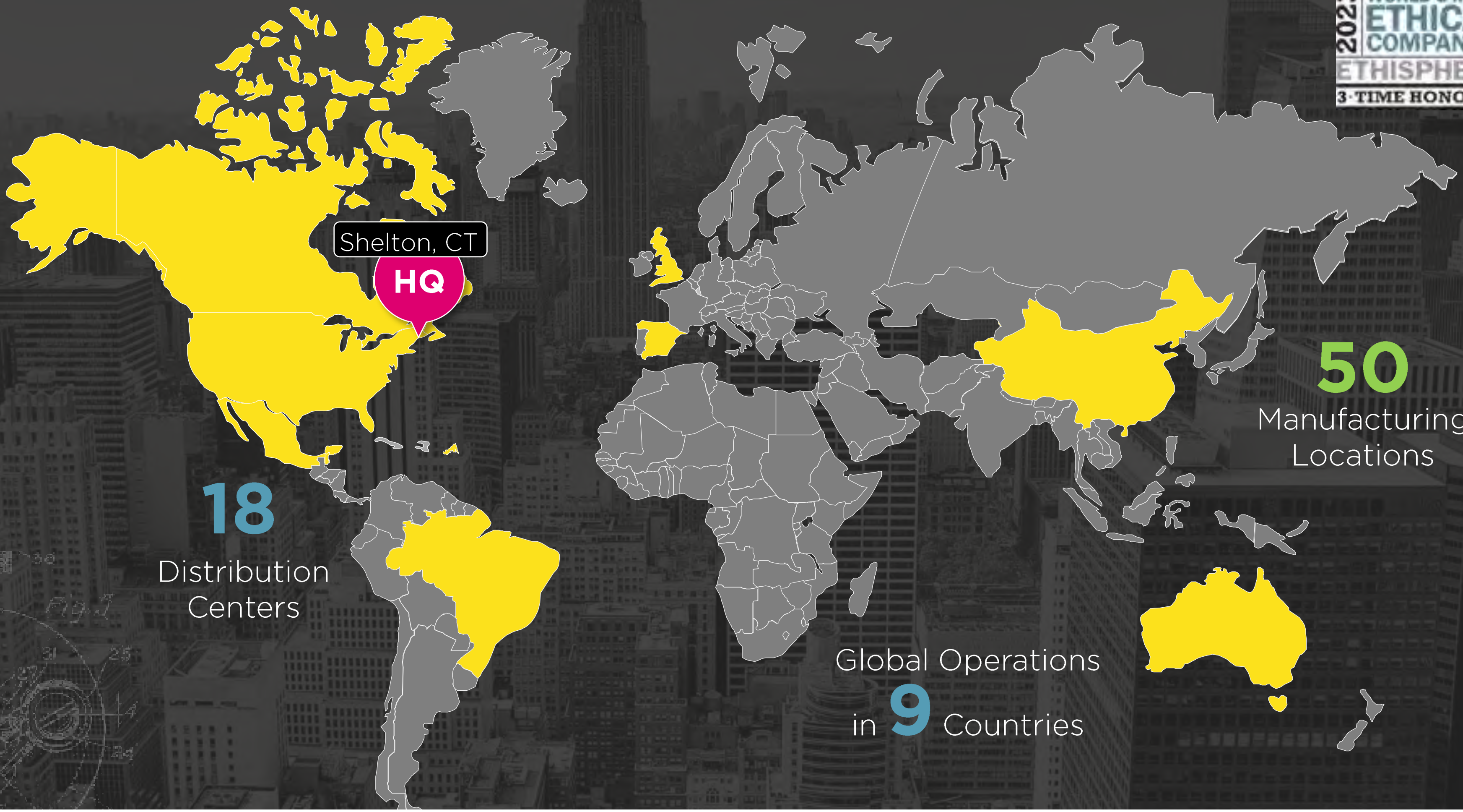
Hubbell was recognized as one of 2022's World's Most Ethical Companies by Ethisphere Institute. This is the second year in a row Hubbell has been named to this list and it reflects the Company's and our employees' continued commitment to compliance and driving an ethical culture.

"World's Most Ethical Companies" and "Ethisphere" names and marks are registered trademarks of Ethisphere LLC

Hubbell Utility Solutions

Hubbell manufactures products that deliver the power and data critical to life and essential for work.

- Quality Products
- Financial Strength
- Focused on Customer Needs
- Distribution Support Network
- Reliable | Energy | Solutions



18 Distribution Centers

50 Manufacturing Locations

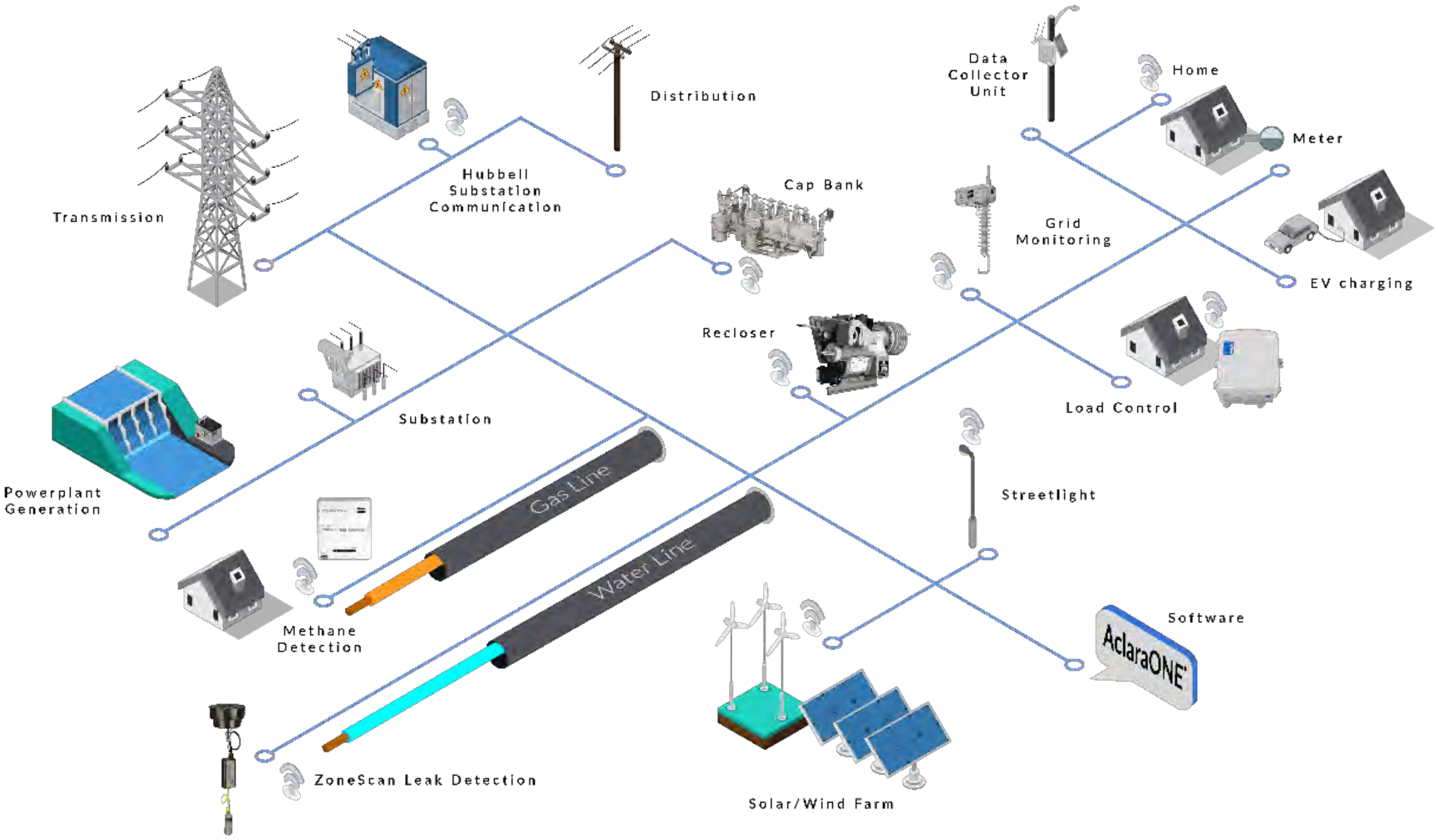
Global Operations in **9** Countries

80+	130+	$4.9B	18,800	2,400	2
Brands Available	Years of Serving our Customers	2022 Annual Revenue	Employees Across the Globe	Patents	Operating Groups

RF TECHNOLOGY

Purpose Built Communications for Utility Applications

Flexible, Scalable and Future Proof Network



"We are investing in system automation to make them smarter and get more information for better decision-making. **Ideally every single consumer meter could be real time point into DSCADA**."
– Magic Valley Coop

"We see a lot of value in shutting down wires before they can start a fire. **Reclosers and FLISR that can enable targeted microgrids would be ideal**."
– PG&E

"We are interested in using EVs as a **tool for demand response** and using them as a **controllable load.**"
– FirstEnergy

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

ACLARA RF NETWORK

OVERVIEW & KEY DIFFERENTIATORS

Topics to be covered in this section…

1. Why should we choose point-to-point over RF mesh?
2. Propagation Study
    a. Design Considerations
    b. Assumptions
    c. Guaranteed?
3. DA, Load Control, Demand Response, Lighting Control
    a. Devices associated with each
4. Lead times

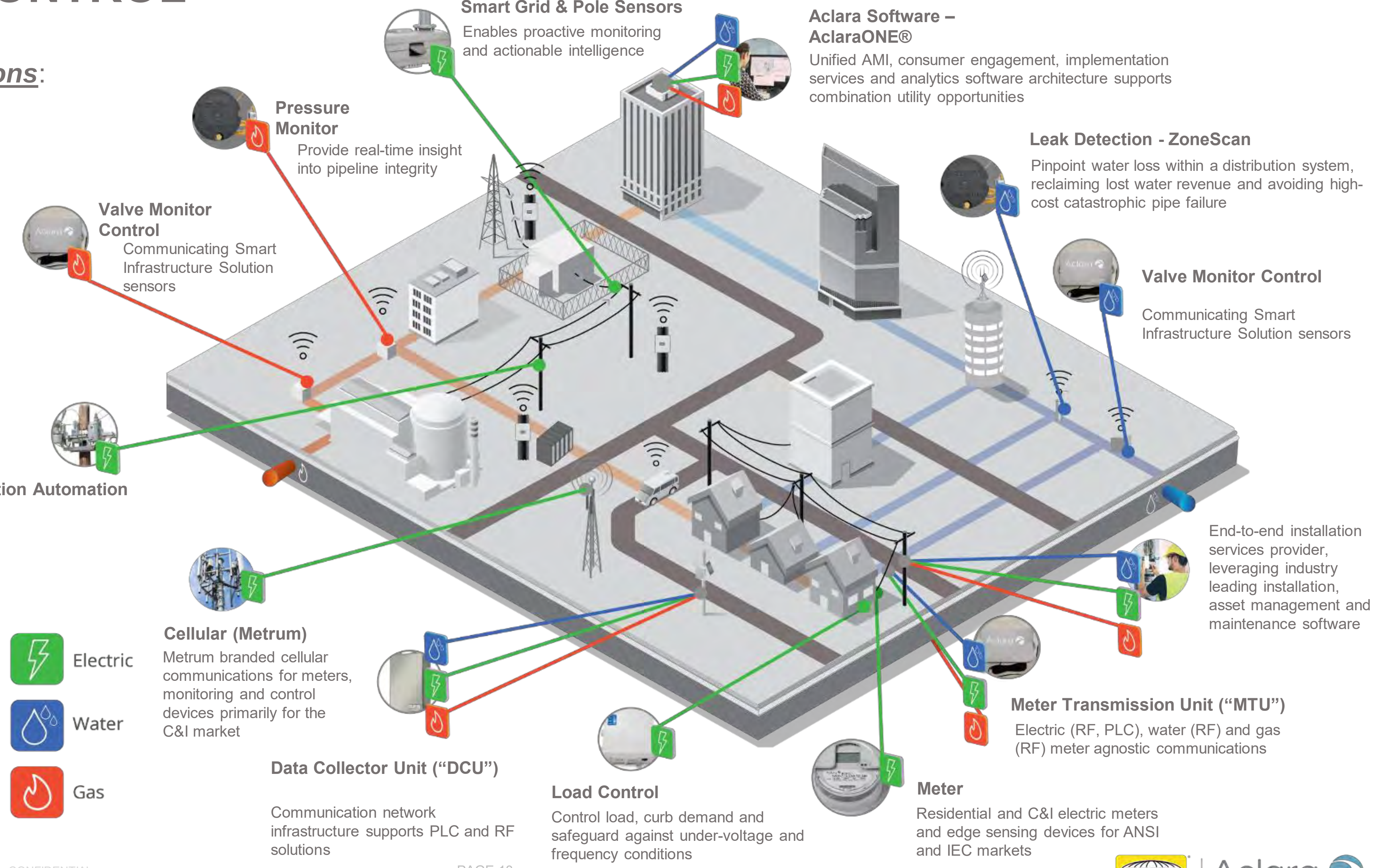
©2023 HUBBELL | ACLARA — ALL RIGHTS

SOLUTION SUITE FOR ELECTRICAL SYSTEM DATA CAPTURE, ANALYSIS & CONTROL

Edge Devices & Communications:
Smart Meters
Line Sensors
EV Charging Solutions
Grid Data Management Platform
RF Coms Network
Installation Services

Protection & Control:
Regulator Controls
Capacitor Controls
LTC Controls
Recloser Controls
Protective Relays

Grid Automation:
Smart Reclosers
Automated Switchgear
Smart Cap Banks
Substation Communications



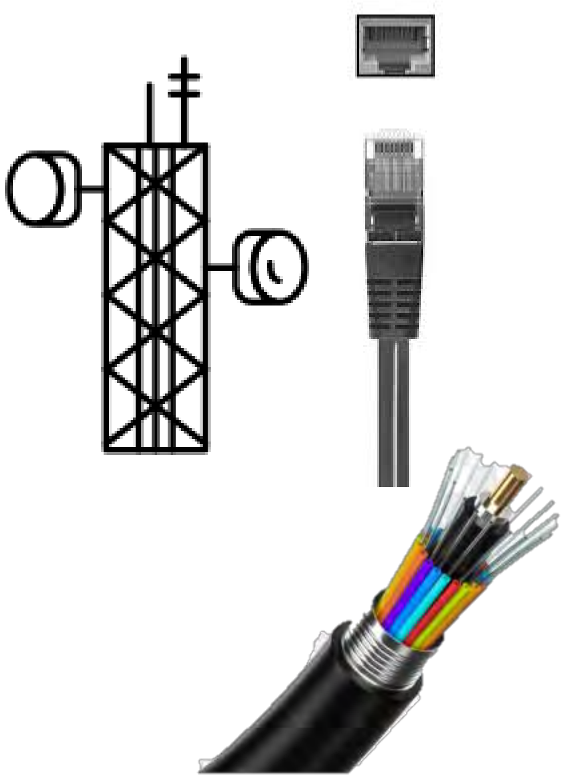
©2021 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

HUBBELL | Aclara

Aclara RF
Infrastructure Components = Simplicity

AclaraONE Software

TCP/IP Backhaul



Data Collection Units / Base Stations

RF Device Endpoints/Sensors

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

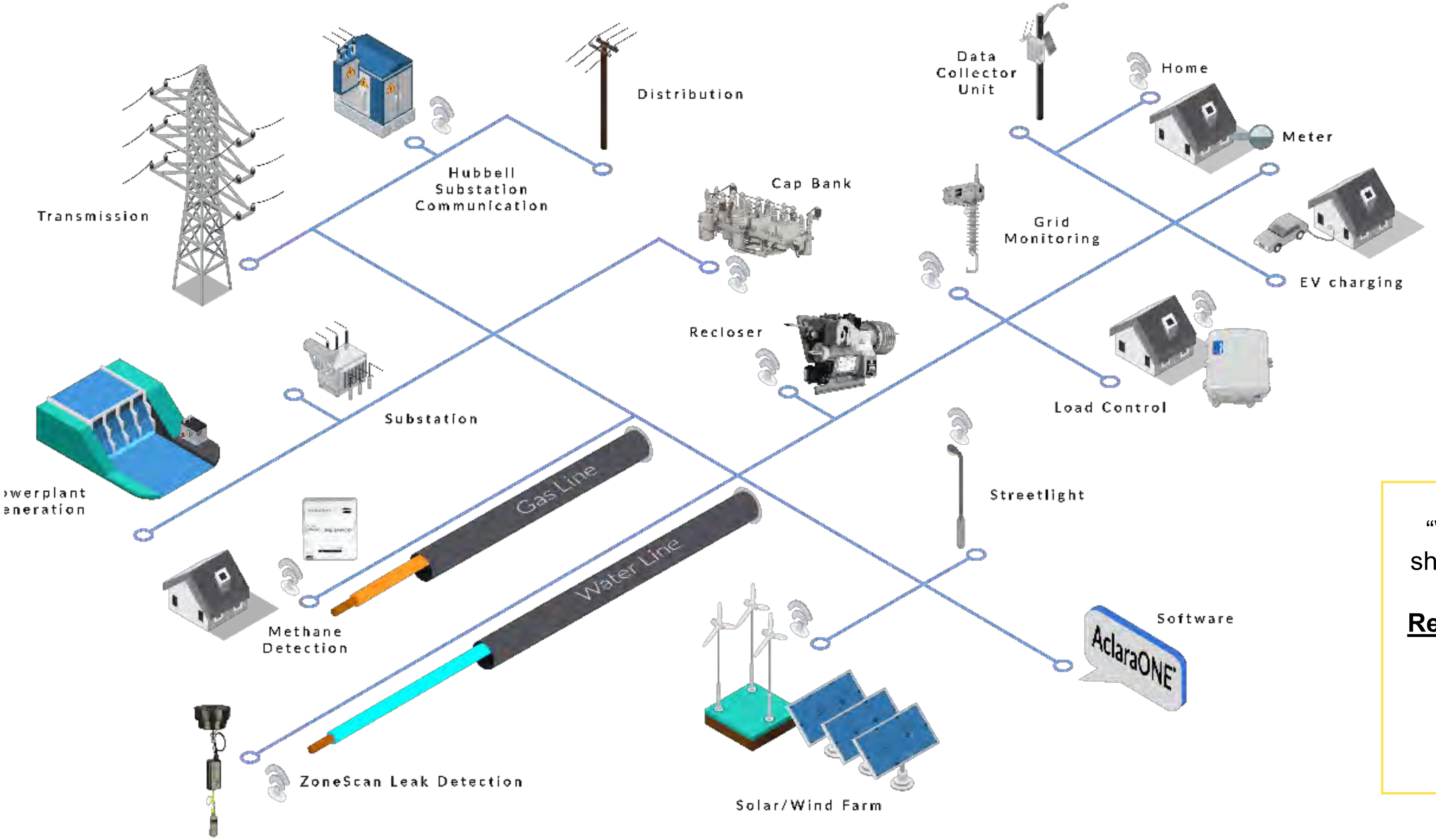
POINT TO MULTIPOINT (P2MP) VS. MESH AMI NETWORKS

Key Measure	PMP	Mesh	Aclara Point to Multipoint	Mesh
Coverage	●	◔	Every endpoint covered directly by a collector device: 2 to 5-mile range	Must be within range of a take-out point, repeater, or other mesh point: ½ mile or less range
Latency	●	◔	Deterministic latency on every endpoint throughout the system	Latency is dependent on number of hops: can vary from milliseconds to minutes, and can change for same node
Network restoration	●	◑	Not required: redundant paths are always operating if a leg goes down	Can take hours depending on extent of network collapse and availability of other communication paths
Communications redundancy	●	◑	Designed into the network: typically, 3X or more to each endpoint	Inconsistent: depends on other devices being in proximity, and other take-out paths available
Radio Spectrum	●	◔	Licensed 450MHz-470MHz spectrum owned by the Utility provides higher power, greater penetration through buildings and better range	Unlicensed Spectrum with no protection from interference, lower allowable power limits due to public spectrum, and less range
Bandwidth	●	◑	Each endpoint and RF link to collector is the same, using small and predictable bandwidth	Endpoints passing along data from other endpoint 'hops' see a large increase of bandwidth – double for passing just one extra node
Read rates	◕	◕	Lower frequency of licensed frequency has slower Baud rates – although more than sufficient for AMI data and controlled bandwidth	Higher frequencies have higher bandwidths when not weighed down by multiple node transmissions through one node – as in a mesh network
Take-out point counts	◕	◑	Need enough collectors to cover entire region in 3X redundancy	Actual collectors might be minimized but are offset by large counts of repeaters and slow down of data transmission due to 'hopping'

● Excellent performance ◕ Good performance ◑ Mediocre performance ◔ Poor performance

One Network – Many Applications

Support Diverse Use Cases with a Flexible, Scalable, Future Proof Comms Network



- Supports Multiple Use Cases
- Augments Existing DA Network
- Secure & Highly Resilient

"We see a lot of value in shutting down wires before they can start a fire. **Reclosers and FLISR that can enable targeted microgrids would be ideal**."
– PG&E

"We are interested in using EVs as a **tool for demand response** and using them as a **controllable load.**"
– FirstEnergy

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

HUBBELL | Aclara

Aclara RF AMI Key Advantages

01 Dual-band, Licensed Spectrum

Navigate traffic on a highway protected by FCC rules and regulations with defined courses of action for bad actors..

02 Utility Owned License

Control rights to use your expansive highway for 10 years with first right to renew an additional decade for a full 20-year return on investment.

03 450–470, 900 MHz

Communicate in a lower frequency, providing superior penetration with excellent distance and propagation characteristics.

04 Outage/Restore Timer

Report utility defined, confirmed, outages and restorations with configurable timer between five seconds and five minutes.

05 Supercapacitor/Last Gasp

Electric: up to six last-gasp messages over a 20-minute time frame following expiration of the outage timer.
Water / Gas: 10% battery life.

06 Redundancy

Create a network with natural resiliency and reliability covering endpoints for more than meter-to-cash – ensure the network performs on “grey sky days” when Distribution Automation is key.

07 Low, Predictable Latency

Consistent, shorter duration communication with devices in time-sensitive applications such as Distribution Automation.

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Why Aclara RF?
What the experts are saying

Meters becoming more of a Smart Sensor

Flexible peer to peer communications with multiple field sensors and data sources for real-time decision making

Artificial Intelligence at the edge and on the network

Predictive and preventive analytics to minimize risk of field failures

Adherence to industry standards - interoperability
- Communications,
- Network Monitoring
- Security

Common network support of multiple applications

Advance load management & balancing

Improved asset management – EV’s, DER’s

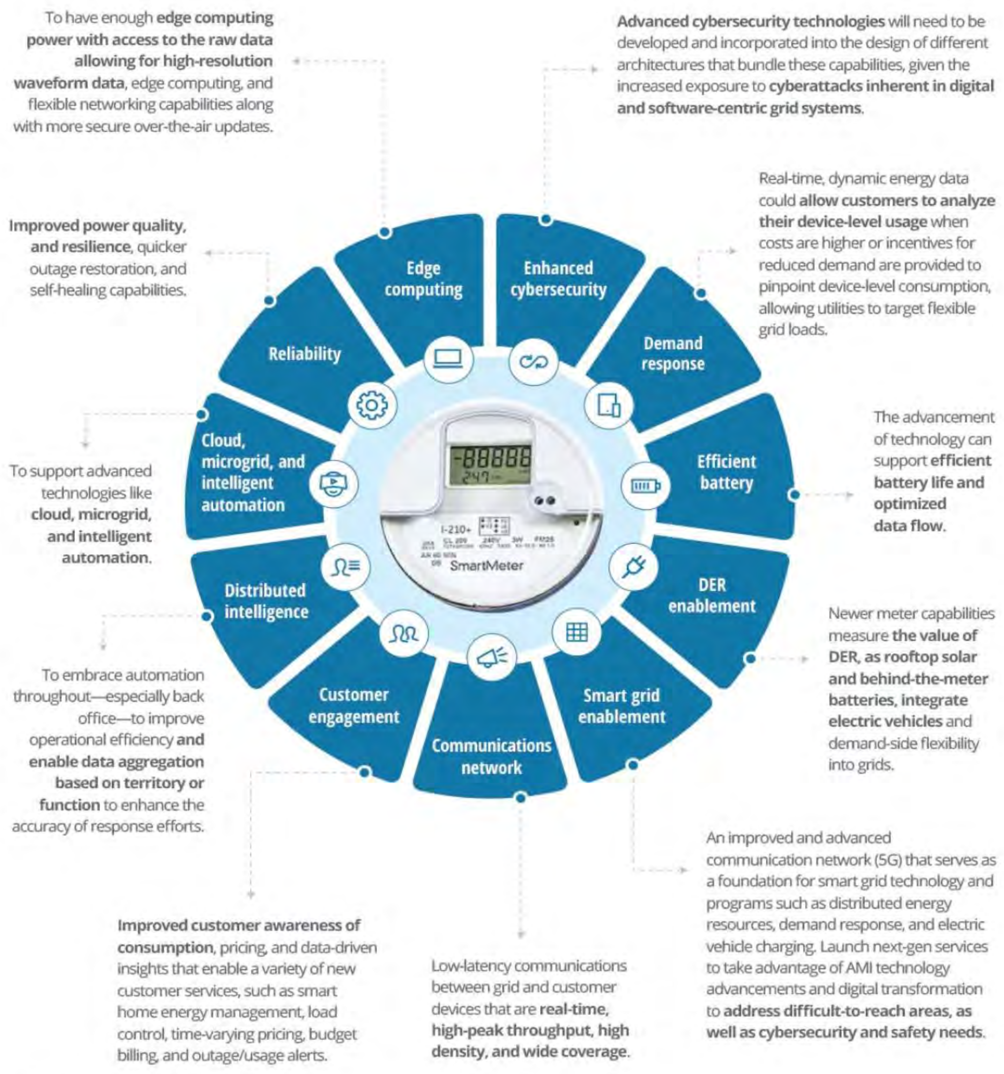
Time synchronized meter PMU

Consumer engagement & awareness

System convergence (Cloud, On-Premises, Hybrid)

Critical Peak Pricing, TOU, Micro Payments

Anticipated capabilities from AMI 2.0



Note: DER = distributed energy resources.
Source: Deloitte Consulting, 2022.

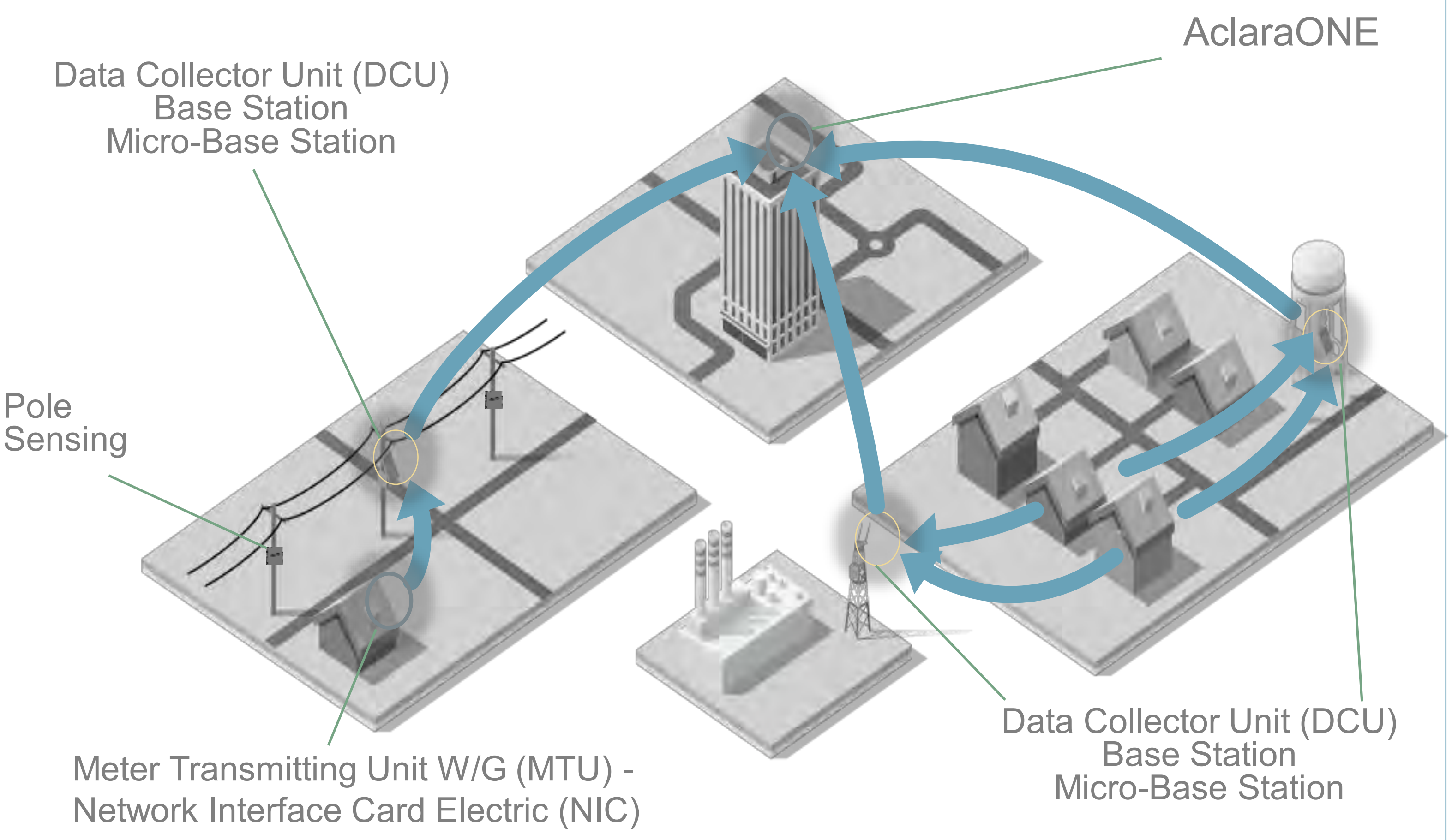
Deloitte Insights | deloitte.com/insights

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

HUBBELL | Aclara

Aclara RF™

Secure, robust network of the future, supporting AMI 2.0 with multiple use cases



DCU/Base Station

- Enhanced QoS
- Improved Resiliency
- Increased Capacity & Throughput
- Backhaul Optimization
- Reduced Infrastructure
- Improved Access to Hard-to-Read Endpoints
- Coexisting BSU & Aclara RF Field Network Gateways

RF Spectrum

- Dual Band 450-470MHz + 900MHz NPCS

Multi-Application Support

- DA Edge Gateway
- Advanced Aclara RF AGM Sensors
- Pole Sensing, Lighting Control

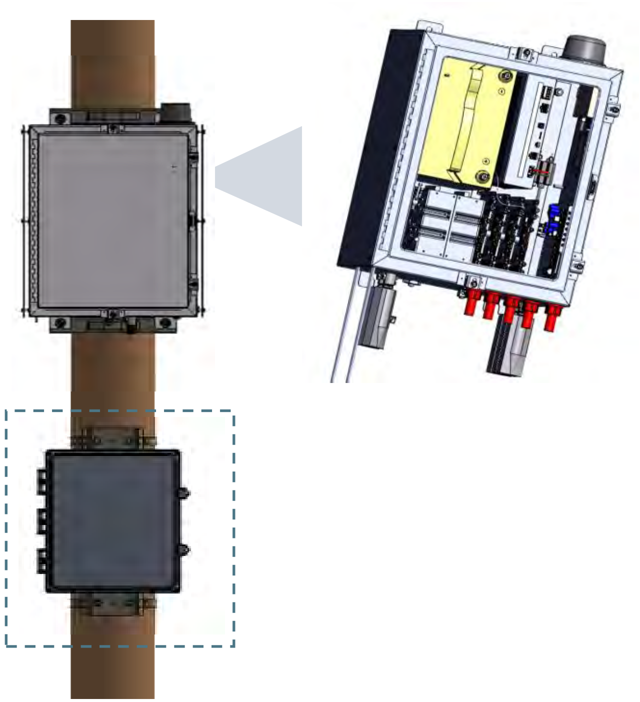
Software

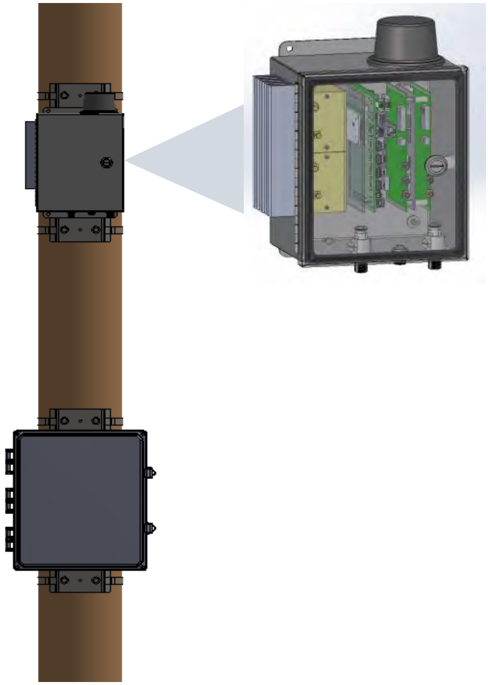
- Advanced Analytics
- Standard Protocols (IPv6)
- Disaster Recovery
- Improved Security

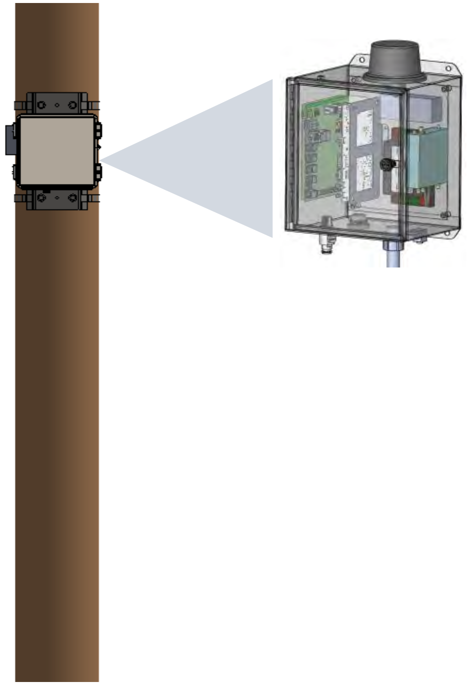
©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

ACLARA RF™ NETWORK INFRASTRUCTURE

Optional auxiliary battery box for additional ride through







Enhanced Base Station
Full duplex
50k endpoints
Dual band

Standard Base Station
Full duplex
10-20k endpoints
2x power
Single band

Micro Base Station
Full duplex
100-2k endpoints
Single band
Low cost

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Enhanced Utility Solutions (EUS)

Gain valuable insights into your network, ensure proper maintenance, and achieve reliable performance. Reduce OpEx or eliminate Capital expenditure with the Aclara Owned Network

Network Services (on-site & ownership models to fit JPEC's needs:

Stand-alone network services

- **System Watch Silver:** Monitoring with weekly Endpoint, BSU and software performance reports.
- **System Watch Gold:** Monitoring and weekly reporting with interactive links to all customer-service related cases.
- **BSU Protect Silver:** Ongoing BSU maintenance past the warranty period
- **BSU Protect Gold:** Ongoing BSU maintenance and repair past the warranty, plus battery maintenance and replacement.

