COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE ELECTRONIC APPLICATION OF MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO CONTINUE THE FULL DEPLOYMENT INSTALLATION OF ITS ADVANCED METERING INFRASTRUCTURE SYSTEM	))))))	CASE NO. 2020-00336

APPLICATION

Comes now Meade County Rural Electric Cooperative Corporation ("Meade County"), by counsel, pursuant to KRS 278.020, 807 KAR 5:001(9), and for its Application requesting a Certificate of Public Convenience and Necessity ("CPCN") to continue with a full deployment installation of an Advanced Metering Infrastructure system ("AMI") to begin in 2021 and continue through 2023, respectfully states as follows:

1. Meade County is a not-for-profit, member-owned, rural electric distribution cooperative corporation duly organized and existing under KRS Chapter 279. Meade County is engaged in the business of distributing retail electric power to approximately 30,000 members in the Kentucky counties of Breckinridge, Grayson, Hancock, Hardin, Meade and Ohio.

2. Pursuant to 807 KAR 5:001 Section 14(1), Meade County's address is 1351 Highway 79, P.O. Box 489, Brandenburg, KY 40108-0489. Meade County's address for electronic mail service is mlittrel@mcrecc.com. This Application, including the Exhibits attached hereto and incorporated herein, contain fully the facts on which Meade County's request for a CPCN is based, and an Order from the Commission granting the CPCN proposed herein is requested.

3. Pursuant to 807 KAR 5:001 Section 14(2), Meade County was incorporated in the Commonwealth of Kentucky on June 4, 1937, and hereby attests that it is currently in good standing in Kentucky.

4. Meade County will construct the proposed continued full deployment AMI project with general funds. Meade County's Construction Work Plan reflects this project. RUS approval has been received. 807 KAR 5:001 Section 15(2)(c), (e).

5. The estimated cost of the project is $5,600,000. Meter cost and installation is projected to be $4,100,000 and network hardware cost and installation is projected to be $1,500,000.

6. Attached hereto and made a part of this Application are the following:

- Direct Testimony of Michael French, P.E., Director of System Engineering
- EXHIBIT 1 Applicant Research, Vendor Assessment and Vendor Choice
- EXHIBIT 2 Description of the AMI Technology
- EXHIBIT 3 AMI Vendor Evaluation Matrix
- EXHIBIT 4 System Acceptance Test Plan
- EXHIBIT 5 Projected Benefits for Meade County and its Membership
- EXHIBIT 6 TS2 End of Sales, FAQ's

7. Mr. French's testimony explains why the proposed project is required by the public convenience and necessity. 807 KAR 5:001 Section 15(2)(a).

8. No franchises or permits will be required for the proposed project. 807 KAR 5:001 Section 15(2)(b).

9. Meade County will replace its existing metering system with the new AMI system throughout its service territory. The new system will not compete with any other public utilities, corporations, or persons. 807 KAR 5:001 Section 15(2)(c).

10. Because the system will be installed through Meade County's territory, Meade County does not believe the maps required by 807 KAR 5:001 Section 15(2)(d) would assist the Commission in its review of this application, and Meade County requests a deviation from that requirement pursuant to 807 KAR 5:001 Section 22. Sample pictures of the AMI meters are found in Exhibit 2. 807 KAR 5:001 Section 15(2)(d).

11. The estimated annual cost of operation after the proposed system is placed into service is $28,500.00 for annual software support and maintenance. 807 AR 5:001 Section 15(2)(f).

12. Meade County is requesting relief pursuant to 807 KAR 5:041 Section 22 from the periodic and statistical testing of meters required by 807 KAR 5:041 Section 16 for the duration of the project for the full deployment of the AMI meters, as all meters, with the exception of the initial pilot meters, in Meade County's service territory will be changed and tested. All testing will resume in January 2024.

WHEREFORE, Meade County respectfully asks that the Public Service Commission of the Commonwealth of Kentucky issue a Certificate of Public Convenience and Necessity authorizing Meade County to continue with a full deployment installation of an AMI system, for a deviation from the requirement to file maps, and for a temporary deviation from the annual testing of meters during the project.

Respectfully submitted,

Honorable Thomas C Brite
Attorney At Law
Brite & Hopkins, PLLC
107 S. Main Street
P.O. Box 309
Hardinsburg, Kentucky 40143

Counsel for Meade County Rural Electric Cooperative Corporation

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE ELECTRONIC APPLICATION OF MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO CONTINUE THE FULL DEPLOYMENT INSTALLATION OF ITS ADVANCED METERING INFRASTRUCTURE SYSTEM	))))))	CASE NO. 2020-00336

VERIFICATION OF MICHAEL FRENCH

COMMONWEALTH OF KENTUCKY)
)
COUNTY OF MEADE)

Michael French, being duly sworn, states that she has supervised the preparation of her 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.

Michael French

The foregoing Verification was signed, acknowledged and sworn to before me this 19th day of October, 2020, by Michael French.

Notary Commission No. KYNP 136744

Commission expiration: August 24, 2024

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE ELECTRONIC APPLICATION OF MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION FOR A CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY TO CONTINUE THE FULL DEPLOYMENT INSTALLATION OF ITS ADVANCED METERING INFRASTRUCTURE SYSTEM	))))))	CASE NO. 2020-00336

DIRECT TESTIMONY OF MICHAEL FRENCH, P.E., DIRECTOR OF SYSTEM ENGINEERING ON BEHALF OF MEADE COUNTY RURAL ELECTRIC COOPERATIVE CORPORATION

Filed: October 28, 2020

Q. Please state your name, business address and position at Meade County Rural Electric Cooperative Corporation ("Meade County").

