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April 14, 2009

Reneé J. Jenkins
Director of Administration
Docketing Division
Public Utilities Commission of Ohio
180 East Broad Street, 13th Floor
Columbus, Ohio 43215

Re: Case Nos. 07-829-GA-AIR; 07-830-GA-ALT;
07-831-GA-AAM; 08-169-GA-ALT; 06-1453-GA-UNC

Dear Ms. Jenkins:

Pursuant to the Commission's Opinion & Order in the above case dockets dated October 15, 2008, enclosed herein is Dominion East Ohio's Assessment of Advanced Metering Capabilities. Please file the enclosed report in the case dockets identified above.

Please call me if there are any questions.

Very truly yours,

Grant W. Garber

Enclosure

cc: Scott Farkas, Esq.
Christine T. Pirik, Esq.
Jeffrey A. Murphy
Vicki H. Friscic
Parties of Record (w/enclosures) (via e-mail)

COI-1420317v1

DOMINION EAST OHIO
Case No. 07-829-GA-AIR

Assessment of Advanced Metering Capabilities

Overview

The following is an assessment of DEO's automated meter reading system (AMR) and the potential capabilities available with DEO's current deployment. In addition, DEO reviewed the opportunities available with parallel electric utilities that may be deploying or considering deployment of an advanced meter infrastructure (AMI) that could provide consumer and utility benefits.

There are three essential components for an effective AMI solution: the meter, the communications infrastructure and a meter data management system (MDMS). The meter typically used in an AMI solution is designed for electric meters to identify consumption in more detail than conventional meters and is capable of communicating that information via a fixed network back to the local electric utility. These meters are powered from the electricity that flows through them. The expansion to an AMI application typically requires a Fixed Network methodology where the network is permanently installed to capture meter readings and other key usage information from the customer's premise. The fixed network architecture consists of a series of antennas, towers, collectors, repeaters, or other permanently installed infrastructure that creates the conduit for the meter data information to be transmitted and received. The electric utilities utilizing AMI have this infrastructure in place to provide a two-way communication between meters at the customer site and the electric utility.

DEO is currently deploying the ITRON Automated Meter for its AMR program. These are smarter meters than the conventional ones used and will transmit data to DEO through a one-way radio frequency system. DEO is using an RF radio frequency system using licensed RF bands. The one-way application means the data moves one way, from the meter with an ERT (encoder-transmitter-receiver) to the meter reading receiver, which in our case is the hand-held device or the truck-mounted mobile collector. The hand-held device or mobile collector is then brought back to the local office where the information is uploaded to the customer information system for billing.

