SDG&E Experience with Advanced Generator Monitoring

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SDG&E Research Project

SDG&E Partnered with

- OSI Soft
- SEL
- UCSD

Goal: Measure and Monitor Rotor Angle and Field Quantities
Combined Cycle Plant

2 Gas Turbine Generators
1 Steam Turbine Generator
Complete overhaul of all machines

Plant Shut Down - February 2014

40,000 Hour Maintenance
Equipment Installation for Rotor Angle Measurement
Solution Architecture – Rotor Speed/Angle

- Customer Existing Sensor (Keyphasor)
- Junction Box (Near the Machine)
- Panel in the Gen Control House
- Control House
- Analog Input Card
- CT/PT Card
- IRIG Input
- Existing Wiring
- Within a Panel Lineup Approx. 10m
- Approx. 10m
- Junction Box (Near the Machine)
- Approx. 8m
- Existing Wiring
- Approx. 100m
- Existing Wiring
- Existing Wiring
- Existing Wiring
- Approx. 8m
- Junction Box (Near the Machine)
- Existing Wiring
- Junction Box (Near the Machine)
- Existing Wiring
- Junction Box (Near the Machine)
Solution Architecture – Field Quantities
Solution Architecture – As Installed

- Terminal Voltage and Current
- Rotor Speed Signal
- Exciter Control House
  - Field Voltage
  - Field Current – Voltage Shunt

Generator Control House

IRIG

100m

EtherCAT – Field Bus and Time Sync
Initial Results
Future Plans

Continued Monitoring and Data Gathering

Model Validation

Parameter measurement