A. Michael French, 1351 Highway 79, Brandenburg, KY 40108. I am the Director of System Engineering.

Q. What is your educational background?

A. Bachelor of Science in Electrical Engineering from the University of Louisville J.B. Speed School of Engineering in 2000 and received my P.E. certification in 2010. I also received certifications in A+, Network+, Security+, Microsoft Certified Professional, Microsoft Certified System Administrator, and Microsoft Certified System Engineer in 2007.

Q. What is your work experience?

A. I have worked for Meade County since May 2000. I have held the following positions: Electrical Engineer, Supervisor of Management Information Systems, System Engineer, and Director of System Engineering. I oversee Meade County's IT department, Metering Department, Mapping Technician, and Engineering Technician.

Q. What is the purpose of your testimony?

A. Meade County is requesting a Certificate of Public Convenience and Necessity to continue with the full deployment installation of an Advanced Metering Infrastructure system ("AMI"). The estimated total cost of the project is $5,600,000. Meter cost and installation is projected to be $4,100,000 and network hardware cost and installation is projected to be $1,500,000.

Q. Have you previously submitted testimony before the Kentucky Public Service Commission?

A. No, I have not testified before the Kentucky Public Service Commission, but I have assisted in the development of other proceedings to include the following cases:

- Case No. 2008-00169 Interconnection and Net Metering Guidelines for Retail Electric Suppliers and Qualifying Customer-Owned Generators
- Case No. 2008-00408 Consideration of the New Federal Standards of the Energy Independence and Security Act of 2007
- Case No. 2011-00450 An Investigation of the Reliability Measures of Kentucky's Jurisdictional Electric Distribution Utilities
- Case No. 2012-00428 Consideration of the Implementation of Smart Grid and Smart Meter Technologies
- Meade County's Construction Work Plans.

Q. Why is Meade County seeking the certificate?

A. Meade County's current Landis + Gyr Power Line Carrier ("PLC") system is End of Life with support ending in 2022 and no ability to order replacement parts since October 2019. This has forced Meade County to evaluate a new AMI system. Meade County's Landis + Gyr Gridstream AMI pilot system was successfully deployed in 2019. After utilizing a System Acceptance Test ("SAT") the pilot was accepted as meeting all requirements and expectations. Meade County has seen several benefits with the pilot system and cost savings. The pilot system has allowed Meade County to analyze its system more efficiently, utilize real time data from meters, allow members to access their

15 minute interval data to make better decisions about their usage, reduce truck rolls, eliminate the need for manual readings, enable remote connects and disconnects for most situations, test pre-pay internally, and find issues in the field before they could cause an outage or member complaint. These benefits, the success of the pilot system, and the end of life of the existing PLC system are the reasons for seeking a Certificate of Public Convenience and Necessity.

Q. Are you sponsoring any exhibits?

A. Yes, I have prepared the following exhibits to support my testimony:

- Exhibit 1 – Applicant Research, Vendor Assessment, and Vendor Choice
- Exhibit 2 – Description of the AMI Technology
- Exhibit 3 – AMI Vendor Evaluation Matrix
- Exhibit 4 – System Acceptance Test Plan
- Exhibit 5 – Projected Benefits for Meade County and its Membership
- Exhibit 6 – TS2 End of Sales, FAQ's

Q. How will Meade County pay for the AMI system?

A. Meade County will construct the proposed AMI project from general funds.

Q. Has Meade County's Board approved the AMI project?

A. Yes, at the September 16, 2020 board meeting.

Q. Does this conclude your testimony?

A. Yes.

Meade County Rural Electric Cooperative Corporation
Case No. 2020-00336
Application for a CPCN to Continue the Full Deployment of its AMI System
Filed October 28, 2020

EXHIBIT 1

Applicant Research, Vendor Assessment and Vendor Choice

On January 18, 2018, Meade County made a mandatory business decision to evaluate a new AMI system after receiving from Landis + Gyr a TS2 End of Sales, FAQ. As provided in Exhibit 6, the FAQ included an explanation that Meade County's existing Power Line Carrier (PLC) AMI system was nearing the end of its useful life. System support is scheduled to end in year 2022, and replacement parts would close by year 2020. In response to the receipt of the FAQ, Meade County formed an AMI Committee on March 3, 2018. On May 7, 2018, the AMI Committee requested presentations to the committee from five (5) different vendors: Aclara, Eaton, Landis + Gyr, Silver Spring/Itron, and Tantalus. The AMI Committee completed thorough evaluation of each vendor, and, on November 6, 2018, a Request for Proposal (RFP) was sent to three (3) of the five (5) vendors: Aclara, Landis + Gyr, and Silver Spring/Itron. The system specifications that the AMI Committee deemed essential are as follows:

1. System is a RF AMI solution (RF Mesh, Point to Multipoint RF, etc.) with two-way communication.
2. Achieve:

    - 100% Coverage (all deployed meters are active on RF mesh network)
    - 99.9% delivery of billing determinants every 72 hours.
    - 95% of all meters must report back following an on-demand request.
    - Meters must be Aclara/GE or Landis & Gyr.
    - The system design results in an average of 8 hops per meter, no more than 12 hops per meter and allows each meter's "last gasp" to be delivered to Futura OMS.
    - Provide integration to SEDC UPN/MDM, and Futura's GIS/OMS.

