JACKSON ENERGY COOPERATIVE

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October 1, 2010

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

Re: AMR/AMI Metering Capabilities

Mr. Derouen:

Jackson Energy Cooperative respectfully submits the information requested in the letter dated September 16, 2010 regarding definitions and equipment associated with AMR/AMI.

Please inform me if any further information is required.

Sincerely,

Donald Schaefer
CW

Donald R. Schaefer
President & CEO

Response to the letter from Mr. Jeff Derouen, dated September 16, 2010:

The central issue of the letter concerns the use of the terms AMR and AMI in reference to the TWACS system installed by Jackson Energy. When Jackson Energy purchased the TWACS system in 2003, it was referred to as an AMR system in addition to Construction Work Plans (CWP) submitted after 2003. However, in response to Case No. 2010-00210, the TWACS system is referred to as an AMI system.

During the summer of 2001, Jackson Energy began evaluating various AMR systems and during the evaluations, the term AMI was not used. In 2002, Jackson Energy installed a pilot AMR project using the TWACS system. Based on the results of the pilot project the TWACS system was purchased. While negotiating with DCSI (Distribution Control System, Inc.), for purchase of the system, the term AMI was not used.

Attachment A is an excerpt from the DCSI End User Software License Agreement Dated May 10, 2002. DCSI states that Jackson Energy is signing a license agreement for "TWACS Net Server (TNS) Standard Automatic Meter Reading (AMR) Package for Electric Metering." This is presented to illustrate that the vendor, DSCI, referred to the TWACS system as an AMR system. This software was purchased for the TWACS pilot project in 2002. When the full TWACS system was purchased in 2003, this same software was capable of controlling the full TWACS deployment.

Jackson Energy selected the TWACS AMR system because it was capable of more than reading meters. Personnel from Jackson Energy visited Southwestern Electric Cooperative, located in Greenville, Illinois, during July of 2001. During the visit Jackson Energy personnel saw the TWACS system in actual use by an electric cooperative. Jackson Energy personnel questioned the staff of Southwestern Electric Cooperative about the TWACS system. During these discussions the TWACS system was referred to as an AMR system.

It was only after Jackson Energy began installing the TWACS AMR system that any personnel were aware of the term AMI being used. The exact definition of AMI was not well defined initially. AMI was used to designate a system that had more capabilities than AMR. However, there was not an official definition or distinction between an AMR and AMI system. Sometimes the terms were used almost interchangeably by vendors and the media.

In August 2006, the Federal Energy Regulatory Commission (FERC) released a staff report titled *"Assessment of Demand Response and Advanced Metering."* The docket number for this report is AD-06-2-000. On pages 17 and 18 of the FERC report, a definition is given for AMI. The following is excerpted from the FERC report:

"Commission staff defines "advanced metering" as follows:

> *Advanced metering is a metering system that records customer consumption [and possibly other parameters] hourly or more frequently and that provides for daily*

or more frequent transmittal of measurements over a communication network to a central collection point.

The key concept reflected in this definition is that advanced metering involves more than a meter that measures consumption in frequent intervals. Advanced metering refers to the full measurement and collection system, and includes customer meters, communications networks, and data management systems. This full measurement and collection system is commonly referred to as advanced metering infrastructure (AMI).

Since the release of this report, this definition of AMI has been accepted by other organizations. Attachment B is a February 2007 document from the Electric Power Research Institute (EPRI). The description of AMI closely resembles the 2006 FERC report. In addition, an Internet search for "FERC definition of AMI" will give numerous results for organizations and publications that reference the 2006 FERC report. If the FERC definition is accepted as a standard definition for AMI, then that definition was established in 2006. This was five years after Jackson Energy evaluated AMR systems and three years after Jackson Energy began installing the TWACS AMR system. If Jackson Energy were purchasing the same TWACS system today that it purchased in 2003, it would be called an AMI system. The TWACS system is the same; it is the terminology that has changed.

Jackson Energy submitted three CWP's using the term AMR for the TWACS system. Two of these CWP's were submitted prior to 2006. The third CWP was submitted on July 25, 2007. In order to prevent confusion with these three previous CWP's, the answers to questions concerning the 2010-2013 CWP used the same term AMR for the TWACS system.

