LICKING VALLEY
RURAL ELECTRIC COOPERATIVE CORPORATION
P. O. Box 605 • 271 Main Street
West Liberty, KY 41472-0605
(606) 743-3179

February 11, 2016

Mr. Jeff Derouen, Executive Director
Kentucky Public Service Commission
211 Sower Blvd
PO Box 615
Frankfort KY 40602-0615

RE: Licking Valley RECC
Application for Certificate of Public Convenience and Necessity
– Automated Metering Infrastructure System

Dear Mr. Derouen:

Enclosed are the original and 10 copies of Licking Valley RECC's Application for an Order granting a Certificate of Public Convenience and Necessity regarding a program to install an Automated Metering and Infrastructure System.

Licking Valley RECC is asking for the Kentucky Public Service Commission for an expedited review of this matter. Our Meter pilot project (Case No. 2012-00013) is complete and we would like to move forward with installation system wide AMI/RF metering technology. Our most pressing problem is the inability to offer prepay metering and Direct Load Control to all of our members.

Sincerely,

Kerry K. Howard
General Manager/CEO

Enclosures

COMMONWEALTH OF KENTUCKY
BEFORE THE
KENTUCKY PUBLIC SERVICE COMMISSION

In the matter of:

THE APPLICATION OF LICKING VALLEY	)	CASE NO. 2015-_____
RURAL ELECTRIC COOPERATIVE	)	
CORPORATION FOR AN ORDER	)	
ISSUING A CERTIFICATE OF PUBLIC	)	
CONVENIENCE AND NECESSITY	)	

APPLICATION

(a) The applicant Licking Valley Rural Electric Cooperative Corporation (Licking Valley RECC) is a nonprofit electric cooperative organized under KRS Chapter 279 and is engaged in the business of distributing retail electric power to member consumers in the Kentucky counties of Breathitt, Elliott, Lee, Magoffin, Menifee, Morgan, Rowan, and Wolfe. This application is submitted in pursuant to KRS 278.020 and 807 KAR 5:001(9).

(b) The post office address of Licking Valley RECC is Post Office Box 605, West Liberty, Kentucky 41472-0605.

(c) Licking Valley RECC's Certificate of Existence is attached as Exhibit 8.

(d) The applicant seeks a certificate of public convenience and necessity ("CPCN") to install an Advanced Metering Infrastructure System ("AMI") to begin in 2016.

(e) Licking Valley RECC will construct the proposed AMI project with RUS loan funds. Licking Valley RECC's Construction Work Plan has been modified to reflect this project. RUS approval has been received.

(f) The estimated cost of the project is: $4,423,173.80 See EXHIBIT 4 for estimated Project Cost.

(g) Attached hereto and made a part of this Application are the following:

EXHIBIT 1 - Applicant research, vendor assessment and vendor choice process
EXHIBIT 2 – Description of the AMI technology
EXHIBIT 3 – Proposed Statement of Work
EXHIBIT 4 – Financial Analysis
EXHIBIT 5 – Projected Benefits for Applicant and its Members
EXHIBIT 6 – Copy of RUS Amendment to Current Approved Construction Work Plan
EXHIBIT 7 – Testimony of Kerry K. Howard
EXHIBIT 8 – Certificate of Existence

WHEREFORE, Applicant asks that the Public Service Commission of the Commonwealth of Kentucky make its order issuing a certificate of convenience and necessity authorizing the applicant to install an AMI system as outlined in the CWP and applicant further requests all proper relief.

VERIFICATION

The undersigned hereby verifies that the statements and information set forth in the foregoing application are true and correct to the best of my knowledge and belief.

Kerry K. Howard, General Manager/CEO
Licking Valley Rural Electric
Cooperative Corporation

STATE OF KENTUCKY
COUNTY OF Morgan

The foregoing was signed, acknowledged and sworn to before me by **KERRY K. HOWARD, General Manager and CEO of Licking Valley RECC**, this 10th day of February 2016.

My commission expires 05/29/2016

Notary Public, State of Kentucky at Large
#466856

(seal)

Evaluation of Necessity for Radio Frequency (RF) AMI Metering.

Licking Valley RECC began using Landis & Gyr Automated Meter Reading meters (AMR's) in 2001 which had the capability for one way communication (TSI's). Prior to that time we had an electromechanical metering system (member read). In 2009 we began a system wide conversion to Landis & Gyr's Automated Meter Information (AMI's) or TSII meters. These automated meters allowed for two way communication. As of January 01, 2015 this system was only 50 % implemented.

After careful consideration and discussion with our metering vendor and the limitations of the TSII's and its future support by the vendor, Management decided that moving forward with the RF implementation would better serve our membership.

Licking Valley RECC staff began researching and assessing various AMR/AMI solutions. The staff included our General Manager, Manager of Office Services, General Superintendent and the Meter Department manager and other staff from the metering department.

The staff appraised various AMI systems currently being used in our industry. A decision was made to deploy Radio Frequency (RF) technology that would be provided by Landis + Gyr.