EXHIBIT 1 (continued)

Applicant Research, Vendor Assessment and Vendor Choice

3. Capable of sending and receiving DNP3 communication to control downline devices.
4. Any meter equipped with a disconnect/reconnect switch must be able to display the open/closed status of the switch on the meter display.
5. Meters must have the ability to collect and report kWh, kW and voltage. Poly phase meters must have additional capability to collect and report Power Factor at peak kW.
6. Poly phase meters shall be auto-ranging in voltage (120-480V).

On February 6, 2019, Meade County received and reviewed the RFP's from all vendors. The AMI Committee evaluated each RFP using a scoring mechanism and performed site visits and conference calls with other electric distribution cooperatives to help determine which vendor could provide the best AMI system solution for Meade County. Aclara and Landis + Gyr were selected for contract negotiations on March 6, 2019. These two (2) vendors were selected due to their long-standing reputation in the field of AMI, and for their well-known system dependability and capability. The AMI committee deemed the Landis + Gyr Gridstream solution most suitable for the needs of Meade County, and a contract was signed on June 30, 2019 to proceed with a pilot program.

Meade County Rural Electric Cooperative Corporation
Case No. 2020-00336
Application for a CPCN to Continue the Full Deployment of its AMI System
Filed October 28, 2020

EXHIBIT 1 (continued)

Applicant Research, Vendor Assessment and Vendor Choice

Areas surrounding Meade County's Brandenburg and Flaherty substations were selected for the AMI pilot project. [1] Pilot installation started on October 23, 2019 and finished on December 30, 2019. Meade County used contractors to install networking equipment, rebuild installations, change meters, perform required testing, and store end of life meters for up to 6 months.

After the installation of the pilot, Meade County and Landis + Gyr started a System Acceptance Test (SAT) on March 6, 2020 as provided in Exhibit 4. The SAT was completed on March 30, 2020 and concluded that all tests met or exceeded expectations. Meade County accepted the pilot on April 21, 2020.

With the success of the pilot, Meade County wishes to proceed with full deployment of the Landis + Gyr Gridstream system.

[1] See PSC Staff Opinion 2018-006

Meade County Rural Electric Cooperative Corporation
Case No. 2020-00336
Application for a CPCN to Continue the Full Deployment of its AMI System
Filed October 28, 2020

EXHIBIT 2

Description of the AMI Technology

The Gridstream Connect, two-way mesh network solution is based on a robust system architecture providing a smart grid system with advanced metering, and the ability to utilize the same network infrastructure for expanding AMI, Load Response, Distribution Automation, and Street Light control initiatives. The expanding connectivity and multi-application platform is uniquely positioned to address the needs of the modern grid and provides exceptional value while preparing utilities for the future market needs.

Gridstream features a multi-tiered security portfolio including:

1. Backhaul Security – Data Privacy and integrity from the collector to Command Center
2. Data Privacy – All upstream and downstream data is kept private using a single network wide key.
3. Firmware Integrity – Network devices can authenticate that a firmware upgrade request came from a trusted source via a digital signature.
4. Command Center Security Controls – User and endpoint auditing, role-based access control, security dashboard, access controls, etc.
5. Validated Cryptography – Cryptographic libraries used by the components have been validated by NIST.

EXHIBIT 2 (continued)

Description of the AMI Technology

6. Message Integrity – Upstream and downstream messages can be validated to ensure messages were not unknowingly tapered with using SHA256 HMAC that includes portions of the AES256 network key.
7. Field Tool Session Management – Field Technicians must authenticate themselves to Command Center on a weekly basis to obtain a new session.

At the center of the Gridstream RF Mesh solution is a true mesh, peer-to-peer network where each endpoint device, router, and collector communicates in a peer-to-peer fashion, extending the coverage and reliability of the network. The asynchronous spread spectrum, multi-channel communication structure allows for increased data throughput and opens more paths to the data collector. The self-healing network features dynamic routing messages that automatically adjust for changes to endpoints and the introduction of obstructions, such as foliage or new construction. System routers utilize one watt of power to increase transmit distance and throughput, while data collectors support up to 25,000 meters, further minimizing infrastructure and maintenance costs.

Key Features Include:

- True wireless, peer-to-peer mesh network
- "Plug-and-work" auto-registering endpoints and devices
- Dynamic routing, self-healing network
- Support for 15-minute interval data
- Integrated disconnect meter option
- Prepay Capabilities

Meade County Rural Electric Cooperative Corporation
Case No. 2020-00336
Application for a CPCN to Continue the Full Deployment of its AMI System
Filed October 28, 2020

EXHIBIT 2 (continued)

Description of the AMI Technology

- ZigBee®-enabled home area network capability
- Outage Notification
- Distribution Automation
- Load Control and Demand Response
- Advanced Grid Analytics
- Intelligent Streetlight Management
- Micro Grid Control
- Interoperability – ANSI C12 compliance
- Safety – UL2735, UL94, temperature sensing, 10kv surge protection, storage of 535 alarms/events
- Robust – DC service switch, single-piece current coil, 10kv surge protection, 10,000 cycle certification
- Ample Memory – Energy, Demand, TOU, LP (8 Channels) and Reactive – out of the box, 535 alarms/ events
- Revenue Protection – Cover removal, vibration sensors, alarms for reverse rotation
- Over the Air Upgradable – Collector, Router, and Meter/module firmware, meter programs
- Remote Support and Billing Operations – On-demand read, connect/disconnect, analytics

Meade County Rural Electric Cooperative Corporation
Case No. 2020-00336
Application for a CPCN to Continue the Full Deployment of its AMI System
Filed October 28, 2020

EXHIBIT 3

AMI Vendor Evaluation Matrix

Please see attached.