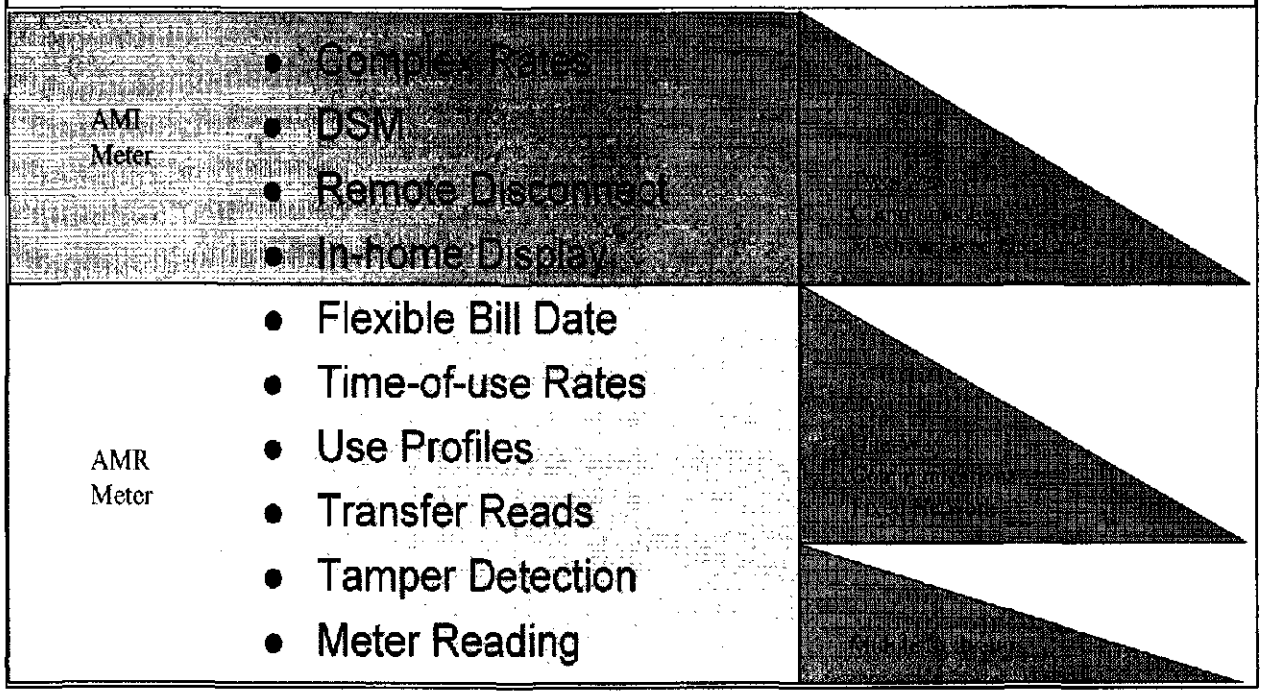
DEO's investigation of the options available from a general benefit of AMI advanced metering systems is shown in the information that follows.

Benefits and Features for Advanced Metering Systems

Figure 1 shows the general benefit spectrum for an advanced metering system along with the meter type and communications system generally required for each benefit. The figure illustrates that benefits above the "basic meter read" can require both an increase in communication frequency and an enhanced meter. The communication systems identified start with the van-

mounted, mobile collector that a utility would generally employ to collect monthly meter reads, then moves to a one-way fixed network. The one-way fixed network allows for daily or on demand meter readings. The top communications system is the two-way mesh or fixed network. This system combined with advanced meters allows the utility to go considerably beyond simply reading the meter.

Figure 1. General AMR/AMI Benefit/Feature Spectrum for Residential Customers



The benefits and features identified in Figure 1 include:

- Meter Reading – The base capability of all advanced systems is to provide accurate and reliable meters reads.
- Tamper Detection – Almost all systems provide some form of tamper indication and transmit a tamper status along with the meter reading. For gas meters a tilt tamper switch is activated by the physical movement of the meter if someone attempts to disconnect it. Electric meters may use a loss of power indicator.
- Transfer Reads – In most cases, when a customer moves, the new customer or landlord will take responsibility for the service without a disruption in service. To accommodate this transfer the utility only needs a meter read. Automated systems that can provide this reading eliminate the need for a service call.
- Use Profiles – Additional meter readings collected between normal billing dates create improved use profiles. This information helps customer service agents when addressing customer consumption questions and can be useful in tamper investigation. Making the