EUS provides the confidence in your network with Aclara, ensuring reliable communications performance and high read success rates for all Aclara RF endpoints.

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Enhanced Utility Solutions (EUS) – Service Options

Anything from a system health report to a full-service, managed solution covering Network as a Service (NaaS) and Software as a Service (SaaS).

Aclara Owned Network (AON)
Includes all NaaS, SaaS, and DCU Hardware

- Operation, maintenance, and monitoring of the communications network and backhaul
- Installation & maintenance of DCUs, network and headend services
- Aclara will manage and analyze AMI data for you

Network Freedom
Includes all NaaS, SaaS

- Benefits of Aclara Owned Network, but utility owns DCUs.

Network Defend
Ongoing monitoring, service, and repair

- Combines Protect Gold & System Watch Gold Services
- Ongoing service for DCU network past the warranty, including battery replacement.
- System Watch monitoring reporting network health with interactive links to all customer-service related cases.

	Bundles	Individual Products			
Service	Network Defend (c)	DCU Protect Silver	DCU Protect Gold	System Watch Silver	System Watch Gold
DCU Maintenance	x	x	x		
DCU Battery Replacement	x		x		
System Health Static Report				x	
System Health Interactive	x				x

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Aclara

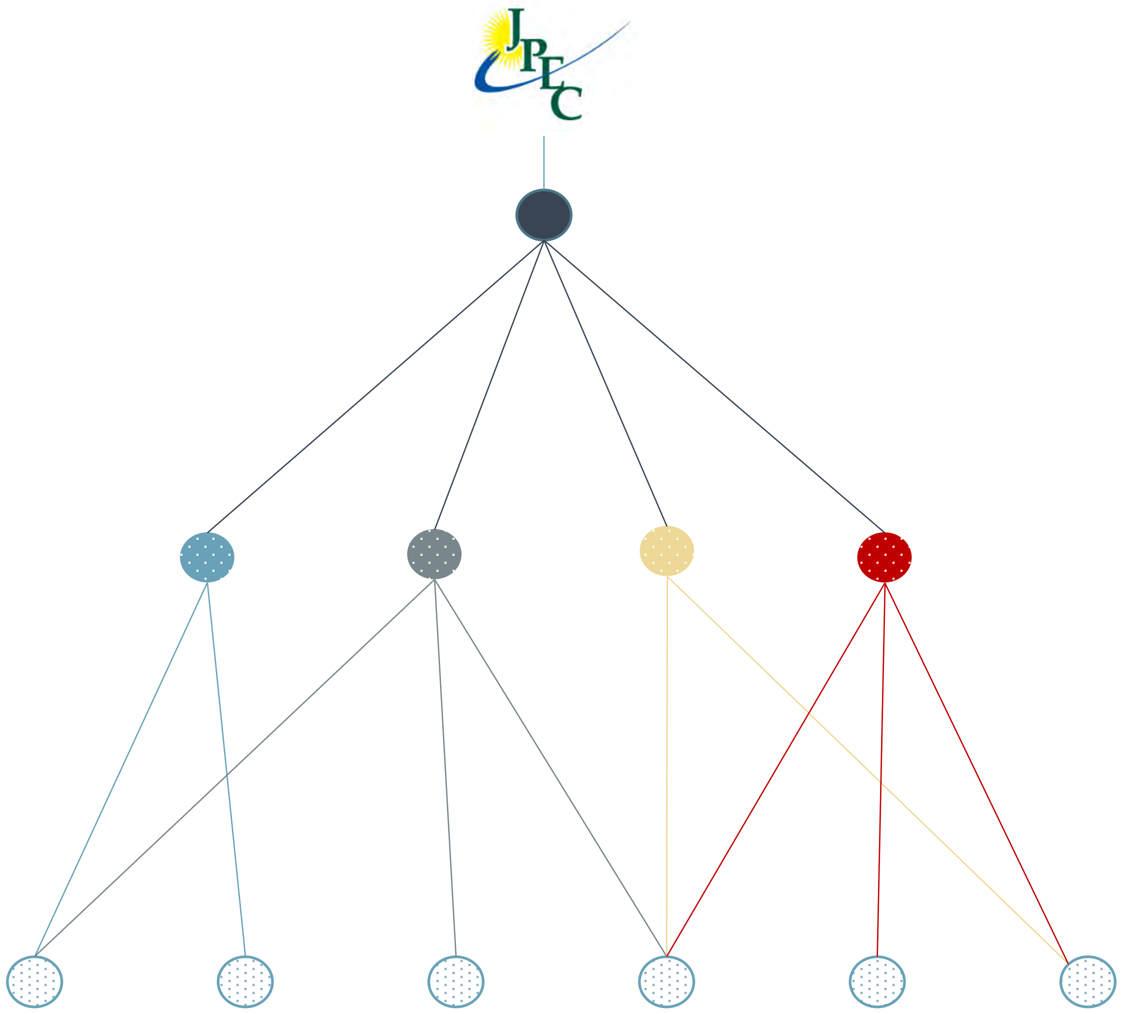
Cyber Security

ACLARA RF
SYSTEM ARCHITECTURE & SECURITY

AclaraONE Headend

RF Network Infrastructure
- Data Collector Units (DCUs)
- Base Stations (BSUs)

Endpoints
Aclara Meter and AMI Module



End-to-End Security

Headend
- Role-based access control
- Windows-based authentication

Application Data
- Encrypted with AES-256
- Authentication with
  - AES-256 (Electric)
  - SHA-256 (Water/Gas)

Endpoint
- Tamper alarms
- Hardware-based security module

DCU/BSU
- Role-based access control*
- Secure boot*
- Door alarm
- Passphrase protected
- Hardware-based security module

Firmware
- Digitally signed using ECDSA
- Encrypted using AES-256 CCM

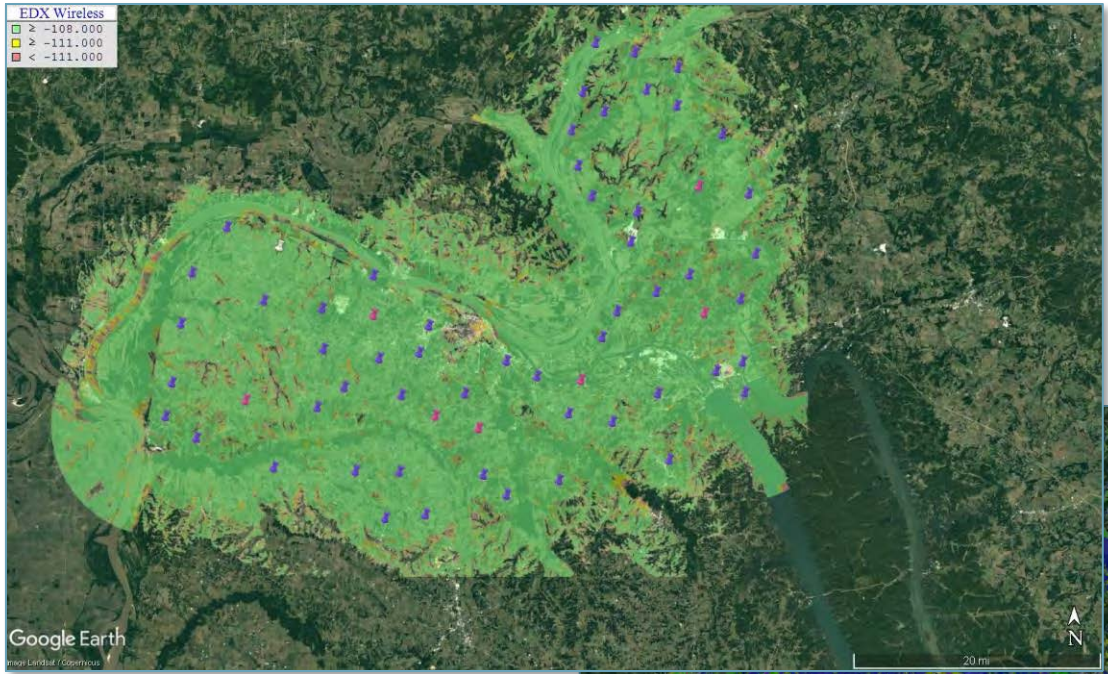
©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Aclara

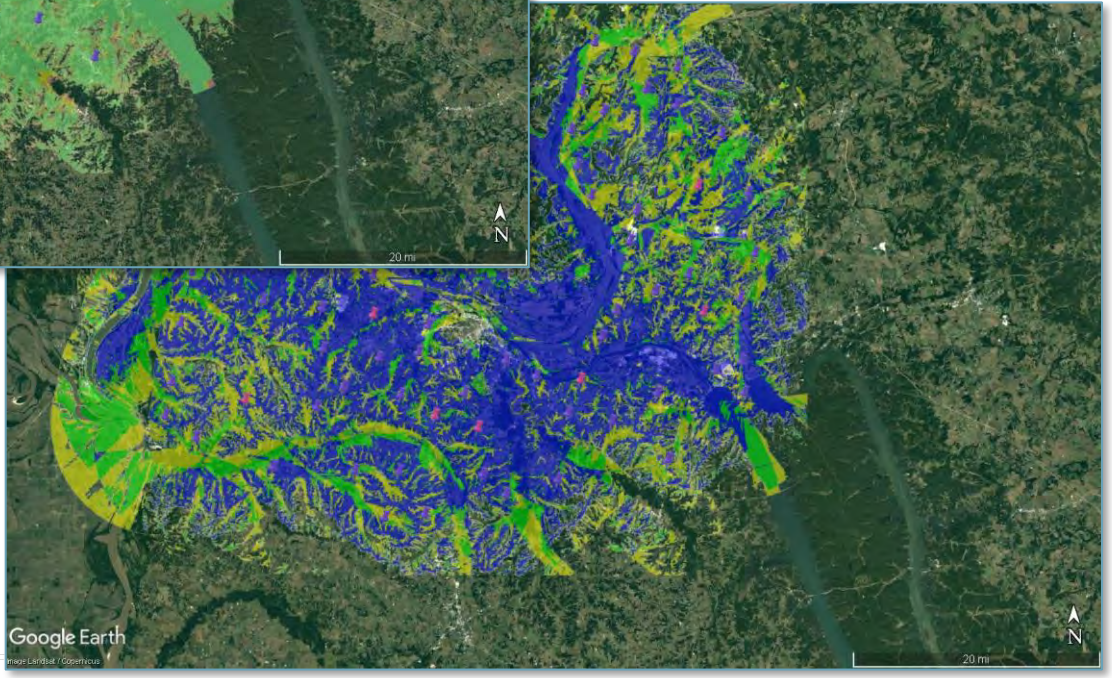
RF Propagation Study Results

Network RF Propagation Study Results

RSSI – Signal Strength



BSU Redundancy



(62 BSUs, No Repeaters)

All BSUs accept meter data from any endpoint that they can hear, providing multiple, simultaneous data paths back to AclaraONE

92.5% of all endpoints can be heard by 2 BSUs

78.6% of all endpoints can be heard by 3+ BSUs

Predicted Redundancy	Overall Coverage %
Single	100%
Double	92.5%
Triple	78.6%

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONF

RF Propagation Study – Results (1 of 2)

Jackson Purchase Energy, KY Electric Full Deployment Propagation Study.				
Standard Range Outside Endpoints				
Standard Range Inside Endpoints				
Predicted Coverage				
Predicted Redundancy	MTU Coverage %	Overall Coverage %		
Single	7.2%	100%		
Double	13.9%	92.5%		
Triple	78.6%	78.6%		
BSU Count				
Base Station Site Type	Base Station Count			
Customer Sites	62			
Aclara Proposed	N/A			
Total BSUs	62			
BSU Quantity and Install Type				
Base Station Site Type	Base Station Count	Antenna Height (ft)		
Electric Pole	54	25-80		
Non-Transmission Pole	1	43		
Roof Mount	N/A	N/A		
Tank / Tower	N/A	N/A		
Lattice Tower	7	60-195		
Aclara Proposed Pole	N/A	N/A		
Total BSUs	62			

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

RF Propagation Study – Results (2 of 2)

Jackson Purchase Energy, KY Electric Full Deployment Propagation Study.				
Customer Data				
Type	Provided Count	Modeled Count*		
Meters	30,305	30,299		
Customer Assets (Non-Poles)	39	8	(7 Lattice Towers & 1 Pole at Sub station)	
Customer Poles	59,875	54		
Coverage Territory				
Metric	Value			
Total Area (SqMi)	645			
Avg. Endpoint per SqMi	47			
Avg. Endpoint per BSU	489			
Highest BSU Elevation	668			
Lowest BSU Elevation	345			

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Meters and NICs

Advanced Meters

- **Industry Leading Quality, Accuracy and Reliability**
- **Residential, Commercial and Industrial Applications**
- **Global Metering Solutions**
- **Extensive AMI Compatibility**

kV2c Gen5
Commercial &
Industrial Meter

I-210+c
Residential Electric
Meters

COMPACT METER

Smart Energy Meters

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Aclara AMI Meter Family

I-210+c
Configurable Residential Meter

This is Aclara’s flagship residential meter product, offering demand, load profile, TOU, service switch, and a full complement of communication options.

RF

Cellular

FORM	CLASS	VOLTS
1S	100 *	120 & 240
2S	200 * & 320*	240
3S	20	120 & 240
4S	20	240
12S	200 * & 320	120 & 240
25S	200 * & 320	120 & 240

* Optional Service Switch

kV2c
Configurable Commercial/Industrial Meter

The Aclara kV2c meter family is one of the most widely accepted ANSI® commercial and industrial meters with over 2 million units deployed in the field since its introduction. The robust revenue-grade meter design is based on Aclara’s cutting edge technology that provides high accuracy and reliability.

RF

Cellular

FORM	CLASS	VOLTS
1S	200	120-480V Auto ranging
2S	200 & 320	
3S	20	
4S	20	
12S	200 & 320	
25S	200 & 320	
9S	20	
16S	100 * , 200 & 320	
36S	20	
45S	20	

* Optional Service Switch

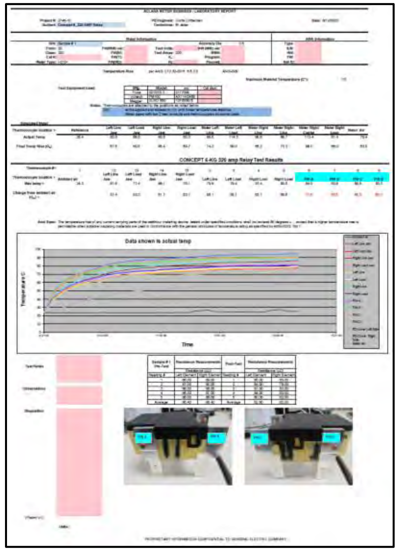
©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

HUBBELL | Aclara

Extend beyond Residential | Service Switch

Outcome:

A disconnect switch for higher rated services and polyphase services for the purpose of enabling Pre-Pay solutions and managing non-pay customers and load-shed actions.



Accepting Sample Requests & pre-order for 2S CL320RD

Solution:

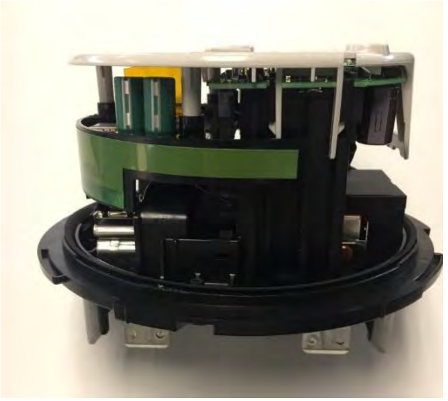
FORM 2S CL 320 RD
Available today.

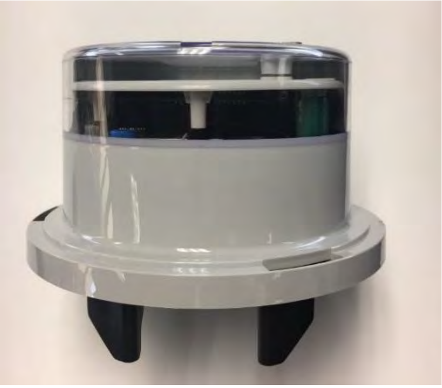
FORM 16S CL 200 RD
Initial Release anticipated Q1 2024
On going research & development related to heat dissipation.

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

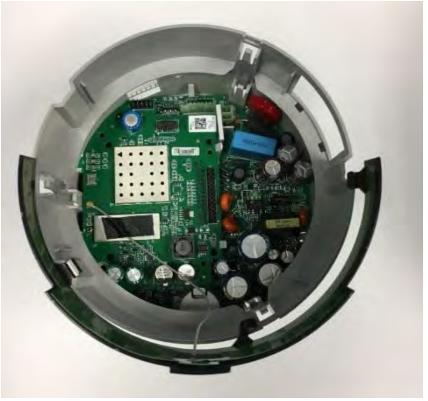
NETWORK INTERFACE CARD (NIC)

I-210+c Residential Meter
(Forms 1s, 2s, 3s, 4s, 12s, 25s)





kV2c Commercial & Industrial Meter
(Forms: 2S, 3S and 4S 12S, 16S, 9S, 45S, 46S and 56S)



- Licensed 450 - 470, 900 MHz
- 5, 15, 30, 60 Min Load Profile & Event Log
- Time of Use - TOU
- On-demand readings
- Measurement Values
  - Real, Reactive, Apparent Energy Measurement
  - Bi-Directional Measurement/Net Metering
  - Voltage Measurement (Min, Avg, Max)
  - Power Quality (Sag/Swell, Outage Count/Duration)
  - Temperature
- Factory Integrated Service Switch Relay (I-210+c)
  - Demand Limiting, Outage Mgt, Pre-Pay
- Over-the-air configuration & firmware updates
- AES 256 encryption: NIST compliant security, Tamper Detect
- Under the cover NIC - Plug & Play

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

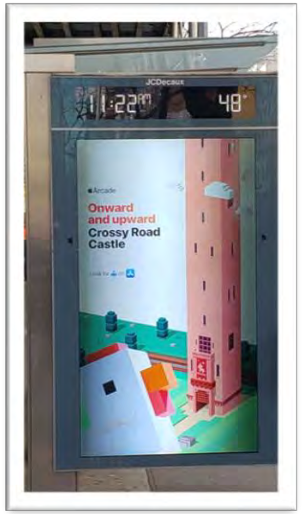
Extend beyond Residential | Service Switch

Outcome:

Fully deployed AMI system, yet significant number of “impossible to read” meters.

Seeking non-socket mount and small form factor meter with features and function of standard meter.

Applications: EV Chargers, DER, Street Furniture, Submetering, Campgrounds, Telecomm, Pole top metering, Padmount metering…



Solution:

I-210+c w/ AMI Communication
Dimension – 5.25”W x 7” H x 3”D
Terminal Block Connection
Voltage = 120V; 208V; 240V
Current = 100A
DIN Rail Mounting Option

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Lead Times

Meter ordering lead time and manufacturing locations

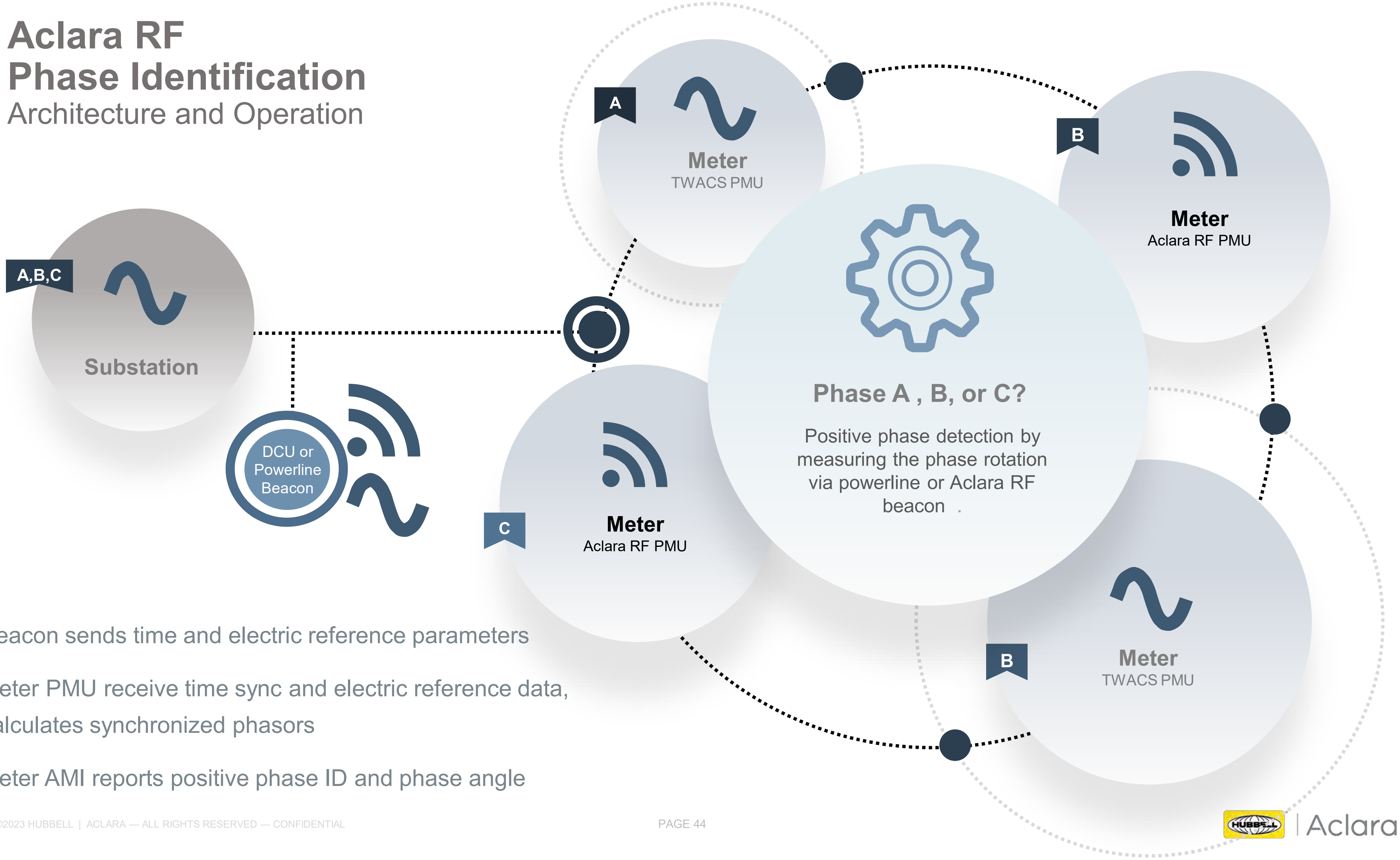
- Typical lead time is 12-16 weeks, current meter with AMI NIC lead time is 18 weeks. First Article Testing (FAT) meters used for software integration is 6-8 weeks.
- Base station lead time is 12-14 weeks.
- Meters are produced and integrated with the Aclara RF NIC in Mexico and shipped directly to the customer. Base stations are produced in Solon, OH.

Warranty of hardware (meters, base stations, ILC's, etc.)

- Aclara's highly reliable meters have an 18-month warranty.
- An extended warranty up to 5yrs can be provided at additional cost.

Applications

Aclara RF
Phase Identification
Architecture and Operation



1. Beacon sends time and electric reference parameters
2. Meter PMU receive time sync and electric reference data, calculates synchronized phasors
3. Meter AMI reports positive phase ID and phase angle

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Aclara RF
Phase Identification

Advanced Metering Infrastructure

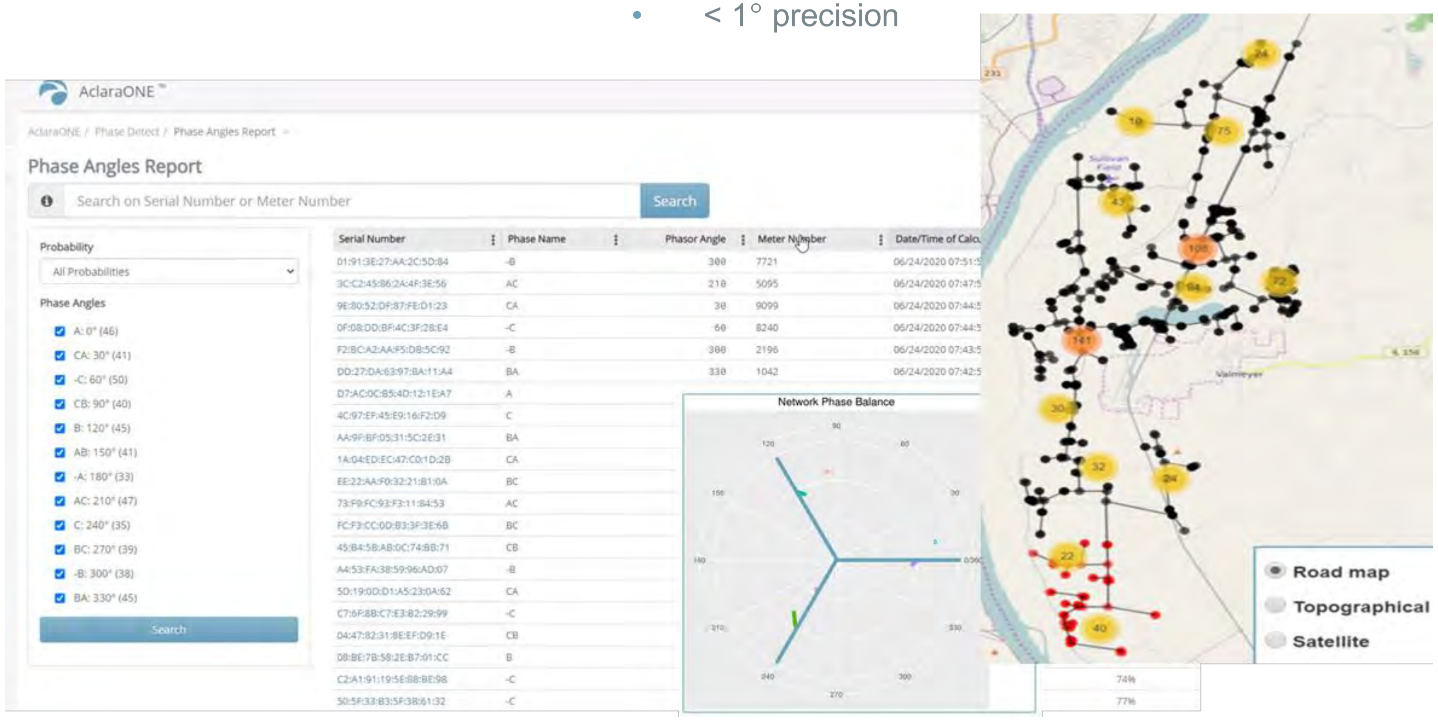
- Detect and Monitor Grid Imbalances
- Reduced OpEx required to maintain phase integrity of devices
- Detect Faults leading to poor QoS
- Improved power quality, balanced grid, validation of restoration following network damage/switching
- Report's phase (A, B, or C) and phase angle (0-360 degrees) of the residential meter endpoint
- Phase on Meter LCD (future)
- GIS load mapping & balancing (future)

HARDWARE

- All Aclara I-210+c with Aclara RF NIC (including network meters)
- Aclara Data Collector Units (DCU2 or DCU2+)

SOFTWARE

- Report groups show meters by phase
- Visualize network loads by phase
- Phase Identification analytic provides 99%-100% accuracy
- < 1° precision



©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Intelligent Load Control/Load Shed

Direct Load Control

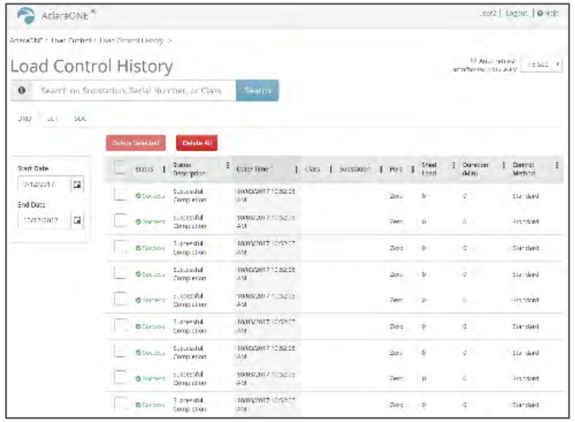
- 2 Relays per Unit (5A, 30A)
- Residential & Commercial (Hot Water Heaters, Pool Pumps, Irrigation, etc.)