AMI Vendor Evaluation Matrix

	Requirement	Desired Level	1-3-9 Definition	Aclara Rating (1-9)	L+G Rating (1-9)	NRTC Rating (1-9)
	General					
1	10 Year Cost of System	Less than 5.75 Million Dollars	1 (> $6 Mil.); 3 ($5.50 - $5.99 Mil.); 9 (<$5 Mil.)	1	3	0
2	Recurring Costs	Less than $100,000 annually	1 (> $150K); 3 ($150K - $75K); 9 (<$50K)	3	9	0
3	Technical Support - Contact Accessibility	24 hour response time	1 (>24); 3 (12-24); 9 (<11:59)	3	3	3
4	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
5	Business Stability	Customer Base (qty/size)	1 (<50/<5M); 3 (51-75/1M); 9(>75/>1M)	9	9	9
6	Business Stability Cont.	Time in AMI Business/Number of Co-op Customers	1 (<10 yrs./<20); 3 (11-15 yrs./21-49); 9(>15 yrs./>50)	9	9	1
7	Flexibility for Future Grid Applications	Investment in R&D/ Historical Commitment to platform	1 (systems older than 5 years unable to be upgraded): 3 (systems older that 5 years upgradeable); 9 (systems older than 5 years upgradeable and exceeds expectations)	3	3	3
8	Life of system	Number of years system will last in the future	1 (<8 yrs.); 3 (8-10 yrs.); 9 (>10 yrs.)	9	9	9
9	User Training	On-Site	1 (Offsite); 3 (Onsite-one visit); 9 (Onsite-multiple visits)	9	9	9
10	Integration Compatibility	Able to communicate with SEDC, Futura, and Milsoft	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	1
11	Software Design/Features	Software is easy to use and offers a full feature set	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	1
12	Flexibility for Different Meter Vendors	2 different meter vendors can be used	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	1	3	9
13	Flexibility for Different Meter types, phases, etc.	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
14	Remote Connect/Disconnect under glass	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
15	Ability to provide a turnkey solution	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	1
	Hardware					
16	Meter and Module Lifecyle per Manufacturer	10 Years	1 (<10 years); 3 (10-12 years); 9 (>12 years)	3	3	3
17	Hardware Warranty	1 year	1 (1 year or less); 3 (13 months - 3 years); 9 (>3 years)	3	3	3
18	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)	1	1	1
19	Equipment Available and Capable of Downline Control Through DNP3 using ethernet comms.	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
20	System Allows Intermittent Shutoffs (Current Limiting)	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3

	Reliability/Accuracy					
21	Accuracy of Meter Data (All Parameters)	+/- .5 volts	1 (>.51); 3 (.50-.24); 9 (<0.239)	3	3	3
22	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
23	Response Time for On Demand Data Retrieval (including OMS/CIS interface)	15 sec minimum	1 (>15 sec); 3 (15-10 sec); 9 (<9.99 sec.)	1	1	3
24	Response Time for Outage/Restoral Notification	15 sec minimum	1 (>15 sec); 3 (15-10 sec); 9 (<9.99 sec.)	1	1	1
25	Response Time for Connect/Disconnect and confirmation	15 sec minimum	1 (>15 sec); 3 (15-10 sec); 9 (<9.99 sec.)	1	1	1
26	Per-Hop Latency	1 sec minimum	1 (>1 sec); 3 (1-0.5 sec); 9 (< 0.5 sec)	9	9	9
27	Bandwidth devoted to AMI operations	15%	1 (>15%); 3 (15-10%); 9 (<10%)	1	1	1
28	Reliability/Accuracy of readings for system	99%	1 (<98%); 3 (98-99%); 9 (>99%)	9	9	9
	Data/Communication					
29	Data Security/Cyber Security	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
30	Auto-Detection of 0-usage (inoperable or out of spec meters)	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
31	Tamper Alerts	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
32	Total System Read Process Time	2 Hours	1 (>2hrs); 3 (1.5-2 hrs.); 9 (1.49 hrs.)	1	1	1
33	Battery Failure Alarm	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
34	Voltage high/low alarms	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
35	Voltage monitoring for PSC and CVR	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
36	Program Meter from office over the air	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
37	Update firmware from office over the air	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
38	Ability to bring in any meter data from tables even if not displayed on meter screen	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
39	Number of meter parameters that can be sent at one time	10	1 (<5); 3 (5-9); 9 (>10)	9	9	9
40	Ability to see errors and diagnostic errors on meter	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	1
41	Blink and outage counts	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
42	Meter notifications alerts (hot socket, etc....)	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
43	TOU/TOD ability	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
44	Ability to read system at one time for load studies/line loss studies	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	1	3	1
45	Prepay abilities	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
46	Net Meter abilities	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
47	Load profile abilities	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	1
48	Transformer loading abilities	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	1
49	Power Quality investigation abilities	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
50	Data Size and Retention of 15 min intervals	1 TB/5 years	1 (>1 TB/<5yrs); 3 (1TB/5 yrs.); 9 (<1TB/>5 yrs.)	1	1	1
51	White papers/communication means to members	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
52	Guaranteed Propagation Study (RF only, if PLC, Score as a 3)	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	3	3
53	Compability, flexibility, and future abilties to work with iPads/mobile devices for field work at meter	Yes	1 (No) ; 3 (Yes); 9 (Yes and exceeds)	3	1	1
			Total	193	203	177

