PECO Automated Meter Reading System

PA PUC DSR Working Group

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Customer Profile

Service Area
Philadelphia & Southeastern PA
Approx. 2,400 sq. mile service area

Customers
Electric = 1.7 million
Gas = 500 thousand

Automated Meters
2.2 million meters on Cellnet Fixed Network
3,000 Large C&I customers on MV-90 & Metretek
PECO - AMR Journey

1993

Investigate & Outsource

- Investigate AMR technology
- Outsource meter reading

1999

Develop Business Case & Contract

- Evaluate internal options
- RFP for external market
- Sign agreement with Schlumberger / Cellnet

2003

Deploy

- Completed in 42 months
- IT system changes
- Business process changes
- 2.2 M automated meters
- 91 Cell Masters
- 8,318 Micro Center Controllers

2007

Create Additional Value

- Implement “day 2” benefits
Cellnet AMR Network Structure

- Cell Master (CM)
- Endpoint devices w/CellNet Radio
- National Operations Center (NOC)
- MicroCell Controller (MCC)
- Exelon Applications
- System Controller
- Wide Area Network
- Local Area Network
- Exelon Applications
AMR network components

91 Cell Masters

8,318 MicroCell Controllers

2.2 M Meters
~1.6 M Res. Electric
~455 K Res. Gas
~135 K Com. Electric
~42K Com. Gas
Relationship with CellNet

- 15 year fee for service performance contract (through 2014)
- CellNet owns and operates the AMR System:
  - All network components – Micro Cell Controllers, Cell Masters
  - All solid state residential meters (approx. 1 million)
  - All meter modules (electric & gas)
- PECO purchases meter reads and other information and retains ownership of all customer data
- Maintenance contracts are in place between CellNet and PECO
AMR Data Delivered

- Meters on the wireless fixed network
  - Electric meters
    - Basic Service Level
      - Daily readings
      - On-demand readings
  - Enhanced Service Level
    - Demand
    - Reactive energy (power factor)
    - Interval
    - Time of Use (TOU)
  - Flags and alarms
  - Real time – outage & restoration
- Gas meters
  - Daily readings
  - Flags and alarms
- Mobile read electric and gas
  - Approx. 18,000 meters in rural areas
  - Monthly energy consumption
  - Flags and alarms
## Business Benefits of AMR

### Customer Interface
- Minimize inconvenience to customers who have difficult to read meters
- Reduce number of estimated bills
- Improve ability to answer questions on 1st call
- Provide more energy usage info.
- Improve customer satisfaction

### Operational / System Reliability
- Improve read rate and accuracy
- Reduce CAIDI by identifying, assessing and responding to outages more efficiently
- Improve productivity of field forces
- Reduce customer call volumes
- Reduce safety incidences
- Increase asset utilization
- Improve ability to design electric distribution network
- Identify precursors to reliability event

### Financial Management
- Improve the meter to cash cycle
- Continuous service - controls
- Increase revenue
- Improve power factor measurement
- Reduce lost revenue from theft
Outage Management Process with AMR

- AMR Initiated Event
  - AMR Last Gasp
  - Call Center
  - IVR

Customer Initiated Calls

Outage Record

SCADA

OMS

Dispatch

AMR Power-Up

AMR Initiated Event

PECO Contacts Customer

AMR Ping

Automatic Processing

Advanced Assessment Tools

Automatic Processing
Outage Example no AMR

Event Time: 11:49:00
Customers Affected: 086
Outage Example with AMR

Event Time: 11:34:00
Customers Affected: 086
Outage Management - Results with AMR

- Improved outage management performance
  - Quicker response due to last gasp
  - More efficient use of field crews due to pinging (automated & manual)
  - Validate power restoration times using daily reports
  - Reduced customer average interruption rate by 5.5 minutes in 2005

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<td>Single Outages</td>
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Challenges of PECO’s AMR System

- **Dumb meters – smart network design**
  - Network calculates demand and aggregates interval data
  - Electric meters transmit the past 9 readings every 5 minutes

- **Network designed to deliver daily reads**
  - Significant network modifications required to deliver large scale TOU and interval data

- **Contract performance standards**
  - Performance standards for interval and TOU is @ 98%
  - Network time synch to the hour is +/- 75 sec.

- **Pricing**
  - Higher fee for interval data and TOU than energy only read

- **PECO IT System**
  - Meter data management system may be required
  - Impact to customer information system needs evaluation
  - Customer presentment
Opportunities

- **Other Project**

- **Potential Opportunities**
  - Distribution equipment load management
  - Equipment failure prediction using outage and power restoration messages
  - Feeder load modeling for planning and analysis purposes
  - Smart Network – convergence of AMR and distribution automation
  - Evaluate future rate offerings
  - Revenue Integrity Service
  - Support new rate offerings.

*Utilize the AMR system to extract as much value as we can for our customers and business*