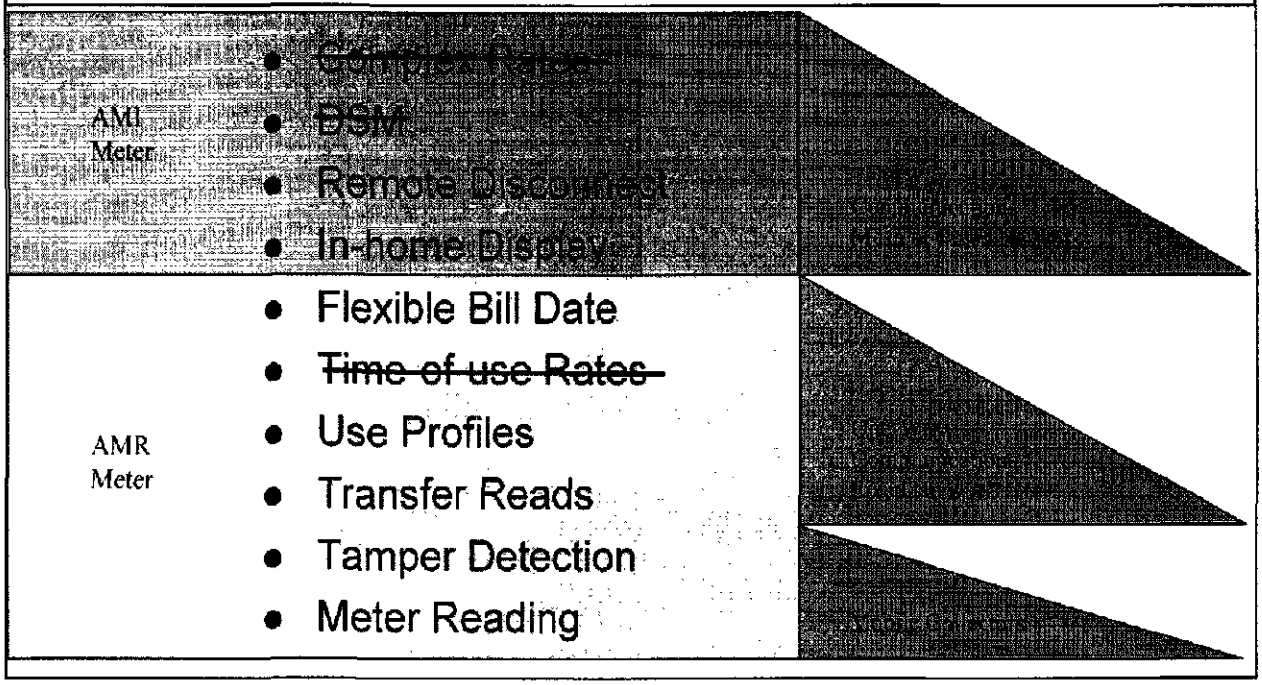
data available to the customer on-line may eliminate the need for the customer's phone call.

- Time-of-Use Rates – A rate structure used by electric utilities that reflects the variable cost of electricity production on a daily/hourly basis.
- Flexible Bill Date – The ability for the customer to select a bill due date that best fits its household's cash flow. In general, this benefit is tied to the ability to collect a meter reading when needed.
- In-home Display – The in-home display has been shown to be an effective feedback tool for reducing electrical consumption. This benefit has been showcased in advanced systems where profile data is sent to the meter by the utility and the meter then transmits the data via a local area network to a display unit.
- Remote Disconnect – Centrally controlled remote disconnect and reconnect is a feature of almost all advanced metering systems with two-way communications being implemented by electric utilities.
- DSM – The ability to directly control consumption by turning equipment on and off (electric water heaters and air conditioning compressors) as a function of system load. In general, this is accomplished by sending a message to the customer's meter, which in turn communicates with a control device on the appliance. Another DSM application is to use the advanced metering system to monitor system voltages and enable improved network voltage control.
- Complex Rates – As a method of controlling peak demand, electric utilities may need to go beyond fixed time-of-use rates and DSM. One example is critical peak pricing, a time-of-use rate that can help prevent system outages. The advanced metering system communicates the event's start and stop points and measures consumption during the period.