Meade County Rural Electric Cooperative Corporation
Case No. 2020-00336
Application for a CPCN to Continue the Full Deployment of its AMI System
Filed October 28, 2020

EXHIBIT 4

System Acceptance Test Plan

Please see attached.

Landis+Gyr AMI System Acceptance Test (SAT)
for Meade County RECC (KY)

ID	Description	Process	Expected Result	Overall Test Result	Test Notes
1.0	**Collector Commands**				
1.1	Ping Collector	Refer to the Ping Collector process document	Command response typically received with 30 seconds.	Pass	
1.2	Get Collector Registration Info	Refer to the Get Collector Registration Info process document	Command response typically received with 30 seconds.	Pass	
1.3	Get Neighbors	Refer to the Get Neighbors of a Collector Radio process document	Command response received showing other radios that are neighbors to the selected Collector Radio typically received with 30 seconds.	Pass	
1.4	Modify Collector Settings	Refer to the Modify Collector Settings process document	Command response typically received with 30 seconds.	Pass	Set NTP Server and Poll Interval
1.5	Get Collector Settings	Refer to the Get Collector Settings process document	Command response typically received with 30 seconds.	Pass	All Settings
1.6	Echo Message	Refer to the Collector Echo Message process document	Command response typically received with 30 seconds.	Pass	
1.7	Collector NTP Time Sync	Refer to the Collector NTP Time Sync process document	Close window then click on the command in the list to view; results typically received with 30 seconds.	Pass	
1.8	Collector Test NTP Server	Refer to the Collector Test NTP Server process document	Enter NTP Server IP Address xxx.xxx.xxx.xxx in the drop-down window and select Send. Complete typically received with 10 seconds.	Pass	
1.9	Update Collector Firmware	Refer to the Update Collector Firmware process document	Command completion received. Function of speed. 5 to 10 mins COLLECTOR and up to 30 mins on the Collector LAN/FAN radios for fiber optic type connection.	Pass	
1.10	Collector Test CC URL	Refer to the Collector Test CC URL process document	Command response typically received with 10 seconds.	Pass	

2.0	Auto-Registration Process				
2.1	Registration Packets - Timing & Success	Use Command Center DEPLOYMENT STATUS REPORT or AMI Dashboard to verify meter registration process	Complete registration within 4 hours, when sufficient mesh enabled endpoints are deployed with related infrastructure, to allow communication links to be established	Pass	
2.2	Status Updates: Inventory/discovered/ Installed/Normal	Monitor AMI Dashboard for meter transition	All devices start in Inventory move to discovered and transition to normal. Rate is dependent on installation density at a given time.	Pass	
2.3	Confirm the AMI system network is capable of 'self-healing'.	Confirm all end points change and report all data when the primary path/collection point is no longer working.	For this, multiple collection points in the same general area must be installed and communicating. Through the AMI software, confirm all the end points registered to "Collection Point 1". Remove "Collection Point 1" from power (and backup power) for 24 – 48 hours, note the time and date "Collection Point 1" was removed from service. Verify all end points have successfully found a new primary path back to a different collection point and all data from the meters are being collected normally. Energize "Collection Point 1".	Pass	
2.4	Electric outage back up power failover	Remove a collection point from its primary power source and allow to failover to the ups battery. Do not remove communications. Verify the collection point continues to collect data and send in a powerloss/battery alarm message.	Remove a collection point from its primary power source for at least 4 hours and is now running on a battery backup or a UPS. Verify in the AMI software a power alarm/event or battery alarm/event is sent, and that data is still being collected. Re-energize the collection point.	Pass	

3.0	**Meter Reading**				
3.1	Daily Read Success Rate	Use DAILY READS STATUS REPORT in Command Center to provide success rate	Meters should provide 15 min data delivered every four hours and a daily self-read at midnight dependent on configuration. Kwh daily read at 95.5% by 6am following day, for all meters in normal status and under a properly maintained	Pass	99.98% daily billable
3.2	LP Read Success Rate	Use DAILY READS STATUS REPORT in Command Center to provide success rate	Meters should provide 15 min data delivered every four hours and a daily self-read at midnight dependent on configuration. Kwh daily read at 95.5% by 6am following day, for all meters in normal status and under a properly maintained	Pass	80.98% interval received, fixed with software upgrade. 99.89% received
3.3	The system is collecting 100% of billing data in a three-day period on all installed and network joined meters.	Confirm the AMI system is collecting a usable daily register billing read for 98.5% of all available meters joined in the network over a 3-day period.	Generate an AMI software reading data collection statistics report and confirm through a billing file export that 98.5% of all meters have a billing register reading within the last 3 days.	Pass	100% 3 day billable
3.4	Verify the AMI system is providing a back fill of missing/missed readings.	Verify data gap filling is being performed by the AMI software/Collection points.	Disconnect a collection point for 12 - 24 hours (making sure all backup power is also removed) and there are not area where redundant collection paths may not interfere. Energize the collection point and verify the missing data readings have been collected. Verify using AMI software reporting tools.	Pass	One meter did not report back in. The interval data gap was filled but the snap read was not filled. Fixed with settings.
4.0					
4.1	Issue On Demand Read request to get Packet Definition = Landis+Gyr Residential Packet Definition A	Refer to the On-Demand Register Read process document	KWh, Received KWh and Net KWh Returned on average < 60 seconds.	Pass	Used LG RF Residential Packet Definition B