Intelligent Load Control

- Based on historic consumer loading profiles
- Fair distribution of load shedding across all consumers
- Factors in the time-of-day changes in usage
- Adjusts to seasonal changes, occupancy changes, etc.
- Increased effectiveness shedding desired amount of load
- Autonomous Load Control Under Frequency/Voltage Detection

Benefits

- Reduce Peak Demand
- Emergency Load Reduction
- Delay Capital Investment
- Reduce cost, peak shaving & reduction, maintain grid stability & efficiency gains
- Maximizes Consumer Comfort While Optimizing Load Shed



©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Controlled Load Shedding & Rotation

Firm Load Shed

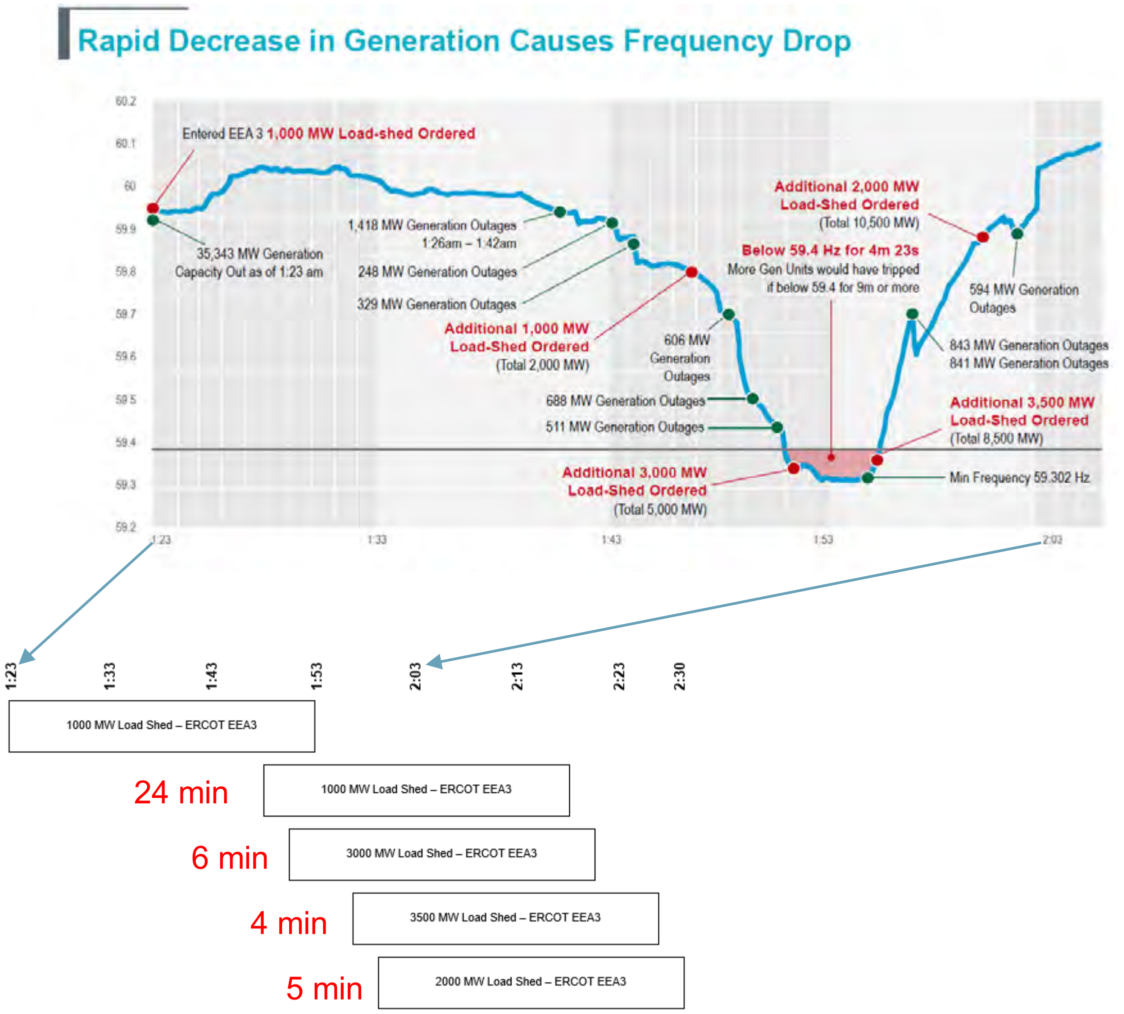
- Recognize & adapt to dynamic load shedding needs
- Act on changing requirements prior to previous load shed being fully executed
- Rotate loads using predefined, flexible load blocks until the “load shed” event is concluded
- Fast & Precise load shed, controlled well within ISO / G&T requirements

Simple Main Interface

- Manage emergency activities prior and during load shedding events
- Removed high stress environment
- Intuitive and simple control interface.
- Tracking/Reporting of all control activities

Preparation is Key

- Estimate load block sizes across the distribution network w/AMI network & edge computing
- Tailor & group to the utility’s requirements
- Load shed rotation patterns and management of critical loads performed before load shedding begins
- Limit/exclude critical loads i.e., hospital, police, fire, consumers with medical needs etc.
- “Underfrequency Reserve” feeders are reserved and excluded from the load shedding intelligence



©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Utility Pole Sensor Suite

Detect pole and conductor impacts and position changes to improve public safety

Quickly determine fault locations

Detect dropped conductors, fire conditions, to improve public safety

Notification and visualization of unusual activity

Advanced analytics for geographic clusters of events

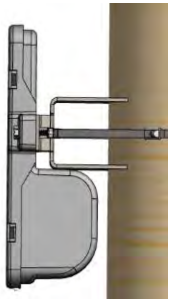
Gain insight into long term asset positional changes

Regular messages for health monitoring of pole and conductor endpoints

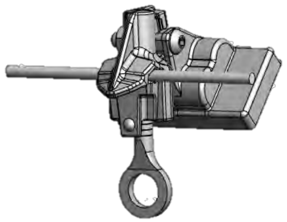
Visualize critical pole analytics (lean, travel, risk)

Rapid deployment and commissioning

[YouTube on Hubbell Power Systems]



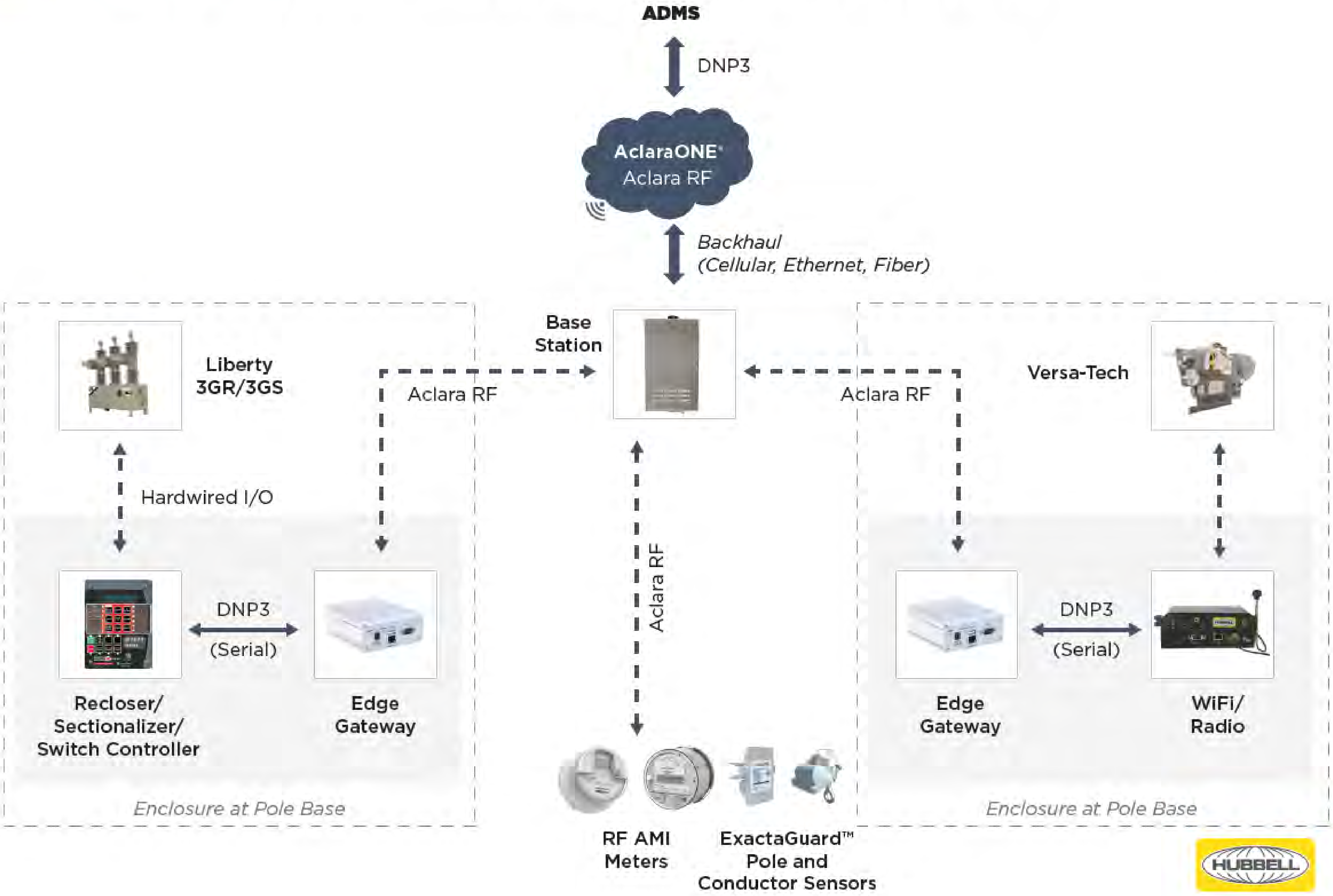
Pole Sensor



Conductor Sensor

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

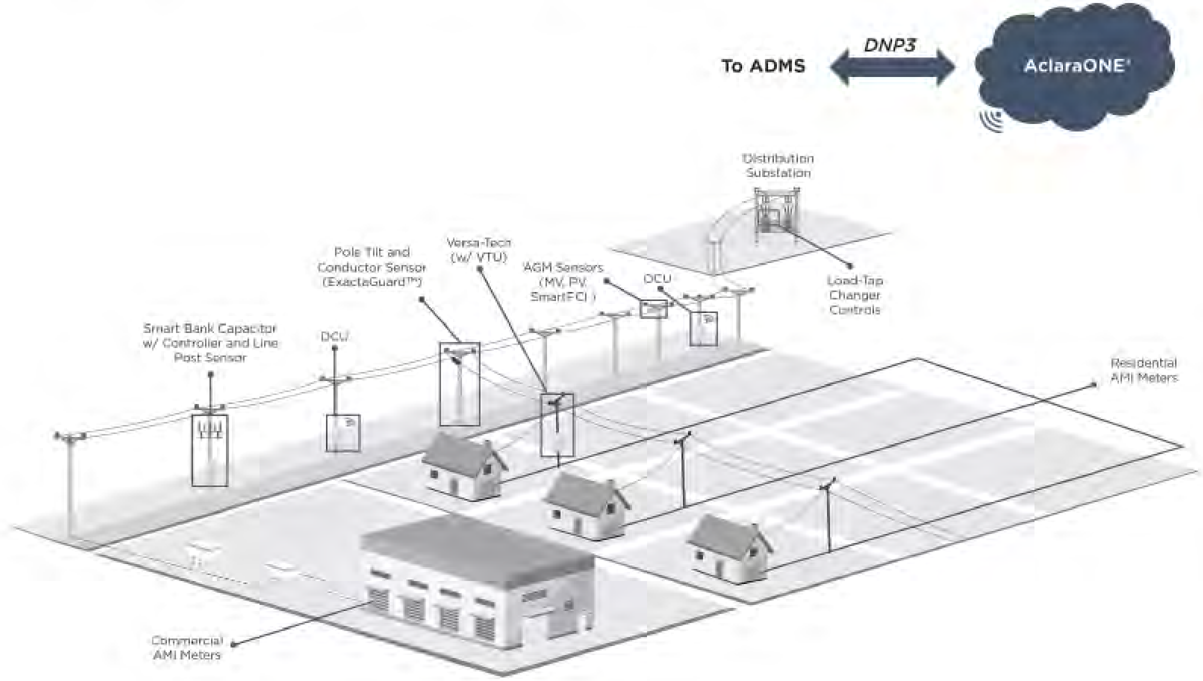
Distribution Automation and Meters with Aclara® RF™



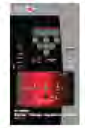
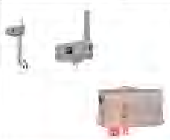
Supported Solutions

- Beckwith
- Schweitzer
- Valquest
- S&C
- QEI
- Eaton / Cooper
- Siemens
- …. more

Grid Visibility Diagram



Device Name	Device Photo
Versa - Tech® (w/VTU)	
Hubbell ® Programmable-Resettable Sectionalizer (PRS)	
SmartBank™ Medium Voltage Capacitor Bank (w/Controller)	
Aclara® RF Communications	
Aclara® Edge Gateway	
Aclara® Data Collector Unit	
Aclara® Intelligent Load Control (ILC)	
Aclara® Residential and Commercial AMI Meters	

Device Name	Device Photo
Versa-Tech® Recloser	
Beckwith Recloser Controller	
Beckwith Capacitor Bank Controller	
Beckwith Voltage Regulator with Controller	
Beckwith Load Tap Changer Controller	
Aclara® Grid Monitoring Sensors Power Sensor MV Sensor SmartFCI™	
Aclara® ExactaGuard™ Pole and Conductor Sensors	
Hubbell® Line Post Sensor	

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

EVSE – Electric Vehicle Charging

Metrology @ the Point of Charge

Product Features

Revenue Grade Metering

Real Time Control

AMI Communication

Low Cost

Benefits

Revenue Grade Metering:
- TOU Verification
- Rate Case Justification
- Ability to Experiment with Rate Structures

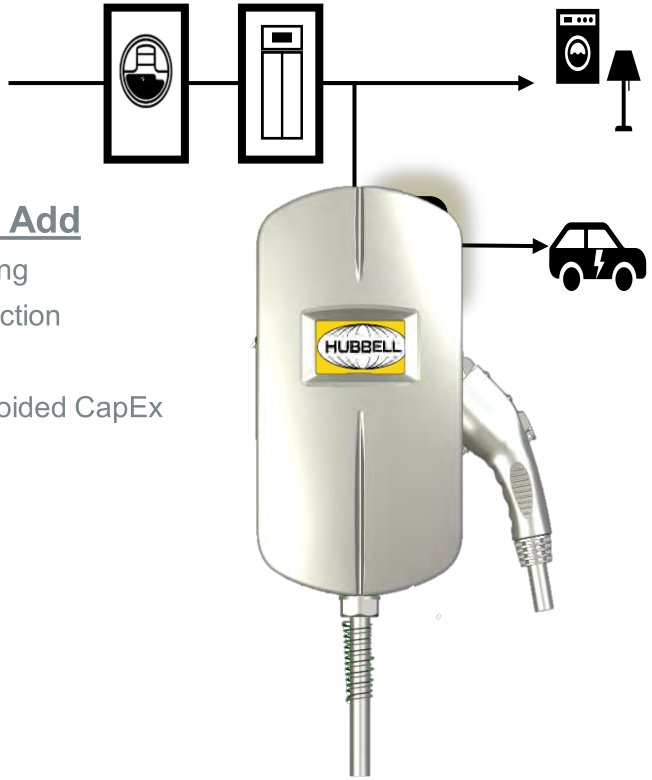
Real Time Control:
- Demand Response
- Peak Load Shaving
- Equipment Protection

AMI Communication:
- Charging Intelligence
- EV Adoption
- Charging Habits
- Real Time Grid Impacts
- Secure

Low Cost:
- Single Installation – no separate meters
- Easy to Use, utilize existing AMI network
- Low Install Cost to Utility and Consumer
- Imporved Grid Efficiency & QoS

Aclara Value Add

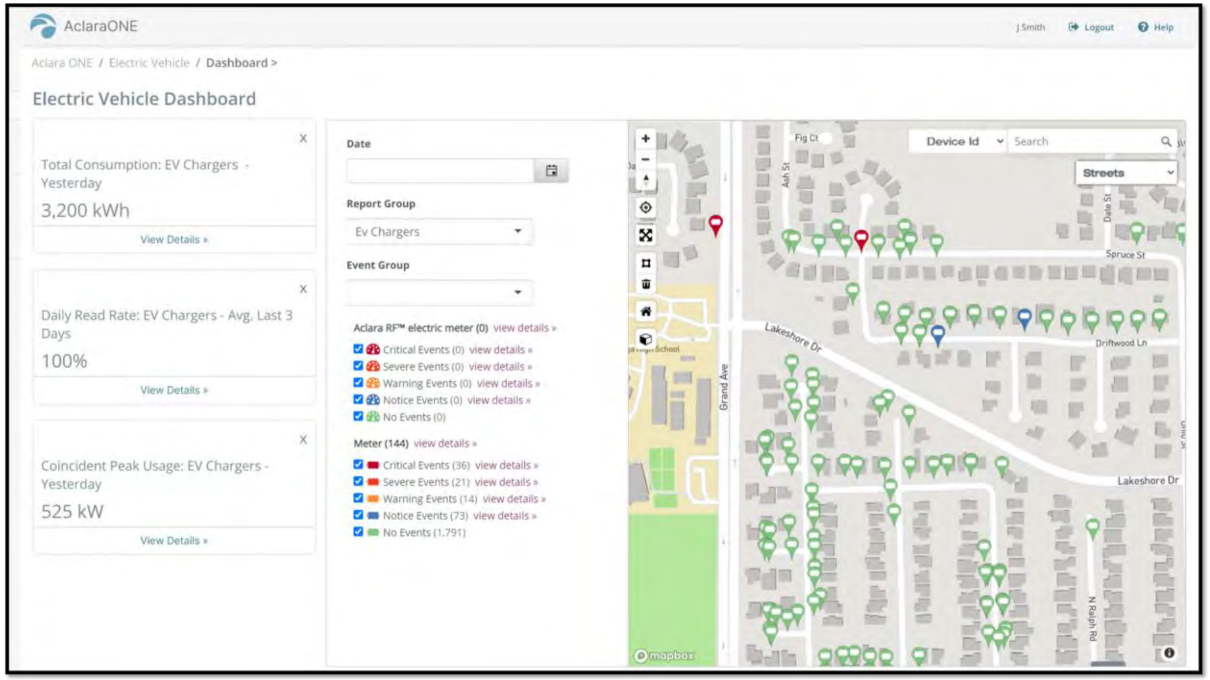
Resource Planning
Equipment Protection
Decarbonization
Deferred and Avoided CapEx

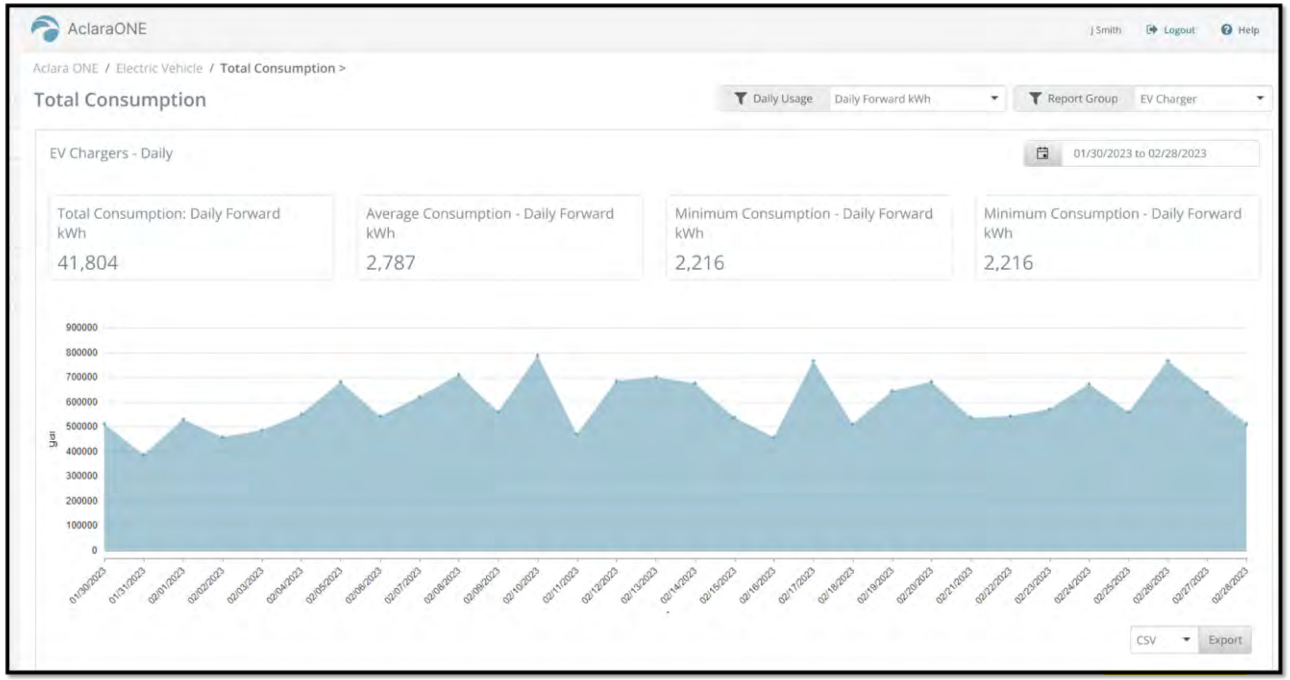


©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

EVSE Software on AclaraONE

- Visibility
  - When are EVs charging? How long and how much are EVs charging?
- Analytics
  - Concident demand by time and location.
- Control
  - Batch EVSEs and control devices (on/off) for peak load shedding events





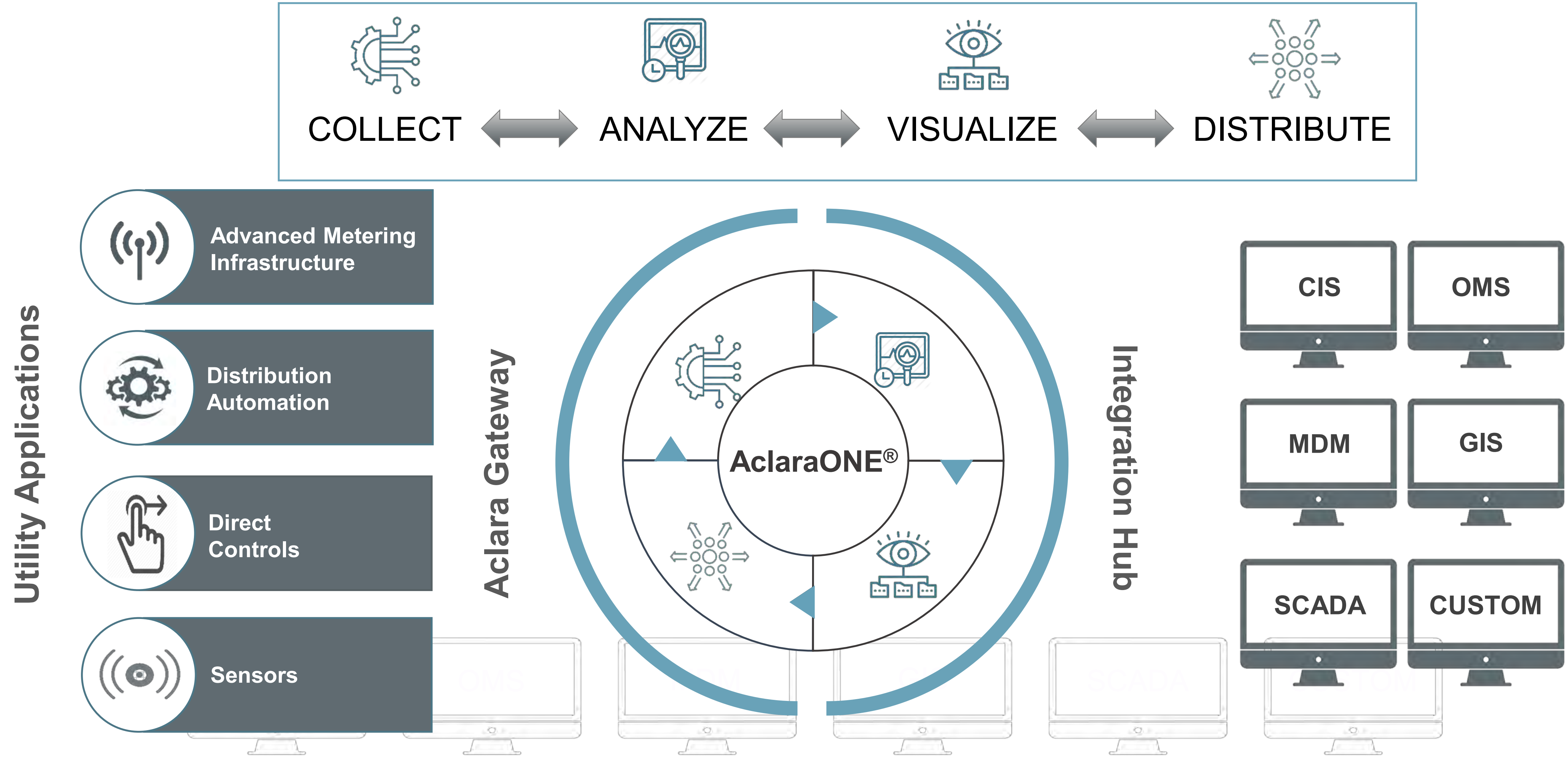
ACLARAONE SOFTWARE

Topics to be covered in this section…

1. Reports (standard and custom)
2. Application Platforms (HES, DA, load control, loading analytics)
3. OMS Integration
    a. Outage notification
    b. Restoration notification
4. Prepay Integration
5. Analytics, Data Storage, and Data Retention
6. On-Premise vs. Hosted
    a. Software updates
    b. Downloading of data to archive
7. How are blink and outage counts recorded?
8. Can the system be read instantaneously for load studies/line loss studies?
9. Does your offering include transformer loading capabilities or will that be handled within NISC's Analytics?

©2023 HUBBELL | ACLARA — ALL RIGHTS

AclaraONE® One network for everyone



©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Questions:

Can the system be read instantaneously for load studies/line loss studies?

- Typically, this is utilized when bell weather meters are used for more advanced DA applications like DVR/CVR/FLISR.

Does your offering include transformer loading capabilities or will that be handled within NISC's MDM?

- Aclara is developing numerous business case applications. Data from Aclara system can go directly to SCADA for analysis, Aclara offer EV Charger transformer asset management & bulk load control for when demand management is critical, to name just a few examples of real-life use cases.

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

ACLARAONE
SOFTWARE AS A SERVICE

The AclaraONE software solution is available via a subscription (Software as a Service) model.

Advantages of SaaS

- No on-premise hardware requirements
- Rapid software deployments
- Easier software upgrades
- Accessibility

External hosting is supported, but it does not provide all of the same advantages (e.g., software upgrades and management) available with Aclara SaaS.

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

On-Prem vs SaaS

- **On-Premise Systems**
  - The On-Premise license only includes the software; the client must provide the infrastructure (i.e. servers, storage, operating system (OS), and databases) needed to run the software.
  - Client IT staff must continuously manage and upgrade the infrastructure as technology advances.
  - The ongoing costs to purchase and maintain the infrastructure can be significant.

- **SaaS Systems**
  - A SaaS subscription is a lower initial investment vs On-Premise license.
  - SaaS systems operate in cloud, you pay for the Service.
  - “NO” software support, maintenance costs, or server infrastructure to support.
  - SaaS subscription fees are charged annually.
  - SaaS subscription fees are treated as an operational expense versus a capital expense.
  - Client selects SLA (98.5% - 99.9%)

©2021 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

ACLARAONE SAAS
DATA & STORAGE

Data is...

- Encrypted at rest on Azure servers
- Only accessible with appropriate authentication.
- Stored on mirrored drives and backed up daily

Standard SaaS offering (head-end) utilizes premium single instance SSDs with an uptime SLA of 99.9%*. Annual disaster recovery testing is completed on the cloud analytics platform.

Software Escrow is an option – common partners include NCC Group and Iron Mountain.

The default amount of data available in AclaraONE is 25 months; additional storage options (including customizations) are available.

**Optional higher-level offering available*

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Search By Page Name

Applications

- CSR Portal 1
- Load Control 1
- MDM 4
- Administration 9
- Billing Management 2
- Reporting 2

Sensors

- Aclara RF™ electric 5
- Aclara RF™ water 3
- Job Scheduler 3

About the AclaraONE® Platform

AclaraONE ®

J Smith | Logout | Help

AclaraONE / Reporting / Usage History Report >

Usage History Report

Search on Report Name or Report Group | Search

Create New Report

Report Name	Last Run St...	Last Run...	Date Range	Data Frequ...	Report Gro...	Devices in ...	Data Source	Status	Export	Delete
TotalConsumption_May_21_2023_Ju... I-210+c_Daily (Aggregated)	Success	06/21/2023 06:06:76 AM	05/21/2023 - 06/21/2023	Daily	Aclara I-210+c	911	Original	All	Export	✖
DailyUsage_Daily Total kWh_Mar_12_2023_Mar_13_2023_Ac... kV2c_Individual Meters	Success	03/14/2023 06:03:17 AM	03/12/2023 - 03/13/2023	Individual Meter	Aclara kV2c	80		All	Export	✖
TotalConsumption_Oct_31_2022_De... Accounts Group_Individual Meters	Success	03/14/2023 03:03:48 AM	10/31/2022 - 12/05/2022	Individual Meter	All Accounts Group	1791		Only Active	Export	✖
DailyUsage_Daily Forward kWh_Mar_08_2023_Mar_10_2023_Ac... kV2c_Individual Meters	Success	03/14/2023 02:03:75 AM	03/08/2023 - 03/10/2023	Individual Meter	Aclara kV2c	89		All	Export	✖
DailyUsage_Daily Forward kWh_Mar_08_2023_Mar_10_2023_Ac... I-210+c_Individual Meters	Success	03/12/2023 12:03:52 PM	03/08/2023 - 03/10/2023	Individual Meter	Aclara I-210+c	911		All	Export	✖
TotalConsumption_Feb_20_2023_M... Accounts Group - Electric_Daily (Aggregated)	Success	03/09/2023 08:03:67 AM	02/20/2023 - 03/06/2023	Daily	All Accounts Group - Electric	1001		Only Active	Export	✖
TotalConsumption_Jan_10_2023_Jan... Accounts Group - Gas_Individual Meters	Success	01/19/2023 00:01:24 AM	01/10/2023 - 01/19/2023	Individual Meter	All Accounts Group - Gas	318		All	Export	✖
TotalConsumption_Jan_10_2023_Jan...		01/19/2023	01/10/2023 -		All Accounts					

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Create New Report

All fields are required

Report Group Aclara kV2c

Note: Meters within a report group often change with time.

Include ☑ Active ☑ Inactive

Unit of Measure Kilowatt hour

Data Frequency Monthly (Aggregated)

Data Element TotalConsumption

Start Date 06/27/2023

End Date 06/27/2023

Name TotalConsumption_Jun_27_2023_Jun_27_2023_Aclara kV2c_Monthly (Aggregated)

Create and Run Now | Cancel

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Search By Page Name

AclaraONE ®

J Smith · Logout · Help

Reporting

Usage History Report

Meter Issues Report

AclaraONE / Reporting / Meter Issues Report >

Meter Issues Report

Report Group

All Accounts Group

Issue Type

- (•) Duplicate Meter Serial Number
- ( ) Duplicate Premise Id
- ( ) Missing Meter Serial Number

Status Type

- [x] Active
- [x] Inactive

Search

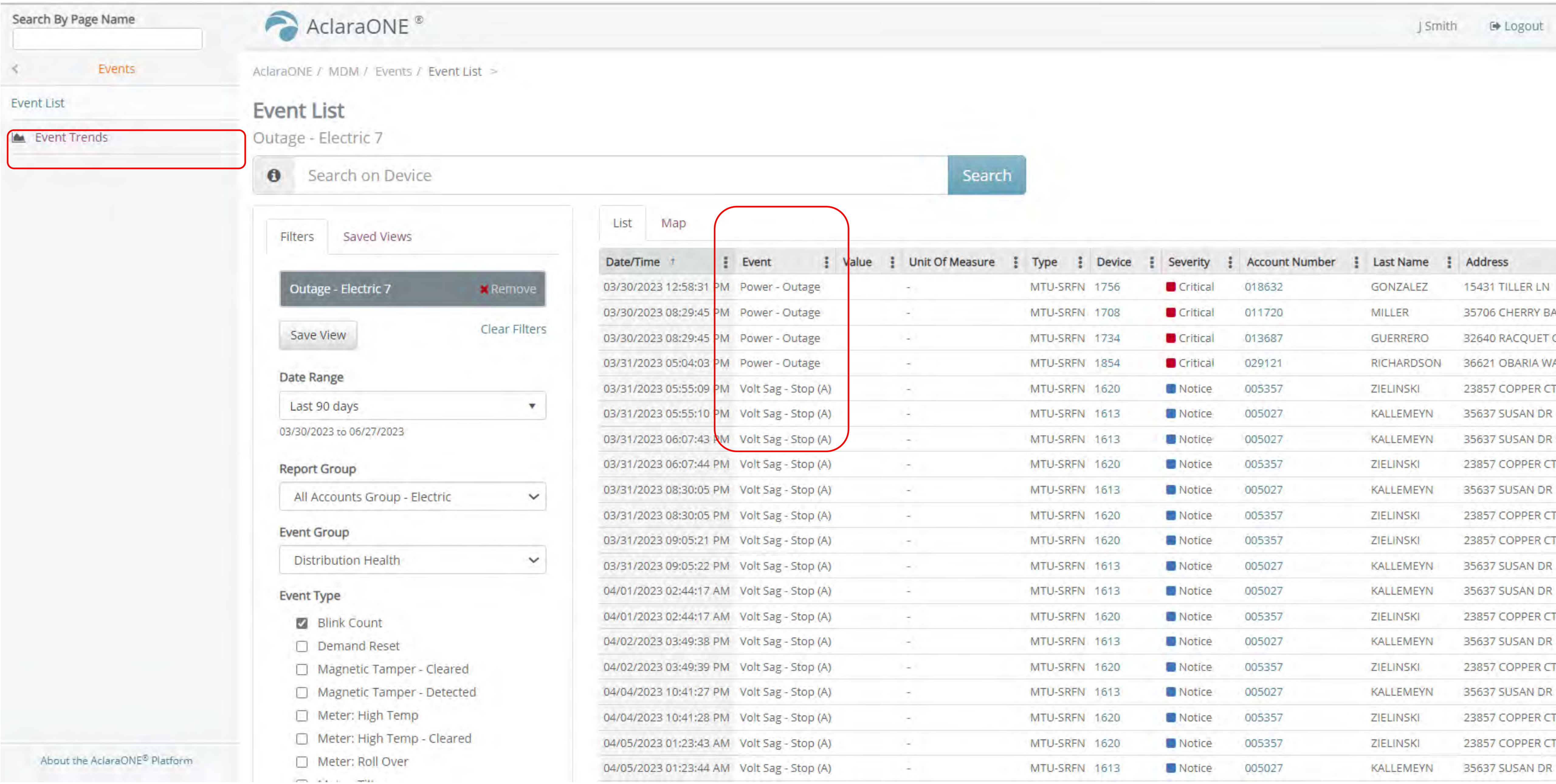
Date Installed	Premise	Accou...	MTU ID	Met...	Addres...	Port	Meter ...
04/11/2018 9:20:41 PM	2222008945	2222008945	21453904	54089959	32430 SHERWOOD DR	1	ONICON SYS-30 1000BTU
04/12/2018 4:13:37 PM	2222009271	2222009271	21453907	54089959	23782 SYCAMORE BLUFF CT	1	ONICON SYS-30 1000BTU
04/12/2018 4:22:04 PM	2222009468	2222009468	21453912	54089938	35685 SUSAN DR	1	ONICON SYS-30 1000BTU
04/19/2018 6:34:11 PM	2222013862	2222013862	21453971	54089938	35860 SUSAN DR	1	ONICON SYS-30 1000BTU