The AMI Solution met the following specifications:

- Has radio frequency (RF) AMI solution with two-way communication.
- Capable of 15 minute interval data
- And achieve:
    - 100% Coverage (all deployed meters are active on RF mesh network)

  - 99.0% delivery of billing determinants daily and readings when needed
  - 95% on-demand request
  - Utilize Landis + Gyr meters
  - Provide integration to NISC's SmartHub and iVUE systems

- Is capable of sending and receiving communication to control devices for load control, demand side management programs and supporting a SCADA system.
- Utilize meter equipped with a disconnect/reconnect switch and displays the open/closed status of the switch on the meter display
- The meters have the ability to collect and report kWh, kW, and voltage
- Can utilize poly phase meters which have the ability to collect and report power factor at peak kW and shall be auto-ranging in voltage (120-480V)

The staff utilized the process to reach desired levels for the system and to make the vendor selection as objective as possible. In addition to cost, items that were thoroughly evaluated for the AMI solution are as follows.

<u>AMI Solution – Additional Criteria Used in Evaluation:</u>

- Technical Support – Contact Accessibility
- Business Stability
- Flexibility for Future Electrical Grid Applications
- User Training
- Meter & Module Lifecycle per Manufacture
- Hardware Warranty
- Storage Capability at the Meter
- Ability for Coop to Control Demand at Member Level (Demand Response)
- System Allows Intermittent Shutoffs (Current Limiting)
- Accuracy of Meter Data (All Parameters)
- Data Storage Intervals: kW, kWh, voltage, blinks, PF, KVA
- Response Time for On Demand Data Retrieval
- Data Security/Cyber Security

- Auto-Detection of 0-usage (inoperable or out of Spec Meters)
- Tamper Alerts
- Total System Read Processing Time
- Battery Failure Alert
- Ease of use for members through online billing options offered by Licking Valley RECC.
- Ease of Use for Coop (cross departmental access)
- User training.
- Support of Prepaid Metering.

After full evaluation, the AMI vendor chosen was Landis + Gyr, (800 Duncan Road, Lafayette, Indiana, 47904). Landis + Gyr will provide a two-way data communications network to monitor Licking Valley RECC's electronic meters using the Gridstream Platform coupled with their Gridstream RF Mesh network solution. This WAN, LAN, HAN communications system operates in the license free 902-928 MHZ bands utilizing IP based network equipment, either individually or in combination with existing fiber optics field network infrastructure. This network will unite Licking Valley RECC's applications, making advanced metering, outage management, power quality monitory and load control cost-effective and practical throughout Licking Valley RECC's service territory as well as allowing for future expansion and application enhancements.

See Exhibit A for chosen equipment used in our 100 meter pilot project in PSC Case No. 2012-00013 and now requesting CPCN for system wide installation.

Meters will be installed by Licking Valley RECC staff.

Gridstream
RF Router

Landis+Gyr
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Advanced, Yet Cost-effective, Communication Solution

Overview

The Landis+Gyr RF Router helps form the powerful Gridstream® RF wireless mesh network used in Advanced Metering, Distribution Automation and Demand Response applications. Network performance and reliability are assured via the routers basic mesh functions including full two-way, peer-to-peer communication to all devices in the network, asynchronous spread spectrum frequency hopping and dynamic message routing.

The RF Router is designed to deliver enhanced on-board memory and communication speeds to support future application and development needs. In addition, advanced functionality enables individual message prioritization, automatic network registration and localized intelligence. The router can also provide distributed device control capabilities via programmable applets.

To provide critical network operations—even during small or widespread system power outages—a typical purchase includes battery backup integrated within the aluminum housing.

FEATURES & BENEFITS:
Why Landis+Gyr makes a difference.

- Interoperability to enable integration with numerous partners and supported devices
- Standards-based, including IPv6, to protect existing and future investments
- Individual message prioritization provides end device interfacing with other smart grid applications and functions
- Dynamic routing by each radio in the mesh network
- Data security and error-checking algorithms to assure integrity and reliability
- Downloadable code for easy, over-the-air firmware updates for near real-time monitoring and control

Product Specifications: Gridstream RF Router

Specifications	
Size	11.82"W x 9.30"D x 4.07"H
Weight	Base – 5 lbs 8 oz (2.49 kg)
	Battery adds 2 lbs 8 oz (1.13 kg)
Operating Temperature	-40°C to +85°C (internal ambient of enclosure)
Power Supply	Operating AC Voltage – 96-317 VAC
	Input for Receive mode / 120VAC Operation – 15 mA (max)
	Input for Transmit mode / 120VAC Operation – 95 mA (peak), 25 mA (Avg)
	Input for Battery charging mode / 120VAC Operation – 30 mA (max)
RF Output Power	21, 25, 30 dBm (user selectable)
General Radio Items	Frequency Range – 902-928 MHz
	Channel Spacing – 100 kHz, 300 kHz, or 500 kHz (dependent on mode)
	Channels – 56, 80, 240 (dependent on mode)
	RF Baud Rates – 9.6, 19.2, 38.4, 115.2, 300 kbps
Battery	Backup Time – 8 hours, typical
	Backup – 12V SLA 2500mAhrs, nominal
	Life – 5–7 years, typical
Processing	CPU – ARM9
	SRAM – 16 MB
	Flash – 8 MB ANSI C12.1 Compliance
Approvals	FCC Certified Part 15.247
ANSI C12.1 Compliance	Operating vibration; operating shock; electromagnetic radiation emissions, electromagnetic susceptibility, surge withstanding capability, electrostatic discharge
Enclosure Material Type	Aluminum/NEMA-4, sealed
Standard Shipment Includes	White, die-cast aluminum all-weather enclosure
	Operation on DC (12/24 VDC) or AC power, with automatic switching between 120 VAC or 277 VAC when connected to power source
	RS-232/485 lines for both LPPx and transparent port communication
	Standard N-Female antenna connector
	Integrated filter for attenuation of out-of-band interference
	Mounting hardware