When Case No. 2010-00210 was submitted to the Commission, there was no prior reference to TWACS, in relation to prepay metering, in filings before the Commission. Jackson Energy could have continued to refer to the TWACS system as an AMR system. But since the capabilities of the system more closely match that of an AMI system, the term AMI was used. Additionally, if Jackson Energy had stated that it intended to install prepay metering using an AMR system it could have caused confusion. A strict definition of an AMR system is that it is only capable of reading meters and not capable of passing information back to the meter or consumer. If this strict definition is used, then prepay metering as proposed by Jackson Energy would be impossible with an AMR system.

It is with this in mind that Carol Wright stated that the TWACS system should be considered an AMI system for the installation of prepay metering as proposed in Case No. 2010-00210. The TWACS system has not been modified since its installation. The equipment that is in the substations now is the same equipment that was originally installed in the substations. In the 2007-2009 CWP, money was allocated for equipment to be installed in two new substations that were being added to the system. This did not modify any existing substation equipment. There have been upgrades to the system software, but these have been maintenance upgrades only. At this time, there are no other

long-term plans to enhance the existing AMI infrastructure other than offering Prepaid Electric Service to our members as described in Case No. 2010-00210.

Capabilities of the TWACS System

TWACS is an acronym that stands for Two Way Communications System.

The TWACS system was chosen for its ability to perform functions beyond meter reading. The capabilities include:

Load Control – The ability to control designated consumer loads. Jackson Energy had consumers with Electric Thermal Storage (ETS) units prior to 2003. These units were separately metered and billed under Jackson Energy's ETS tariff. The meter on the ETS service controlled when the ETS unit charged. The meters were being phased out by the manufacturer. The ability of the TWACS system to control the ETS load was one of the considerations that influenced the purchase of the system.

Line-Voltage Monitoring – The ability to obtain a voltage reading from a meter. If there is a question about the voltage in an area, the TWACS system can be used to obtain voltage readings from multiple consumers in that area.

Remote Service Connect/Disconnect – The ability to remotely connect and disconnect a consumer's meter.

Outage Monitoring/Restoration Monitoring – The ability to determine if an individual consumer is out of power during an outage and the ability to determine if an individual consumer's power has been restored after power is restored in an area.

Tamper/Theft Detection – The ability to determine if a meter tampering or energy theft has occurred.

DCSI END USER
SOFTWARE LICENSE AGREEMENT
Dated May 10, 2002

LICENSOR: Distribution Control Systems, Inc. ("DCSI")
5657 Campus Parkway
Hazelwood, Missouri 63042

LICENSEE: Jackson Energy Cooperative
U.S. Highway 421 South
McKee, Kentucky 40477

1.0 Licensee's End User Status: Licensee has purchased from DCSI certain TWACS-10 System hardware and desires to use certain proprietary software of DCSI and third parties in connection with such hardware but which is not included in such purchase. Licensee (hereinafter sometimes also referred to as the "End User") represents and warrants that it is and shall remain the owner and operator of the TWACS-10 System and desires to obtain a license to use such software in conjunction with its operation of the TWACS-10 System.

2.0 Software Licensed: Set forth in Attachment (A), attached hereto and forming a part hereof, is a listing of the DCSI and third party software being licensed to End User for use in End User's TWACS-10 System. Only the object code form of the software listed in Attachment (A) (hereinafter the "Software") is licensed under this Agreement. End User hereby acquires only a limited license to use the Software and related Software Documentation in accordance with the terms and conditions of this License Agreement. Third party software is licensed to End User by DCSI pursuant to software sublicensing arrangements with the respective third parties identified in Attachment A.