1 · 25 items per page · 1 - 4 of 4 items

CSV · Export

About the AclaraONE® Platform

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL



©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

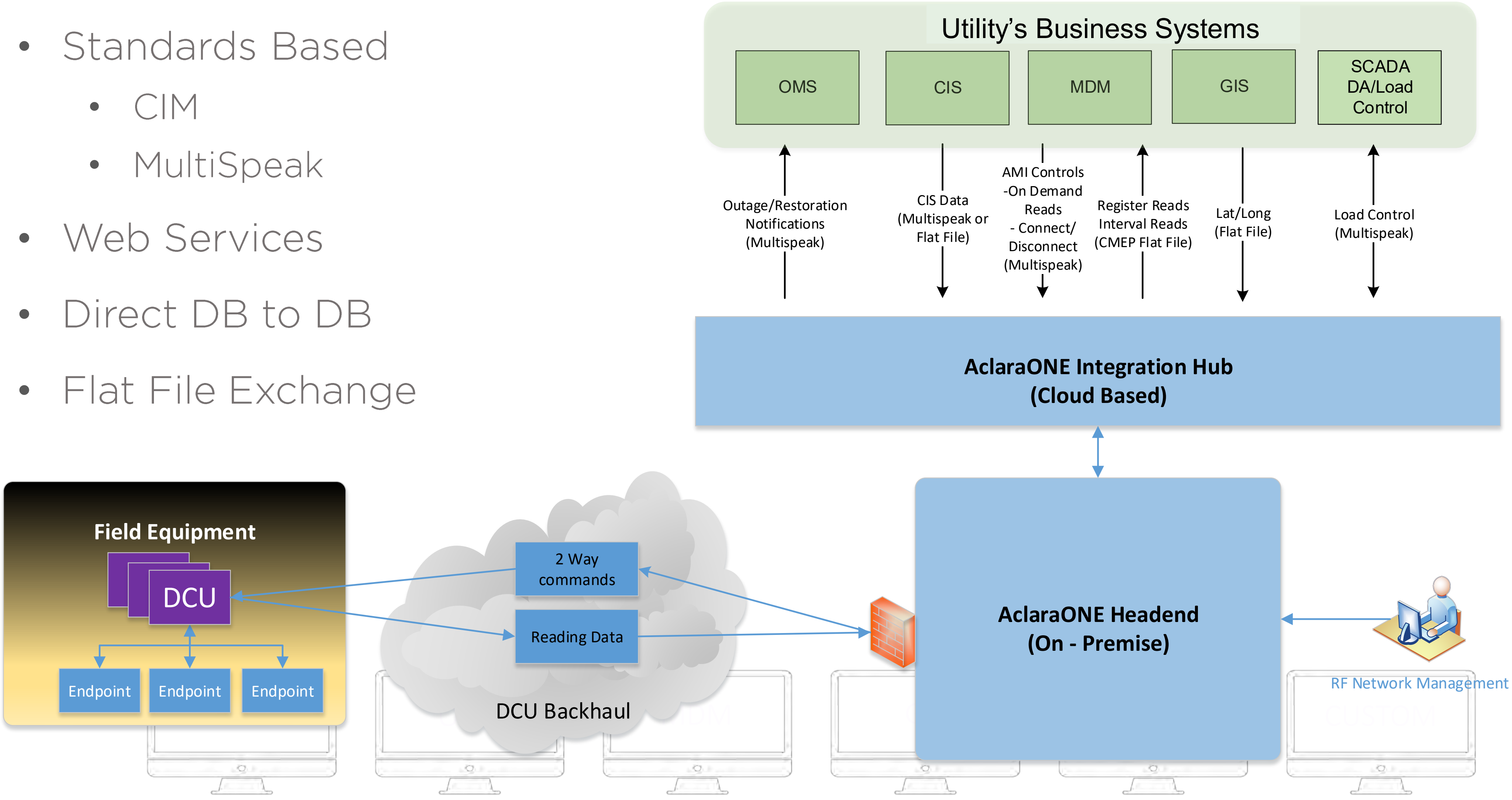
Software Integration

- Confident integrating with existing utility systems
- Implementation includes scheduled account data synchronization
- Billing Reads populated through flat file exports
- Flexibility to use any file formats needed
- Integration into any system to accommodate flat-file exchange or industry standard APIs

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

ACLARAONE® ARCHITECTURE

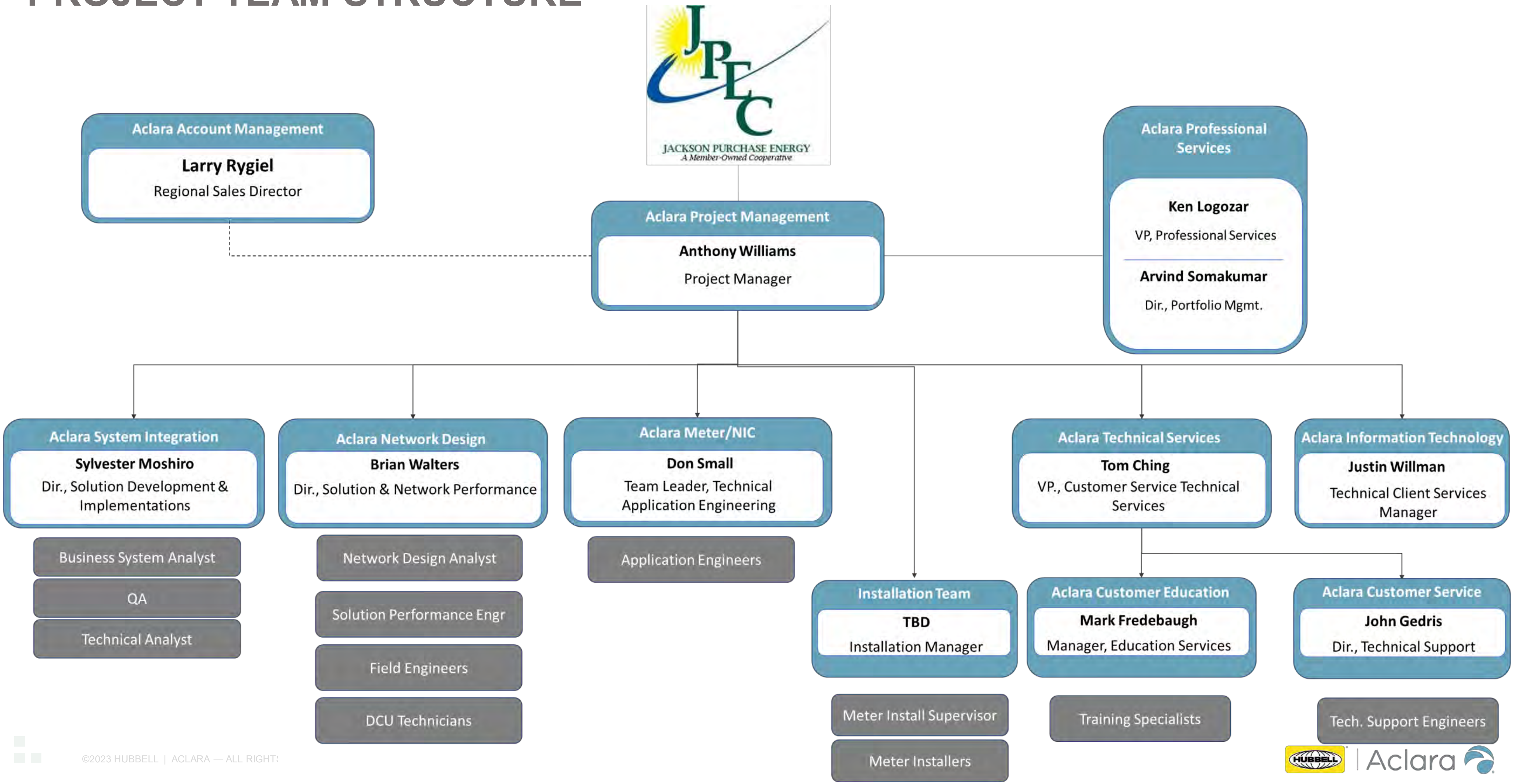
- Standard Based
  - CIM
  - MultiSpeak
- Web Services
- Direct DB to DB
- Flat File Exchange



AclaraONE Demo

PROJECT IMPLEMENTATION

PROJECT TEAM STRUCTURE



©2023 HUBBELL | ACLARA — ALL RIGHT

HUBBELL | Aclara

PROJECT MANAGEMENT SERVICES

- **Single Point of Contact in Aclara Project Manager – from project kick off to FSAT approval**
- **Product Knowledge and Extensive Experience**
- **Organized Methodology/Approach**
  - Risk/Issue Management - Project issues, risks and mitigations are tracked and reviewed at project level
  - Communication and Reporting - Encourage pro-active, frequent, and open communication with project team
  - 3rd party software vendor (CIS,OMS, etc) communication
  - Status Meetings - weekly project level meetings and monthly governance meetings
  - Escalation processes
- **Onsite Support as needed**
  - Project kick off
  - BSU deployment
  - Training

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

IMPLEMENTATION APPROACH

PHASE 1

PROJECT KICKOFF

- Team Introductions
- Project Planning
- Timeline Review
- Review Goals and Objectives
- Frequency Scans
- BSU Site Surveys
- RF meter configuration

PHASE 2

REQUIREMENTS & DESIGN

- Integration Planning
- Mobilization Planning
- Order Hardware
- Testing Strategies

PHASE 3

CONFIGURATION & NETWORK DEPLOYMENT

- Begin BSU Network Installation
- Configuration and Test Preparation
- Deliver CIS/Billing/Account Interfaces

PHASE 4

TESTING,TRAINING & ACCEPTANCE

- Product Training
- System Acceptance Testing
- Begin Meter/MTU Deployment
- Client Acceptance (ISAT)

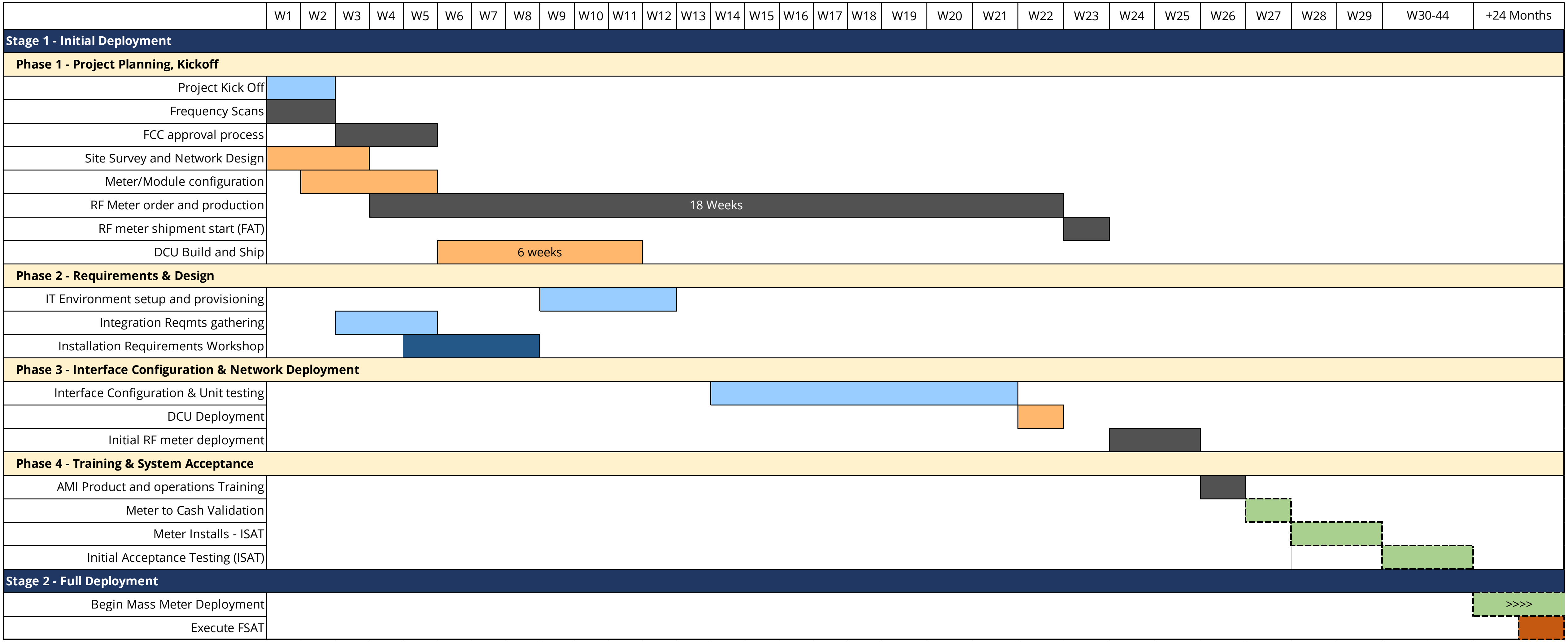
PHASE 5

MASS DEPLOYMENT

- Bulk Endpoint Deployment
- Performance Monitoring
- Support Transition
- FSAT

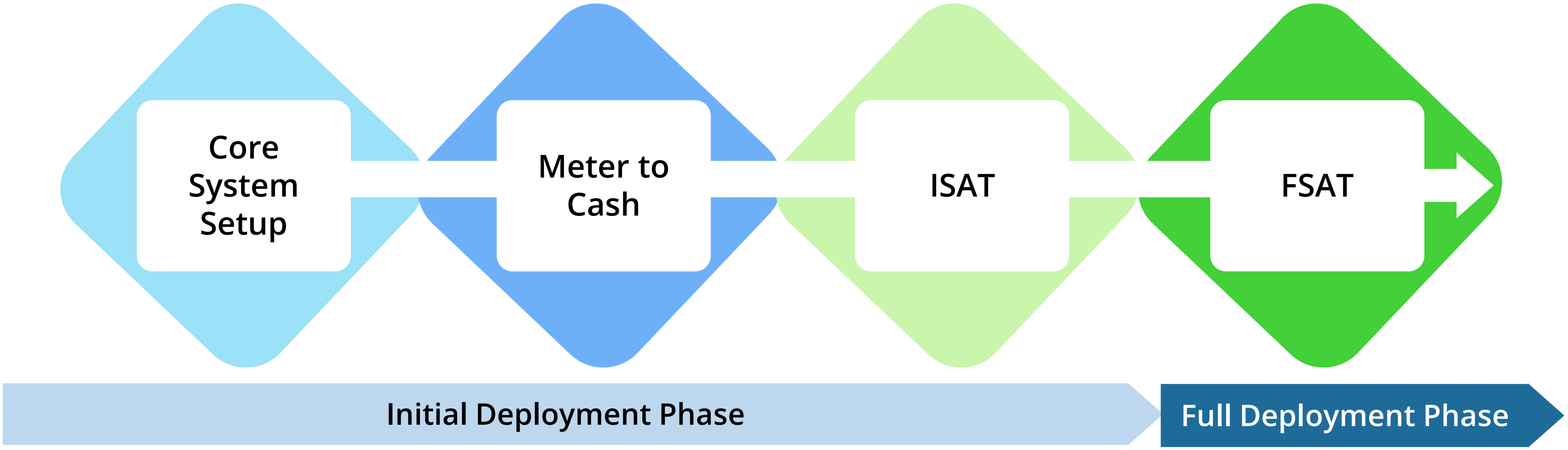
©2021 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

PROPOSED PROJECT TIMELINE



©2021 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

PROJECT MANAGEMENT AND SUPPORT



- Aclara Project Manager is primary point of contact from project from kick off to FSAT approval
- Software and Integration resources are actively involved until ISAT approval and are available on an as-needed basis until FSAT sign off
- Network and solution performance team is available to support the system until FSAT sign off
- Project kick off to ISAT approval is expected to take 10-12 months
- Bulk meter deployment and FSAT is expected to be completed within

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

PROJECT TRAINING - ONSITE

- Train-the-trainer approach, role-based training
- Training materials will be provided to JPEC

Day 1	Topic	Recommended Attendance
Electric AMI Network 8:30 am – 3:00 pm	Introductions	All
	Objectives and Documentation	All
	AMI Network Overview	All
	Electric End Point Overview	All
	Lunch	
	DCU Overview and Maintenance	AMI administrator, Field Operations Team, Service Supervisors and Contractors
	RF Fundamentals	AMI administrator, Field Operations Team, Service Supervisors and Contractors
	Day 1 Review, Follow-Up, Discuss Day 2	AMI administrator, Field Operations Team, Service Supervisors and Contractors

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

PROJECT TRAINING - ONSITE

Day 2	Topic	Recommended Attendance
AclaraONE Software 8:30 am – 3:00 pm	Day 1 Review and Follow-Up	All
	Field activity (DCU visit and EP installation)	Field Operations Team, Service Supervisors and Contractors
	Lunch	
	AclaraONE Software Training • System Data Flow • Endpoint Communication screens • DCU Communication screens • Daily Shift success screens • Network troubleshooting screens • Network device search and information • Analytics functions • Live software demo	Billing Analyst, Customer Service Representatives, AMI Administrator, Field Operation Team (supervisor)
	Network Security	AMI Administrator, Field Operation Team (supervisor)
	Aclara University and Connect	All
	Final Review, Follow-up	All

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

PROJECT TRAINING – DCU INSTALLATION & COMMISSIONING

Training JPEC staff

- Onsite training conducted to certify technicians on commissioning and service options
- Training to form the basis of preventive maintenance activities
- Detailed product manuals to establish JPEC’s network deployment and maintenance SOPs

Simple and efficient configuration of DCUs

- Aclara training program provides detailed understanding of base station commissioning steps
- Secure terminal access via serial to connection or browser-based interface
- Commissioning designed to support quick replacement of failed infrastructure

Testing and Troubleshooting Backhaul Connections

- Network performance team has access with preferred providers (AT&T and Verizon) to facilitate detailed troubleshooting should issues arise.
- Options for direct local access to the Network Devices to troubleshoot cellular connections
- Aclara network team works with JPEC IT Team on fiber and ethernet connected devices

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Project Management
Testing and System Acceptance

First Article Testing

- Primary Focus on RF Electric meter configuration validation
- Verify meter programs, UOM, read intervals
- Verify meter label design
- Leverage Headend and MeterMate software

Integration Testing

- Interoperability of AclaraONE and JPEC back-office systems
- Validate import/export file formats and data loads
- Leverage sample data
- Prerequisite to user testing

SAT – Meter to Cash Testing

- User driven testing, prior to full system deployment
- Aclara to provide standard test cases for reference
- End-to-end 'day in the life' testing with real field data

SAT – Performance Acceptance

- System Performance metrics tracked through the full deployment
- Necessary corrective measures applied as needed
- Performance Acceptance achieved at the end of full deployment

Copyright 2022 – Aclara Technologies, LLC - Confidential – Not for Distribution

TECHNICAL SUPPORT

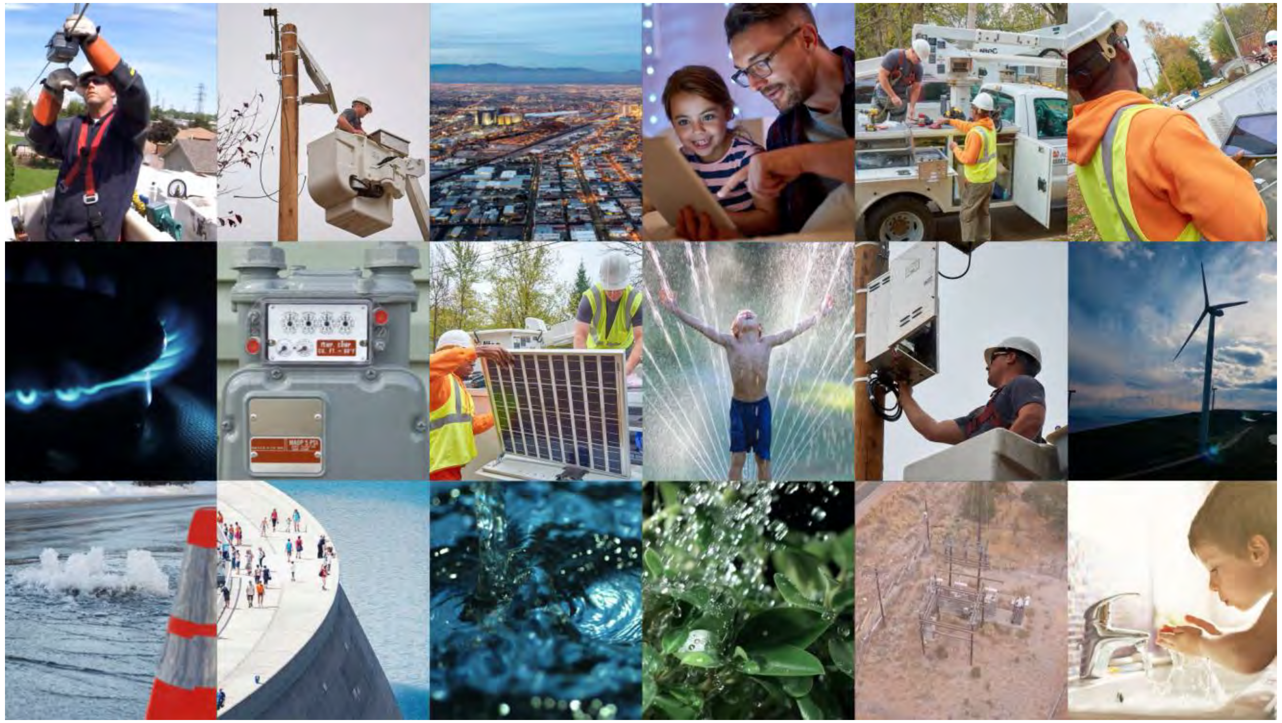
Topics to be covered in this section…

1. Support
   a. Deployment
   b. Post-deployment

©2023 HUBBELL | ACLARA — ALL RIGHTS

Aclara
Managed Services and Warranty

- Hosting
- System monitoring
- Network maintenance
- Shared networks
- Network management
- Maintenance and onsite repair
- Communications
- Preventative maintenance



Copyright 2022 – Aclara Technologies, LLC - Confidential – Not for Distribution

Aclara
Customer Support

https://connect.aclara.com / support@aclara.com / 800-892-9008

Copyright 2022 – Aclara Technologies, LLC - Confidential – Not for Distribution

Aclara
Training and Aclara University

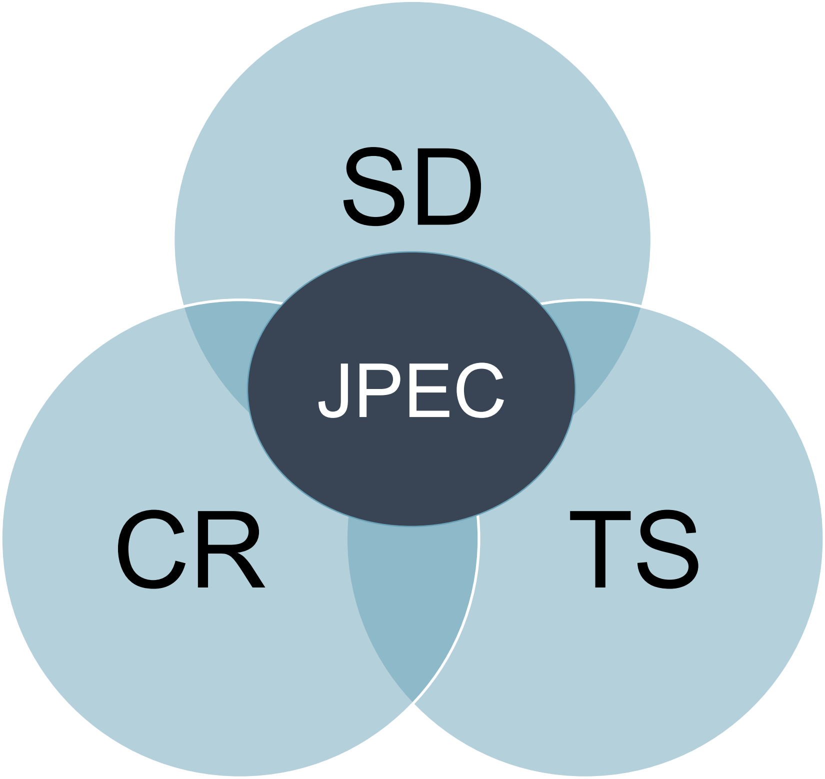
- Flexible, focused training for your success!
- Live classroom sessions
- In-depth courses taught by a live, experienced instructor
- Courses offered covers all Aclara product lines
- Certification courses to prepare for upcoming projects or to expand product knowledge
- Virtual training
- Aclara University Online
- Free LMS available 24/7
- On-demand training for both high level and in-depth learning needs
- Browser and device neutral

Copyright 2022 – Aclara Technologies, LLC - Confidential – Not for Distribution

Aclara Relationship Program

- Hubbell/Aclara experts aligned with your account
- Shared CSAT performance goal
- Deeper understanding of your specific needs
- Regular meetings and check-ins
- Visibility and attention on cases, concerns and requests
- Ensuring our solutions and processes deliver for you

Role	Name	Phone	Email
Sales Director	Larry Rygiel	810.931.2011	lrygiel@hubbell.com
Client Relations	Ami LaBarbera	314.895.6403	alabarbera@hubbell.com
Technical Support	Eddie Griesenauer	314.895.7378	egriesenauer@hubbell.com



©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Installation Services, etc.

Jeff Marsh
Advanced Meter Services
jmarsh@advancedmeterservices.com
859-983-3374

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

Total Cost Ownership – 10 Yr.

Jackson Purchase Energy 10-year TCO	
SaaS - HE On-Prem	[redacted]
Network	
Electric Endpoint	
Software License	
AclaraONE Software Annual Fee	
Professional Services	
Training	
Installation	
Total	

Jackson Purchase Energy 10-year TCO											
SaaS - HE & Analytics Cloud Based	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Network	[redacted]										
Electric Endpoint											
AclaraONE Software Annual Fee											
Professional Services											
Training											
Installation											
Total											

©2023 HUBBELL | ACLARA — ALL RIGHTS RESERVED — CONFIDENTIAL

WRAP-UP, Q & A


CLOSING

thank you.

Exhibit 3

Request for Proposal

RFP NO 2023-0001

Advanced Metering Infrastructure and Services Pricing

Provided by:

Quality Resources, LLC

PO Box 9

Slaughters, KY 42456

Issued By:

Jackson Purchase Energy

Paducah, KY

Description	Quantity	Rate
Meter exchange **Includes qualified personnel with each truck and proper PPE**	**1**	[redacted]

Pricing will be fixed for the first year. Subsequent year increases will be reviewed on an annual basis and will be capped at 3% maximum increase per year.

A. Company Information

Our mission statement is: Provide Safe, Professional, Experienced, and Productive individuals to assist customers with routine projects as well as respond to emergency events. Following is information about our company:

Routine capabilities:

Meter Technician – Routine reads, Disconnects and Reconnects, and replacements as necessary.

Facility design – Underground and Overhead - Pole staking, route determination, Easement and right of way attainment.

Inspections – Inspect circuits by visiting each pole and noting any deficiencies and make recommendations to improve reliability. Inspect work completed by others. Visually inspect Pad mounted equipment such as transformers, switching cabinets, etc.

Warehouse assistance – provide qualified personnel to assist with warehouse duties.

Attachment audits – count and document third party attachments to poles.

Project Management – provide individuals who will oversee a project start to completion including the following stages: bid process, selection of contractor, pre-construction meeting, progress meetings, work performed, close out documents, etc.

Organization:

Kimberly Parker – CFO and Member

Billy Joe Parker –President of Field Operations and Member

Background:

Kimberly Parker – Kim adds 26 years of multi-unit management experience over multiple states at one time. Her roles and responsibilities were to oversee the growth of employees and managers to ensure the policies and procedures of an organization are adhered for the betterment of the employee and customer experience.

- 8 years of Co-Managing Quality Resources, LLC. Running all operational office duties, financial responsibilities, and legal processes to run a Utility Inspection Company.
- Regional Management Trainer and Trouble Shooter for Cracker Barrel Old Country Store
- District Manager at Cato for 11 years

Billy Joe Parker – Billy adds 28 years to his electrical career. His roles and responsibilities include foreman, superintendent, project manager in the utility business. Having worked in the field for 28 years he understands the importance of a well-maintained system. Billy Joe has recently successfully completed the COSS program through Alliance Safety Council, and is now a certified occupational safety specialist. It is important to him to provide a service that is safe and reliable.

- Owner/Member for 10 years at Quality Resources, LLC
- Crew Foreman for 5 years at Kenergy Corporation
- Superintendent for 13 years at Hendrix Electric

B. **Contact Information**

Quality Resources, LLC
PO Box 9
Slaughters, KY 42456
Federal ID# - 46-3152891

Accounts Receivable Address:
Quality Resources, LLC
PO Box 9
Slaughters, KY 42456

Accounts Payable Address:
Quality Resources, LLC
PO Box 9
Slaughters, KY 42456

Primary Contact Information:
Billy Joe Parker
PO Box 9
Slaughters, KY 42456
BJParker@Qualityresourcesllc.com
270-635-6970

C. References

Pennyrile Rural Electric:
Steve Walters–Manager of Member Services
270-886-2555

Scope of work for Pennyrile Rural Electric: Provide qualified personnel to perform meter readings, disconnect and reconnect of meters.

Taylor County RECC
Brad Vaughn- Operations Manager
270-469-8032

Scope of work for Taylor County RECC: Provide qualified personnel to perform disconnects and reconnects of meters for nonpayment.

Jackson Purchase Energy
Jeremy Goodman-Manager of Operations
270-293-3746

Scope of work for Jackson Purchase Energy: Provide qualified personnel to perform meter readings and disconnect and reconnect of meters for nonpayment.

D. Additional Information

Quality Resources, LLC is a certified Woman Owned Business located in the western part of Kentucky.

Quality Resources, LLC is not part of ANY pending or continuing litigation regarding any technology being proposed or any pending, active, or planned merger or acquisition.

E. **SCOPE OF WORK QUALITY RESOURCES IS BIDDING:**
EXHIBIT B- METER EXCHANGE - SECTION A

1. Quality Resources LLC will provide 2-3 Meter Technicians. Each employee will have his or her own company truck properly marked. Employees will be available 24/7.

2. Each Quality Resources employee will go through a safety orientation. Employees will be provided with all proper PPE for the duties at task: FR Clothes, Rubber gloves, face shields, Volt Meters, etc.

3. Employees will be required to do a basic Meter Exchange.
   i include before and after pictures of meter exchange
   ii complete service order created by JPEC, while onsite, through NISC's AppSuite
   iii data processing will be provided by iOS or android devices

4. If a hazardous condition is discovered, Quality Resources, LLC will notify JPEC System Control Center immediately. Actions will be taken, within the qualifications of the individual inspector, to isolate the hazard and/or ensure public safety.

5. Minor duty changes or additions may be necessary throughout a contract term. Any duty considered major or requiring additional training by Quality Resources would be considered and agreed upon by both parties before they are implemented.

F. Exceptions to Bid

Due to Quality Resources, LLC only submitting a bid for installation of meters, we take the following exceptions to the bid.

1. No copy of Software License Agreement, or associated documents.
2. No Annual Report or a Profit and Loss Statement from vendor, due to not providing any products.
3. No Additional information for AMI System due to not providing any products.
4. No Field Acceptance Test (FAT), and/or System Acceptance Test (SAT) required due to not providing any products.
5. No Additional information for Metering modules due to not providing any products.
6. No Additional information for Network and Data due to not providing any products.
7. No Additional information for Applications and Billing due to not providing any products.
8. No Additional information for AMI System features due to not providing any products.
9. No Additional information for Outage notification and monitoring due to not providing any products.
10. No Additional information for Security due to not providing any products.
11. No Additional information for Cybersecurity due to not providing any products.
12. No Additional information for System Testing and Commissioning due to not providing any products.
13. No End of Life testing will be done by Quality Resources.

We appreciate the opportunity to provide pricing for the Meter Exchange and look forward to working with you.

Thank you,

Billy Joe Parker

Billy Joe Parker
President of Operations

Exhibit 4

LUTHAN
ELECTRIC METER TESTING

625 Birkhead Ave
Owensboro, KY 42303
270-683-2474

Jackson Purchase Energy Corporation
6525 Hwy 60 W
Paducah, KY 42001

We are pleased to present the following proposal to improve and enhance the current meter testing services we provide you and simplify the process for meeting your regulatory compliance by utilizing industry best practices and standards. This proposal includes one-time services to prepare for your AMI deployment along with continued services. We feel this proposal will accomplish the goal of meeting or exceeding all regulatory requirements for meter testing along with reducing billing errors, increasing revenue, and ensuring safe installations. We ask that you consider us for the implementation of your pilot program to help in the seamless transition into your deployment.

We appreciate your time and consideration of this proposal and look forward to continuing our long relationship with Jackson Purchase Energy Corporation.

Sincerely,

Luke Book
V.P. of Operations

LUTHAN
ELECTRIC METER TESTING

625 Birkhead Ave
Owensboro, KY 42303
270-683-2474

Statement of Work

Deployment Services for RFP No. 2023-0001

Advanced Metering Infrastructure and Services

Scope of Work for Single Phase meter Exchange

Technicians will attempt to notify each home/business owner in person prior to performing work. Technicians will minimize the length of any outage necessary to perform assigned tasks. Technicians will make any minor repairs to the meter base and all associated components when possible.

Technicians will exchange the proper Utility supplied meter. All safety issues found concerning improper mounting of hardware, transformer oil leaks, damaged poles and/or pole mounted equipment and all other issues affecting the safety of personnel, the general public and utility equipment will be reported to Utility immediately.

METER EXCHANGE

- **Inspect Meter Base for evidence of tampering**
- **Verify solid connections in meter base and ground connection.**
- **Record Existing Nameplate Information**
- **Record All Billing Readings**
- **Install New Meter**
- **Record New Nameplate Information**
- **Seal Meter Enclosure with Utility Supplied Seals**
- **Digital Image Capture – AS FOUND and AS LEFT digital images**
- **Capture and record GPS coordinates at meter location**
- **Provide Electronic File of Meter Exchange Information**

All locations that are found to be not accessible will be referred to the Utility to make arrangements for the exchange. We assume that the Utility will provide us with the necessary keys, codes, combinations or contact information to perform the meter exchange.

IR and K-Base Rebuild/Rework and Change Out.

- **Replace meter box or socket, conduit, K-base adaptor, etc.**
- **Install/Replace CTs and/or PTs**
- **Change out meter**
- **Rewire installation**
- **Perform complete site test**
  (All material supplied by utility)

Instrument Rated Test and Change out

- **Record all energy readings and meter nameplate information**
- **Perform full inspection of IT Rated metering installations**
- **Report any hazardous conditions requiring immediate attention to the utility**
- **Perform Ratio and Burden test on current transformers**
- **Verify voltage ratio on secondary voltage transformers**
- **Induce load if necessary**
- **Verify billing multiplier**
- **Complete ANSI test on meter to verify accuracy**
- **Perform complete site test**
- **Document site with digital photos as needed**
- **Provide site analysis report showing vectors, rotation, voltage, current and harmonics**
- **Provide summary report of findings**
- **Provide utility with a digital format of results**

Rate Schedule

Description	Unit Cost
Meter exchange (All 2s meters)	[redacted]
Instrument Rated Test and Change out	
Router Install	
IR and K-Base Rebuild/Rework and Change Out	
Poly Phase Self Contained Test and Change Out	
End of Life Testing, Storage, and Disposal	

Acceptance and Authorization

By signing below, both parties agree to the included Scope of Work and Rate Schedule.

