Before the Department of Energy Washington, D.C. 20585

))

)

)

In the Matter of

Implementing the National Broadband Plan by Studying the Communications Requirements of Electric Utilities To Inform Federal Smart Grid Policy

NBP RFI: Communications Requirements

COMMENTS OF STEELE-WASECA COOPERATIVE ELECTRIC

I. Introduction

a. Identification/description of your company.

Steele-Waseca Cooperative Electric is a distribution cooperative that mainly serves the rural area of the three counties of Rice, Steele, and Waseca in southwestern Minnesota. Some of Steele-Waseca Cooperative Electric's service territory also exists in the surrounding counties of Blue Earth, Dodge, Faribault, Freeborn and Le Sueur. With headquarters in Owatonna, MN, Steele-Waseca Cooperative Electric serves 9,583 members. The majority of the members served are in rural, agricultural areas though there are residential areas in Steele-Waseca Cooperative Electric territory in the bedroom communities of Medford and Lonsdale. Industrial and commercial areas are found on the outskirts of the cities of Claremont, Faribault, and Owatonna. Consumer density is 4.65 members per mile of power line. The terrain in Steele-Waseca Cooperative Electric's territory ranges from flat farm land to rolling hills with much wooded areas. Steele-Waseca Cooperative Electric buys all its power from Great River Energy, (GRE).

b. Overview of communications networks

i. Why private networks?

- Better Coverage than Commercial Providers
- Reliability
- Security
- Quicker Response on Maintenance Issues
- Direct Control of Assets

ii. What technologies are used?

- a. GRE's 700 Mhz system with Arcadian Networks, Inc
- b. GRE's 450 Mhz mobile radio system
- c. Fiber backhaul

c. Overview smart grid deployment plans

i. Types of applications and number of devices

Steele-Waseca Cooperative Electric plans to have two-way communication to all meter endpoints (current quantity 10,000) along with two-way communications to feeder electronic reclosures and capacitor banks (current quantity 65).

ii. Timeframe for deployment

- Two-way communication with meter endpoints 2nd quarter 2012
- Two-way communications to all substation electronic reclosers 2015

d. Overview of communications requirements

i. Current

- Mobile radio is point to point and point to multipoint.
- AMR metering is currently sending limited information over commercial provider fiber network

ii. Future

- Mobile radio will be including AVL data and mobile messaging
- AMR will become 2 way and more consumer usage information will be sent back and forth over commercial fiber network.
- Video surveillance of substations and other critical infrastructure

e. Assessment of existing networks to meet current and future communications needs

i. What are the communications gaps?

- Lack of commercial provider service coverage in some remote rural areas.
- Secure methods to transmit the consumer and utility sensitive information.
- No spectrum available to address the above two issues inhouse.

ii. What do you need to fill those gaps?

A dedicated spectrum that Steele-Waseca Cooperative Electric can utilizes to ensure consumer and utility information is secure and further build out of communications area can occur.

f. Commercial services

i. Do they currently meet utility needs?

1. Mission critical applications

No. Security and service area coverage is inadequate for transmission of all data. Response time for repair of infrastructure is also not prioritized for the utility infrastructure communications by commercial communication providers.

2. Non-mission critical applications

No. Service area coverage is inadequate for transmission of all data.

ii. How can they be improved?

- Continued build out of commercial communication networks with guaranteed spectrum for critical utility data transmission.
- Secure methods of transmitting utility data guaranteed by commercial providers.
- Battery backup at all mission critical areas
- Priority given to utilities in maintenance responses

II. Smart grid and communications requirements today

- a. Detailed description of smart grid applications (e.g. AMI, DA, and DR).
 - i. Describe the types of applications, the extent of their deployment and whether they are mission critical. AMI-Steele-Waseca Cooperative Electric has nearly 100% deployment of AMI meters that are capturing daily and hourly data which is transmitted to headquarters on a daily basis. This information is critical in the financial aspect of the utility operations.

DA- Steele-Waseca Cooperative Electric has all distribution automation being done at the substation level through a SCADA system controlled by GRE. This information is mission critical in the operation of the distribution power grid Steele-Waseca Cooperative Electric maintains.

DR- Steele-Waseca Cooperative Electric has an extensive demand response system that directly controls end use devices such as water heaters, AC, heat and irrigation. The system is capable of reducing peak demands between 10-15% depending on season of year. The operation of these devices are mission critical in maintaining system continuity.

