

Integrating AMI into Distribution Operations

USE CASES		UTILITY DRIVER					
		Cust Sat	Reliability	Safety	PQ	Cost Savings	Bulk Ops
GRID OUTAGE ID & MGMT	Identify sustained outages	x	x				
	Filter outage messages	x	x				
	Predict nested outage		x	x		x	
	Visualize outages, restorations & islanding		x	x	x		
	Outage association (single-phase & time stamp)		x				
	Identify downed energized conductors			x			
CUST OUTAGE INFO	Identify intermittent service problems	x		x	x	x	
	Identify open main break	x				x	
	Outage communication	x					
EQUIPMENT MGMT & HEALTH	Overloaded hydraulic recloser	x	x			x	
	Capacitor health & control					x	
	Transformer winding shorts & regulator misoperation	x			x	x	
	Transformer health		x			x	
GRID MGMT	Identify mapping errors	x	x			x	
	Visualize near real-time voltage	x			x		
	Feedback for CVR systems				x	x	x
	Analyze feeder voltage profile				x		
	Identify individual DER (solar, ES, EV)				x	x	x
	Reconnect/disconnect (step restoration & load shedding)	x	x	x		x	x
	Alternative to SCADA		x			x	

Background, Objectives, and New Learnings

Many utilities have been working towards or are in the process of deploying advanced metering infrastructure, or AMI, systems. Each utility's infrastructure and topology are unique. There are many different deployment strategies, and most are driven by the need to accurately collect data associated with electricity usage.

Previous EPRI research¹ has explored the opportunities and factors that enable a utility to realize operational benefits associated with AMI deployments as well as document the challenges with each approach.

This project will specifically focus on approaches to integrate AMI data with DMS to enable enhanced grid operations. EPRI intends to work with utilities to design, develop, and demonstrate approaches for automating AMI data integration and utilization for utility identified use cases that support improvements to customer satisfaction, reliability, safety, power quality, and cost savings.

Benefits

This project leverages investments in AMI to provide operational insights into a range of system conditions. The

Project Highlights

- Makes the most of AMI data; develops and demonstrates new processes that maximize the value of AMI in distribution operations
- Develops approaches to correlate OMS data and AMI data to for various operations use cases
- Demonstrates opportunities to improve customer satisfaction, reliability, safety, power quality, and achieve cost savings using AMI

project also will enable integrated AMI, OMS, GIS, and DMS systems to identify hazardous conditions, inform grid management decisions, and improve operations.

By collaborating, participants can share different integration techniques, use case algorithms, and other processes that enhance utilization of AMI in operations. Participants also can share the impact the additional information has to distribution system operators, including any new procedures that are developed based upon the demonstrations and implementation roadmaps.

The key benefits include:

- Understanding leading practices for using AMI to improve reliability and power quality
- Demonstrating and documenting the value of AMI to support operational goals
- Establishing and documenting integration requirements and processes for AMI
- Understanding of AMI requirements to maximize the contribution to operations
- Roadmap for integration of AMI in a distribution control center

¹ Integrating AMI with Distribution Operations: Use Cases that Benefit Distribution Operations. EPRI, Palo Alto, CA: 2018. 3002013423.

Project Approach and Summary

EPRI will work with participating utilities to develop a plan to implement identified use cases through the following tasks:

Use case identification—Work with utility staff to identify high value use cases for using AMI in distribution operations based on planned or existing deployments.

Capabilities evaluation—Evaluate capabilities of the distribution and AMI systems to support the chosen use case.

Develop Implementation Approach—Develop analytical methodologies and implementation approaches to integrate identified use cases. Work with the utilities to determine the detailed algorithms and presentation of the information.

Demonstrate implementation—Demonstrate analytical methodology in the lab environment utilizing utility data sets. The demonstration will enable validation and refinement of the approach.

Implementation Roadmap—Develop implementation plans and roadmaps to integrate into distribution control center operations. Identify gaps that must be closed in order to fully integrate.

Deliverables

Each utility participating in this project will receive the following deliverables:

- In-person workshop to identify use cases
- Documentation of use case capabilities
- Script implementation of selected use case(s)
- Report that documents results of individual lab demonstration
- Guide to integration of AMI data in DCC operations
- Report summarizing results across all utility demonstrations

The non-proprietary results of this research will be incorporated into EPRI's Distribution Operations and Planning and Distribution Systems R&D programs and made available to the public for purchase or otherwise.

Price of Project

The price of this project is \$85,000 per participant. This project qualifies for Self-Directed Funding (SDF) or Tailored Collaboration (TC) funds. Funding can be split across two years.

Project Status and Schedule

This project is expected to run for 24 months with periodic meetings with all participants to share lessons learned throughout the life of the project. The project is expected to begin in 2019.

Who Should Join

Any distribution utility that is considering or making the business case for deploying AMI or has already deployed AMI and desires to utilize AMI data to realize distribution operations' desired use cases.

Contact Information

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