Jackson Purchase Energy Corporation	LUTHAN Electric Meter Testing, LLC
Full Name	Full Name
Title	Title
Signature	Signature
Date	Date

Exhibit 5

15 year cost of ownership

[redacted]

[redacted]	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Replacement Process	[redacted]														
End of Life Meter Testing, Storage, and Disposal															
Network Collectors															
Meters (Including Modules)															
Maintenance and Support															
Project Deployment															
Training/Travel															
Cellular															
Project Credit															
Annual Costs															
15 Yr Cost															
Included Above:															
Meter base replacement for meter swap															
Pole replacements at DCU sites															
Meter swap using NISC appsuite															
Site survey and administrative labor															
5 year extended warranty on meters and DCUs															

[redacted]

[redacted]5/2023															
Replacement Process	[redacted]														
Meter Testing, Storage, and Disposal															
Network Collectors															
Meters (Including Modules)															
Maintenance and Support															
Project Deployment															
Training/Travel															
Cellular															
Project Credit/Patronage Capital															
Annual Costs															
15 Yr Cost															
Included Above:															
Meter base replacement for meter swap															
Pole replacements at approx. 10% of sites															
Meter swap using NISC appsuite															
Administrative labor															

[redacted] r

*As of 12/5/2023	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Replacement Process	[redacted]														
Meter Testing, Storage, and Disposal															
Network Collectors															
Meters (Including Modules)															
Maintenance and Support															
Project Deployment															
Training/Travel															
Cellular															
Project Credit/Patronage Capital															
Annual Costs															
15 Yr Cost															
Included Above:															
Meter base replacement for meter swap															
Pole replacements at approx. 10% of sites															
Meter swap using NISC appsuite															
Administrative labor															

[redacted]

*As of 12/5/2023	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Replacement Process	[redacted]														
Meter Testing, Storage, and Disposal															
Network Collectors															
Meters (Including Modules)															
Maintenance and Support															
Project Deployment															
Training/Travel															
Cellular															
Project Credit/Patronage Capital															
Annual Costs															
15 Yr Cost															

15 year cost of ownership

Included Above:															
Meter base replacement for meter swap															
Pole replacements at approx. 10% of sites															
Meter swap using NISC appsuite															
Administrative labor															

[redacted]

*As of 12/5/2023	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Replacement Process	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Meter Testing, Storage, and Disposal	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Network Collectors	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Meters (Including Modules)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Maintenance and Support	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Project Deployment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Training/Travel	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Shipping	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cellular	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Project Credit/Patronage Capital	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Annual Costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
15 Yr Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Included Above:	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Meter base replacement for meter swap	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Pole replacements at approx. 10% of sites	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Meter swap using NISC appsuite	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Administrative labor															

[redacted]

*As of 12/5/2023	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15
Replacement Process	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Meter Testing, Storage, and Disposal	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Towers (150'+)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Network Collectors	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Meters (Including Modules)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Maintenance and Support	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Project Deployment	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Training/Travel	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Shipping (Estimated)	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Cellular	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Project Credit/Patronage Capital	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Annual Costs	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
15 Yr Cost	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Included Above:	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Meter base replacement for meter swap	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Pole replacements at approx. 10% of sites	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Meter swap using NISC appsuite	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Administrative labor	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

AMI Vendor Evaluation Matrix

	Requirement	Desired Level	1-3-9 Definition	Rating	Shortlist Selection					
				(1-9)	[redacted]					
	General									
1	15 Year Cost of System	Less than $8M	1 (> $9 Mil.); 3 ($8 - $9 Mil.); 9 (<$8 Mil.)		9	1	1	3	3	1
2	Recurring Costs	Less than $50,000 annually	1 (> $100K); 3 ($50K-$100K); 9 (<$50K)		3	1	1	3	3	3
3	Technical Support Availability	24/7	1 (8/5 outside of our business time); 3 (8/5 during our business time); 9 (24/7)		9	9	9	3	3	3
4	Business Stability	Time in AMI Business	1 (<10 yrs); 3 (10-20 yrs); 9(>20 yrs)		9	9	9	9	9	3
5	Business Stability Cont.	Electric AMI revenue as % of overall revenue	1 (<20%); 3 (21-49%); 9(>50%)		9	3	9	1	3	3
6	Integration Compatibility	Able to communicate w/ NISC, Milsoft, and Survalent	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
7	Flexibility for Different Meter Vendors	2 different meter vendors can be used	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		1	3	1	3	3	3
	Hardware									
8	Meter and Module Lifecyle per Manufacturer	10 Years	1 (<10 years); 3 (10-12 years); 9 (>12 years)		9	9	9	9	9	9
9	Hardware Warranty	3 year	1 (<3yrs); 3 (3-5yrs); 9 (>5 years)		1	3	3	3	1	1
10	Meter Warranty	5 year	1 (<3yrs); 3 (3-5yrs); 9 (>5 years)		1	3	1	3	1	1
11	Storage Capability at the Meter	30 days/15 min intervals	1 (<30 day/15 min intervals); 3 (44 days/15 min intervals); 9 (>44 days/15 min intervals)		9	9	9	9	9	9
12	Equipment Available and Capable of Downline Control Through DNP3 using ethernet comms.	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
13	Outdoor Lighting Control	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
14	Load Control devices avalaible	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
15	Meter option capable of cellular communicaiton	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	1	1	1	1	1
16	CL 320 single phase meters have remote disconnect capabilites	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	1	3	3	1	3
	Reliability/Accuracy									
17	Accuracy of Meter Data (All Parameters)	+/- .5 volts	1 (>.51); 3 (.50-.24); 9 (<0.239)		3	3	3	3	3	3
18	Data Storage Intervals: kW, kWh, voltage, blinks, PF, KVA	15 min interval	1 (> 15 min intervals); 3 (15 min intervals); 9 (< 15 min intervals)		9	9	9	9	9	9
19	Average response time for on demand requests	15 sec minimum	1 (>15 sec); 3 (15-10 sec); 9 (<9.99 sec.)		3	3	3	3	3	3
20	Per-Hop Latency	1 sec minimum	1 (>1 sec); 3 (1-0.5 sec); 9 (< 0.5 sec)		9	3	3	1	3	9
21	Reliability of billing determinates every 72 hours	99%	1 (<99.5%); 3 (99.5%); 9 (>99.5%)		3	9	3	9	3	3
	Data/Communication									
22	Communicatiion speed	150 kbps+	(1) <150 kbps ; (3) 150-500 kbps ; (9) >500 kbps		3	9	9	3	9	9
23	Data Security/Cyber Security	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
24	Auto-Detection of 0-usage (inoperable or out of spec meters)	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
25	Tamper Alerts	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
26	Temperature Alarms	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
27	Voltage high/low alarms	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
28	Voltage monitoring for PSC and CVR	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
29	Program Meter from office over the air	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
30	Update module firmware from office over the air	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
31	Blink and outage counts	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3

32	Meter notifications alerts (hot socket, etc.…)	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
33	System is capable of phase detection	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	1	1	3	3
34	TOU/TOD ability	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
35	Ability to read system at one time for load studies/line loss studies	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
36	Prepay abilities at no additional cost	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	1	3	3
37	Net Meter abilities	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
38	Load profile abilities	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
39	Transformer loading abilities	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		1	1	3	9	3	3
40	Power Quality investigation abilities	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
41	Data Size and Retention of 15 min intervals	5 years	1 (<2 yrs); 3 (2-5 yrs.); 9 (>5 yrs.)		3	1	1	1	3	3
42	Guaranteed Propagation Study	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)		3	3	3	3	3	3
				Total	166	156	154	150	148	148

Installed Cost

Meter Replacement (non-instrument)	[redacted]
Meter Replacement and Test (instrument)	
Meter Base Changeout (Expected)	
Meter Base Changeout (Unexpected)	
Meter Testing, Storage, and Disposal	
Router Installation by JPEC	
Gateways, Routers, Collectors, Modems, Mounting Hardware	
Pole Replacements	
Towers	
Meters (Including Modules)	
Deployment Costs (Services, Project Management, etc.)	
Training	
Sales Tax	
Shipping	
JPEC Labor	
Project Credit	
Total	

Exhibit 6

COMMONWEALTH OF KENTUCKY
BEFORE THE
KENTUCKY PUBLIC SERVICE COMMISSION

In the Matter of:

Electronic Application of Jackson Purchase Energy Corporation for a Certificate of Public Convenience and Necessity Authorizing the Installation of a New Advanced Metering Infrastructure (AMI) System	))))))	Case No. 2024-00013

DIRECT TESTIMONY OF

TRAVIS SPICELAND

ON BEHALF OF

JACKSON PURCHASE ENERGY CORPORATION

Filed: January 26, 2024

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

Electronic Application of Jackson Purchase Energy Corporation for a Certificate of Public Convenience and Necessity Authorizing the Installation of New Advanced Metering Infrastructure (AMI) System	))))))	Case No. 2024-00013

VERIFICATION OF TRAVIS SPICELAND

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF McCRACKEN)

Travis Spiceland, Vice-President Engineering of Jackson Purchase Energy Corporation, being duly sworn, states that he has supervised the preparation of his Direct Testimony in the above-referenced case and that the matters and things set forth therein are true and accurate to the best of his knowledge, information and belief, formed after reasonable inquiry.

Travis Spiceland

The foregoing Verification was signed, acknowledged and sworn to before me this 26th day of January, 2024, by Travis Spiceland.

Commission expiration: 8-25-2026

AMY VICK
My Commission Expires 08-25-2026
NOTARY PUBLIC
Notary ID # KYNP5841
STATE AT LARGE, KENTUCKY

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Travis Spiceland, and my business address is 6525 US Highway 60 W, Paducah, Kentucky 42001.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed by Jackson Purchase Energy Corporation ("Jackson Purchase") as Vice-President of Engineering.

Q. PLEASE BRIEFLY DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I am a 2012 graduate of the University of Kentucky with a BS in Mechanical Engineering. I am also a registered professional engineer in Kentucky. I have worked 11 years in the electric distribution industry. I have been employed by Jackson Purchase for approximately 3 years, 2 of which have been in my current position.

Q. PLEASE SUMMARIZE YOUR RESPONSIBILITIES AS VICE-PRESIDENT OF ENGINEERING.

A. My responsibilities are to oversee all functions of the engineering department. This includes, but is not limited to, field design, pole attachments, system protection, system inspections, mapping, budgeting, and planning.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE KENTUCKY PUBLIC SERVICE COMMISSION?

A. No.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to explain the need for the replacement of Jackson Purchase's existing power line carrier (PLC) AMI system with a radio frequency (RF) AMI system. To explain the Request for Proposal ("RFP") process undertaken by Jackson Purchase, the evaluation process for the bids received pursuant to the RFP and the process taken to choose a supplier.

Q. PLEASE BRIEFLY SUMMARIZE JACKSON PURCHASE'S APPLICATION AND THE RELIEF REQUESTED IN THIS PROCEEDING INCLUDING WHY A NEW AMI SYSTEM IS NEEDED.

A. Jackson Purchase is requesting in this Application to upgrade its current PLC AMI system with an RF AMI system. Jackson Purchase continues to have multiple issues with the current PLC system including failure to receive monthly billing reads and continued deterioration of read rates. It is also becoming more difficult for Jackson Purchase to procure replacement parts and meters for the current system.

Q. WILL THE NEW AMI SYSTEM RESULT IN ANY WASTEFUL DUPLICATION OF FACILITIES OR COMPETE WITH ANY OTHER ENTITIES?

A. The new RF AMI system will be replacing the current PLC AMI system so it will not result in wasteful duplication of facilities. Additionally, the AMI system will only be installed within Jackson Purchase's service territory so it will not compete with any other entities. Jackson Purchase reviewed multiple meters and 8 AMI vendors before choosing its preferred vendor. Multiple attempts were made to address and correct issues with our current PLC system in efforts to prolong the life of the asset. The latest of which included onsite troubleshooting by the manufacturer. After the troubleshooting no improvement was noted in read rates. Increased cost for manual meter reading and deteriorating system read rates prompted Jackson Purchase to consider an AMI upgrade. In addition, the current PLC system is incapable of providing interval data in the capacity needed for ongoing and upcoming energy demands. Not only will the new RF system provide adequate reads but it will be capable of meeting the foreseeable needs of Jackson Purchase's members at a reduced annual Operations and Maintenance (O&M) expense. The decrease in O&M expense is due largely to a reduction in manual meter reading expense and expenses associated with disconnects and reconnects.

Q. PLEASE DESCRIBE THE AMI SYSTEM AND MANUFACTURER CHOSEN BY JACKSON PURCHSE FOR THIS PROJECT.

A. Jackson Purchase has selected Aclara Technologies' two-way point-to-multipoint RF solution. Details regarding Aclara Technologies' RF network are provided in Exhibit 2 of the Application. Although Jackson Purchase has determined Aclara Technologies to be the least cost and preferred vendor, there is no contract in place at the time of filing this Application.

Q. PLEASE DESCRIBE IF ANY OTHER VENDORS WILL BE USED FOR PORTIONS OF THE PROJECT AND WHAT SERVICES THEY WILL BE PROVIDING.

A. Two additional vendors will be used for portions of the project. Jackson Purchase intends to use Quality Resources LLC to perform meter replacements across the system. This vendor was the low-cost bidder for the replacement portion of the project. Jackson Purchase also intends to use Luthan Electric Meter Testing to complete instrument rated testing and replacement, end of life testing, storage, and disposal, and meter base replacements for the consolidation of meter forms. Both vendors were selected for their respective portions of work to reduce the overall cost of the project.

Q. PLEASE DESCRIBE THE PROCESS JACKSON PURCHASE UNDERTOOK IN THE RFP PROCESS, THE EVALUATION OF THE BIDS AND THE PROCESS TO SELECT THE WINNING BIDDER.

A. Jackson Purchase solicited RFP responses from 8 AMI vendors and 2 meter replacement and testing companies. The RFP contained over 150 questions related to the functionality of the vendor's AMI offering. In conjunction with the RFP, Jackson Purchase provided information of its poles, meters, substations, and tower sites to each vendor. The RFP in its entirety is included in Exhibit 1. The evaluation matrix was determined by a 7 member team prior to the responses to the RFP being received by Jackson Purchase. The evaluation matrix included in Exhibit 5 was used by the selection team to "shortlist" vendors and aid in the selection of the winning bidder. Details of the 4 "shortlisted" vendors were presented to Jackson Purchase's Board of Directors and provided in Exhibit 5.

Q. PLEASE DESCRIBE THE TIMELINE ANTICIPATED FOR THIS PROJECT, INCLUDING THE NUMBER OF METERS TO BE INSTALLED PER YEAR.

A. Pursuant to the Commission's acceptance of Jackson Purchase's CPCN, the project is anticipated to take approximately two years to complete. The proposed schedule includes approximately 5,000 meter replacements in 2024 and the remaining meter replacements in 2025. Potential impacts to the proposed timeline include material availability and personnel resources at time of commencement.

Q. HOW WILL THIS PROJECT BE FUNDED BY JACKSON PURCHASE?

A. Jackson Purchase proposes to fund this project from both general funds and financing available through Rural Utility Services (RUS), pending RUS loan approval.

Q. **HAS THIS PROJECT BEEN INCLUDED IN JACKSON PURCHASE'S MOST CURRENT WORK PLAN?**

A. Yes

Q. **HAS THE WORK PLAN MENTIONED ABOVE BEEN APPROVED BY RUS AND IS IT ON FILE WITH THE COMMISSION?**

A. Yes. Commission Staff approved the work plan in Staff Opinion 2023-005.

Q. **HAS THIS PROJECT BEEN APPROVED BY JACKSON PURCHASE'S BOARD OF DIRECTORS?**

A. Yes, it was approved at the December 2023 Board meeting, a copy of the Board Resolution approving the project is attached to the Application as Exhibit 9.

Q. **ARE YOU SPONSORING ANY EXHIBITS TO THE APPLICATION?**

A. I am sponsoring Exhibits 1, 2, 3, 4, 5, 6, 7, 8, and 9 to the Application.

Q. **IF SO, WERE THOSE EXHIBITS PREPARED BY YOU OR UNDER YOUR DIRECT SUPERVISION?**

A. Yes.

Q. **DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?**

A. Yes.

Exhibit 7

Action	Completion Date
RFP Release	3/24/2023
Pre-Proposal Conference Calls	Upon request
RFP Inquiries Deadline	4/14/2023
Proposal Submission Deadline – 2:00 pm CST	5/30/2023
Responses Evaluated	6/5/2023 - 11/10/2023
Notice of Award*	11/15/2023
Contract Negotiations/Contract Execution/Notice to Proceed*	11/16/2023 - 3/29/2024
CPCN Approval by Kentucky Public Service Commission	TBD
Begin Installation of Collectors	Summer 2024
Complete Collectors Installations	12/31/2024
Replace approximately 5,000 meters with new RF meters in 2024	12/31/2024
Replace approximately 25,0000 meters with new RF meters in 2025	12/31/2025
Desired Project Completion (System Installed, Tested, Functional and Accepted by JPEC)	6/26/2026

*Contingent upon KY PSC approval

Exhibit 8

Summary of Benefits to End User

- Remote connect/disconnect
- Prepay
- Distribution automation
- Load control capability
- Demand response capability
- Power quality monitoring
- Phase detection
- Hot socket detection
- EV charger communication capability
- Reduced O&M costs
- Interval data for energy monitoring
- Outdoor lighting control capability
- Outage detection and notification improvements

Exhibit 9

Jackson Purchase Energy
P.O. Box 4030 • 2900 Irvin Cobb Drive
Paducah, KY 42002-4030
270.442.7321 • 800.633.4044
Visit our Web Site www.JPEnergy.com

March 15, 2021

Linda Bridwell
Executive Director
Kentucky Public Service Commission
P.O. Box 615
211 Sower Boulevard
Frankfort, KY 40602-0615

Re: Jackson Purchase Energy Corporation's Advanced Metering Infrastructure

Dear Ms. Bridwell:

It has recently come to my attention, as President and Chief Executive Officer ("CEO") of Jackson Purchase Energy Corporation ("JPEC"), that the Kentucky Public Service Commission ("Commission") may be formally unaware that JPEC has in place in its service territory an Advanced Metering Infrastructure ("AMI") system. Upon learning of this I investigated the matter and in the interest of full disclosure wish to provide detailed information to the Commission on the subject.

In the course of developing and implementing its 2009-10 Construction Work Plan ("CWP") JPEC's then-CEO obtained sufficient financing from the Rural Utilities Service ("RUS") and directed that approximately 25,941 AMI meters be installed throughout JPEC's service territory utilizing Power Line Carrier ("PLC") technology at a total cost of approximately $5,688,637.[1] Completion of the AMI build-out occurred between 2009 and 2010 and JPEC has utilized the system ever since and continues to use it currently.[2] These meters have a 15-year life and will be fully depreciated in 2024-25.

[1] For the sake of brevity, portions of JPEC's 2009-10 CWP relevant to the AMI system are provided as Attachment 1. JPEC can provide the entire 2009-10 CWP upon request by the Commission.
[2] In 2014, JPEC considered moving to another AMI technology and put a small AMI pilot project in place in

A rigorous review of JPEC's internal records and the Commission's case database on its public website does not reveal that JPEC ever sought or obtained approval for this construction from the Commission in the form of a Certificate of Public Convenience and Necessity ("CPCN"). This came as a surprise to me and other current management staff, none of whom were at JPEC in 2009-2010 when the current AMI system was constructed and implemented.

There are probably several explanations for why JPEC did not obtain a CPCN for its AMI system at the time. However, while it would be speculative on my part to now provide a definitive reason, it is instructive to recount some of the recent history regarding the Commission's consideration of CWPs for distribution cooperatives.

Prior to 2012 there was substantial confusion among electric distribution cooperatives regarding whether projects contained in their biennial or triennial CWPs were ordinary extensions of existing systems in the usual course of business obviating the need to obtain a CPCN; or, whether and under what circumstances a CPCN was required for a particular system improvement. This issue was further complicated by the fact that these CWP projects were entirely financed using federal money provided by the Rural Utilities Service ("RUS") which had to itself approve the CWP before any construction could commence. When JPEC's AMI system was completed in the 2009-10 timeframe it had been RUS-approved and there was not yet a formal Commission review mechanism for CWPs. Essentially, it was up to the utility to determine which projects were "ordinary extensions in the usual course of business" and which required CPCNs.

Because of this uncertainty the Kentucky Association of Electric Cooperatives requested a staff opinion on whether distribution cooperatives' CWPs required a CPCN from the Commission prior to beginning work on CWP projects. In PSC Staff Opinion 2012-004 (January 31, 2012), Staff reiterated that the Commission's policy "is to apply the law to all construction projects and it will continue to require CPCNs prior to construction of all projects not exempt by law."[3] This statement followed a detailed discussion of CPCNs and the

---

Calvert City, Kentucky, whereby approximately 500 meters were installed utilizing Radio Frequency ("RF") technology at a total cost of approximately $100,000. JPEC ultimately determined that this technology did not provide sufficient improvements over the PLC system and declined to implement a system-wide replacement.

[3] See *Staff Opinion 2012-004*, January 31,2012, p. 2. This Staff Opinion is provided as Attachment 2.

unambiguous statement that the Commission has and will continue to apply the CPCN requirement to construction projects unless a particular project falls within two exemptions. KRS 278.020(1) exempts from prior approval through a CPCN "retail electric suppliers for service connections to electric consuming facilities within its certified territory" and "ordinary extensions of existing systems in the usual course of business."[4] The Staff opined that the "focus of the review is duplication and cost not whether a construction project is part of an electric cooperative's CWP…project."[5] The Staff Opinion concluded by stating that a work group would be established to examine current application of the law relative to CPCNs, especially as regards electric distribution cooperatives' CWPs.

In the months following this Staff Opinion the Commission determined that electric distribution cooperatives should thereafter submit their CWPs so that each construction project could be analyzed on an individual basis to determine whether that individual project is exempt from the requirement in KRS 278.020(1) to obtain a CPCN.

On July 5, 2012 JPEC submitted its 2012-15 CWP which the Staff considered in issuing PSC Staff Opinion 2012-0014 (July 16, 2012).[6] In that Staff Opinion it was determined that all construction projects except one contained in the CWP fell within the "ordinary course of business" exemption. However, Commission Staff was unable to conclude whether the project designated as **SCADA/DA—Hardware and Communication Equipment—RUS Code 703,** satisfied the "ordinary course of business" exemption. The Commission Staff requested that JPEC submit additional information for further consideration of whether the project was in the "ordinary course of business" exemption or required a CPCN.

On August 1, 2012, the Commission received the additional information on the **SCADA/DA** project from JPEC resulting in a subsequent PSC Staff Opinion 2012-016 (August 10, 2012).[7] In the Staff Opinion JPEC's clarifying response is summarized by Commission Staff, where it is stated:

---

[4] Extensions in the ordinary course of business are now the subject of a specific Commission regulation. KAR 5:001, Section 15(3).
[5] *Staff Opinion 2012-004,* January 31, 2012, p. 2.
[6] This Staff Opinion is provided as Attachment 3.
[7] This Staff Opinion is provided as Attachment 4.

> Jackson Purchase states that this project represents an upgrade of existing systems. Jackson Purchase has the hardware in place i.e. AMI meters, feeder regulation and SCADA controlled substations. This project includes: modifying substation feeder regulators to allow for remote adjustment, enhancing the SCADA software to monitor and control regulator output, and installing new software that analyzes downstream AMI voltages and feeds information back to the SCADA system for regulator control.[8]

It is clear from this exchange of information between JPEC and the Commission Staff that JPEC was transparent on the matter of installation of AMI meters on its system and that Commission Staff also knew of their existence.[9] In PSC Staff Opinion 2012-016 it was determined that the **SCADA/DA** project satisfied the "ordinary course of business" exemption. Taken together, PSC Staff Opinions 2012-0014 and 2012-016 acted as a final Commission Staff opinion that JPEC's 2012-15 CWP projects all satisfied the "ordinary course of business" exemption from the KRS 278.020(1) CPCN requirement.

Subsequently, in JPEC's 2016-19 CWP submission PSC Staff Opinion 2016-004 (February 22, 2016) was issued determining that all JPEC's projects, except for the RUS Code 600 projects, met the "ordinary course of business" exemption.[10] Commission Staff posed requests for information to JPEC to obtain additional clarification on the Code 600 projects. On February 26, 2016, JPEC provided responses and again informed the Commission on the quantity of new single-phase and three-phase AMI meters it projected would be installed during the CWP period. This information apparently provided Commission Staff its needed clarification and on March 28, 2016, PSC Staff Opinion 2016-004A was issued determining that the Code 600 projects also met the "ordinary course of business" exemption.[11] Taken together, PSC Staff Opinions 2016-004 and 2016-004A acted

---

[8] *Staff Opinion 2012-016,* August 10, 2012, pp. 2-3.

[9] Additional specific data on JPEC's AMI meters is contained in the 2012-15 CWP itself which was the subject of Staff Opinions 2012-0014 and 2012-016. Attachment 5 is a page from the 2012-15 CWP containing detailed information on RUS Code 601-Meters, which provides quantities of AMI meters originally installed in 2009-10, and additional meters that were anticipated to be installed between 2012-15. This page can be found on page 30 of 85 of JPEC's 2012-15 CWP filing made at the Commission.

[10] This Staff Opinion is provided as Attachment 6.

[11] This Staff Opinion is provided as Attachment 7. Appended to the Staff Opinion are JPEC's February 26, 2016 responses. The AMI meter information is contained on page 2 of 4, designated as "Meters—RUS Code 601."

as a final Commission Staff opinion that JPEC's 2016-19 CWP projects all satisfied the "ordinary course of business" exemption from the KRS 278.020(1) CPCN requirement.

In JPEC's recent rate adjustment proceeding under the Commission's streamlined procedure[12] the Commission asked a direct question about JPEC's AMI pilot program. JPEC's response provided information on the original AMI deployment of PLC technology and then explained its subsequent pilot program using RF technology to explore whether a system change-out from PLC to RF made operational and financial sense.[13] This question and answer further demonstrates that JPEC's system-wide AMI system was no secret.

After carefully reconstructing the history of JPEC's AMI system deployment, and considering the project against KRS 278.020(1) and the body of law governing "extensions in the ordinary course" now codified in 807 KAR 5:001, Section 15(3), JPEC has concluded that a CPCN for its AMI system should have been requested in 2009. However, hindsight is correct 100 percent of the time and one can only speculate why JPEC management at the time didn't seek the Commission's approval although it is clear the matter of CWP projects was in a state of confusion and flux at the time. The Commission ultimately provided clarity on the subject and in 2012 implemented a procedure for electric distribution cooperatives to obtain review of their CWPs to determine if any projects required CPCN treatment.

JPEC's purpose for providing the above detailed historical review of its AMI system deployment is not intended as absolution from its responsibility in 2009 to apply for the Commission's permission to construct its AMI system. Nor is it intended to shift blame to the Commission Staff for being aware of the existence of the AMI system but not calling JPEC to task for its failure to obtain that permission, or to claim that the Commission's tacit knowledge somehow acted as a ratification of JPEC's actions. Rather, it is simply to admit that a mistake was made and convey JPEC's sincere belief that neither prior nor current JPEC

---

[12] See *In the Matter of: The Electronic Application of Jackson Purchase Energy Corporation for a General Adjustment of Rates Pursuant to Streamlined Procedure Pilot Program Established in Case No. 018-00407*, PSC Case No. 2019-00053.

[13] See *Id.*, PSC-DR-01-09. For ease of reference this response is provided as Attachment 8. The response incorrectly states that JPEC first implemented the PLC AMI system in 2008. As discussed previously in this letter construction actually began in 2009.

management intended to hide the fact that JPEC had constructed an AMI system beginning in 2009.

JPEC respectfully apologizes for this unfortunate decision made some twelve years ago and pledges to the Commission that it will prospectively redouble oversight among its senior management staff and its local and regulatory counsel to ensure that situations such as this are not repeated.

JPEC appreciates what it knows will be careful and judicious consideration of this matter by the Commission, and will be most willing to discuss it further or provide any additional information which is needed by Commission Staff or Commissioners.

Because of the capabilities of its AMI system JPEC can remotely read approximately 94% of all meters on its system. Therefore, the Commission's regulation requiring that each meter on JPEC's system must be read at least annually, 807 KAR 5:006, Section 7(5)(b), is, in JPEC's opinion, inefficient and unnecessary. JPEC intends in the near future to formally apply to the Commission for a deviation from that responsibility.

Sincerely Yours,

Greg Grissom
President and Chief Executive Officer

Andy Beshear
Governor

Rebecca W. Goodman
Secretary
Energy and Environment Cabinet

Commonwealth of Kentucky
Public Service Commission
211 Sower Blvd.
P.O. Box 615
Frankfort, Kentucky 40602-0615
Telephone: (502) 564-3940
psc.ky.gov

Kent A. Chandler
Chairman

Angie Hatton
Vice Chairman

Mary Pat Regan
Commissioner

December 6, 2023

PSC STAFF OPINION 2023-005

Greg Grissom
6525 US Highway 60 W
Paducah, Kentucky 42001
Phone: (270) 442-7321

Re: Jackson Purchase Energy Corporation, 2024-2027 Construction Work Plan
Request for Staff Opinion

Dear Mr. Grissom:

Commission Staff acknowledges receipt of your letter dated October 24, 2023, on behalf of Jackson Purchase Energy Corporation (Jackson Purchase) requesting a staff advisory opinion. Specifically, the letter requests an opinion as to whether any or all projects contained in Jackson Purchase's 2024-2027 Construction Work Plan (CWP) require a Certificate of Public Convenience and Necessity (CPCN) or whether the projects fall within the "ordinary course of business" exemption of KRS 278.020(1)(a)2 and 807 KAR 5:001, Section 15(3), and, therefore, do not require a CPCN.

Pursuant to the Commission's decision that each construction project contained in a CWP should be analyzed on an individual basis to determine whether that individual project is exempt from the requirement in KRS 278.020(1) to obtain a CPCN, Commission Staff has reviewed the projects contained in Jackson Purchase's 2024-2027 CWP. This letter represents Commission Staff's opinion, which is advisory in nature, and not binding on the Commission should the issues herein be formally presented for Commission resolution.

As with all legal opinions requesting a determination of the exemption from the requirement of a CPCN, Commission Staff's review does not consider the reasonableness or the need for each project. Therefore, because reasonableness and need are not considered herein, or in other non-rate cases, the cost of such a project can be denied recovery in a rate case if found to be unreasonable or unnecessary.

According to its 2024-2027 CWP, Jackson Purchase proposes construction identified by the following RUS Codes: 1) New Lines – RUS Code 100 at a projected cost of $6,367,708; 2) Tie Lines/New Construction – RUS Code 200 at a projected cost of $600,000; 3) Conversion and Line Changes- RUS Code 300 at a projected cost of $2,593,504; 4) Substation/Switching Metering Changes – RUS Code 500 at a projected cost of $8,775,000; 5) Miscellaneous Distribution Equipment – RUS Code 600 at a projected cost of $33,205,686; and 6) Other Distribution Items – RUS Code 700 at a projected cost of $6,121,639. The total estimated cost of all projects contained in Jackson Purchase's CWP is $57,663,537.

KRS 278.020(1) provides, in relevant part, as follows:

> No person, partnership, public or private corporation, or combination thereof shall commence providing utility service to or for the public or begin the construction of any plant, equipment, property, or facility for furnishing to the public any of the services enumerated in KRS 278.010, except:
>
> 1. Retail electric suppliers for service connections to electric consuming facilities located within its certified territory; [or]
> 2. Ordinary extensions of existing systems in the usual course of business;
>
> . . .
>
> until that person has obtained from the Public Service Commission a certificate that public convenience and necessity require the service or construction.

Regarding the exception to the CPCN requirement, Administrative Regulation 807 KAR 5:001, Section 15(3) provides, in full, as follows:

> Extensions in the ordinary course of business. A certificate of public convenience and necessity shall not be required for extensions that do not create wasteful duplication of plant, equipment, property, or facilities, or conflict with the existing certificates or service of other utilities operating in the same area and under the jurisdiction of the commission that are in the general or contiguous area in which the utility renders service, and that do not involve sufficient capital outlay to materially affect the existing financial condition of the utility involved, or will not result in increased charges to its customers.

Included in Jackson Purchase's 2024-2027 CWP is an Advanced Metering Infrastructure (AMI) system upgrade. The total number of replacement meters is approximately 30,360 at an estimated cost of $5,588,920 and is included as RUS Code 601. The hardware/software for this AMI system upgrade is also included in RUS Code 700 and is accounted for in Code 705.

Jackson Purchase was included as a party to Case Number 2012-00428, *Consideration of the Implementation of Smart Grid and Smart Meter Technologies*. As a party to that case, Jackson Purchase received a copy of the final order dated April 13, 2016 that stated in pertinent part:

> With regard to CPCNs, the Commission finds it appropriate for jurisdictional electric utilities to obtain CPCNs for major AMR or AMI meter investments and distribution grid investments for DA, SCADA or volt/var resources. In the past, when addressing requests for CPCNs for AMR and AMI meters, the Commission has noted its concern regarding a number of meter related issues such as cost, compatibility with current system equipment and software, and unplanned obsolescence.

Commission Staff is of the opinion that Jackson Purchase's AMI meters and the hardware/software for its AMI system upgrade (collectively, the AMI Project) does not satisfy the "ordinary course of business" exemption, and therefore, that Jackson Purchase would require a CPCN from the Commission prior to commencing this part of the Construction Work Plan.

