Advancing Wind Power in Illinois - Emerging Technologies

GE Intelligent Platforms
Proficy SmartSignal
Agenda

What is GE Intelligent Platforms & Proficy SmartSignal?

What do we do?

What are we doing for the Consortium?
Proficy SmartSignal

- Algorithms originated at Argonne National Laboratory in the 80’s
- SmartSignal formed in 1999, Headquartered in Lisle, IL
- Started the Predictive Analytics market
- Steady growth
  - in Power – about ½ of US power gen (by MW) uses SS
  - and O&G industries – North Slope, GOM, refineries, midstream
- Acquired by GE Intelligent Platforms in January 2011
Predictive Analytics

Acts as a Supporting Experienced Operator & Technician
Leverages Past Experience...
Works 24x7
The Proficy SmartSignal Solution

Starts with Data from Your Equipment

Removes the Effects of Changing Conditions

Posts Emerging Problems to Incident List

Personalized Empirical Models

Pulls every 5-10 minutes
Models Focused On Failure Modes

Detect **Blade Pitch & Yaw Failures:**
- HUB model: typically 17 sensors

Detect **Gearbox Failures:**
- MECHANICAL model: typically 17 sensors

Detect **Voltage/Current Failures:**
- GENERATOR model: typically 19 sensors
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Phase 1

• Install IT Network and Servers at Invenergy and IIT.

• Install Proficy SmartSignal Software at IIT

• Create and activate models for 1 wind turbine utilizing the existing available sensors.

• Install a local camera to visually monitor turbine condition and environment
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Phase 2

• Identify and Install additional sensors that would enhance condition monitoring capabilities.

• Modify the models to include additional sensors.
Additional Instrumentation

- **Vibration**
  - 6 High Frequency Accelerometers
  - 6 Low Frequency Accelerometers
  - Signal Processing / Data Acquisition Box
  - Bentley 3701 Wind Turbine Monitor

- **Lube Oil**
  - Pressure and Temperature Instrumentation
  - Particulate Counter
  - Data Acquisition Box

- **Blade Pitch Motors**
  - Current and Voltage Instrumentation
  - Stator Temps
  - Data Acquisition Box
Gearbox Temp and HS_BRG_TEMP_2 are about 10 degrees high

Status:
Date of Notification:
Equipment Tag: GEARBOX_TEMP, HS_BRG_TEMP_2
Category:

Description:
The GearBox Temp and High Speed Bearing Temp 2 tags are running about 10 degrees higher than the sister turbines.

Diagnosis:
Continue to watch closely, could be indication of lube oil cooler issue...

Customer Response:
Possible Sticky Thermostat is preventing enough lube oil from being routed through the radiator.
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Monitoring Software Demonstration

imagination at work