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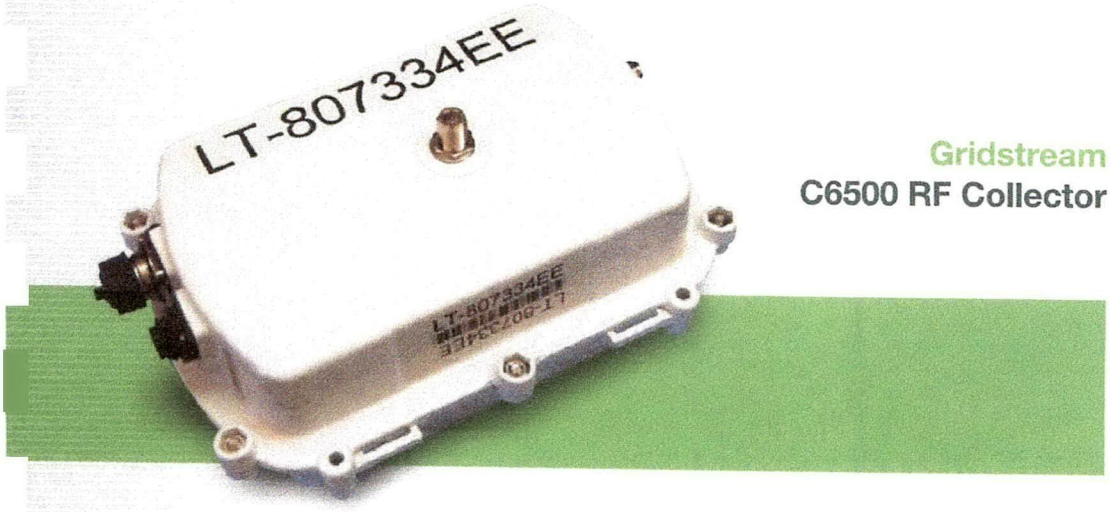

Gridstream
C6500 RF Collector

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C6500 RF Collector
Ethernet only

C6530 RF Collector
with CDMA/EVDO wireless modem

Versatile and Cost-Effective Communication Solution

Overview

Ease of installation and dependable design make the Gridstream® C6500 Collector a cost-effective, workable option for efficient communication between Gridstream RF endpoints, routers and the Command Center server, while performing all necessary functions of the standard data collector.

The C6500 can be installed in a variety of locations and is configured to accept public backhaul communication options. The C6500 can be ordered with an internal CDMA/EVDO wireless backhaul modem or without a modem in cases where an Ethernet connection is available.

FEATURES & BENEFITS:
Why Landis+Gyr makes a difference.

- Interoperability to enable integration with numerous partners and supported devices
- Standards-based, including IPv6, to protect existing and future investments
- Integrated wireless radio backhaul modem
- Data security and error-checking algorithms assure integrity and reliability
- Simpler and reduced installation time
- Dynamic routing by each radio in the mesh network
- Downloadable code for easy, over-the-air firmware upgrades and near real-time monitoring and control

Specifications

Dimensions (excludes antennas)	5.04"H x 11.82"W x 9.30"D
Antennas	Two (2), one blackhaul (top) and one (1) Gridstream (bottom)
Antenna Height Minimum	20 ft.
Weight	9.6 lbs.
Standard Compliance	FCC Part 15, Class B
Operating AC Voltage	96-277 Vrms
Power Consumption	9W typical – batteries not charging
	18W typical – batteries charging
Operating Frequency Band	902-928 MHz, unlicensed
Transmit Output Power	1W maximum for single IWR radio
Baud Rate Range	9.6, 19.2, 38.4, 115.2, 300 kbps
Endpoint Capacity (initial)	4,500
Processing	CPU – ARM 9
	Internal Memory – 16 MB
	Flash – 8 MB
Operating Temperature	-40°C to 60°C, outdoors
Storage Temperature	-40°C to 85°C
Color	White
Enclosure Material/Type	Aluminum/NEMA-4, sealed
Battery	Backup Time – 8 hours, typical
	Backup – LiFePO4 cells in a 4s4p arrangement, 13.2V, 10000mAhrs nominal
	Life – 15 years, maintenance free
Backhaul Communications	Integrated wireless CDMA/EVDO or wired Ethernet connection
Supplied Cellular Carriers	C6530: Verizon or Sprint
Mounting Options	Utility poles and streetlights

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Product Specifications

Residential:
E330 FOCUS AX
E350 AX-SD
Single Phase

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Scalability Delivered in Advanced Residential Metering

Overview

The FOCUS® AX surpasses other meters in its class to deliver options you need for a highly functional and affordable metering solution. The combination of the FOCUS Service Disconnect base module and powerful AX register supports a variety of connect/disconnect and service-limiting applications. The result: A single solution to manage demand, time of use, load profile and reactive—with no costly upgrades.