In analyzing whether Jackson Purchase's other proposed projects would materially affect its financial condition, Commission Staff takes notice of Jackson Purchase's 2022 Annual Report, which shows Jackson Purchase having net utility plant of approximately $127,893,603 as of December 31, 2022. With the exception of the AMI Project, Commission Staff is of the opinion that the individual projects in Jackson Purchase's 2024-2027 CWP do not require a CPCN. When reviewed individually, each of those proposed construction projects would not materially Jackson Purchase's existing financial condition based on their estimated cost. Therefore, with the exception of the AMI Project, each construction project is generally considered an extension in the ordinary course of business. Likewise, the cost estimate of each project, with the exception of the AMI Project, considered separately in the 2024-2027 CWP will not have an immediate or significant impact on Jackson Purchase's rates. Lastly, with the exception of the AMI Project, the individual construction projects would not result in wasteful duplication of facilities or conflict with the service of other utilities. Thus, Commission Staff is of the opinion, with the exception of the AMI Project, that each of the proposed projects set out in Jackson Purchase's 2024-2027 CWP satisfy the "ordinary course of business" exemption from CPCN requirement.

This letter represents Commission Staff's interpretation of the law as applied to the facts presented. This opinion is advisory in nature and not binding on the Commission should the issues herein be formally presented for Commission resolution. Questions concerning this opinion should be directed to Andrew Bowker at (502) 782-2580.

Sincerely,

Nancy J Vinsel

Nancy J. Vinsel
General Counsel

Jackson Purchase Energy Cooperative
6525 US Highway 60 W
Paducah, KY 42001
270.442.7321 • 800.633.4044
www.JPEnergy.com

October 24, 2023

Via email at PSCED@ky.gov

Ms. Linda C. Bridwell, P.E.
Executive Director
Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40602

Re: Jackson Purchase Energy Corporation 2024-2027 Construction Work Plan Request for Staff Opinion

Dear Ms. Bridwell:

Please find attached for filing with the Commission, Jackson Purchase Energy Corporation's ("Jackson Purchase") 2024-2027 Construction Work Plan Request for a Staff Opinion, as a request for the opinion of Commission Staff regarding whether any projects contained in Jackson Purchase's 2024-2027 Construction Work Plan ("CWP") require a Certificate of Public Convenience and Necessity ("CPCN") or whether all the projects fall within the "ordinary course of business" exemption and, therefore, do not require a CPCN.

Enclosed for Commission Staffs review are the following documents:

- Jackson Purchase's 2024-2027 CWP, the same bearing the original certification and signature of Travis Spiceland, Vice President of Engineering for Jackson Purchase and a duly registered professional engineer under the laws of the Commonwealth of Kentucky; and
- An excerpt of the minutes ofthe meeting held September 29, 2023, by Jackson Purchase's Board of Directors, the same reflecting the Board's approval and adoption ofthe 2024-2027 CWP.

Please also be advised that the CWP has been reviewed and approved by the United States Department ofAgriculture, Rural Development, Rural Utilities Service (RUS).

According to its 2024-2027 CWP, Jackson Purchase proposes the following construction projects grouped by RUS codes: 1) New Lines - RUS Code 100 at a projected cost of$6,367,708; 2) Tie Lines/New Construction - RUS Code 200 at a projected cost of $600,000; 3) Conversion and Line Changes - RUS Code 300 at a projected cost of $2,593,504; 4) Substation/Switching Metering Changes - RUS Code 500 at a projected cost of$8,775,000; 5) Miscellaneous Distribution Equipment RUS Code 600 at a projected cost of $33,205,686; and 6) Other Distribution Items - RUS Code 700 at a projected cost of $6,121,639. The total estimated cost of all projects contained in Jackson Purchase's CWP is $57,663,537.

Included in Jackson Purchase's 2024-2027 CWP is an Advanced Metering Infrastructure ("AMI") system upgrade. The total number of replacement meters is approximately 30,360 at an estimated cost of$5,588,920 and is included as RUS Code 601. Jackson Purchase recognizes that the AMI system upgrade normally requires a CPCN from the Commission prior to beginning installation. Jackson Purchase anticipates filing a CPCN for an AMI system upgrade in the next four to six months. The hardware/software for this AMI system upgrade is also included in RUS Code 700 and is accounted for in Code 705.

Should you require any additional information or have any questions or concerns, please do not hesitate to contact me.

This is to certify that the foregoing electronic filing was transmitted to the Commission on October 24, 2023; and that pursuant to prior Commission Orders, no paper copies of this filing will be made.

If you have any questions, please let me know.

Sincerely,

Greg Grissom
President / CEO
Jackson Purchase Energy

Enclosure

RESOLUTION OF THE BOARD OF DIRECTORS
of
JACKSON PURCHASE ENERGY CORPORATION

Paducah, Kentucky

WHEREAS, *a four (4) year Construction Work Plan dated 2024-2027, has been prepared by the Engineering department ofJackson Purchase Energy Corporation under direction ofTravis Spiceland, P.E. the Corporation's Vice President ofEngineering, in the amount of $57,663,537.*

RESOLVED, *that the Board of Directors ofJackson Purchase Energy Corporation approve the 2024-2027 Construction Work Plan as a course ofaction to be followed, or until amended with the approval of the Rural Utilities Service;*

BE IT, THEREFORE RESOLVED *that this resolution was properly authorized and adopted on behalf of Jackson Purchase Energy Corporation by the Board during the duly regular monthly Board Meeting held at the Office of the Corporation on Friday, September 29, 2023.*

Signature of the Secretary

I, Wayne Elliott, Secretary-Treasurer of Jackson Purchase Energy Corporation, do hereby certify that the above is a true excerpt from the minutes of the meeting of the Board of Directors of Jackson Purchase Energy Corporation, held on the 29th day of September 2023, at which meeting a quorum was present.

Wayne Elliott

Wayne Elliott
Secretary/Treasurer

Jackson Purchase Energy Corporation

Kentucky 20 McCracken

CONSTRUCTION WORK PLAN (CWP)

Jan 2024 – Dec 2027

Prepared By:

Travis Spiceland, P.E.
Vice President of Engineering
Registration No. 37856

I certify that this 2024-2027 Construction Work Plan was prepared by me or under my direct supervision, and that I am a duly registered professional engineer under the laws of the Commonwealth of Kentucky.

10/5/2023
Date

By:
Travis Spiceland, P.E.

STATE OF KENTUCKY
TRAVIS A.
SPICELAND
37856
LICENSED
PROFESSIONAL ENGINEER

JACKSON PURCHASE ENERGY CORPORATION
2024 – 2027 CONSTRUCTION WORK PLAN

Kentucky 20 McCracken

Table of Contents

Executive Summary

Purpose of Report

This report documents the engineering analysis of the Jackson Purchase Energy Corporation (JPEC) electric distribution system and summarizes the proposed construction for the four-year planning period from 2024-2027.

The report also provides engineering support, in the form of descriptions, costs and justification of required new facilities for a loan application to RUS in order to finance the proposed construction program.

General Basis of Study

For this 2024-2027 Construction Work Plan (CWP), information from JPEC's Long Range Plan (LRP), previous CWP and our current Load Forecast (LF) was considered. System loading was obtained by using 2018-2022 non-coincident peak loads grown at rates historically established. This method provides design loading of 184.4 MW for Summer and 185.7 MW for Winter in year 2027. The RUS approved 2012 LRP called for a peak of 238 MW while the 2023 LF calls for a peak of 155 MW. The load forecast, which was completed by JPEC's power supplier Big Rivers Electric Corporation (BREC), includes potential impacts of future Demand Side Management (DSM) programs as well as electric vehicle (EV) saturation.

An analysis, using RUS guidelines and the design criteria herein, of thermal loading, voltages, and physical conditions was performed on all the substations, distribution lines and major equipment of the existing system. Milsoft's WindMill software was used to analyze the distribution circuits during the peak loading periods. For each deficiency that was determined, alternative solutions were investigated and economically evaluated so that the most cost-effective construction, if required, could be proposed.

The Cooperative's 2012 LRP load projections and recommendations were reviewed and found to be adequate for this four-year planning period. All the construction proposed herein is consistent with the LRP unless otherwise noted and explained.

The Cooperative's 2019 Operations and Maintenance Review, (Review Rating Summary; RUS Form 300), was used to determine construction required to replace physically deteriorated equipment and material, upgrade portions of the system to conform with code or safety requirements, and/or improve reliability or quality of service.

Any new distribution or power supply construction requirements were considered simultaneously as a "one system" approach for the orderly and economic development of the total system. All proposed construction and recommendations relative to power supply and delivery were discussed with the Cooperative's power supplier, BREC.

Results

Upon completion of the proposed construction, the system will provide adequate and dependable service to nearly 30,885 meters; 25,637 residential, 5,191 small commercial, 15 large commercial and industrial loads. Average monthly residential usage is projected to be 1,195 kWh.

Although no new loads are defined, there are considerable amounts of developable land for both residential and industrial growth in the JPEC territory.

Service Area

Jackson Purchase Energy Corporation, whose headquarters are in Paducah, Kentucky, provides service to customers in Ballard, Carlisle, Graves, Livingston, Marshall, and McCracken Counties in western Kentucky.

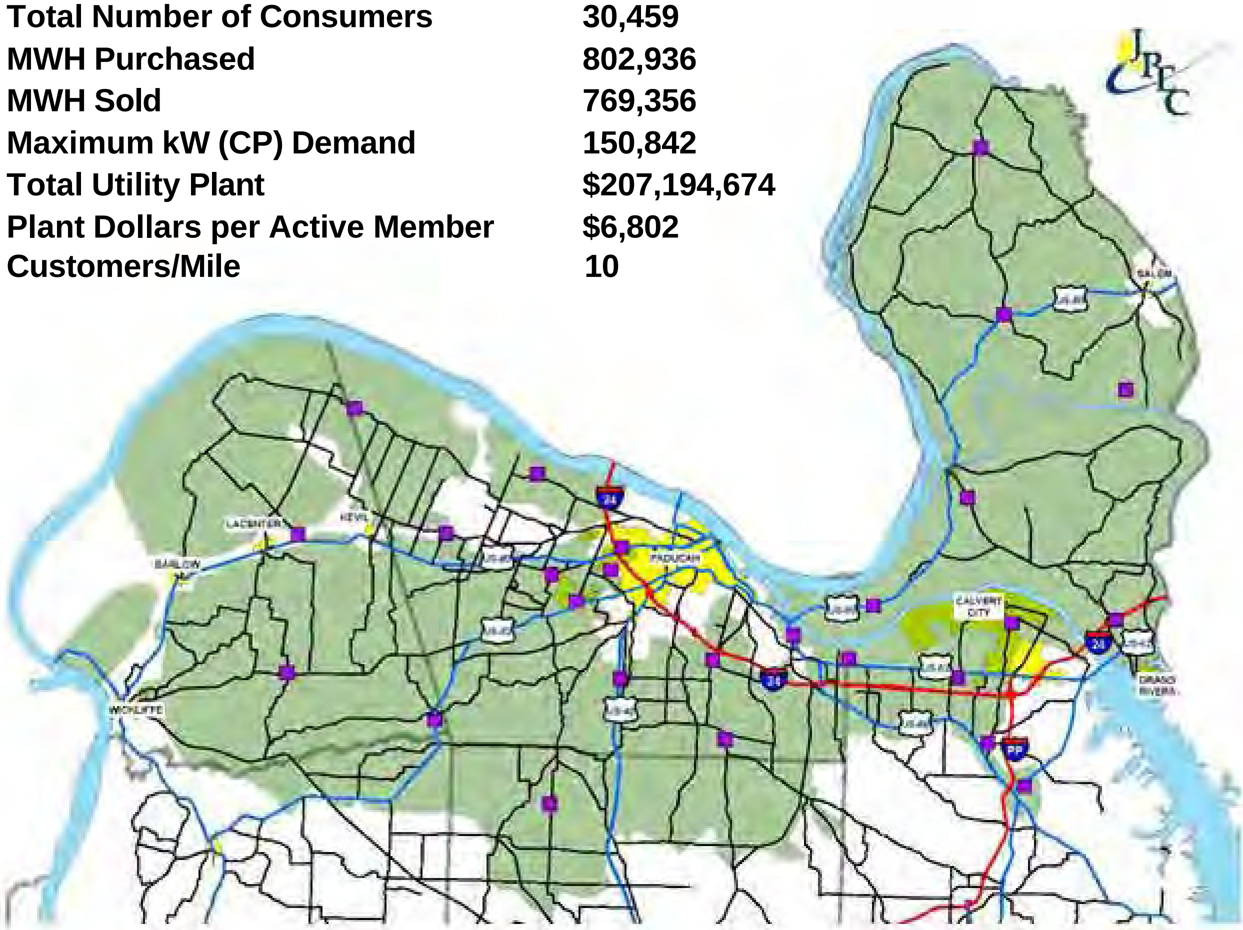
JPEC's service area is comprised mostly of rolling hills and farmland. Much of the service area is rural/residential in nature, but JPEC also serves strong commercial, industrial, and tourism loads. JPEC's service area is adjacent to Kentucky Lake, the Mississippi and Ohio Rivers.

Interstate 24, which links Nashville to the Midwest, bisects the service area from east to west. A section of the new Interstate 69 runs along the eastern service area along with other major state and federal highways that run throughout the service area. JPEC service area also contains major railway lines, a regional airport, and four rivers.

JPEC operates 29 delivery points that are served at 69 kV and distributes power at a primary voltage of 7.2/12.47 kV over approximately 2,988 miles of line. JPEC also has two direct serve customers. One is served at 69/4.6 kV and the other is served at 69/13 kV.

The following data is from Jackson Purchase Energy Corporation's 12/31/2022 RUS Form 7:

Total Number of Consumers	**30,459**
MWH Purchased	**802,936**
MWH Sold	**769,356**
Maximum kW (CP) Demand	**150,842**
Total Utility Plant	**$207,194,674**
Plant Dollars per Active Member	**$6,802**
Customers/Mile	**10**



GENERATION and TRANSMISSION POWER SUPPLIER

Big Rivers Electric Corporation (BREC) provides all power and energy needs to JPEC and two other distribution cooperatives. BREC is located in Owensboro, Kentucky.

All new distribution, transmission, and substation construction requirements are considered simultaneously as a "one system" concept – between JPEC and BREC – for the orderly and economic development of the total system. All recommendations relative to power supply and delivery are discussed with BREC.

Summary of Construction Program and Costs

JPEC's distribution system was analyzed to identify the construction requirements needed to adequately serve the projected CWP load of 185.7 MW. Improvements were identified based on voltage drop, conductor loading, economic conductor analysis and operational experience. An explanation of each system improvement is located in Section IV.

An overall breakdown of proposed construction projects by RUS 740C codes is listed below in Table I-C-1

Table I-C-1

System Additions and Improvements Summary

RUS Form 740C Category	Category Name	Estimated Cost	
100	New Distribution Lines	$	6,367,708
200	Tie Lines/New Construction	$	600,000
300	Conversion & Line Changes	$	2,593,504
400	New Substation/Switching/Metering	$	-
500	Substation/Switching/Metering Changes	$	8,775,000
600	Misc. Distribution Equipment	$	33,205,686
700	Other Distribution Items	$	6,121,639
	2024 - 2027 CWP Total	**$**	**57,663,537**

100 – New overhead and underground line construction

200 – New tie lines

300 – Conversion and line changes

400 – New construction of substations

500 – Substation upgrades, replacements, and other changes

600 - Miscellaneous distribution equipment and pole changes. This includes aged conductor replacements, voltage regulators, switched capacitors, sectionalizing, automated meters, transformers, pole changes, line relocations, and fiber.

700 - Other distribution Items, outdoor lighting, software and hardware for AMI, and SCADA/DA

JACKSON PURCHASE ENERGY CORPORATION 2024-2027 CWP
COST SUMMARY SPREADSHEET

NEW-CONSTRUCTION - RUS CODE 100

ITEM	RUS CODE	Miles	Avg. $/Consumer	# Cons		2024	2025	2026	2027	TOTAL
New Underground Construction	101	68.8	$4,678.73	999		$1,067,656	$1,132,249	$1,200,750	$1,273,396	$4,674,051
New Overhead Construction	102	14.5	$3,840.49	441		$386,868	$410,274	$435,096	$461,419	$1,693,657
		83.3	Total Code 100:	1440		$1,454,524	$1,542,523	$1,635,846	$1,734,815	**$6,367,708**

TIE LINES/NEW CONSTRUCTION - RUS CODE 200

SUB-SECTION	RUS CODE	Original Conductor	INST. COND/#PH	$/MI	# OF MILES	2024	2025	2026	2027	TOTAL
Draffenville, New Hwy 68 Circuit	201-20*	N/A	750 ALUG	$500,000	1.2	$600,000	$0	$0	$0	$600,000
			Total Code 200:	$ 500,000.00	1.2	$600,000	$0	$0	$0	**$600,000**

LINE CONVERSION / REPLACEMENT - RUS CODE 300

SUB-SECTION	RUS CODE	Original Conductor	INST. COND/#PH	$/MI	# OF MILES	2024	2025	2026	2027	TOTAL
Burna PROH_00034077 - PROH_00034145	301-12*	1ph #2 ACSR	3ph 1/0 ACSR	$181,747	2.2	$0	$0	$0	$399,843	$399,843
Culp PROH_00028600 - PROH_00028642	342-30	1ph #2 ACSR	3ph 1/0 ACSR	$164,851	0.55	$0	$90,668	$0	$0	$90,668
Cumberland PROH_00033215 - PROH_00033281	315-30	1ph #2 ACSR	3ph 1/0 ACSR	$157,000	2.51	$394,070	$0	$0	$0	$394,070
Draffenville PROH_00031223 - PROH_00031224	366-30	1ph #1/0 ACSR	3ph 1/0 ACSR	$157,000	0.1	$15,700	$0	$0	$0	$15,700
Grand Rivers PROH_00041851 - PROH_00035334	376-30	1ph #2 ACSR	3ph 1/0 ACSR	$173,093	0.8	$0	$0	$131,551	$0	$131,551
Grand Rivers PROH_00035691 to PROH_00035728	339-16*	1ph #2 ACSR	3ph 1/0 ACSR	$181,747	0.3	$0	$0	$0	$54,524	$54,524
Joy PROH_00042185 - PROH_00036619	305-30	1ph #2 and #1/0 ACSR	3ph 1/0 ACSR	$164,850	2.71	$0	$446,744	$0	$0	$446,744
Kansas PROH_00014298 - PROH_00014303	361-30	1ph #2 ACSR	3ph 336 ACSR	$168,000	1.02	$0	$171,360	$0	$0	$171,360
Ledbetter PROH_00038602 - PROH_00038616	331-30	1ph #2 ACSR	3ph 1/0 ACSR	$157,000	0.41	$64,370	$0	$0	$0	$64,370
Ledbetter PROH_00042326 - PROH_00038936	331-31	1ph #2 ACSR	3ph 1/0 ACSR	$164,852	0.25	$0	$41,213	$0	$0	$41,213
Lovelaceville PROH_00044960 - PROH_00010373	349-30	1ph #2 ACSR	3ph 336 ACSR	$160,000	0.61	$97,600	$0	$0	$0	$97,600
Possum Trot PROH_00027430 - PROH_00027448	378-30	1ph #2 ACSR	3ph 1/0 ACSR	$181,747	0.47	$0	$0	$0	$85,421	$85,421
Possum Trot PROH_00001611 - PROH_00030312	378-31	1ph #2 ACSR	3ph 1/0 ACSR	$157,000	0.98	$153,860	$0	$0	$0	$153,860
Smithland PROH_00001929 - PROH_00040695	332-30	1ph #2 ACSR	3ph 1/0 ACSR	$173,093	1.24	$0	$0	$214,635	$0	$214,635
Smithland PROH_00081251 - PROH_00039826	332-31	1ph #2 ACSR	3ph 1/0 ACSR	$173,093	1.34	$0	$0	$231,945	$0	$231,945
* Carryover from previous plan			TOTAL CODE 300		15.45	$725,600	$749,985	$578,131	$539,788	**$2,593,504**

SUBSTATION IMPROVEMENTS - RUS CODE 500'S

ITEM	RUS CODE	Original Equipment	Recommended Equipment	# Items		2024	2025	2026	2027	TOTAL
Draffenville - Substation Upgrade	511*	Add recloser to existing structure				$35,000	$0	$0	$0	$35,000
Kansas - Substation Upgrade	513	Upgrade recloser source and load switches on each feeder				$25,000	$0	$0	$0	$25,000
Kevil - Substation Upgrade	514	Upgrade to 15/20/25 MVA transformer, add ckt regulation, add control house w/ solid state relays				$0	$1,000,000	$2,420,000	$0	$3,420,000
New York - Substation Upgrade	508*	Upgrade to solid state relays w/ cabinet, add feeder regulation, add 69kV circuit breaker				$0	$1,635,000	$0	$0	$1,635,000
Smithland - Substation Upgrade	515	Upgrade to 15/20/25 MVA transformer, add ckt regulation, add control house w/ solid state relays				$0	$0	$1,000,000	$2,660,000	$3,660,000
* Carryover from previous plan										
			TOTAL CODE 500			$60,000	$2,635,000	$3,420,000	$2,660,000	**$8,775,000**

MISCELLANEOUS DIST. EQUIPMENT - RUS CODE 600'S

ITEM	RUS CODE			# Items		2024	2025	2026	2027	TOTAL
New Transformers/Meters	601					$1,668,185	$6,431,854	$1,379,423	$1,460,545	$10,940,007
Service Upgrades	602					$178,155	$188,934	$200,364	$212,486	$779,939
Sectionalizing	603					$371,528	$390,104	$409,609	$430,090	$1,601,331
Voltage Regulators	604					$50,000	$51,500	$53,045	$54,636	$209,181
Capacitors	605					$50,000	$51,500	$53,045	$54,636	$209,181
Pole Replacement	606					$3,108,587	$3,296,657	$3,496,105	$3,707,619	$13,608,968
Conductor Replacement	608					$600,000	$618,000	$636,540	$655,636	$2,510,176
Smart Grid Fiber	616					$500,000	$515,000	$530,450	$546,364	$2,091,814
Misc	607					$300,000	$309,000	$318,270	$327,818	$1,255,088
			TOTAL CODE 600			$6,826,455	$11,852,549	$7,076,851	$7,449,831	**$33,205,686**

OTHER DIST. ITEMS - RUS CODE 700'S

ITEM	RUS CODE			# Items		2024	2025	2026	2027	TOTAL
Outdoor Lights-Replacement	701					$1,267,200	$1,370,477	$941,061	$646,196	$4,224,934
Outdoor Lights-New	702					$81,609	$84,898	$88,319	$91,879	$346,705
AMR/AMI Equipment	705					$1,275,000	$275,000	$0	$0	$1,550,000
			TOTAL CODE 700			$2,623,809	$1,730,375	$1,029,380	$738,075	**$6,121,639**

2024-2027 Kentucky 20 - McCracken			**CONSTRUCTION WORK PLAN TOTAL:**			$12,290,388	$18,510,432	$13,740,208	$13,122,509	**$57,663,537**

DISTRIBUTION DESIGN CRITERIA

Each of the following criteria items were reviewed and accepted by the RUS General Field Representative and management of Jackson Purchase Energy Corporation

All construction proposed herein is designed to meet, at a minimum, the standards of adequacy for voltages, thermal loading, safety and reliability on the system as described below.

1. The minimum voltage on primary distribution lines is 118 volts (120 bolt base, 126 volts at source) after no more than 2 stages of regulation beyond the substation.

2. Primary conductors loaded over 60% of their thermal rating (50% for major tie lines between substations) will be evaluated.

3. The following equipment will be evaluated if the nameplate rating is thermally loaded by more than the percentage shown:
   a. 85% - Power Transformers (OA rating)
   b. 90% - Substation and Line Voltage Regulators
   c. 90% - Oil Circuit Reclosers
   d. 90% - Line Fuses

4. Loading on single phase lines should be limited to no more than 35 amperes to mitigate potential balancing and sectionalizing problems. Exceptions may be allowed, and load shifts or conductor multi-phasing will be recommended on a case-by-case basis.

5. Poles and/or crossarms to be replaced if found to be physically deteriorated by visual inspection and/or test.

6. Capacitor banks should be installed on distribution lines as required to maintain at least a 98% power factor at peak loading conditions. Capacitor switching will be utilized for this purpose as required.

7. Aged Conductors (and associated poles and hardware as required) should be replaced as needed.

8. New substations and existing substation upgrades will be coordinated with Big Rivers Electric Corporation.

Distribution Line and Equipment Costs

Construction cost estimates for the four-year planning period are shown in Table II-B-1. Cost estimates for distribution equipment are shown in Table II-B-2.

Table II-B-1
Distribution Equipment Cost Estimates
Annual Projected Unit Costs Per Mile

Size	Type	2024	2025	2026	2027
#2 ACSR	Replace 1-PH	$56,870	$59,714	$62,699	$65,834
#2 ACSR	Convert 3-PH	$129,500	$135,975	$142,774	$149,912
1/0 ACSR	Convert 3-PH	$157,000	$164,850	$173,093	$181,747
336.4 ACSR	Convert 3-PH	$160,000	$168,000	$176,400	$185,220

Table II-B-2
Distribution Equipment Cost Estimates
Annual Projected Unit Costs

Device	Type	2024	2025	2026	2027
V. Regulator (1)	656 amp	$62,250	$65,363	$68,631	$72,062
V. Regulator (1)	548 amp	$48,125	$50,531	$53,058	$55,711
V. Regulator (1)	438 amp	$44,250	$46,463	$48,786	$51,225
V. Regulator (1)	328 amp	$44,000	$46,200	$48,510	$50,936
V. Regulator (1)	219 amp	$40,125	$42,131	$44,238	$46,450
V. Regulator (1)	150 amp	$45,250	$47,513	$49,888	$52,383
V. Regulator (1)	100 amp	$29,338	$30,804	$32,345	$33,962
Capacitors	900kVAR w/ controls	$18,375	$19,294	$20,258	$21,271
Capacitors	300kVAR fixed	$4,095	$4,300	$4,515	$4,740
Reclosers	Viper w/ controls	$35,689	$37,473	$39,347	$41,314
Reclosers	CMR w/ controls	$6,096	$6,401	$6,721	$7,057

Status of Previous CWP Items

Project Status from the 2020-2023 CWP

Code	Substation	Status
201-21	LED	Completed
201-20	DRA	Carry Over
301-12	BUR	Carry Over
303-12	CAL	Completed
304-23	CUL	Completed
312-12	JOY	Completed
317-12	LIT	Completed
320-12	LIT	Completed
339-16	GRA	Carry Over
340-23	KEV	Deleted
341-16	KAN	Completed
342-16	KRE	Completed
343-16	LOV	Completed
345-16	NEW	Deleted
348-21	NEW	Completed
349-21	NEW	Completed
342-23	KRE	Deleted
506	KAN	Completed
508	NEW	Carry Over
509	KRE	Completed
510	SMI	Completed
511	DRA	Carry Over

Analysis of Long-Range Plan

In July of 2012, Distribution System Solutions, Inc. out of Walton, Kentucky prepared Jackson Purchase Energy Corporation's 2012 Long Range Plan (LRP). The RUS General Field Representative approved the LRP in 2012.

The LRP recommended that JPEC continue to be built and operated at 12.47kV throughout the study period. Alternate plans, including conversion to 25kV were explored but found to be less economical. While feeder losses had the potential to be reduced, the list of intangible items is extensive and highly expensive compared to the potential lower losses.

During the second block (2016-2019) of the LRP it was determined that four stations; Little Union, Kevil, Kansas, and New York are projected to be overloaded. With the energizing of the Maxon Substation in 2013, it was projected that Little Union would still be overloaded by the end of this time block. Presently, the station is 78% loaded versus the projected 95%. This station does warrant monitoring for possible changes in this CWP, but other stations require immediate improvement.

The LRP recommends the construction of two new substations: Buchanan Road and Ceredo. Ceredo was recommended to alleviate loading issues on New York and Kevil subs. At this time, JPEC does not see the need to build a new station but instead invest in the upgrades of the New York and Kevil stations.

The last recommendation was to upgrade the transformer at the Kansas Substation. This was completed in 2020 providing amble capacity at this station.

The existing LRP should be valid for the next CWP. However, it is recommended that load growth patterns, load projections and proposed load centers be reviewed as needed.

Operations and Maintenance Survey

The current O&M Survey (Review Rating Summary, RUS Form 300) was completed in October 2019. This report is reviewed by the President and CEO and the RUS GFR every four years and is the basis for the following conclusions and recommended items.

The first recommendation is to work with JPEC's joint users to remove their attachments in an effort to remove stub poles around the system.

The second recommendation was to monitor problem trees in heavily residential areas.

The third recommendation was to continue working to reconcile the record of idle services in the billing system with actual idle services in the field and continue to remove idle services from the field.

Sectionalizing Study

A sectionalizing study analyzes the existing overcurrent protection scheme and proposes changes to improve the overall effectiveness of the scheme. Sectionalizing studies take place on a substation-by-substation basis.

The four main goals of a sectionalizing study are:

(1) **Safety** – Protective devices should be able to detect and interrupt the full range of fault currents available in their zone of protection coverage. Calculated minimum fault current values should be detected and cleared by the protective device.
(2) **Reliability** – Limit the outage hours per consumer by isolating or "sectionalizing" faulted portions of the circuit so that the minimum number of customers are interrupted. Additional devices – where needed – will further limit the overall outage hours.
(3) **Coordination** – Good protective device coordination will ensure that the closest device to the fault opens, which can enhance fault locating and reduce overall outage hours.
(4) **Protection** – A well designed protection scheme will minimize damage to the distribution system by limiting the time that damaging overcurrent is present on the faulted portion of the system.

JPEC plans on updating the sectionalizing study in this CWP period but until then the current 2009 plan will remain in effect. General sectionalizing device costs projections will be listed in the "603" category in this report.

Table II-E-8
Substation Load Table

	Installed Capability		Existing System²					4 Year System Unimproved³		4 Year System Improved³		
			Noncoincident Peak Demand					Noncoincident Peak Demand		Noncoincident Peak Demand		
	Nameplate (MVA)	Rating (kVA)	Peak (kW)	Peak Year	Power Factor @ Peak	Max % Load	% Increase	2023 Peak (kW)	Max % Load	2023 Peak (kW)	Max % Load	
Burna	5/6.25/7	5,000	3,611	2021	96.82%	72%	1.0%	3,758	75%	3,758	75%	
Calvert City	12/16/17.9	12,000	6,445	2018	98.16%	54%	1.0%	6,707	56%	6,707	56%	
Coleman Road	15/20/25/28	15,000	9,357	2018	93.69%	62%	1.0%	9,737	65%	9,737	65%	
Culp	12/16/17.9	12,000	9,444	2022	98.03%	79%	1.0%	9,827	82%	9,827	82%	
Cumberland	7.5/8.4	7,500	5,136	2018	91.32%	68%	1.0%	5,345	71%	5,345	71%	
Draffenville	7.5/9.375/10.5	7,500	3,609	2019	99.47%	48%	1.0%	3,756	50%	3,756	50%	
Freemont	15/18.75/21	15,000	7,927	2022	98.98%	53%	2.0%	8,580	57%	8,580	57%	
Grand Rivers	12/16/20/22.4	12,000	8,832	2019	97.43%	74%	1.0%	9,191	77%	9,191	77%	
High Point	7.5/9.375/10.5	7,500	2,093	2022	99.38%	28%	1.0%	2,178	29%	2,178	29%	
Husbands Road	12/16/17.9	12,000	8,631	2022	97.72%	72%	3.5%	9,904	83%	9,904	83%	
Joy	7.5/9.375/10.5	7,500	1,823	2022	100.00%	24%	2.0%	1,973	26%	1,973	26%	
Kansas	15/20/25/28	15,000	7,744	2020	98.52%	52%	2.0%	8,382	56%	8,382	56%	
Kevil	7.5/9.375/10.5	7,500	6,765	2022	100.00%	90%	2.0%	7,323	98%	7,323	49%	1
Krebs Station Road	15/20/25	15,000	10,219	2021	100.00%	68%	1.0%	10,634	71%	10,634	71%	
La Center	5/6.25/7	5,000	4,143	2021	99.07%	83%	1.0%	4,311	86%	4,311	86%	
Ledbetter	12/16/17.9	12,000	8,651	2022	99.70%	72%	3.0%	9,737	81%	9,737	81%	
Little Union	12/16/17.9	12,000	9,300	2022	99.02%	78%	3.0%	10,467	87%	10,467	87%	
Lovelaceville	7.5/9.375/10.5	7,500	6,303	2020	99.45%	84%	3.0%	7,094	95%	7,094	95%	
Maxon Road	7.5/9.375/10.5	7,500	4,584	2022	96.02%	61%	1.0%	4,770	64%	4,770	64%	
New York	12/16/17.9	12,000	7,439	2022	99.91%	62%	2.0%	8,052	67%	8,052	54%	
Olivet Church Road	12/16/17.9	12,000	7,141	2021	99.37%	60%	1.0%	7,431	62%	7,431	62%	
Palma	12/16/17.9	12,000	7,982	2019	95.94%	67%	1.0%	8,306	69%	8,306	69%	
Possum Trot	12/16/20/22.4	12,000	6,914	2022	99.53%	58%	3.0%	7,782	65%	7,782	65%	
Ragland	5/6.25/7	5,000	2,488	2022	100.00%	50%	2.0%	2,693	54%	2,693	54%	
Reidland	7.5/9.375/10.5	7,500	6,279	2018	94.35%	84%	1.0%	6,534	87%	6,534	87%	
Smithland	7.5/9.375/10.5	7,500	6,674	2022	99.87%	89%	1.5%	7,084	94%	7,084	47%	1
Strawberry Hill	15/20/25/28	15,000	9,111	2021	94.49%	61%	1.0%	9,481	63%	9,481	63%	
Vulcan	12/16/20/22.4	12,000	7,893	2020	98.38%	66%	1.0%	8,213	68%	8,213	68%	

1. The transformers at Kevil and Smithland substations will be upgraded according to Section 3, Pages 34-35. The new rating is reflected in the four year improved peak.
2. Based on substation peak load data.
3. Based on five-year average growth rates by substation.

