Demand Response and Integrated Resource Planning

A Winning Combination

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Powering forward. Together.
Key Attributes of the New DR

- Automated
- Ease of Use
  - Forecasting
  - Dispatch
  - Allocation of Resource (Economic, Reliability)
  - Visibility of Location and Availability of Resource
- Capability to deliver high value resources, by providing rapid response, and communicating real time price and control signals
- Technologies leverage open standards
- Platforms are highly scalable and flexible
- Track DR resources for reporting
- Cyber security is built and tested
Key Attributes of the New DR

- Today’s demand response is integrated to many of SMUD current business systems
  - SSN, MDMS, EMS, GIS, SAP
  - Future can be ACLM, DA, DMS, OMS
- Future of DR is automated and machine to machine
  - DRMS AutoDR uses the Internet to interface directly with customer systems
  - DRMS uses SSN and Broadband to interface directly with customer systems
  - DRMS can ultimately support all DR including legacy DR such as ACLM, VECP and contracts
  - DRMS can be integrated with DA, DMS, and OMS
Common Issues with DR

- Trust in the availability and reliability of the resource
- Uncertainty in the sustainability of the resource
- Alignment and competition with traditional resources (cost and capability)
- Need for investment before the program is needed
  - Requires an 18 to 36 month lead time for full program capability
  - Steps include:
    - Build the infrastructure
    - Design and conduct pilot programs
    - Establish resource capability, characteristics, and value
    - Demonstrate viability of programs and value of resources
Demand Response Management System (DRMS) Capability

Many Varieties of Eggs are in the DRMS Basket
DR – Meeting Needs and Providing Solutions

- **Needs**
  - Resource Adequacy
  - Reserves
    - Non-Spin Reserve
    - Spinning Reserves
  - Regulation
  - Renewable Firming Resource
  - Call Options
  - Load Reduction
  - Location/Substation/Feeder/Transformer Options for load growth, EV and renewable integration
  - Transmission/Distribution Investment Alternative
  - BANC

- **Solutions – Menu Approach**
  - AutoDR
  - Pricing: TOU and CPP
  - Thermostat Programs
  - Direct Load Control
  - Weather Independent Solutions
  - Storage (Thermal/Electrical/Other)
  - Adjustable Customer Load (Up/Down)
  - Special Contracts
  - Voluntary Emergency Curtailment (VECP)
  - BANC Resources
Overall Goal for 2014 and Beyond

- Integrate DR from a variety of sources into SMUD business operations as a committed, on-going, long-term activity
- Obtain funding commitments to:
  - Leverage Smart Grid projects to develop new Commercial, Industrial, and Residential programs to serve IRP objectives
  - Technology enhancement to the DRMS, Silver Springs, metering platforms and others as required
  - Exploring integration of DR into the future Distribution Management Systems
Overall Goal for 2014 and Beyond

- Develop AutoDR to its potential – 40 MW (or more) is a realistic goal
- Develop Small Commercial and Residential DR to its potential
  - Technology is not yet ready for large deployment
  - Customer response to program designs and technology options requires further study
  - Migration of customers from ACLM to a new model will require a few more years as technology standardizes and matures
- Deliver a DR portfolio that is reasonable and achievable
  - Current projections show 295 MW or about 9% of system load by 2021 is possible with a sustained commitment to DR
SMUD Implementation of the New DR

• The new DR is a multi-dimensional platform
• Business processes, technology, policy, and program design all being built to work together and integrated across the organization
  – This is a continuing work-in-progress and on-going learning opportunity
• Concurrent development of process, technology, policy, and programs is required to meet aggressive schedules
• SMUD has just begun to explore the capability its new DR systems, processes, and technology can provide
  – “We built it, now we have to learn how to use it.”
2013 PowerDirect® AutoDR Pilot Program

- Program Design Goals
  - Provide a reliable, predictable and sustainable load reduction
  - Offer ease of compliance
  - Encourage maximum performance
  - Provide customer choice with four program options to meet customer and SMUD business needs

- Basis for the long-term PowerDirect® AutoDR program
  - Economic – Considered along with SMUD supply-side resources
  - Reliability – Planned as required into the SMUD resource portfolio

- Program Features
  - Designed to accommodate shorter, more frequent dispatch in addition to longer duration events up to four hours
  - Automated notification, dispatch, and settlement
  - Voluntary customer participation
  - Performance bands for capacity-contract based programs
Start the Discussion

- What opportunities does the new demand response capability present?
- How will the customers, utilities, regulators, industry, research, and all other parties work together to explore the possibilities and opportunities?
- How can we build demand response that is reasonable, achievable, and cost-effective to meet a variety of business and resource needs?
- What is needed to gain a long-term commitment to develop the new DR?