4.2	Issue On Demand Read request to get Packet Definition = Landis+Gyr RIS Read Packet Definition	Refer to the On-Demand Register Read process document	KWh, Preset Demand, Received KWh, Current Phase A, B, C and Net KWh Returned on average < 60 seconds.	Pass	Used LG RF Phase Voltage Report Packet Definition Residential
4.3	Verify the AMI system is setup to bring back the correct requested data fields for C&I meters.	Verify for polyphase electric meters the correct register data is being recorded and reported.	Through a scheduled manual read and an ad-hoc read using the AMI software system, at the same time a coop employee performs a manual reading at the meter through the optical data port of field tool device. Verify the readings match for multiple channels.	Pass	
5.0					
5.1	Create a new configuration group and move endpoints into it	Refer to the Meter Configuration Group process document	Meter should transition from Configure to Normal status.	Pass	
5.2	Load new Firmware into Command Center	Refer to the Load Firmware into Command Center process document	Imported firmware now shows as an available entry.	Pass	
5.3	Firmware Upgrades	Refer to the Firmware Download, Remote process document	Module Firmware updated Successfully. Key for success of firmware upgrade is to conduct the upgrade in a manner that reduces any negative impact on normal scheduled billing data and power quality data acquisition and commands. Depending on size of upgrade, either single, grouped, or broadcast commands are utilized. On average: Single endpoint < 1 day >95.5% success, up to 1000 <= 2 days; includes 2 passes to achieve >95% success, up to 10,000 < 3days; includes 2 passes to achieve >95% success. Total Population (assume max 14 K per C7400 Collector and 5K per C6400 collector) < 7 days; includes 2 passes to achieve >95% success.	Pass	
5.4	Load New DCW into Command Center	Refer to the Load DCW into Command Center process document	Imported DCW now shows as an available entry.	Pass	

5.5	Download DCW to a meter	Refer to the DCW Download, Remote process document	DCW updated Successfully. On average < 30 seconds with 99.5% success rate.	Pass	
5.6	Test meter/module configurability for polyphase electric meters.	Verify meter parameters (recording and reporting intervals) can be changed 'over-the-air' from the AMI software system. Must be able to configure and re-configure items such as; Sag/Swell alarms, TOU programs, or meter collecting/reporting intervals.	Using 5 – 10 installed Polyphase meters on the system. Alter the reporting and recording intervals and confirm the change. Setup status, events, and alarms. Confirm these status and event changes. All changes and updates must be done from the office through the software system	Pass	
5.7	Test meter/module configurability for single phase electric meters.	Verify meter parameters (recording and reporting intervals) can be changed 'over-the-air' from the AMI software system. Must be able to configure and re-configure items such as; Sag/Swell alarms, TOU programs, or meter collecting/reporting intervals.	Using 5 – 10 installed residential meters on the system. Alter the reporting and recording intervals and confirm the change. Setup status, events, and alarms. Confirm these status and event changes. All changes and updates must be done from the office through the software system.	Pass	
6.0	**Endpoint Commands (Ability to Send On Demand Commands using Command Center)**				
6.1	Perform a ping on a meter	Refer to the Ping a Meter process document	Command response received. On average < 60 seconds with 95% of endpoints responding (single packet response).	Pass	
6.2	Perform a Get Time	Refer to the Get Meter time Command process document	Command response received. On average < 60 seconds with 95% of endpoints responding (single packet response).	Pass	
6.3	Perform a Get Endpoint Configuration	Refer to the Get Endpoint Configuration Command process document	Command response received. On average < 60 seconds with 95% of endpoints responding (single packet response).	Pass	

6.4	Perform Connect/Disconnect Status	Refer to the Get Switch Status Information process document	Service Connect Information display window will switch status as closed. After Disconnect command is sent it will show open. On average < 60 seconds with 95% of endpoints responding (single packet response).	Pass	
6.5	Perform Connect/Disconnect	Refer to the Service Switch Operation, Remote process document	Display on meter goes to "OPN"...Remote Disconnect window will show Open Display on meter foes to "CLS"...Remote Connect window will show Closed. On average < 60 seconds with 95% of endpoints responding (single packet response).	Pass	
6.6	Perform Time Sync	Refer to the Perform Time Sync on a meter Command process document	Command response received. On average < 60 seconds with 95% of endpoints responding (single packet response).	Pass	
6.7	Perform Get Endpoint Info	Refer to the Get Endpoint Info Command process document	Command response received. On average < 60 seconds with 95% of endpoints responding (single packet response).	Pass	
6.8	Perform Module Configuration	Refer to the Get Module Configuration Command process document	Command response received. On average < 60 seconds with 95% of endpoints responding (single packet response).	Pass	
6.9	Perform Group Commands	Refer to the Perform Group Commands process document	Command response received. On average < 60 seconds with 95% of endpoints responding (single packet response for up to 100 meters).	Pass	
7.0	**Endpoint Configuration and Field Testing**				
7.1	Test electric meter endpoint communication in the field.	Using a field handheld tool or device, verify communications with 5 polyphase electric and 5 residential meters.	Connect to the meter with the field device using the mesh network and once through the optical port. Verify a reading of kwh and demand can be retrieved. Verify diagnostic information from the AMI network can also be retrieved.	Pass	
7.2	Test meters capable of remote disconnect.	Using a field handheld tool or device, verify with 5 residential meters a disconnect can be performed from the field.	Connect to the meter with the field device using the mesh network and once through the optical port. Confirm a successful disconnect and reconnect.	Pass	