System Outages and Reliability

The record of JPEC's service interruptions for the past five years is shown in Table II-E-9. The five-year average outage hours per consumer is 4.24. This value fell from the previous five-year average of 4.92 hours per consumer due to reduced severity of MEDs. Excluding storms, the five-year average outage hours per consumer rose slightly from the previous CWP. This is due partly due to the increase in scheduled work.

Table II-E-9

SUMMARY OF SERVICE INTERRUPTIONS

Outage Hours per Consumer

Year	Power Supply	Major Storms	Scheduled	Other	Total	Total Without Storms
2018	0.21	6.10	0.10	1.74	8.14	2.05
2019	0.00	4.45	0.10	2.19	6.74	2.29
2020	0.03	0.16	0.13	1.39	1.71	1.55
2021	0.14	0.00	0.15	1.89	2.18	2.18
2022	0.02	0.18	0.15	2.06	2.42	2.24
Average	0.08	2.18	0.13	1.86	4.24	2.06

Outage Minutes per Consumer

Year	Power Supply	Major Storms	Scheduled	Other	Total	Total Without Storms
2018	12.52	365.76	5.79	104.50	488.58	122.82
2019	0.00	266.94	6.20	131.16	404.29	137.36
2020	1.63	9.82	7.86	83.57	102.88	93.06
2021	8.24	0.00	8.78	113.63	130.65	130.65
2022	1.31	10.97	9.18	123.88	145.35	134.37
Average	5.60	160.63	7.16	108.21	281.60	120.97

Historical Cost Data - Table II-E-10

	Historical			Projected				
Description	**2020**	**2021**	**2022**	**2024**	**2025**	**2026**	**2027**	**Total Work Plan 2024-2027**
101 - New Underground Customers								
1. New services constructed	263	249	226	246	248	251	253	999
2. Cost per Customer	$ 6,771.01	$3,649.45	$3,773.97	$4,340.07	$4,557.07	$4,784.92	$5,024.17	
3. Cost of New Customers	$1,780,776.50	$908,712.28	$852,917.79	$1,067,656.11	$1,132,249.31	$1,200,750.39	$1,273,395.79	$4,674,051.60
4. Total Wire Footage	89,605	73,192	105,676	89,491	90,386	91,290	92,203	363,369
Average Footage	341	294	468	364	364	364	364	1,455
Total Miles	16.97	13.86	20.01	16.95	17.12	17.29	17.46	68.8
102 - New Overhead Customers								
1. New services constructed	114	115	97	109	110	111	112	441
2. Cost per Customer	$ 2,490.25	$2,403.73	$3,236.49	$3,560.14	$3,738.15	$3,925.05	$4,121.31	
3. Cost of New Customers	$ 283,888.71	$276,428.48	$313,939.88	$386,868.44	$410,273.98	$435,095.55	$461,418.84	$1,693,656.81
4. Total Wire Footage	15,305	22,019	19,132	18,819	19,007	19,197	19,389	76,411
Average Footage	$ 134	191	197	173	173	173	173	693
Total Miles	2.90	4.17	3.62	3.56	3.60	3.64	3.67	14.5
601 - New Underground Transformers								
1. New transformers added	119	128	97	115	116	117	118	466
2. Cost per Transformer	$ 2,750.60	$3,559.91	$5,002.44	$4,517.75	$4,743.64	$4,980.82	$5,229.86	
3. Cost of New Transformers	$ 327,320.95	$455,668.80	$485,236.79	$518,035.33	$549,376.47	$582,613.75	$617,861.88	$2,267,887.43
601 - New Overhead Transformers								
1. New transformers added	321	393	286	333	337	340	343	1,353
2. Cost per Transformer	$ 1,262.15	$1,421.67	$1,612.61	$1,913.03	$2,008.68	$2,109.12	$2,214.57	
3. Cost of New Transformers	$ 405,150.58	$558,717.66	$461,206.26	$ 637,676.67	$676,256.11	$717,169.60	$760,558.36	$2,791,660.73

	Historical			Projected				
Description	**2020**	**2021**	**2022**	**2024**	**2025**	**2026**	**2027**	**Total Work Plan 2024-2027**
601 - New Meters AMI New Customers								
1. New Meters for Customers	240	0*	539	355	358	362	365	1,440
2. AMI Replacement Meters				2,500	27,860			30,360
3. Cost per Meter	$263.55	----	$296.57	$179.50	$184.50	$220.00	$225.00	
4. Cost of New Meters	$63,252.00	----	$159,849.95	$512,472.50	$5,206,221.00	$79,640.00	$82,125.00	$5,880,458.50
*No meters were purchased in 2021								
602 - Service Upgrades								
1. Number of Service Upgrades	26	49	42	46	46	46	47	185
2. Cost per Service Upgrade	$ 1,779.16	$5,537.82	$3,361.66	$ 3,915.50	$4,111.28	$4,316.84	$4,532.68	
3. Cost of Service Upgrades	$ 46,258.16	$271,353.41	$141,189.73	$178,155.31	$188,933.71	$200,364.20	$212,486.23	$779,939.44
603 - Sectionalizing Equipment	$ 265,987.37	$138,665.38	$656,855.00	$371,527.71	$390,104.10	$409,609.30	$430,089.77	$1,601,330.88
604 - Voltage Regulators	N/A	$7,575.44	N/A	$50,000.00	$51,500.00	$53,045.00	$54,636.35	$209,181.35
605 - Capacitors	N/A	N/A	N/A	$50,000.00	$51,500.00	$53,045.00	$54,636.35	$209,181.35
606 - Poles - Addition/Replacement								
1. Replacement of Poles	1,120	846	810	925	935	944	953	3,757
2. Additional Poles	53	33	66	51	51	52	52	206
3. Total Poles	1,173	879	876	976	986	996	1,006	3,963
4. Cost per Pole Change	$ 2,293.25	$2,275.87	$3,033.36	$3,185.03	$3,344.28	$3,511.49	$3,687.07	
5. Cost of Poles	$2,689,978.25	$2,000,491.78	$2,657,224.08	$3,108,587.33	$3,296,656.86	$3,496,104.60	$3,707,618.93	$13,608,967.72
608 - Conductor Replacement	$ 100,724.20	$247,112.44	$207,348.94	$600,000.00	$618,000.00	$636,540.00	$655,636.20	$2,510,176.20
701 & 702 - Outdoor Lights								
1. New Outdoor Lights Added (702)	91	126	119	112	113	114	115	455
2. Replacement of Outdoor Lights (701)	211	809	1,581	1,739	1,826	1,217	812	5,594
3. Total Outdoor Lights	302	935	1,700	1,851	1,939	1,331	927	6,049
4. Cost per Outdoor Light	$ 717.02	$734.31	$670.96	$ 728.65	$750.51	$773.03	$796.22	
5. Cost of Outdoor Lights	$ 216,541.22	$686,583.93	$1,140,628.95	$1,348,809.38	$1,455,375.05	$1,029,380.76	$738,074.16	$4,571,639.35

NEW MEMBER EXTENSIONS – RUS CODE 100

A total of 1,440 new services are anticipated – 999 of which are underground, 441 are overhead construction. The total projected cost for new service construction is $6,367,708.

The average length of service per overhead customer is 173 feet, and 364 feet for underground. The total projected length for the work plan period is approximately 83 miles.

TIE LINES/NEW CONSTRUCTION – RUS CODE 200

Draffenville Substation, New Hwy 68 Ckt

Code 201-20

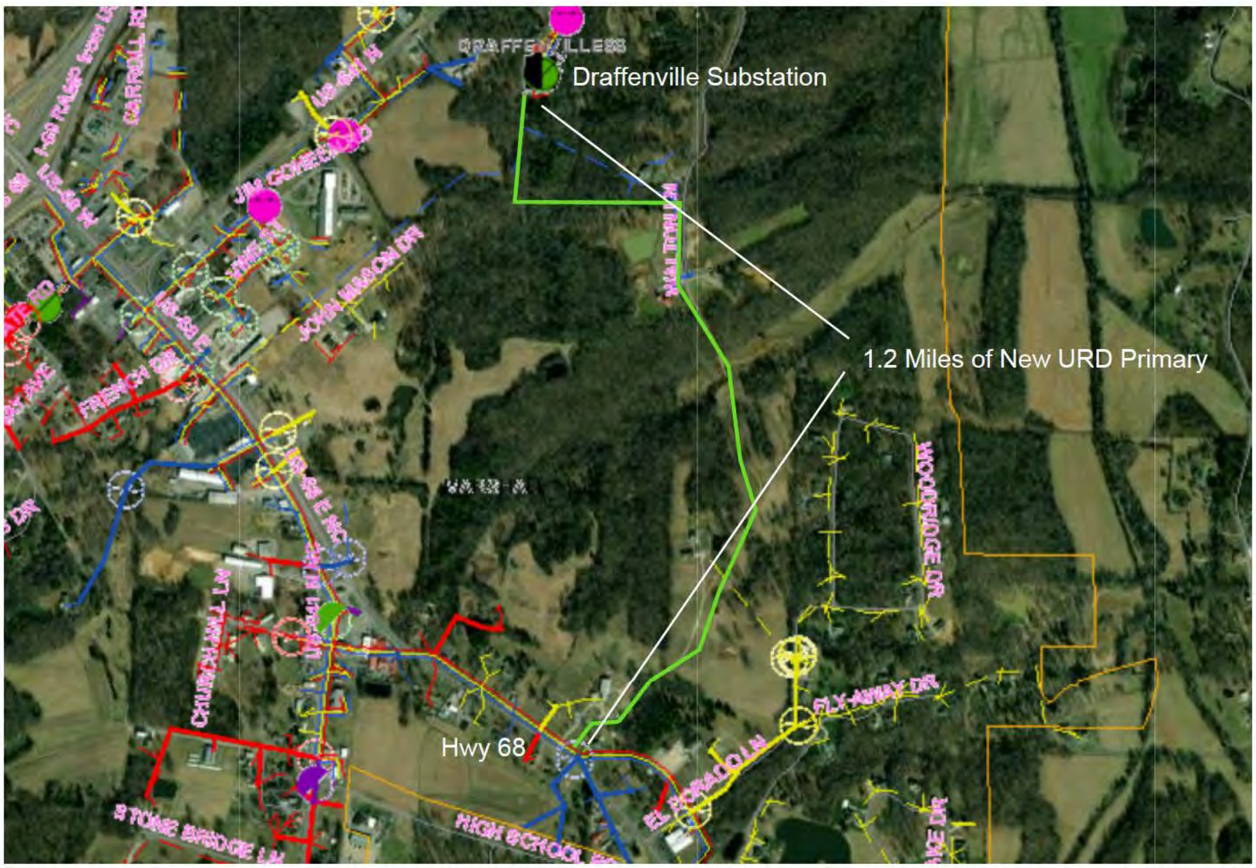
Estimated Cost: $600,000

Year: 2024

Description of Proposed Construction

There will be a new feeder added to the Draffenville substation in order to provide a tie point and improve overall reliability of the station. This project will consist of building 1.2 miles of new underground line.

The total projected cost for the upgrades at Draffenville is $600,000.



SYSTEM IMPROVEMENTS – RUS CODE 300

Burna Substation, Smithland 14254

Code 301-12

Estimated Cost: $399,843

Year: 2027

Description of Proposed Construction

Sections PROH_00034077 to PROH_00034145 – Convert 2.2 miles of single-phase #2 ACSR to three-phase 1/0 ACSR. These line sections are along Maxfield Rd (KY-1608) from US-60 west to Duley Rd (CR-1323) in Smithland.

Reason for Proposed Construction

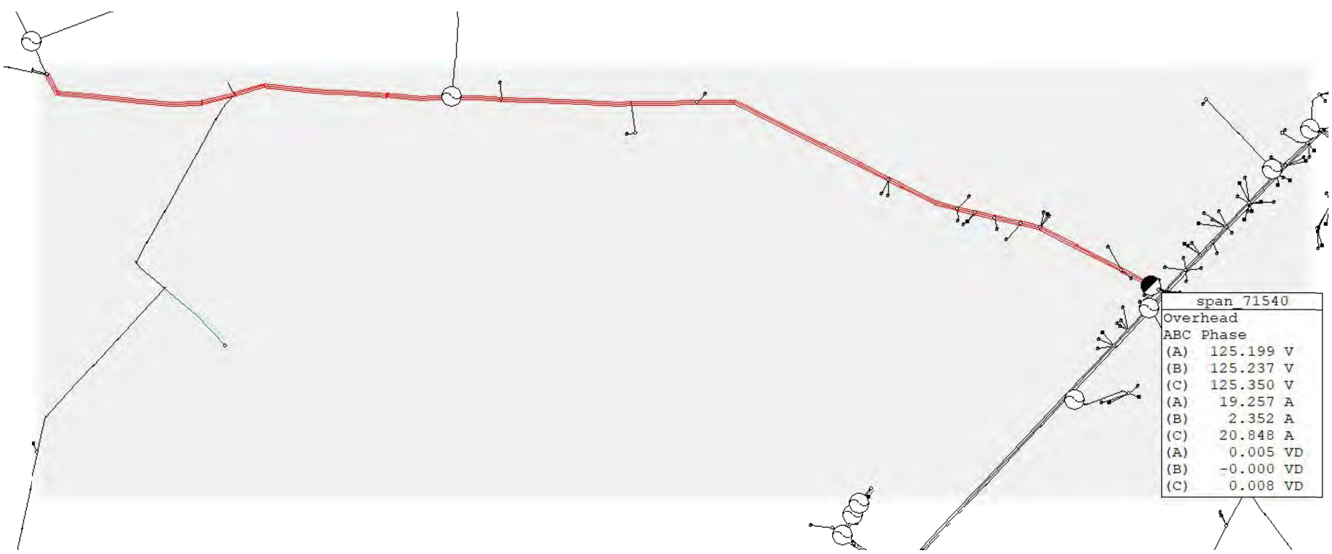
Design Criteria (DC) Item 4 is being violated. (43 amps on single phase)

Results of Proposed Construction

DC Item 4 will be met.

Alternative Corrective Plan Investigated

All potential backfeeds consist of aged copper, which would not be a preferred solution for sustaining the additional load of the backfeed; and would not improve system reliability. 1/0 ACSR was chosen instead of a smaller conductor because this tap may eventually become a three-phase tie point helping to relieve the area North of Smithland.



SYSTEM IMPROVEMENTS – RUS CODE 300

Culp Substation, Sharpe 42244

Code 342-30

Estimated Cost: $90,668

Year: 2025

Description of Proposed Construction

Sections PROH_00028600 to PROH_00028642 – Convert 0.55 miles of single-phase #2 ACSR to three-phase #1/0 ACSR. These line sections are along Sharpe School Rd from Hwy 68 north to Hunters Lane in Calvert City.

Reason for Proposed Construction

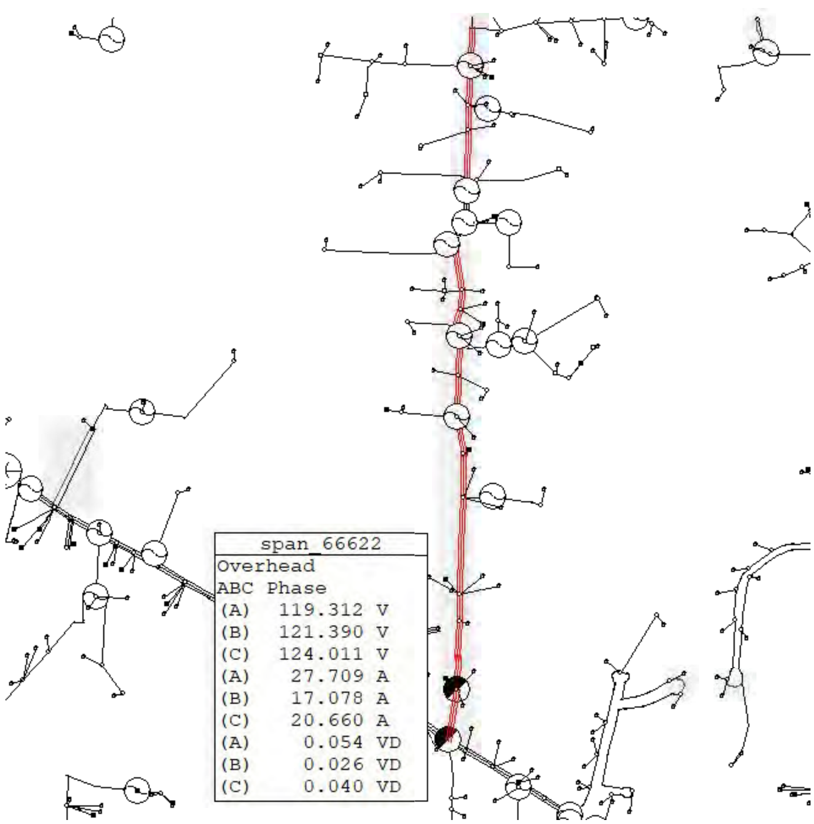
Design Criteria (DC) Item 4 is being violated. (66 amps on single phase)

Results of Proposed Construction

DC Item 4 will be met.

Alternative Corrective Plan Investigated

This is a radial tap, no backfeed to relieve loading exists.



SYSTEM IMPROVEMENTS – RUS CODE 300

Cumberland Substation, Pinckneyville 15224

Code 315-30

Estimated Cost: $394,070

Year: 2024

Description of Proposed Construction

Sections PROH_00033215 to PROH_00033281 – Convert 2.51 miles of single-phase #2 ACSR to three-phase 1/0 ACSR. These line sections are along Kitchen Rd from Pinckneyville Rd east to Shelby Rd near Salem.

Reason for Proposed Construction

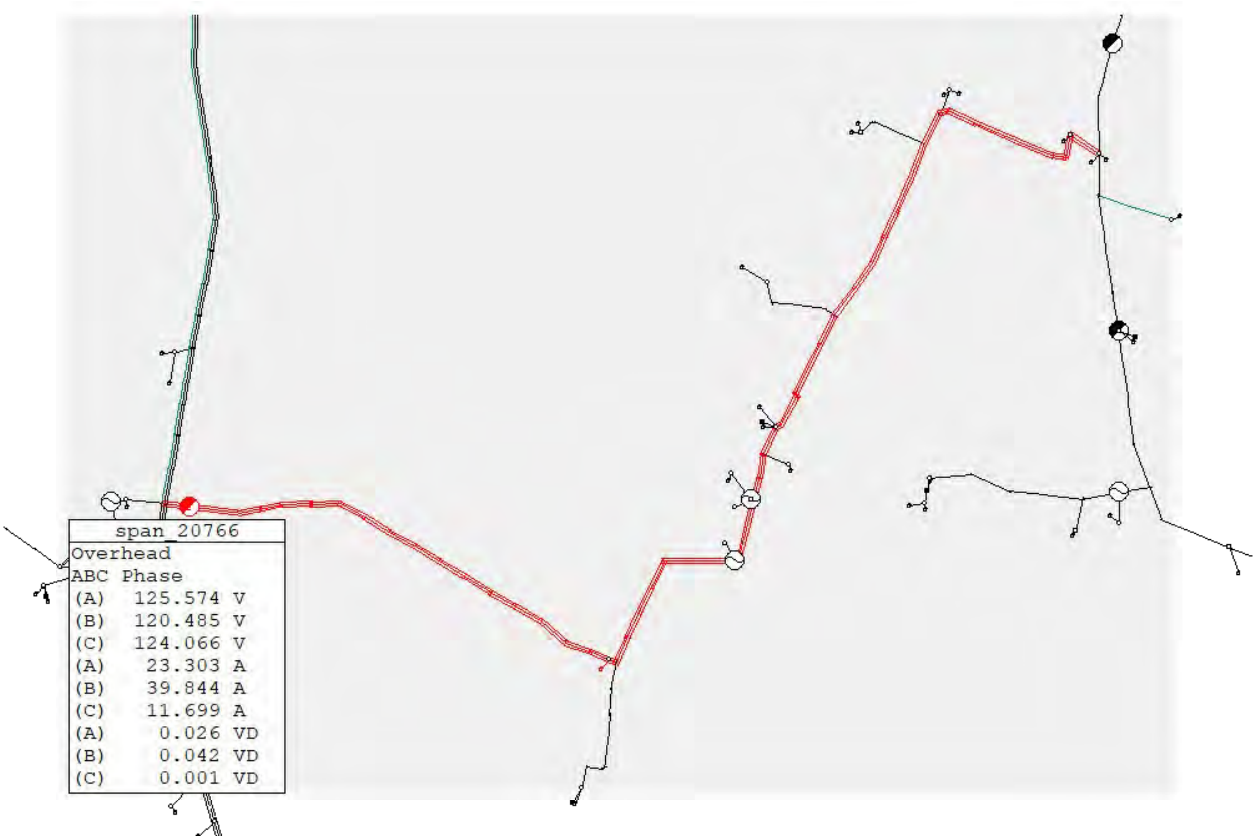
Design Criteria (DC) Items 1 and 4 are being violated. (70 amps on single phase)

Results of Proposed Construction

DC Item 1 and 4 will be met.

Alternative Corrective Plan Investigated

This is a radial tap, no backfeed to relieve loading exists.



SYSTEM IMPROVEMENTS – RUS CODE 300

Draffenville Substation, Draffenville 66214

Code 366-30

Estimated Cost: $15,700

Year: 2024

Description of Proposed Construction

Sections PROH_00031223 to PROH_00031224 – Convert .1 mile of single-phase 1/0 ACSR to three-phase 1/0 ACSR. These line sections are along Gate Rd from Native Circle to the end of the road in Benton.

Reason for Proposed Construction

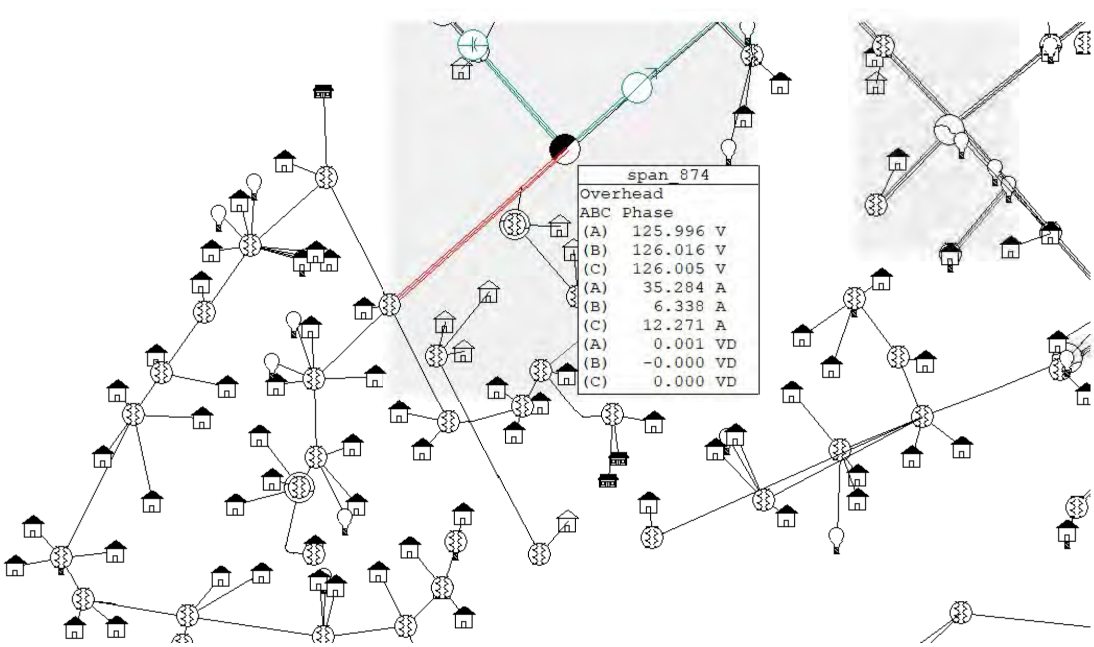
Design Criteria (DC) Item 4 is being violated. (54 amps on single phase)

Results of Proposed Construction

DC Item 4 will be met.

Alternative Corrective Plan Investigated

This is a radial tap, no backfeed to relieve loading exists.



SYSTEM IMPROVEMENTS – RUS CODE 300

Grand Rivers Substation, Smithland 76224

Code 376-30

Estimated Cost: $131,551

Year: 2026

Description of Proposed Construction

Sections PROH_00041851 to PROH_00035334 – Convert .8 miles of single-phase #2 ACSR to three-phase 1/0 ACSR. These line sections are along Red Bud Rd from Dover Rd north to Doe Run Rd in Grand Rivers.

Reason for Proposed Construction

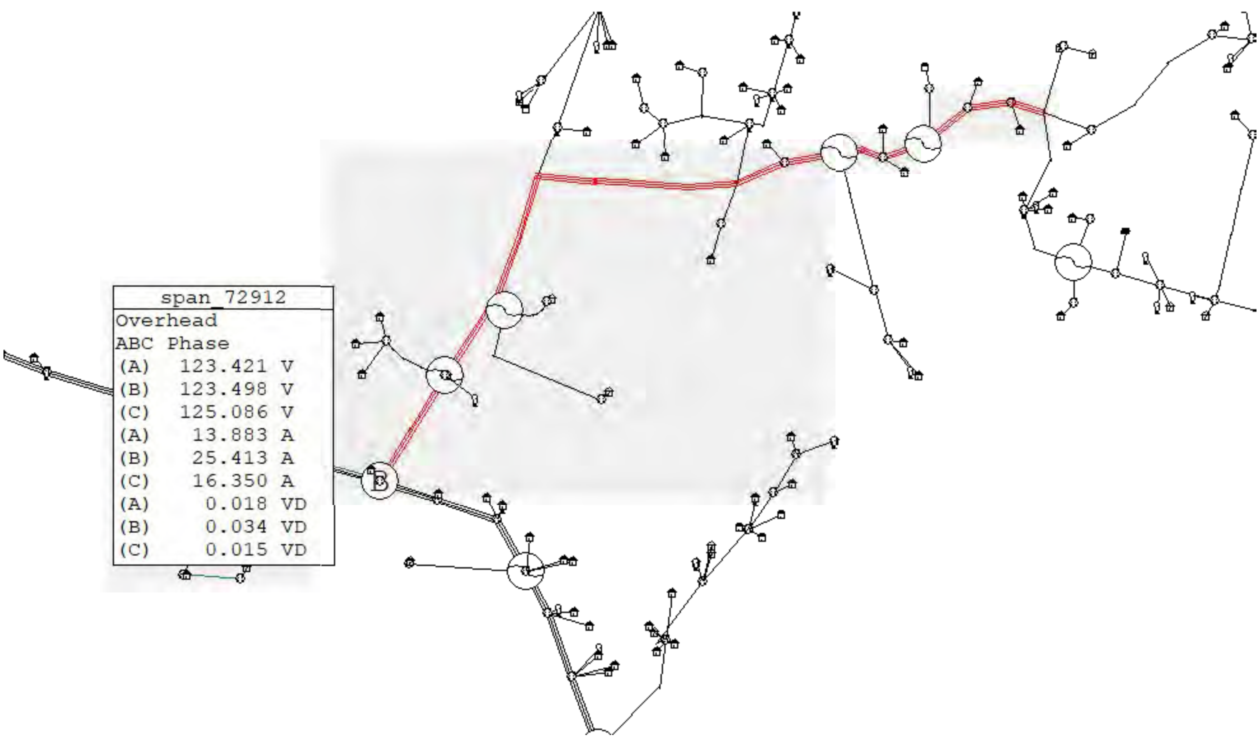
Design Criteria (DC) Item 4 is being violated. (56 amps on single phase)

Results of Proposed Construction

DC Item 4 will be met.

Alternative Corrective Plan Investigated

This is a radial tap, no backfeed to relieve loading exists.



SYSTEM IMPROVEMENTS – RUS CODE 300

Grand Rivers Substation, Averitt 7605

Code 339-16

Estimated Cost: $54,524

Year: 2027

Description of Proposed Construction

Sections PROH_00035691 to PROH_00035728 – Convert 0.27 miles of single-phase #2 ACSR to three-phase 1/0 ACSR. These line sections are along Koon Rd (CR-1123) to Jennings Rd in Grand Rivers.

Reason for Proposed Construction

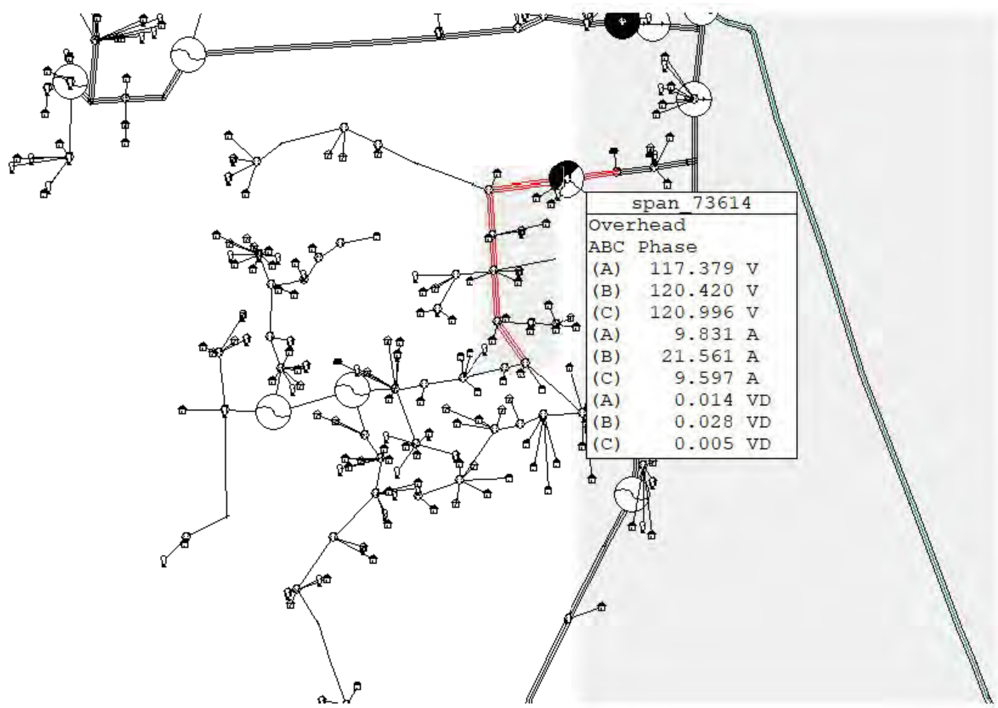
Design Criteria (DC) Items 1 and 4 are being violated. (41 amps on single phase)

Results of Proposed Construction

DC Item 1 and 4 will be met.

Alternative Corrective Plan Investigated

This is a radial tap, no backfeed to relieve loading exists.



SYSTEM IMPROVEMENTS – RUS CODE 300

Joy Substation, Hampton 17495
Code 305-30
Estimated Cost: $446,744
Year: 2025

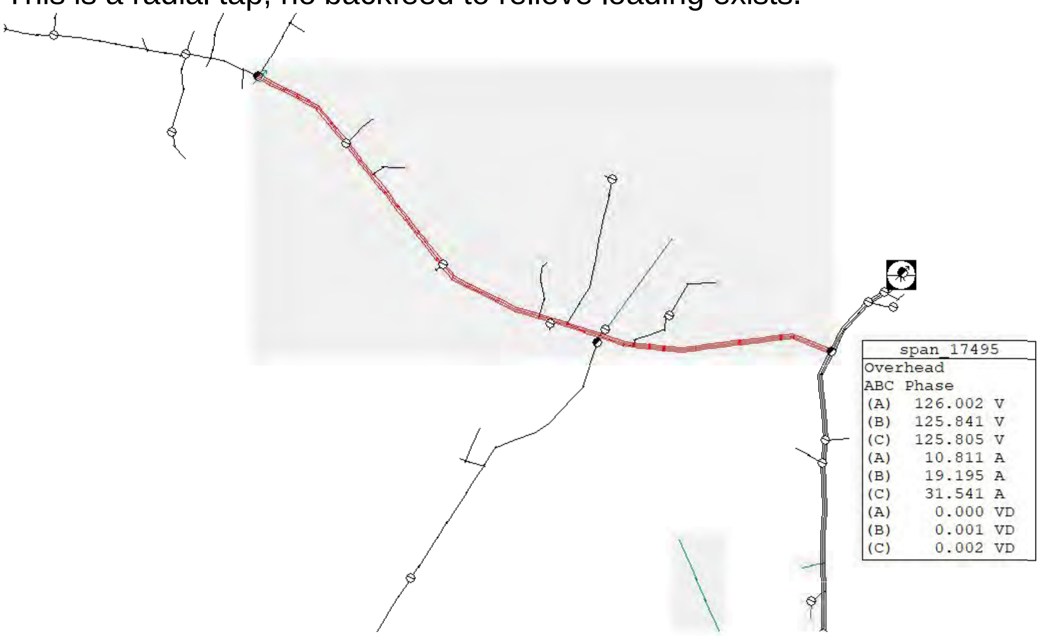
Description of Proposed Construction

Sections PROH_00042185 to PROH_00036619 – Convert 2.71 miles of single-phase #2 and 1/0 ACSR to three-phase 1/0 ACSR. These line sections are along Lola Rd from Carrsville Rd west to Cave Springs Rd in Smithland.

Reason for Proposed Construction
Design Criteria (DC) Item 4 is being violated. (62 amps on single phase)

Results of Proposed Construction
DC Item 4 will be met.

Alternative Corrective Plan Investigated
This is a radial tap, no backfeed to relieve loading exists.