- b. Functional requirements needed to support those smart grid applications.
 - i. What are your specific requirements with regard to cost, Coverage, Capacity (Bandwidth), Latency, Reliability, Back-up power (AC Independence), and Security for each of these applications?

Steele-Waseca Cooperative Electric needs a communication system that can be operated at reasonable cost, but also it must be reliable and capable of withstanding power interruptions. All critical devices must have battery backup with the communications. Security of the data being transmitted must be at the level acceptable to NERC which some commercial communication providers are not meeting.

III. Smart grid and communications requirements of tomorrow

a. Detailed description of future smart grid applications

- i. Describe the types of applications, the extent of their deployment, and whether they are mission critical.
 - Further buildout of distributed automation at substations and feeder located devices. This is expected to increase by 150% in the next 10 years. Mission critical
 - The addition of video surveillance at critical infrastructure locations. Non-mission critical
 - The addition of mobile AVL data with a response of at minimum 2 minute intervals. Non-mission critical
 - Continue build out of AMI with more consumer information being transmitted on an increased frequency duration. Mission critical.
 - Continued build out of controlled end-user devices. Mission critical.
- b. Functional requirements needed to support those smart grid applications.
 - i. What are your specific requirements with regard to cost, Coverage, Capacity (Bandwidth), Latency, Reliability, Back-up power (AC Independence), and Security for each of these applications?

The requirements will be for reliable wide area coverage with bandwidths carrying considerably more data than is done with the present system. Reliability will be most important during times of system emergencies when commercial systems are most likely to experience problems. The need will be for a reliable self healing network providing redundant communication paths.

IV. Technology Options and Other Considerations

a. What technology options are available to meet your needs?

- i. Wireless
 - 1. Licensed
 - GRE's 700 Mhz backhaul and 450 Mhz trunk radio system
 - 2. Unlicensed

Some frequencies are available to use but only for nonmission critical applications.

- ii. Wireline
 - 1. Fiber

Fiber is available in some areas and only used as a backhaul.

2. PLC or Wireline

Steele-Waseca Cooperative Electric uses PLC with the AMR system. However this is not feasible to high bandwidth transmission of data.

- b. What other considerations come into play in terms of choosing a technology option for your utility?
 - i. Terrain, Foliage, Customer Density, Size of Service Territory,

Overhead/Underground Grid Topology, etc.

Steele-Waseca Cooperative Electric mainly serves rural agricultural areas. Consumer density is 4.65 members per mile of power line. The terrain in Steele-Waseca Cooperative Electric's territory ranges from flat farm land to rolling hills with much wooded areas. Communications in these areas need to rely short hop communications with store and forward type capabilities.

V. Recommendations

a. Based on your functional requirements and applications, what technology options would you prefer to use for your utility?

i. Current

- Fiber for backhaul
- Licensed 700 Mhz for transmission of AMI data and critical infrastructure devices.
- Licensed 450 Mhz for mobile radio transmission

ii. Future

Same as above though bandwith currently available in the License 450 Mhz and 700 Mhz may not be enough as more information is being transmitted from mission critical infrastructure devices.

VI. Commercial systems

a. Do they meet your needs?

Commercial systems may meet the need for AVL provided the service coverage is expanded. Commercial systems do not meet the security and response maintenance duration needed for mission critical infrastructure.

b. What improvements would meet your needs?

Commercial systems do not meet the security and response maintenance duration needed for mission critical infrastructure. For commercial system to be considered for SCADA, AMI and end user controlled devices, first a build out in service area needs to be expanded. Then the security of the transmission needs to be improved to meet NERC standards. Priority needs to be given to the utility on the transmission of data and response to address maintenance issues of the network.

VII. Conclusion

In response to federal and state mandates and goals, Steele-Waseca Cooperative Electric is to share more information with consumers on their electric use and to more efficiently operate the existing distribution grid to lower power losses. To accomplish these goals and mandates Steele-Waseca Cooperative Electric must gather and share more power consumption information along with control more utility and end user devices. The information gather is very security sensitive and must be transmitted on a very reliable communication network. Currently commercial communication providers cannot meet the security, priority and reliability requirements hence licensed spectrum is used. However as more information needs to be

collected and transmitted the currently utilized license spectrums will not be able to meet the expected bandwidths requirements. Utilities need to have dedicated, broadband spectrum in order to maintain reliable and secure electric systems.

Respectfully submitted,

Steele-Waseca Cooperative Electric

Kristi Robinson 2411 West Bridge Street Owatonna, MN 55060 507-446-4235

6/28/2010