Features such as reactive energy and power quality measurements deliver empowering data to run advanced applications such as voltage monitoring, VAR control and load curtailment.

The E350 FOCUS AX-SD incorporates a 200A, motor-driven, cam action disconnect/connect switch under the meter cover. This advanced, market-leading switch, coupled with the field-proven reliability of the E350 AX-SD, delivers Landis+Gyr's third-generation design answer to today's evolving utility requirements.

FEATURES & BENEFITS:
Why Landis+Gyr makes a difference.

- Most advanced cam-driven switch design to withstand 10K cycles at full rated current
- Switch continues operation even under low voltage conditions
- Prepay ready
- Power quality data (sag/swell)
- Magnetic/DC presence detection (based on leading current)
- 8 channels of load profile
- Surpasses ANSI requirements for surge protection (10KV) and meter accuracy
- Full 200 amp disconnect rating
- Advanced over-the-air-flashable firmware upgrades avoids loss of billing or configuration data

Product Specifications: **E330 FOCUS AX and E350 AX-SD** Single Phase

Specifications

General Specifications	Active Energy "kWh-kW" meter and Reactive Energy "kVA or kVAR"	
	Digital Multiplication Measurement Technique	
	Non-Volatile Memory	
	Designed for 20+ years life	
	Meets ANSI standards for performance	
	Utilizes ANSI protocol (between meter and AMI device)	
	9-Digit LCD	
	Display scroll sequence programmable (factory or end user)	
	Configuration Port – cover does not have to be removed or optional ANSI C12.18 optical port available	
Operating Temperature	-40C to +85C under cover	
Nominal Voltage	120V or 240V	
Operating Voltage	80% to 115% of Vn	
Frequency	60Hz +/- 5%	
Humidity	5% to 95% relative humidity, non condensing	
Starting Load (Watts)	Class 20	0.005 Amp (0.6W)
	Class 100	0.030 Amp (3.6W)
	Class 200	0.050 Amp (12W)
	Class 320	0.080 Amp (19.2W)
	Class 480	0.120 Amp (28.8W)
Voltage Burden	< 1.9W Max	
Load Performance Accuracy	Accuracy Class 0.2% (reactive energy 0.5%)	
Available Forms	Self-Contained	1S, 2S, 2SE, 12S, 25S
	Transformer Rated	3S, 4S
	K-Base	2K
Display Options	Energy Metrics: +kWh, -kWh, Net kWh, and added kWh (Security), kVAh or kVARh	
	Metric Energy Display Format – 4x1, 4x10, 5x1, 5x10, 6x1 or 6x10	
	Time of Use and Demand Billing	
AMI Platform	Modular or Integrated	
Selectable Meter Multiplier	Up to 4096 as result of PT ratio • CT ratio	
Applicable Standards	ANSI C12.1 for electric meters	
	ANSI C12.10 for physical aspects of watt hour meters	
	ANSI C12.18 Protocol specifications for ANSI Type 2 Optical Port	
	ANSI C12.19 Utility Industry End Device Data Tables	
	ANSI C12.20 for electricity meters, 0.2 and 0.5 accuracy classes	
	CAN3-C17-M84 Canadian specifications for approval of type of electricity meters	
Service Disconnect	10,000 operations at full rated current (disconnect/connect)	
	Available forms: 1S, 2S, 12S, 25S	
International Certifications	Measurement Canada (MC) AE-1641, AE-2041 (integrated)	

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Commercial:
E330 FOCUS AX
Polyphase

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Economical and Reliable Option for Light Commercial Applications

Overview

The FOCUS® AX Polyphase meter provides a cost-efficient alternative for light commercial metering applications that do not require all of the functionality of the S4e meter. As an addition to the FOCUS family of meters, the AX Polyphase brings the same proven solid-state performance utilities have come to expect from FOCUS meters, in an economical and AMI-ready platform for commercial and industrial applications.

A single circuit board design, mounted at the front of the meter allows room for modular AMI communications or a KYZ output board. Highly accurate load performance and the use of field-proven Digital Multiplication Measurement Technique ensure reliability and dependability during the entire life of the meter.

The FOCUS AX Polyphase meter is available for both self-contained and transformer-rated meter forms and includes the ASIC, non-volatile memory, selectable metrics, flexible display functionality, an optional KYZ output, configuration port, and a customer program option.

The FOCUS AX Polyphase meter contains a 120V to 277V auto-ranging power supply that is suitable for both 277/480V, 4W, WYE and 240/480V 4-wire Delta services. The robust design of the FOCUS AX meter exceeds the ANSI 6KV surge requirements and provides 10KV of surge protection.