SYSTEM IMPROVEMENTS – RUS CODE 300

Kansas Substation, Folsomdale 61224
Code 361-30
Estimated Cost: $171,360
Year: 2025

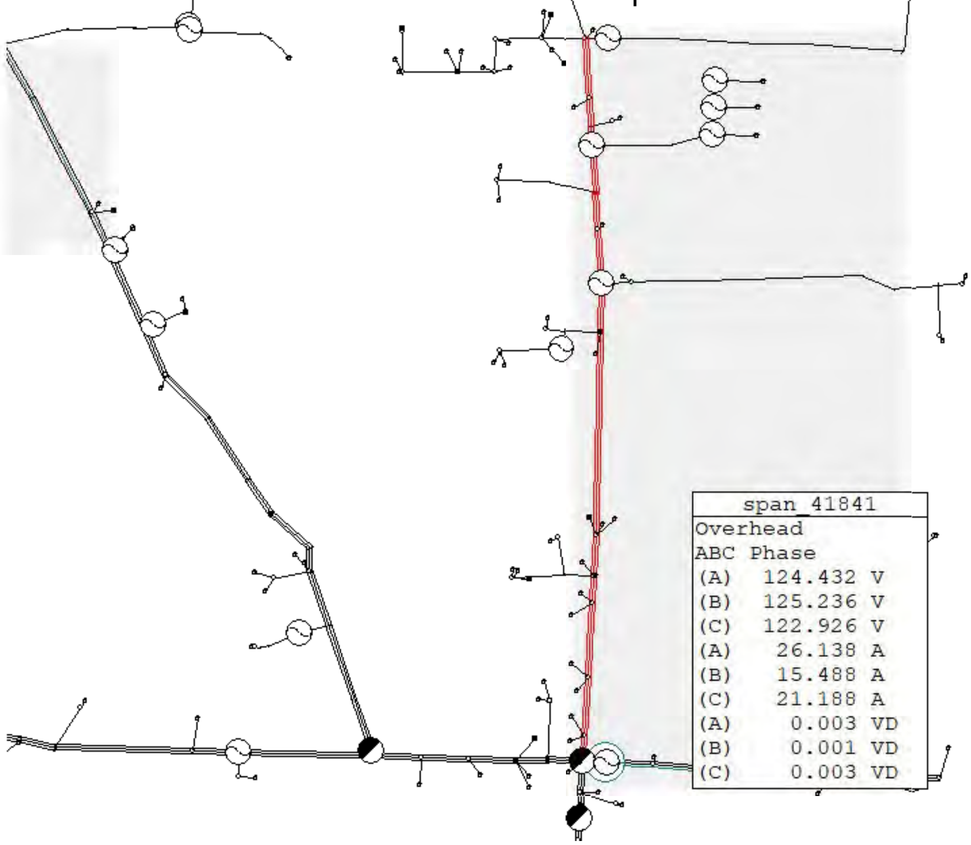
Description of Proposed Construction

Sections PROH_00014298 to PROH_00014303 – Convert 1.02 miles of single-phase #2 ACSR to three-phase 336 ACSR. These line sections are along KY-1241 running north from Shaw Rd to Alvin Rd in Boaz.

Reason for Proposed Construction
Design Criteria (DC) Item 4 is being violated. (64 amps on single phase)

Results of Proposed Construction
DC Item 4 will be met.

Alternative Corrective Plan Investigated
The new line section will create backfeed capabilities and assist with load support.



SYSTEM IMPROVEMENTS – RUS CODE 300

Ledbetter Substation, Ledbetter 31244

Code 331-30

Estimated Cost: $64,370

Year: 2024

Description of Proposed Construction

Sections PROH_00038602 to PROH_00038616 – Convert .41 miles of single-phase #2 ACSR to three-phase 1/0 ACSR. These line sections are along Rudd Spees Rd from Hicks Ln south to Cody Cooper Rd in Ledbetter.

Reason for Proposed Construction

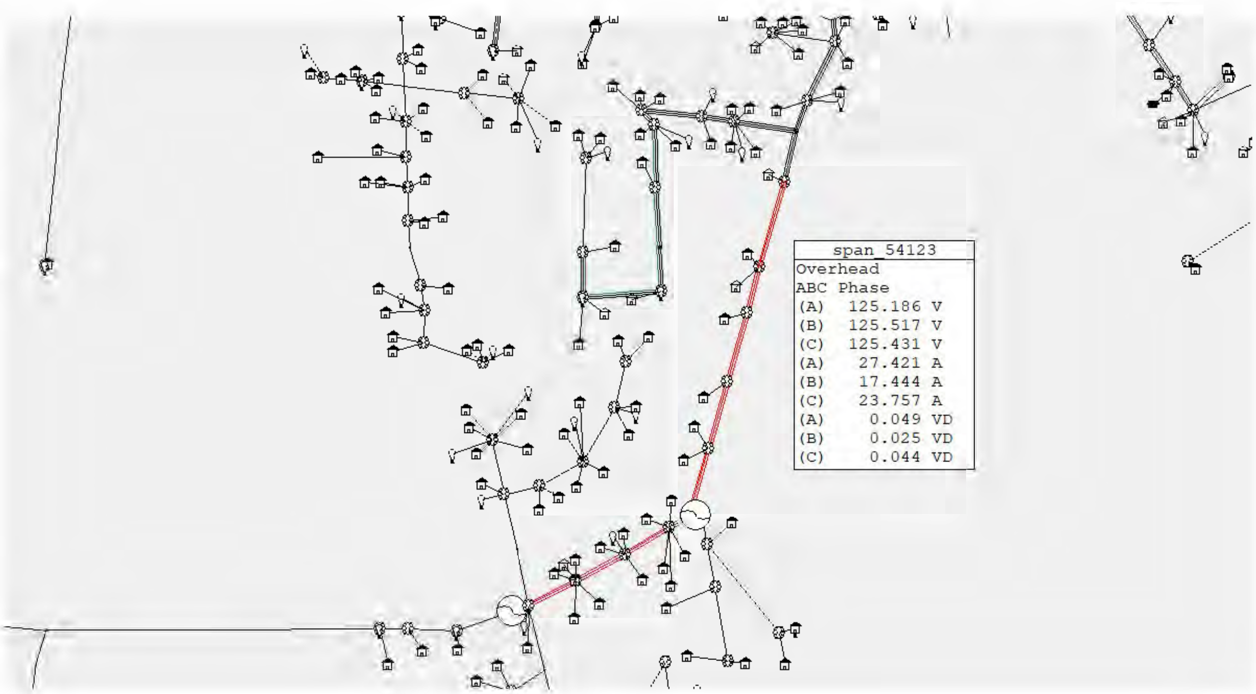
Design Criteria (DC) Item 4 is being violated. (69 amps on single phase)

Results of Proposed Construction

DC Item 4 will be met.

Alternative Corrective Plan Investigated

This is a radial tap, no backfeed to relieve loading exists.



SYSTEM IMPROVEMENTS – RUS CODE 300

Ledbetter Substation, Ledbetter 31244

Code 331-31

Estimated Cost: $41,213

Year: 2025

Description of Proposed Construction

Sections PROH_00042326 to PROH_00038936 – Convert 0.25 miles of single-phase #2 ACSR to three-phase 1/0 ACSR. These line sections are along Shelia Drive beginning north of US 60 and running south to Erwin Circle in Ledbetter.

Reason for Proposed Construction

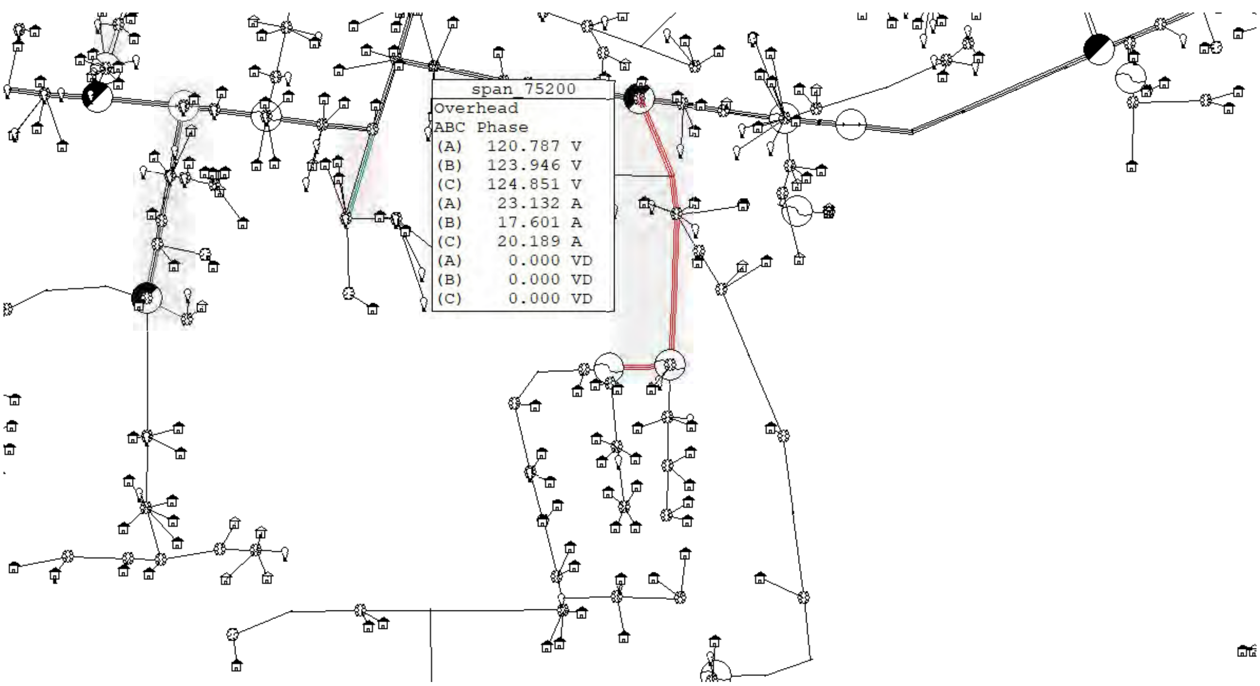
Design Criteria (DC) Item 4 is being violated. (61 amps on single phase)

Results of Proposed Construction

DC Item 4 will be met.

Alternative Corrective Plan Investigated

This is a radial tap, no backfeed to relieve loading exists.



SYSTEM IMPROVEMENTS – RUS CODE 300

Lovelaceville Substation, Lovelaceville 49224

Code 349-30

Estimated Cost: $97,600

Year: 2024

Description of Proposed Construction

Sections PROH_00044960 to PROH_00010373 – Convert 0.61 miles of single-phase #2 ACSR to three-phase 336 ACSR. These line sections run along Hamburg Rd from E Walnut St. north to Upshaw Ln in Lovelaceville.

Reason for Proposed Construction

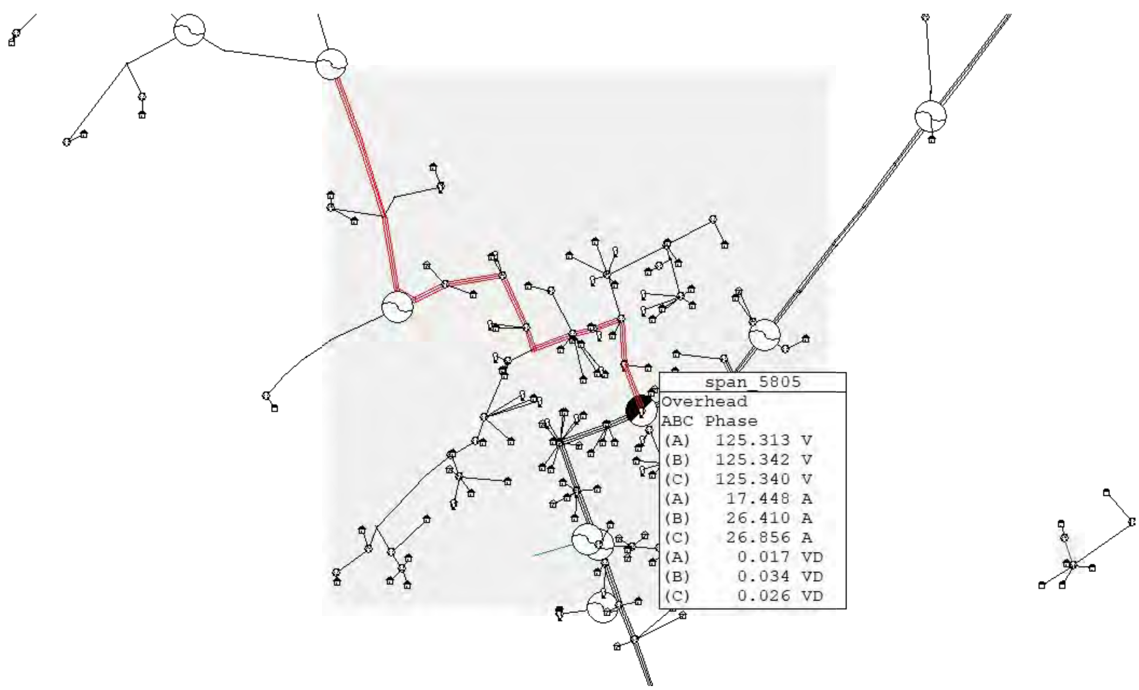
Design Criteria (DC) Item 4 is being violated. (71 amps on single phase)

Results of Proposed Construction

DC Item 4 will be met.

Alternative Corrective Plan Investigated

This is a radial tap, no backfeed to relieve loading exists.



SYSTEM IMPROVEMENTS – RUS CODE 300

Possum Trot Substation, Possum Trot 78224

Code 378-30

Estimated Cost: $85,421

Year: 2027

Description of Proposed Construction

Sections PROH_00027430 to PROH_00027448 – Convert .47 miles of single-phase #2 ACSR to three-phase 1/0 ACSR. These line sections are along Windy Hills Circle and Breeze Ln. from US-62 north to Gale Rd in Calvert City.

Reason for Proposed Construction

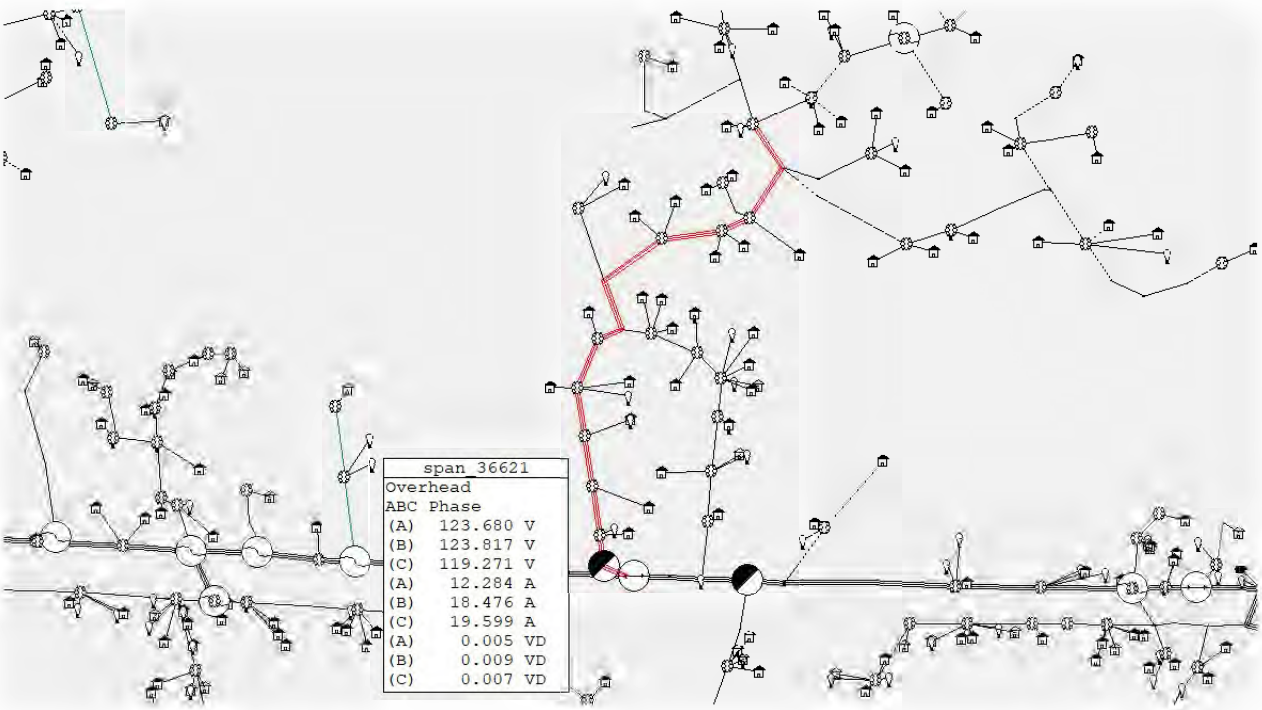
Design Criteria (DC) Item 4 is being violated. (50 amps on single phase)

Results of Proposed Construction

DC Item 4 will be met.

Alternative Corrective Plan Investigated

This is a radial tap, no backfeed to relieve loading exists.



SYSTEM IMPROVEMENTS – RUS CODE 300

Possum Trot Substation, Industrial Loop 78254
Code 378-31
Estimated Cost: $153,860
Year: 2024

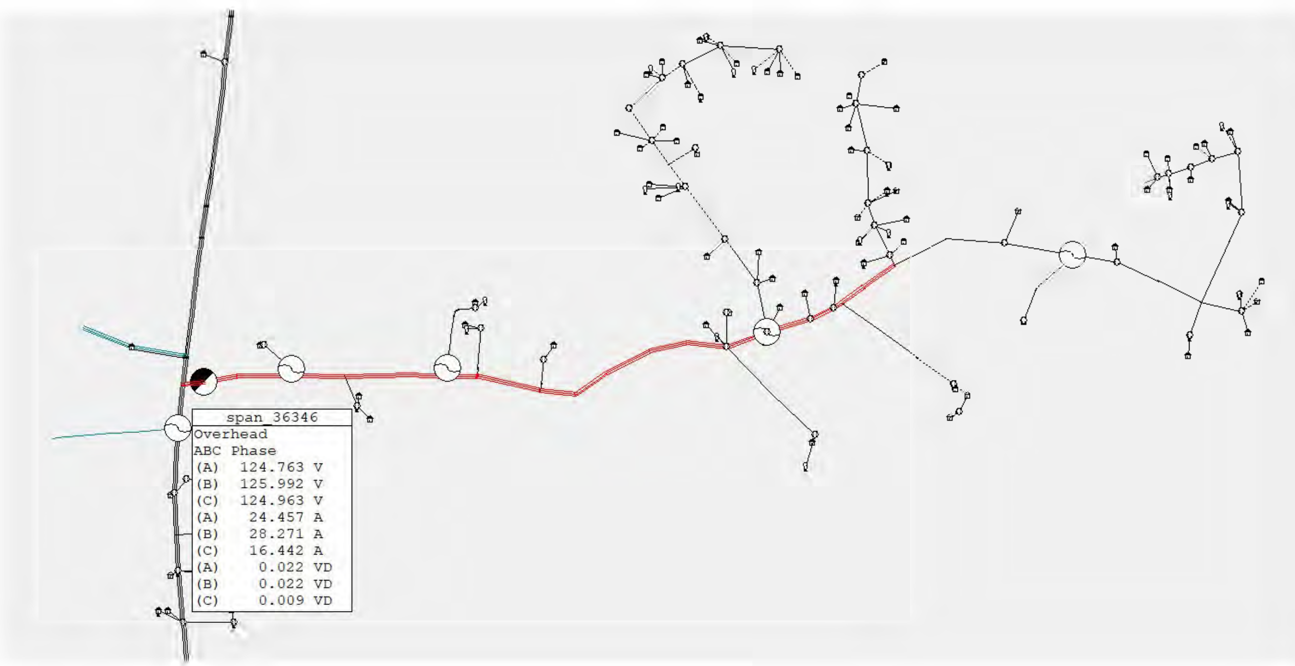
Description of Proposed Construction

Sections PROH_00001611 to PROH_00030312 – Convert .98 miles of single-phase #2 ACSR to three-phase 1/0 ACSR. These line sections are along Calvert City Rd from Industrial Pkwy east to Retirement Circle in Calvert City.

Reason for Proposed Construction
Design Criteria (DC) Item 4 is being violated. (70 amps on single phase)

Results of Proposed Construction
DC Item 4 will be met.

Alternative Corrective Plan Investigated
This is a radial tap, no backfeed to relieve loading exists.



SYSTEM IMPROVEMENTS – RUS CODE 300

Smithland Substation, Tiline 32224

Code 332-30

Estimated Cost: $214,635

Year: 2026

Description of Proposed Construction

Sections PROH_00001929 to PROH_00040695 – Convert 1.24 miles of single-phase #2 ACSR to three-phase 1/0 ACSR. These line sections are along Mount Zion Rd from Linley Rd south to Coon Chapel Rd in Smithland.

Reason for Proposed Construction

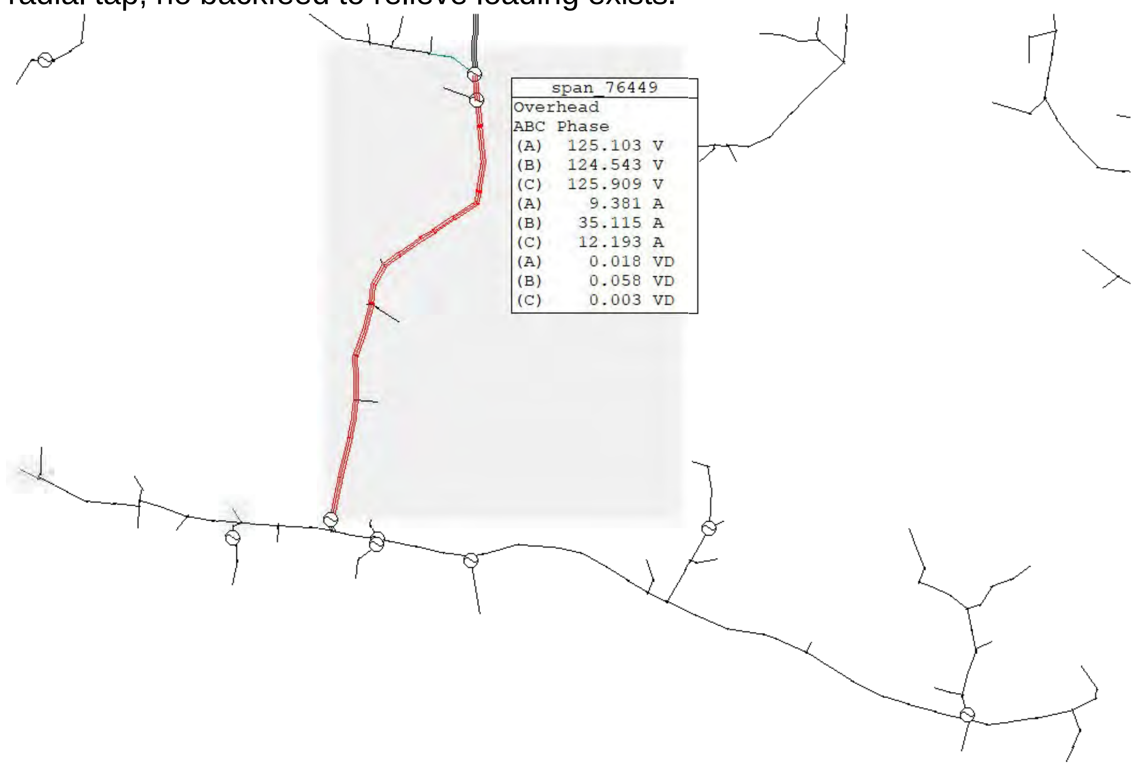
Design Criteria (DC) Item 4 is being violated. (57 amps on single phase)

Results of Proposed Construction

DC Item 4 will be met.

Alternative Corrective Plan Investigated

This is a radial tap, no backfeed to relieve loading exists.



SYSTEM IMPROVEMENTS – RUS CODE 300

Smithland Substation, Mitchell Store 32244
Code 332-31
Estimated Cost: $231,945
Year: 2026

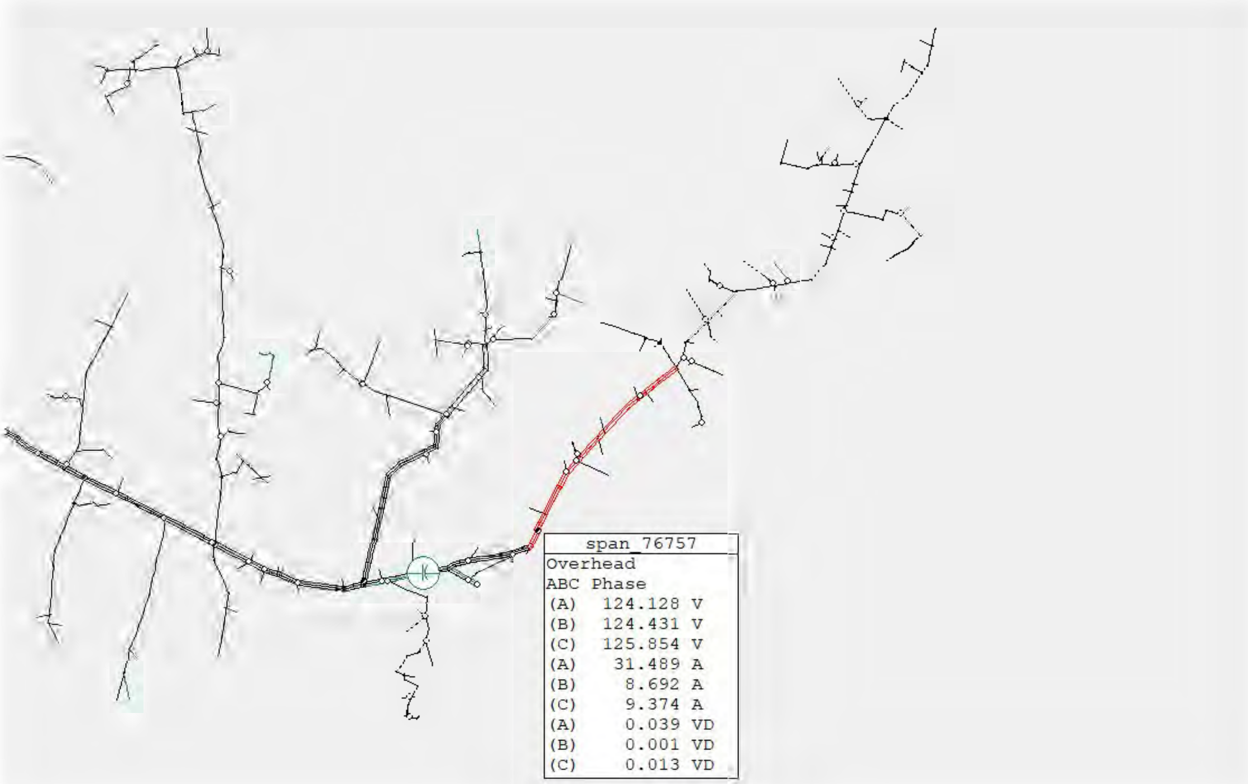
Description of Proposed Construction

Sections PROH_00081251 to PROH_00039826 – Convert 1.34 miles of single-phase #2 ACSR to three-phase 1/0 ACSR. These line sections are along Paradise Rd from Iuka Rd north to Country Rd in Grand Rivers.

Reason for Proposed Construction
Design Criteria (DC) Item 4 is being violated. (50 amps on single phase)

Results of Proposed Construction
DC Item 4 will be met.

Alternative Corrective Plan Investigated
This is a radial tap, no backfeed to relieve loading exists.



SUBSTATION UPGRADES– RUS CODE 500

Upgrade Kevil Substation to 15/20/25 MVA (514) - The Kevil substation will be upgraded in 2026. With the increase in transformer size, a 69kV breaker will be used for transformer protection along with installing new solid-state relays and upgrading to feeder regulation.

The total projected cost for the upgrades at New York is $3,420,000.00.

Kevil Substation Upgrade:	Quantity		Unit Price	Total(Time Escalated)	Years Escalated
Steel Modifications			$375,000.00	$409,772.63	3
Transformer:	1 - 69/12.5kV 15/20/25 MVA		$700,000.00	$764,908.90	3
Circuit Breaker or Switcher	1 - 69 kV	@ $50,000 ea.	$50,000.00	$54,636.35	3
Regulators:	9 - 438 Amp	@ $40,000 ea.	$40,000.00	$393,381.72	3
Foundations			$175,000.00	$191,227.23	3
Feeder Breakers	3-1200A R-Mags	@$35,000	$105,000.00	$114,736.34	3
Conduit and Control Cable			$75,000.00	$81,954.53	3
Relays and Battery Equipment			$50,000.00	$54,636.35	3
Switches and Bus Work			$375,000.00	$409,772.63	3
Oil Containment			$80,000.00	$87,418.16	
Fence/Site Prep			$100,000.00	$106,090.00	2
Control House			$280,000.00	$305,963.56	3
		Subtotal		$2,974,498.38	
Testing			$50,000.00	$54,636.35	3
		Subtotal		$3,029,134.73	
Engineering (7.4%)				$224,155.97	
		Subtotal		$3,253,290.69	
Contingency (5%)				$162,664.53	
		Total		**$3,415,955.23**	
		Total for Budget		**$3,420,000.00**	

Upgrade New York Substation to feeder regulation (508) - The New York substation will be upgraded in 2025. The old Krebs Rd transformer was installed at New York in 2023 which increased available capacity. Upgrade in 2025 will include feeder regulation, solid state relays, and 69kV breaker addition.

The total projected cost for the upgrades at New York is $1,635,000.

New York Substation Upgrade:	Quantity		Unit Price	Total(Time Escalated)	Years Escalated
Steel Modifications			$100,000.00	$109,272.70	3
Circuit Breaker or Switcher	1 - 69 kV	@ $70,000 ea.	$70,000.00	$76,490.89	2
Regulators:	15 - 438 Amp	@ $40,000 ea.	$40,000.00	$636,540.00	2
Foundations			$50,000.00	$57,963.70	3
Conduit and Control Cable			$40,000.00	$43,709.08	3
Relay Cabinet			$25,000.00	$27,318.18	3
		Subtotal		$951,294.55	
Labor (50%)				$475,647.27	
Testing			$20,000.00	$21,854.54	3
		Subtotal		$1,448,796.36	
Engineering (7.4%)				$107,210.93	
		Subtotal		$1,556,007.29	
Contingency (5%)				$77,800.36	
		Total		**$1,633,807.66**	
		Total for Budget		**$1,635,000.00**	

Upgrade Smithland Substation to 15/20/25 MVA (515) – The Smithland substation will be upgraded in 2027. With the increase in transformer size, a 69kV breaker will be used for transformer protection along with installing new solid-state relays and upgrading to feeder regulation.

The total projected cost for the upgrades at Smithland is $3,660,000.

Smithland Substation Upgrade:	Quantity		Unit Price	Total(Time Escalated)	Years Escalated
Steel Modifications for Highside Breaker			$100,000.00	$112,550.88	4
Transformer:	1 - 69/12.5kV 15/20/25 MVA		$700,000.00	$787,856.17	4
Circuit Breaker or Switcher	1 - 69 kV	@ $70,000 ea.	$70,000.00	$78,785.62	4
Regulators:	9 - 438 Amp	@ $40,000 ea.	$40,000.00	$405,183.17	4
Foundations			$175,000.00	$202,872.96	5
Feeder Breakers	3-1200A R-Mags	@$25,000	$25,000.00	$84,413.16	4
Conduit and Control Cable			$75,000.00	$84,413.16	4
Relays and Battery Equipment			$50,000.00	$57,963.70	5
Feeder Bay Steel & Conductors	4		$200,000.00	$927,419.26	5
Oil Containment			$80,000.00	$90,040.70	4
Control House			$280,000.00	$324,596.74	5
Site Work			$30,000.00	$33,765.26	4
		Subtotal		$3,156,095.53	
Testing			$50,000.00	$57,963.70	5
		Subtotal		$3,214,059.23	
Engineering (7.4%)				$237,840.38	
		Subtotal		$3,451,899.62	
Contingency (5%)				$172,594.98	
		Total		**$3,658,259.86**	
		Total for Budget		**$3,660,000.00**	

RUS CODE 601

New Transformers and Meters

A total of 1,819 new transformers are anticipated – 466 of which are underground, 1,353 are overhead construction. The total projected cost for adding new transformers is $5,059,548.

A total of 1,440 new meters are anticipated at an estimated cost of $291,538.50.

An AMI system upgrade is planned during 2024 and 2025. The total number of replacement meters is approximately 30,360 at an estimated cost of $5,588,920.

The total cost for anticipated new transformers and meters over the 2024-2027 CWP is estimated at $10,940,007.

RUS CODE 608

Replace Aging Conductor – RUS Code 608
JPEC is planning to replace a significant amount of CWC conductor with new #2 ACSR. There are an estimated 94 miles of this wire on the system. JPEC is planning to replace approximately 20 miles of this wire over four years. Reconductor projects are also planned along the Cumberland, Pinckneyville Ckt. and the Grand Rivers, Averitt Ckt. to replace small conductor with #336 ACSR.

The projected cost of this conductor replacement is $2,510,176.

RUS CODE 616

Communications/New Fiber – RUS Code 616
JPEC plans to add fiber between substations on existing overhead poles. This project will include approximately 105 miles of new fiber between existing substations. This is needed for redundant communication paths between substations and communication to down-line electric system devices. All work will be done within existing ROW and no tree clearing will be required.

RUS CODE 700

Outdoor Lighting – RUS Code 701 and 702
JPEC plans to replace 5,594 lights over the 2024-2027 CWP period. These replacements are due to failure of aging lights. All new lights installed will be LED fixtures.

Along with the replacements, 455 new lights are anticipated during this CWP.

The total projected cost of replacements and new installations is $4,571,639.