Distributed Control for Smart Grids

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Project Technical Lead
Project Objectives

- Demonstrate a distributed control scheme that fills gaps in existing systems at SDG&E
- Strategically interoperate the various types of actively controllable devices in the distribution system in response to dynamically changing operating conditions
- Improve distribution system electrical efficiency, reliability, power quality, voltage and frequency control, and operational costs
Project Phases

- Phase 1: Design and development of technical solution(s)
- Phase 2: System installation and testing at Integrated Test Facility (ITF)
- Phase 3: System installation and testing on a simulated portion of distribution system
Project Approach

• Understand the preferred operational responsibilities and control characteristics of controllable distribution system assets.

• Identify distributed control methods and approaches to control resources and integrate as part of a unified control scheme.

• Test methods of communicating and coordinating control across multiple resources.

• Demonstrate distributed control concepts that fill gaps in the currently planned SDG&E control system infrastructure.
Conceptual Overview of Control System Architecture Envisioned by this Project

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The project team is a combination of internal staff and contractor(s)

Internal staff includes a Project Technical Lead supported by SDG&E technical staff.

Plans, progress, results, and the final report will be reviewed by a technical expert review panel that includes SDG&E stakeholders who may be users the results.

The ITF will be used for much, if not all, pre-commercial demonstration work.
Key Deliverable

- Comprehensive final report describing work done and results available
  - For use by SDG&E stakeholders and adoption as may be appropriate
  - For delivery to CPUC to be made available to other prospective users

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Project Schedule

- Stakeholder (User) Consultation, Project Plan Development, and Contractor Procurement Activities
  Third Quarter of 2015 and First Quarter of 2016

- Phase 1: Design and Development of Technical Solution
  June thru December 2016 (7 months)

- Phase 2: System Installation, Testing, at SDG&E’s Integrated Test Facility
  September 2016 thru May 2017 (9 months)

- Phase 3: System Installation, Testing, in SDG&E’s Utility Distribution System
  October 2016 thru September 2017 (12 months)

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Project Status

• Project plan developed and contractor competitively procured
• Internal SDG&E project team formed and activity launched
• Contract initiation meeting and workshop held with project review panel, including technical expertise from the following departments:
  ✓ Electric Distribution Operations
  ✓ Distribution/Substation Automation and Protection Engineering
  ✓ Smart Grid IT
  ✓ Distribution Resource Planning
  ✓ Customer Programs
  ✓ Distributed Energy Resources
  ✓ Clean Transportation
  ✓ Electric Distribution Engineering (Standards)
  ✓ Enterprise Architecture
• Next step: Design and build the demonstration system
Q & A