7.3	Test Communications to Data Collectors and Repeaters in the field.	Using a field handheld tool or device, verify communications with all installed AMI network equipment.	Connect to the AMI network equipment with the field device and not through a local port on the AMI device. Confirm data diagnostics, system specs, and other health check information is received.	Pass	
8.0	**Remote Connect/Disconnects**				
8.1	Perform and Verify Scheduled Remote Connect/Disconnect	Refer to the Issue and Verify Remote Connect/Disconnect Success/Failure process document	Switch State changes on the scheduled time. On average < 60 seconds with 95% of endpoints responding (single packet response).	Pass	
9.0	**Scheduled Demand Reset**				
9.1	Demand Reset - Single Meter	Refer to the Demand Rest on a meter process document	Demand is reset, and number of resets increase by 1 each time. On average < 30 seconds with 95% of endpoints responding (single packet response).	Pass	
9.2	Demand Reset - Group	Refer to the Perform Group Demand Reset process document	Group: Demand reset occurs on all meters in the group that are currently communicating. On average up to 100 endpoints < 1minute for 95% of endpoints responding, up to 1000 endpoints < 1minute for 95% of endpoints responding (single packet response for up to 100 meters).	Pass	
9.3	Schedule Demand Reset - Schedule events	Refer to the Scheduled Demand Reset process document	Demand Reset event should occur on the specified meter(s) at midnight on the scheduled day.	N/A	Using demand reset within the meter.
10.0	**Daily Performance Statistics**				
10.1	Verify capability to retrieve daily performance stats from Command Center	Reporting -> Daily Reads Status Report	Daily reads status report will be exported showing history during the test phase at the conclusion of testing.	Pass	

11.0	**Outage Detection and Restoration**				
11.1	Single meter outage and restoration detection	Refer to the Single meter power outage and restoration detection process document	Meters should go to Lost/Normal status in Command Center, within on average < 60 seconds from when event is transmitted by endpoint, with up to 98.5% of endpoints reporting.	Pass	
11.2	Multiple meter outage and restoration detection (if possible).	Remove a random sample of meters (up to 10) or remove the power source to a meter test bench or similar to simulate an outage. Verify the outage message and the restore message is received at the AMI software system.	Meters should go to Lost/Normal status in Command Center, within on average < 60 seconds from when event is transmitted by endpoint, with up to 98.5% of endpoints reporting.	Pass	Can not do multiple meters but outages have shown this is working. Can not give exact times but looks to be within average times or better.
12.0	**Dashboard and System Events**				
12.1	Meter Tamper	Refer to the Meter Tamper Detection process document	Event will be flagged in Log Viewer and returned to Command Center within a 60 minute time frame of detection.	Pass	
12.2	Virtual Disconnect Usage	Put a meter with consumption into a Virtual Disconnect group and validate that a flag is set on the Dashboard	The AMI Dashboard will display the violation of virtual disconnect.	Pass	
12.3	Collector Communication Events	Verify that communication issues with collectors are reported and flagged on the Dashboard	The AMI Dashboard will show alert.	Pass	
12.4	Setup specific login groups (member service, admin, etc.) and verify login permissions on set correctly.	Confirm all setup groups and users in those groups have the correct log in permissions for their roles. Verify new users and groups can be created and assigned.	Create user logins and groups. Verify each group has their own specific roles. Verify there are no generic users or shared logins.	Pass	
13.0	**System Integration Testing**				

13.1	Data exports are successful to the CIS (Tyler Tech).	Verify all data collected and required to be exported from the AMI software to the existing CIS is correct and fully executing.	Confirm a flat file interface between the AMI software system and CIS is successful. Also confirm the MultiSpeak interface is exporting data from the AMI into the CIS. Test both interfaces.	Pass	
13.2	Data exports are successful to the MDMS (NISC).	Verify all data collected and required to be exported from the AMI software to the existing MDMS is correct and fully executing.	Confirm a flat file interface between the AMI software system and MDMS is successful. Also confirm the MultiSpeak interface is exporting data from the AMI into the MDMS. Test both interfaces.	Pass	
13.3	Read Data exports are successful to the OMS (Milsoft).	Verify all data collected and required to be exported from the AMI software to the existing OMS is correct and fully executing.	Confirm a flat file interface between the AMI software system and OMS is successful. Also confirm the MultiSpeak interface is exporting data from the AMI into the OMS. Test both interfaces.	Pass	

Meade County Rural Electric Cooperative Corporation
Case No. 2020-00336
Application for a CPCN to Continue the Full Deployment of its AMI System
Filed October 28, 2020

EXHIBIT 5

Projected Benefits for Meade County and its Membership

Rate Structure Every meter will be capable of supporting Time-of-Use rates, Net Metering, Critical Peak Pricing, and Real Time Pricing.