With customer satisfaction as our top priority, we are committed to providing the best metering solution in terms of capability, technology and affordability. By uniting our experience and technology with that of our strategic allies and development partners, we provide metering solutions that cover the range of utilities' light commercial and industrial need.

FEATURES & BENEFITS:
Why Landis+Gyr makes a difference.

- Digital Multiplication Measurement technique
- Non-volatile memory
- Designed for a 20+ year life
- Meets or exceeds industry and ANSI standards
- Uses ANSI protocol (between meter and advanced metering device)
- 6 digit LCD and 3 Alpha ID
- Selectable meter multiplier
- Event log of 500+ entries
- 77 kb of load profile memory, 1–8 channels
- Advanced second generation over-the-air-flashable firmware

Specifications

General Specifications	Active Energy "kWh-kW" meter	
	Digital Multiplication Measurement Technique	
	Non-Volatile Memory	
	Designed for 20+ years life	
	Meets ANSI standards for performance	
	Utilizes ANSI protocol (between meter and AMI device)	
	9-Digit LCD	
	Display scroll sequence programmable (factory or end user)	
	Configuration Port – cover does not have to be removed or optional ANSI C12.18 optical port available	
Operating Temperature	-40C to +85C under cover	
Nominal Voltage	120–277V Auto Ranging Power Supply	
Operating Voltage	80% to 120% of Vn	
Frequency	60Hz +/- 5%	
Humidity	5% to 95% relative humidity, non condensing	
Starting Load (Watts)	Class 20	0.005 Amp (0.6W)
	Class 200	0.050 Amp (6W)
	Class 320	0.080 Amp (9.6W)
Voltage Burden	< 1.8W Max	
Load Performance Accuracy	Accuracy Class 0.2%	
	Exception: Form 36S 0.5%	
	Reactive energy 0.5%	
Available Forms	Self-Contained	12S, 12SE, 16S, 16SE, 25S, 25SE
	Transformer Rated	9S, 36S, 45S
Display Options	Energy Metrics: +kWh, -kWh, Net kWh, and added kWh (Security)	
	Metric Energy Display Format – 4x1, 4x10, 5x1, 5x10, 6x1 or 6x10	
	Time of Use and Demand Billing	
AMI Platform	Modular	
Selectable Meter Multiplier	Up to 4096 as result of PT ratio • CT ratio	
Applicable Standards	ANSI C12.1 for electric meters	
	ANSI C12.10 for physical aspects of watt hour meters	
	ANSI C12.18 Protocol specifications for ANSI Type 2 Optical Port	
	ANSI C12.19 Utility Industry End Device Data Tables	
	ANSI C12.20 for electricity meters, 0.2 and 0.5 accuracy classes	
	CAN3-C17-M84 Canadian specifications for approval of type of electricity meters	

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Commercial:
E650 S4x
Polyphase

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Enhanced Metering for Commercial and Industrial Applications

Overview

Expanding upon the industry-leading flexibility of Landis+Gyr polyphase meters, the E650 S4x sets a new standard for versatility in a C&I metering platform. Out of the box, the S4x is a full featured C&I meter that provides four-quadrant measurements of active and reactive energy, load profile, and TOU without a battery when existing on an AMI network.

The E650 S4x provides the metrics utilities need to take full advantage of advanced grid management technologies. Delivered, received and per quadrant measurements of active, reactive and apparent energy are all simultaneously calculated, as are their respective demand values. Additionally, the S4x provides two alternative methods for calculating reactive and apparent energy and demand values. They can be either directly measured or vectorially derived, giving an electric utility the ultimate flexibility in how they measure and bill their customers.

The E650 S4x provides all of its metrics at significantly higher resolution than most competitive C&I meters. All energy and demand metrics are stored with milli-unit resolution. All instrumentation metrics such as voltage, current, and phase are stored in micro-units.

The E650 S4x raises the bar on security and tamper detection capabilities. A tilt and vibration sensor can identify significant shock force applied to the meter. A dedicated Hall Effect sensor is used to detect strong magnetic field presence. The physically actuated cover removal switch can trigger an alarm and log an event. A new optical port lockout feature allows total control over port access through a compatible communication module.

The S4x has significantly more RAM, ROM and non-volatile memory for load profile, self-reads, and event logs. Standard 16 channel load profile memory of 256 KB can be upgraded to 1 MB without the need of additional hardware. An optional second 16 channel recorder can be configured with a different interval length than the first, making it an ideal instrumentation recorder for continuously monitoring voltage, current, phase and frequency. Load profile data is stored in 32 bit registers that can easily handle the increased data resolution the S4x offers without interval overflow or need for a scale factor.

The meter is available with multiple hardware options that further expand its capabilities. With the addition of an Enhanced RF communications module, the S4x becomes a powerful C&I endpoint on the industry leading Landis+Gyr Gridstream® AMI network. An I/O Board enables inputs that can increment a load profile channel or trigger a different billing rate; and outputs that can provide KYZ pulses or trigger load control devices. The Enhanced RF module and I/O Board are available together for even greater functional versatility. A true three-phase power supply can ensure that the S4x keeps metering even if a voltage phase is lost.