ATTACHMENT A
TO
JACKSON ENERGY COOPERATIVE
SOFTWARE LICENSE AGREEMENT

I. DCSI SOFTWARE

VENDOR/ SUPPLIER	DESCRIPTION	COMPUTER EQUIPMENT MODEL TYPE	QTY.	LICENSING PARAMETERS PARAMETER	QTY.
DCSI	TWACS Net Server (TNS) Standard Automatic Meter Reading (AMR) Package for Electric metering.	INTEL Processor	1	Seats[1] Maximum Meters[2] Maximum Utilities	3 25,000 1
DCSI	TWACS Net Server (TNS) Load Control License ("LC Lite") Providing Control Commands, Only	INTEL Processor	1	Seats[1] Maximum LCTs Maximum Utilities	1 unlimited 1
DCSI	SCE Firmware[3]				
DCSI	RCE Firmware[4]				

II. THIRD PARTY SOFTWARE---NOT INCLUDED IN THIS SOFTWARE LICENSE AGREEMENT

VENDOR/ SUPPLIER	DESCRIPTION	COMPUTER EQUIPMENT MODEL TYPE	QTY.	LICENSING PARAMETERS PARAMETER	QTY.
Microsoft	Windows 2000 Operating System	INTEL	1	NOT SPECIFIED BY DCSI	NOT SPECFIED BY DCSI

THIRD PARTY SOFTWARE, AS SPECFIED ABOVE, IS FURNISHED AND PRE-LOADED ON THE TWACS NET SERVER HARDWARE BY END USER. LICENSING OF THE SOFTWARE SHALL BE DIRECTLY WITH THE IDENTIFIED VENDOR/SUPPLIER UNDER THE TERMS AND CONDITIONS OF THE APPLICABLE SOFTWARE LICENSE AGREEMENT.

[1] "Seats" refers to the maximum number of concurrent (simultaneously active) users.
[2] Maximum Meters counts electric, gas and water meters separately, even when a single TWACS AMR device automates more than one meter.
[3] Licensed with each Substation Communications Equipment (SCE) unit delivered.
[4] Licensed with each Remote Communications Equipment (RCE) transponder delivered.

Advanced Metering Infrastructure (AMI)

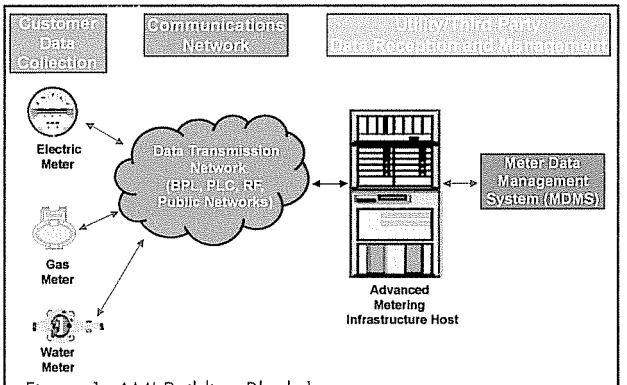

Figure 1: AMI Building Blocks[1]

Overview of AMI

Advanced metering systems are comprised of state-of-the-art electronic/digital hardware and software, which combine interval data measurement with continuously available remote communications. These systems enable measurement of detailed, time-based information and frequent collection and transmittal of such information to various parties. AMI or Advanced Metering Infrastructure typically refers to the full measurement and collection system that includes meters at the customer site, communication networks between the customer and a service provider, such as an electric, gas, or water utility, and data reception and management systems that make the information available to the service provider.

AMI Components

Figure 1 shows the building blocks of AMI. The customer is equipped with advanced solid state, electronic meters that collect time-based data. Meters include all three types—electricity, gas, and water meters. These meters have the ability to transmit the collected data through commonly available fixed networks such as Broadband over Power Line (BPL), Power Line Communications (PLC), Fixed Radio Frequency (RF) networks, and public networks (e.g., landline, cellular, paging). The meter data are received by the AMI host system and sent to the Meter Data Management System (MDMS) that manages data storage and analysis to provide the information in useful form to the utility. AMI enables two-way communications, so communication from the utility to the meter could also take place.