Ability for Pre-Pay Metering Members can be provided a pre-pay solution that will potentially aid enrolled members in usage reduction, as well as eliminate the requirements for deposits. Meade County has been testing pre-pay abilities with the pilot system internally and is finding no issues. Once the system is fully deployed, Meade County can provide this service to its members.

Member Access Members can log-in to SEDC's member portal or use Meade County's app to access their consumption data. These tools give the members access to daily, and 15-minute interval usage data allowing members to make more informed decisions on energy usage. Net meter accounts may also access daily, and 15-minute interval usage being delivered back to Meade County.

Real Time Data Real time data allows Member Service Representatives to better serve the membership helping to answer billing or usage concerns and improve customer service.

Outage Reporting Outage response times improve by locating the cause of an outage faster. When outages are restored, verifications can be made to ensure all members have power before leaving the area.

Meade County Rural Electric Cooperative Corporation
Case No. 2020-00336
Application for a CPCN to Continue the Full Deployment of its AMI System
Filed October 28, 2020

EXHIBIT 5 (continued)

Projected Benefits for Meade County and its Membership

Advanced Grid Analytics Having access to all data within the meter provides great abilities to monitor the distribution system. Identifying low or high voltages, overloaded transformers, hot sockets, instrument rated metering issues, blinks, etc. enhances the ability of the cooperative to address potential issues before outages or member complaints occur.

Cost Savings The AMI system will eliminate the need for manual meter reads and service connections and disconnections. Alerts for tampering and unauthorized access to meters will reduce the opportunity for energy theft. Dispatchers can ensure whether a member has an outage and check voltage on a meter before sending crews to potential false outages.

Reduce Safety Risk to Employees and Members The AMI system will reduce truck rolls which are likely to result in fewer automobile accidents as well as injury from animals, etc. The cooperative will be alerted to potential energy theft and will be able to know the situation prior to going on site to address it.

Meade County Rural Electric Cooperative Corporation
Case No. 2020-00336
Application for a CPCN to Continue the Full Deployment of its AMI System
Filed October 28, 2020

EXHIBIT 6

TS2 End of Sales, FAQs

Please see attached.

TS2 End of Sales, FAQ's

Q:	**I heard that the TS2 system is going away.**
A:	That is partially correct. The sale of TS2 modules is going to end due to vendor notifications of component obsolescence. However, TS2 network equipment will continue to be available. The TS2 system will remain supported in Command Center through 2022 and the support is available through 2022.
Q:	**How long do I have to purchase TS2 products and what is available for sale?**
A:	The last-time buy will close on **October 31, 2019,** for the following equipment: ▪ TS2 FOCUS AL (Part numbers FASY-0694-0001/2, FASY-0624-0003/4, and Multi-Utility FASY-0749-0001/2) ▪ TS2 FOCUS AX/AX-SD* (Part numbers 26-1238, 26-1239, 26-1240, 26-1241) ▪ TS2 S4e* (Part number FASY-0636-0002) ▪ TS2 kV2c (Part numbers FASY-0538-0002 and Multi-Utility FASY-0650-0002) ▪ TS2 Load Control Switch (Part numbers FASY-0530-0008/10) You must take delivery of this product by **March 31, 2020**. **Note the S4e meter has been discontinued and meter stock has been depleted. Landis+Gyr is actively developing a TS2 module for the new S4x meter and is also investigating qualifying the TS2 AX module for the FOCUS AX Polyphase.*
Q:	**What are my options for an upgrade?**
A:	You may want to consider Gridstream RF and/or PLX going forward as the added features and benefits are significant. Your TS2 can remain in place while you transition, and your technical team would be happy to sit down and review options.
Q:	**I want to continue to use my TS2 network. Can I get replacements?**
A:	The PLC 3000 Collectors and Transformer Coupling Units will remain available as they are compatible with TS2 and/or PLX.
Q:	**I have load control with TS2, what are my options?**
A:	Your TS2 load control may stay in place while you consider upgrades to your network and a transition to Gridstream RF or PLX.
Q:	**I've got a lot of investment in meters. Are they junk if I upgrade?**
A:	Landis+Gyr has introduced new FOCUS AXe/AXe-SD and S4x meters with much more capabilities available with Gridstream RF and PLX deployments, so consider the cost of a retrofit versus the benefit of new metering.
Q:	**I have all my substations upgraded to TS2. Do I keep adding or replacing TS2 meters? What are my options?**
A:	Option 1. Stay with TS2, but understand that its capabilities are limited and any endpoints you purchase under this last-time buy opportunity are an investment in 12-year-old technology. Option 2. Take advantage of your current investment and Landis+Gyr's reputation in the marketplace to consider a migration to their latest generation AMI systems and meters.
Q:	**I have begun the migration to Gridstream RF or PLX, but won't have my TS2 system replaced before October 31, 2019. What are my options?**
A:	Many utilities have added the new AMI network to certain areas or substations, and made all new meter purchases of the new technology. As they deploy new meters, their policy is to conduct a "remove from service" of the TS2 meters, and place them into stock for re-use elsewhere on their system. Re-use of the TS2 meters helps to manage costs.
Q:	**What version of Command Center supports all of the PLC and RF offerings.**
A:	Command Center 7.0 which is available now.