LOAD PROFILE:

- 16 CH 256K standard, 1MB option
- 2nd recorder option
- 32 bit data storage

SUPERIOR METRICS:

- Four-quadrant measurement
- Delivered and received kW, kVA and kVAR demands
- Two alternate methods of VAR and VA calculation
- Milli-unit energy and demand resolution
- Micro-unit instrumentation resolution

UNIQUE SECURITY:

- Magnetic tamper detection
- Cover removal switch
- Tilt & vibration sensor

HARDWARE OPTIONS:

- Enhanced Gridstream RF module
- I/O board
- Three-phase power supply

Product Specifications: Commercial E650 S4x Polyphase

Specifications

General Specifications	Active and reactive energy are standard		
	TOU and 256K load profile are standard		
	ANSI C12.19 standard protocol		
	Unsurpassed 10KV surge protection for safety		
	Designed for 20+ years of life		
	Extensive event logging		
	Magnetic Tamper Detection via Hall Effect sensor		
	Cover removal switch		
	Tilt and vibration sensor		
Operating Temperature	-40C to +85C under cover		
Nominal Voltage	Standard Power Supply	120–480V (2 and 3 wire 120, 208, 240, 277, 347, 480. 4 wire 120/208, 240/416, 277/480, 347/600)	
	3 Phase Power Supply Option	120–277V (2 and 3 wire 120, 208, 240, 277. 4 wire 120/208, 277/480)	
Operating Voltage	Standard Power Supply	98 to 552 VAC (line to neutral) Auto Ranging Power Supply	
	3 Phase Power Supply Option	98 to 318 VAC (line to neutral) Auto Ranging Power Supply	
Frequency	50 or 60Hz ± 5%		
Humidity	Less than or equal to 95% relative humidity, non-condensing		
Accuracy Class	Class 20, 120, 200, & 320 meters ± 0.2%		
	Class 480 meters and forms 36S, 29S, 36A ± 0.5%		
Over Voltage Withstand	Temporary (.5 sec) 150% rated voltage		
	Continuous (5 hours) 120% rated voltage		
Starting Current (amps)	Class 20	0.005 Amp	
	Class 150	0.050 Amp	
	Class 200	0.050 Amp	
	Class 320	0.080 Amp	
	Class 480	0.120 Amp	
Available Forms	Self-Contained	S-Base	2S, 12S, 14/15/16/17S, 25S, 1S, 2SE, 12SE, 14/15/16/17SE, 25SE
	Self-Contained	K-Base	12K, 14/15/16K, 27K
	Self-Contained	A-Base	16A
	Transformer Rated	S-Base	3S, 3SC, 4S, 8/9S, 45S, 36S, 29S
	Transformer Rated	A-Base	8/10A, 45A, 36A
Applicable Standards	ANSI C12.1 for electric meters		
	ANSI C12.10 for physical aspects of watt hour meters		
	ANSI C12.20 for electricity meters, 0.2 and 0.5 accuracy class		
	CAN3-C12-M84 Canadian Specs for approval of electrical meters		
	CAN3-Z234.4-79 Canadian Specs for all numeric dates and times		
Voltage Burden	≤ 2.5W		

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Description of the AMI Technology

Gridstream RF is a multi-functional solution supporting advanced multi-energy metering, personal energy management and distribution automation application. Gridstream residential and commercial metering solutions support up to 5-minute interval data collection, load management, home area networking and outage management applications.

At the center of the Gridstream RF Mesh solution is a true mesh, peer-to-peer network where each endpoint, device and router communications in a peer-to-peer fashion, extending the coverage and reliability of the network. The asynchronous, multi-channel communication structure allows for increased data throughout 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 network
- Remote programmability
- "Plug-and-work" auto-registering endpoints and devices
- Dynamic routing, self-healing network
- Support for 15-minute interval data
- Integrated disconnect meter option
- Licking Valley RECC selected the Gridstream solution based on its capability to directly support real-time Advanced Grid applications for the following uses:
- Meter register reads including daily kWh, time-of-use registers and demand
- Interval data for billing, customer information, load studies and engineering and rate studies

- Service connect/disconnect and service limiting capability
- Power outage notification
- Direct customer engagement
- Pre-payment
- Load control with individual device current and duty-cycle reporting
- Critical peak/time-of-use pricing
- Capacitor bank and voltage regulator, monitoring
- Faulted circuit indicator and transformer monitoring
- End-to-End security
- Voltage monitoring for Conservation Voltage
- Reduction and Dynamic Voltage Management
- Interfacing with NISC's MDMS Data Analytics to leverage system data for operational use

Proposed Statement of Work

1. Introduction

   Licking Valley RECC proposes to deploy an Advanced Metering Infrastructure (AMI) solution utilizing a radio frequency (RF) mesh two-way network to support key utility applications including advanced metering, demand response and distribution automation.

