Aggregated Demand Response Pilot

Demand Side Management
Resource Support

Northwest Power and Conservation Council
September 9, 2015 – Portland OR

Jim Gaston/John Steigers
Energy Northwest
Energy Northwest

1957

A not-for-profit Municipal Corporation

Asotin County PUD
Benton County PUD
Chelan County PUD
City of Port Angeles
City of Richland
City of Centralia
Clallam County PUD 1
Clark Public Utilities
Cowlitz County PUD
Ferry County PUD
Franklin County PUD
Grant County PUD
Grays Harbor County PUD
Jefferson County PUD
Kittitas County PUD
Klickitat County PUD
Lewis County PUD
Mason County PUD 1
Mason County PUD 3
Okanogan County PUD
Pacific County PUD
Pend Oreille County PUD
Seattle City Light
Skamania County PUD
Snohomish County PUD
Tacoma Public Utilities
Wahkiakum County PUD
Energy Northwest

- Cost-based generation and services to regional public power
- Owns and operates over 1,300 megawatts of nuclear, hydroelectric, solar, and wind generation assets
- Current development efforts underway include demand side management resources, small modular nuclear, photovoltaic solar, and distributed energy storage
What is the Pilot?

- BPA, as balancing authority, is obliged to balance its system
  - 4,300(+) MW intermittent wind generation
  - Increasingly less capacity and flexibility of its hydroelectric resources
- EN’s Pilot provides BPA 35 MW of Fast INC balancing reserves
  - “Fast” < 10-minute Response From Notification
  - “INC” Load Reduction (same net effect as a generation increase)
- BPA pays EN capacity reservation: performance based
  - EN pays incentives to participants
  - No event or energy based compensation for Pilot; capacity fee only
  - Limits on calls and duration
- Timeline – Initial period ends Jan 2016; options through Jan 2017
Demand Response Aggregated Control System (DRACS)

- Robust SCADA architecture, data management, & coding
- Hosted in Pacific Northwest National Laboratory’s Energy Infrastructure Operations Center (EIOC)
- Cloud-based secure communications; FISMA-compliant
- Functionality
  - Communicates with BPA Demand Response Operations Management System (DROMS) via Open ADR v.2.0 communication protocols
  - Monitors 24/7 all asset loads, status, comms pathways; alarms/alerts
  - Receives event notifications; calls for all assets’ response; monitors and reports load change to BPA, all utilities, and all assets in real time
  - Generates all settlement records and documentation for BPA
  - Provides participating utilities and assets with 24/7 load reporting
City of Richland WA
Demand Voltage Reduction (DVR)

- (10) 115/13.8kV substations; (15) load tap changing transformers
- (71) distribution feeder voltage and load metering points
- Direct DRACS to SCADA connection
- Fixed voltage increments (2.5%)
- Capacity – 850 kW
- Actual Performance – 980 to 2,400(+) kW
City of Richland – Demand Voltage Reduction
Event 1507- 087 - Jul 7, 2015 - 5:34pm
North Pacific Paper Corporation (NORPAC)

- Cowlitz County PUD
- (3) newsprint machines
- (9) refiner lines
- (4) 5,000hp(+) motors per line

- Direct DRACS to facility DCS
- Real-time meter data out
- Event control signals in
- Shuts down (2) refiner lines
- (8) motors ->20(+) megawatts
Cowlitz County PUD/NORPAC
Event 1507-087 - Jul 7, 2015 - 5:34pm
Ponderay Newsprint Company (PNC)

- Pend Oreille County Public Utility District
- (1) newsprint machine; (2) thermal-mechanical refiner lines
- (3) 25,000hp drive motors per refiner line
- Direct DRACS to DCS connections
- (1) refiner line taken off line for DR Events
- (3) motors -> 16 MW(+)

Demand Response
Powin Energy Battery Energy Storage System

- Portable, self-contained, 968 lithium ion batteries
- Onboard communications, server/BMS, power electronics
- 120kW in/out
- 500kWh storage
- Connections at 480vAC 3-phase
- Very fast response
- Currently deployed in Tualatin OR
Powin – Battery Energy Storage System
Event 1507-091 - Jul 15, 2015 - 2:44pm
DR Pilot - Summary

Demand Response Pilot Project - February through May 2015

- Cumulative Delivered Capacity [676.67 MWh]
- Cumulative Required Capacity [430.40 MWh]
- Events

Key Points:
- Go Live
- PNC Agreement
- AM-01
Pilot Results To-Date

September 7, 2015, to-date:

• Performance: 52 called events - 94% success
  • Industrial contributors; very good performance, getting better
  • Availability 98%(+)
• Pilot events are being aligned with real-world BPA operations
  • Effective August 1st
  • Phased-in alignment

Actively recruiting additional participant utilities and load contributors
Lessons Learned To-Date

DR Team’s utility-focused engagement policy/model very well-received
Settlement docs should be accomplished immediately post-event
  • Early identification of emergent issues
Definition of DRACS functionality and reporting requirements
  • Make programing changes? => full spectrum on-line testing
Communicate early and often with customer (BPA), utility participants, and assets
Cost-based participant-governed structure
  • Concept seems very well-received both by utilities and assets
  • Transparency in structure and economics is highly valued
Questions?
Interests?

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