Benefits and Features for Advanced Metering Systems for the Gas Utility

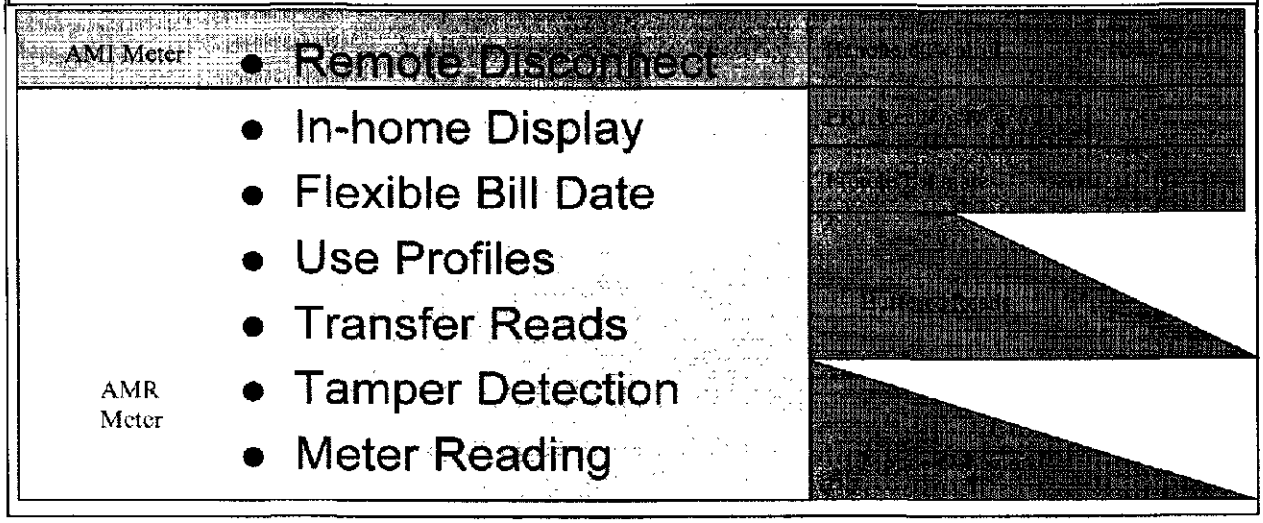
Figure 2 shows how the general AMR/AMI benefit/feature spectrum would be modified for the gas utility in the future. Specifically we found that three of the features would not apply. Gas is a storable commodity that can be delivered to meet customer demands; therefore, time-of-use and complex rates such as critical peak pricing are not needed as insurance for cost effective infrastructure utilization. The control of our customers' equipment via active demand side management programs is also not an approach for the gas industry. Due to the safety nature of our commodity, decreasing the flow of gas through a meter for conservation purposes could pose potential risks to the consumer. We must maintain a constant operating pressure to all connected appliances. Instead, the gas industry's demand side efforts address residential energy needs via weatherization and high efficiency appliances.

Figure 2. General AMR/AMI Benefit/Feature Spectrum for Gas Utility Residential Customers



The following information provided in Figure 3 shows the AMR/AMI benefit/feature spectrum as envisioned by DEO based on our current AMR deployment. The key difference between the general approach identified in Figure 2 and DEO's potential approach shown in Figure 3 is the implementation of advanced technology without the added expense of a fixed network.

Figure 3. AMR/AMI Benefit/Feature Spectrum for Dominion's Gas Residential Customers



DEO envisions the following AMR/AMI benefits:

- Meter Reading – Soon after the installation of all ERT modules on DEO meters is complete, monthly meter reading via mobile collectors will become standard practice.
- Tamper Detection – A process to identify and act on a tamper code will be implemented once monthly reading via mobile collectors is in place.
- Transfer Reads – At Virginia Electric Power, Dominion has successfully implemented a process of collecting off-cycle reads via handheld meter service computers mounted in customer service vehicles and using these reads to complete transfer read orders. This process of obtaining off-cycle reads currently completes 84% of all transfer read orders without a field call. DEO expects to adapt the process for use in Ohio.
- Use Profiles – Off-cycle reads collected via the buffered read process will be added to the Customer Information System for use by our Customer Service Agents and to the customer accessible usage table in "Manage my Account" on-line.
- Flexible Bill Date – A flexible bill date does not need to imply that a meter reading is collected on that date. A customer's bill for a specific date can be developed using a combination of measured and estimated consumption. Based on Dominion's experience with off-cycle read collection in Virginia, the estimated portion of the bill, for most customers would be less than 6 days.
- In-home Display – Itron and its partner, Aztech Associates, have just announced a new in-home display that can pick up the meter reads transmitted by the ERT on the meter. This means that a customer can have a detailed display of gas usage without the utility collecting the information and sending it back to an advanced meter for transmission to an in-home display.
- Remote Disconnect – Dominion has been working with Itron and its gas meter manufacturing company, Actaris, on the development of the industry's first advanced gas meter. This meter incorporates Itron's newest data logging ERT and an internal tamper proof shut-off valve that is operated via a handheld meter service computer. The initial target installation sites would be inside meters located on multi-meter manifolds.

DEO's automated meter reading project is due to be completed by the end of 2011. We have currently deployed over 500,000 RF ERT devices in our service area. Our system is comprised of both drive-by and hand-held data collection devices that will obtain meter information that often times could not be obtained due to meter obstructions or access to the meter that requires an appointment with the homeowner. The table below provides an indication of DEO's potential project deployment of several of the features discussed above. DEO is also pursuing the opportunity for a potential pilot of the remote shut-off valve technology. This pilot would target potential multiple meter manifolds that consist of two to five meters, where access from a landlord may be difficult in providing final readings for the tenants or other service activity is required on a single unit within the building.

Table 1. Estimated Timeline for DEO AMR/AMI Benefit/Feature Spectrum

Benefit/Feature	Target Date
Meter Reading with Mobile Collectors	2011
Use Tamper Detection Code	2011
Transfer Reads via Buffered Reads	Pilot 2010, Implement 2011
Use Profile - Buffered Reads in CIS	2011
Use Profile - Buffered Reads in Manage My Account	Mid 2012
Flexible Bill date	Mid 2012

Compatibility with Other Systems

The AMR system being installed by DEO is an Itron ERT based, drive-by system, which does not require a fixed network. It is only compatible with other ERT based systems manufactured by Itron. None of the manufacturers surveyed have the ability to read another's meter read transmissions. Based on a recent survey conducted by AGA there were 26 gas or combination utilities across the United States that are currently using or deploying automated meter reading technology. There were only 13 of those responding that indicated they were currently reviewing the AMI technology to determine its benefit and compatibility with existing AMR applications.

Partnering With Electric Utilities

DEO has contacted two of the larger electric utilities that overlap our distribution system: CEI, a subsidiary of First Energy, and American Electric Power. These companies are currently investigating AMI systems with a two-way communications fixed network. AEP indicated it is in the early stages of a pilot in the Columbus, Ohio area to facilitate access to meters and provide a safer working environment for its employees. Such AMI systems, even Itron's Open-Way system, are not capable of reading the ERT RF based systems. The application of AMI for measurement of gas and/or water is still being developed and will not provide the same benefits for customers or the utility. Additional investments in the Customer Information System and the development and implementation of a meter data management system would be needed for DEO to receive the data from other utilities' infrastructure. Additional modifications and replacement of the current ERT to a two-way AMI meter device would be required as well.

There are currently no standards developed for the AMI technologies. Each meter must be able to reliably and securely communicate the information collected to some central location for the electric utility and then be distributed to DEO. Considering the varying environments and locations where DEO's meters are found, communication of data between DEO and the electric utility could pose a problem. The rural areas of our service territory would present different challenges than more urban areas. In addition, DEO crosses over multiple electric utility providers that could pose a challenge if the AMI applications were different. DEO's findings indicate that the implementation of AMI is still very new in its application for natural gas and even for parallel electric utilities in our service area at this time. However, DEO is willing to continue to investigate opportunities to work with the electric utilities in our distribution service area as these utilities look to expand or make future commitments that could be mutually beneficial in the future.