2. Responsibilities

2.1 Landis + Gyr (L&G) will:

- Deliver their Gridstream RF two-way AMI head-end solution.
- Support the integration of the head-end system with the MDMS, CIS, GIS and other appropriate systems.
- Commission the RF network
- Perform System Acceptance Testing (SAT) based on a mutually agreed upon Plan.
- Train Licking Valley RECC personnel on the installation and maintenance of network devices, DA radios and RF field tools and on the use of Command Center head-end software for utility operations and network administration.
- Provide ongoing technical support for the duration of deployment.

2.2 National Information Solutions Cooperative (NISC) will:

- Deliver the Meter Data Management System (MDMS).
- Support the integration of the MDMS with the head-end system, CIS and other appropriate systems.
- Perform System Acceptance Testing (SAT) based on a mutually agreed upon Plan.
- Train Licking Valley RECC personnel on the use of the MDMS software.
- Provide ongoing technical support for the duration of deployment.

2.3 Licking Valley RECC will:

- Prepare facilities for the installation of the head-end system and network infrastructure.

- Install network devices.
- Provide existing communication infrastructure for use as the AMI system communication backhaul.
- Remove existing meters and replace with AMI meters.
- Test meters.
- Provide project oversight and management.

2.4 Projected Timeline:

Completed installation of 100 meter pilot project – September 30, 2015
Satisfied with results of pilot project - December 07, 2015
Approval from PSC of CPCN - March 01, 2016
Begin System wide Meter installation as needed - March 01, 2016
Project complete - March 2020

Estimated Project cost

Equipment	Number of Devices	Cost	Total
RF C6500 Series Collector	5	$ 6,500.00	**$ 32,500.00**
RF C5400 Series Collector Mounting Kit	5	$ 850.00	**$ 4,250.00**
RF Routers	486	$ 1,615.00	**$ 784,890.00**
Meters with Communication Modules Landis +Gyr RF Focus - Residential	17000	$ 156.88	**$ 2,666,960.00**
Meters with Communication Modules Landis +Gyr RF Focus AX Polyphase Meter with Communication Modules for Commercial & Industrial	300	$ 251.75	**$ 75,525.00**
Services & Training			**$ 45,400.00**
RF Tools			**$ 4,900.00**
Labor - Routers & Collectors 2 men 1 -1/2 hour each@ 30.25	496	$ 90.75	**$ 45,012.00**
Labor - Meters 1 man 1/2 hour @ 30.25	17000	$ 15.12	**$ 257,040.00**
Transportation $25.00 per hour			
Routers 1.5 x 25.00	496	$ 37.50	**$ 18,600.00**
Meters 1/2 hour X 25.00	17300	$ 12.50	**$ 216,250.00**
Labor - Overhead Cost @ 90%			**$ 271,846.80**
Total Cost For CPCN Meter Project			**$ 4,423,173.80**

Projected Benefits for Applicant and its Members

Enhance/Improve Member Satisfaction:

Data collected from the AMI system will be accurate and available for members to access via Licking Valley RECC's website (www.lvrecc.com) and Smart Hub. The access to hourly usage data will allow members to make more informed decisions on energy usage. This will help members to become more energy efficient and to see cost savings from their informed choices. Additionally, the Landis+Gyr solution will position Licking Valley RECC to eventually provide members an avenue for load control in their homes.

The data from the AMI system will also help Licking Valley RECC to operate more efficiently which will have a positive effect for members. These meters allow Licking Valley RECC to continue uploading monthly billing reads system wide. Member Service Representatives will have access to the hourly usage and historical data of members and will be able to help members manage their usage.

Licking Valley RECC is proposing the installation of a portion of meters with remote connect and disconnect features. With this capability, the cooperative will be able to connect and disconnect accounts on the same day. This will make work processes more efficient, as well as improve member satisfaction.

Due to the system's capability, Licking Valley RECC can continue with Pre-Pay Metering system wide, instead of 50% of the system as it now stands. This aids enrolled members in usage reduction, as well as eliminate the requirements for deposits.

Reduce Safety Risk to Employees and Members:

The AMI system will allow Licking Valley RECC to work more efficiently and safely. Since meter reading will continue to be automated, there will be less truck rolls which are likely to result in fewer automobile accidents as well as injury from animals, etc. Additionally, by utilizing the available AMI system alarms, 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.

Enhance and Improve Data:

The AMI system will greatly improve the accuracy of available data for system analysis. This includes the prediction of future load, the depiction of load at critical times and identifying trouble areas, such as low voltage or overloaded transformers, on the system. Ultimately, this will aid Licking Valley RECC in reducing outages.

Additionally, through use of the AMI system and the MDMS the potential to evaluate alternative rate structure in the future will be available.

Cost- Saving Benefits:

The AMI system will eliminate the need for manual meter reads on 3 phase accounts and for service connections and disconnections to the majority of residential properties. Detection of tampering and unauthorized access to meters will generate an alarm to System Operators, thus reducing opportunity for energy theft. The system and the software will improve response time to malfunctioning meters. Additionally, the proposed Landis+Gyr system will allow Licking Valley RECC to control voltage over the distribution system. By having the ability to control down-line regulators the cooperative will be capable of load shaving and ultimately avoid costs.