AMI Costs and Benefits

Costs

The total capital costs of deploying AMI include the hardware and software costs (meter modules, network infrastructure, and network management software for the AMI system), as well as installation costs, meter data management, project management, and information technology integration costs. Figure 2 shows the breakdown of AMI system costs based on an electricity use meter

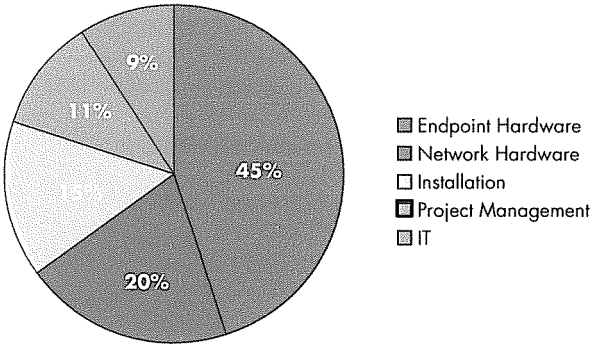

Figure 2: AMI System Cost[1]

AMI hardware costs have declined by more than a fifth over the past decade. By 2005-06, the average hardware cost per meter was estimated to be $76. The capital costs related to communications infrastructure installation ranges from $125-150 per meter.

Benefits

Benefits associated with AMI deployment can be broadly categorized as:

- System Operation Benefits
- Customer Service Benefits
- Financial Benefits

System Operation Benefits - primarily associated with reduction in meter reads and associated management and administrative support, increased meter reading accuracy, improved utility asset management, easier energy theft detection, and easier outage management.

Customer Service Benefits - primarily associated with early detection of meter failures, billing accuracy improvements, faster service restoration, flexible billing cycles, providing a variety of

time-based rate options to customers, and creating customer energy profiles for targeting Energy Efficiency/Demand Response programs.

Financial Benefits - these accrue to the utility from reduced equipment and equipment maintenance costs, reduced support expenses, faster restoration and shorter outages, and improvements in inventory management

Market Penetration and Examples of AMI Deployment

Recent estimates indicate that AMI currently has a low market penetration of less than 6 percent in the U.S. The highest deployment is by electric cooperatives with a penetration close to 13 percent, followed by investor-owned utilities with close to 6 percent penetration. AMI installation varies widely across states too – the five states with the highest penetration of advanced meters are Pennsylvania, Wisconsin, Connecticut, Kansas, and Idaho.

Applying EPRI's IntelliGrid® Architecture for AMI Projects

EPRI offers an industry-developed set of tools, processes, and best practices collectively known as IntelliGrid® Architecture. Adaptable to individual company needs and reliant on open, standards-based systems, the IntelliGrid® Architecture makes it possible for utilities to design and deploy an advanced metering infrastructure that can be more easily integrated into a utility's enterprise systems, outage management, asset management, customer management, and other functions.

An AMI that follows IntelliGrid® principles will be

- More easily integrated with existing and future systems
- Flexible enough to adapt to new uses as they are discovered
- Lower in cost due to the use of standard interfaces that avoid "vendor lock-in"
- Secure and reliable because it was designed with those principles in mind from the start
- Resistant to obsolescence due to changing technologies

Issues That Require Further Considerations

There are a number of issues that need to be addressed for increasing deployment of AMI systems. These issues primarily pertain to metering systems for electricity, which is most frequently discussed in the industry. Some of the issues are.

AMI Specifications

Consistent specifications for AMI systems may be difficult to achieve in the short-term due to variations in interval data requirements, based on billing and settlement requirements in wholesale markets. Developing consistent specifications will be critical for supporting investments in AMI

AMI and Demand Response Networks

In the context of Demand Response (DR), there is a need to develop a consistent approach for integrating the communication backbone for providing price signals or notification of system emergencies with the AMI system.

Interoperability and Standard Interfaces

AMI systems offered by different vendors will be required to conform to standards established by the American National Standards Institute (ANSI). Also, there is a need to develop standard interfaces between systems, such as between the host AMI system and MDMS, between MDMS and other utility data systems, as well as interfaces with DR networks and systems

Security

Security issues associated with meter data transmission from the customer meters to the AMI host system will need to be addressed to ensure that only authorized devices provide and receive meter data.

Cost-Benefit Assessment

Uniformity in cost-benefit assessment across different business case assessments for AMI is essential. This will enable regulators to compare proposals and deployments across utilities under their review, and also allow electric utilities to comprehensively judge whether they should deploy AMI.

References

1. Assessment of Demand Response and Advanced Metering – Staff Report, FERC Docket AD06-2-000; August 2006

For More Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com)

Technical Contacts

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