Amendment To Current Approved
Construction Work Plan

Amendment # **2016-1** Borrower Designation **KY 56**

Work Plan Period 2012-2015 (extended 2016)

Change Proposed

CPCN Meter Project
Replace meters and associated equipment

Reason for Change

Required upgrade

Method of Financing

Loan Funds **X**
General Funds
Contributions in Aid

Status of Borrowers Environmental Report: NA

Estimated Cost: **$4,423,174**

Engineering Support Attached: Yes

Requested By _____ Date: 1-15-2016
General Manager/CEO

Approved By: Mike Norman Date: 1-15-2016
RUS, GFR

Subject to BER approval? Yes No **X**

Status of Construction: Proposed

COMMONWEALTH OF KENTUCKY
BEFORE THE
KENTUCKY PUBLIC SERVICE COMMISSION

In the matter of:

THE APPLICATION OF LICKING VALLEY RECC	**)**	**CASE NO. 2016-_____**
FOR AN ORDER ISSUING A CERTIFICATE	**)**	
OF PUBLIC CONVENIENCE AND NECESSITY		

TESTIMONY OF KERRY K. HOWARD

Q1. Please state your name, business address and position with Licking Valley RECC.

A. Kerry K. Howard, Post Office Box 605, West Liberty, Kentucky 41472. I am General Manager

Q2. What is your educational background?

A. Bachelor of Science from Morehead State University.

Q3. What is your work experience?

A. I have worked for Licking Valley RECC since 2005.

Q4. Have you previously submitted testimony before the Kentucky Public Service Commission?

A. Yes

Q5.What is Licking Valley RECC requesting in this case?

A. Licking Valley RECC is requesting a certificate of public convenience and necessity to install an Advanced Metering Infrastructure system ("AMI").

Q6. Why is Licking Valley RECC seeking the certificate?

A. Licking Valley RECC has 50% of system with Automated Meter Reading (AMR's) and 50% with Automated Meter Information (AMI's) installed. The AMR/RF technology will allow for Time of use, prepay metering, current data, will allow for more Demand Side Management programs, more efficient delivery of information, will support SCADA technology, and possible voltage reduction with inline voltage regulators and capacitors.
In addition an AMI/RF system will allow Licking Valley RECC to analyze its system more efficiently and should improve reliability through shorter response times and fewer truck rolls, thereby reducing the risk of accidents. It will enable remote connection and disconnections for

most situations. The proposed system will generate an alarm in the event of tampering and unauthorized access; will decrease the response time for malfunctioning meters; and will provide Licking Valley RECC with the ability to control distribution assets so as to maximize the capacity and efficiency of system devices.

Q7. How will Licking Valley RECC pay for the AMI/RF system?

A. RUS has approved a modification to the Licking Valley RECC Construction Work Program (AM8). Loan funds will provide 100% of the cost of the project.

Q8. Has Licking Valley RECC's Board approved the AMI/RF project?

A. Yes, updates are given at monthly board meetings.

Q9. Does this conclude your testimony?

A. Yes.

COMMONWEALTH OF KENTUCKY
BEFORE THE
PUBLIC SERVICE COMMISSION

In the Matter of:

THE APPLICATION OF LICKING VALLEY RECC)
FOR AN ORDER ISSUING A CERTIFICATE OF)
PUBLIC CONVENIENCE AND NECESSITY) CASE NO. 2016-00___

VERIFICATION OF KERRY K. HOWARD

I Kerry K. Howard, General Manager/CEO of Licking Valley RECC hereby state that I have read the foregoing Testimony and that the statements contained therein are true and correct to the best of my knowledge and belief on this ___ day of February 2016.

Kerry K. Howard, General Manager/CEO
Licking Valley RECC

COMMONWEALTH OF KENTUCKY
COUNTY OF MORGAN

The foregoing verification statement was SUBSCRIBED AND SWORN to before me by Kerry K. Howard, General Manager/CEO, Licking Valley RECC, on this 10th day of February 2016.

Notary Public # 466856
My commission expires: 05/29/2016

Commonwealth of Kentucky
Trey Grayson
Secretary of State

Certificate of Existence

I, Trey Grayson, Secretary of State of the Commonwealth of Kentucky, do hereby certify that according to the records of the Office of the Secretary of State,

LICKING VALLEY RURAL ELECTRIC COOPERATIVE CORPORATION

is a nonprofit corporation duly incorporated and existing under KRS Chapter 273, whose date of incorporation is June 22, 1940 and whose period of duration is perpetual.

I further certify that all fees and penalties owed to the Secretary of state have been paid; that articles of dissolution have not been filed; and that the most recent annual report required by KRS 273.3671 has been delivered to the Secretary of State.

IN WITNESS THEREOF, I have hereunto set my hand and affixed my Official Seal at Frankfort, Kentucky, this 12th day of September, 2007.

Certificate Number: 52977
Jurisdiction: Licking Valley RECC
Visit http://apps.sos.ky.gov/business/obdb/certvalidate.aspx to validate the authenticity of this certificate.

Trey Grayson
Secretary of State
Commonwealth of Kentucky
52977/0031185