



**PLANNED TUTORIALS FOR THE  
2010 CLIENT COMMITTEE MEETINGS & CONFERENCE  
UPDATED JUNE 3, 2010**

**TUTORIAL: On-Line Monitoring Benefits and Justification**

*Sunday, October 10<sup>th</sup>, 1:00 pm - 5:30 pm*

Many utilities are exploring the possibilities of using on-line monitoring for their equipment. Before an on-line monitoring program can begin though there are many factors that must be considered and researched. This tutorial will cover some of the main considerations such as measuring the added benefits of an on-line program versus off-line testing; the key parameters to be monitored; justifying the cost of the program; training and more. User experiences will be presented and discussed including the pitfalls and the success stories of on-line monitoring programs.

*The following outline details the subjects to be covered within the tutorial:*

1. Calculating Benefits
  - a. What goes into benefit calculation?
  - b. Failure avoidance
    - How to calculate historical failure rates
    - Typical industry values to use
    - Environmental cleanup costs
  - c. How to quantify the probability of a successful catch
  - d. Key parameters to monitor
  - e. Benefit of deferring capital investments
  - f. Capital cost savings benefits
  - g. O&M cost savings benefits
    - Reduction of off-line testing
    - Extending intervals
      - By how much?
      - What is the fair cost for doing this?
2. Calculating and Justifying Costs
  - a. Cost of sensors and monitoring systems
  - b. Cost of communication systems
  - c. Cost of integrating communications, alarms and reporting
  - d. Maintenance costs of monitoring systems
  - e. Expected/observed failure rate of sensors, communications, etc.
  - f. Replacement costs of sensors over the time period of the analysis
3. Analysis Methodology
  - a. Length of time of the analysis to observe benefits?
  - b. How does the rate of build-out (number of units installed/yr.) impact benefits calculation?
  - c. What is realistic?
  - d. How to include escalation rates?
4. Utility Experiences with Online Monitoring



## **TUTORIAL: Basics of IEC 61850 Standard**

*Sunday, October 10<sup>th</sup>, 1:00 pm - 5:30 pm*

IEC 61850 is a standard that is being used to make substation automation easier, save money by elimination of significant amount of substation wiring and make interoperability between relays manufactured by different vendors. The standard has its root in Europe and is spreading fast in other parts of the world. In USA the response has been cautious. American utilities are implementing this standard on specific stations to study the performance and savings impact. Hence there is an unclear understanding of this standard in the US.

The intent of this tutorial is to introduce this standard to the engineers, managers and technicians representing various utilities. This session assumes that the audience knowledge of this standard is minimal to none. The tutorial will start with background information and will explore the basics of the standard. It will provide a general overview of the various aspects of this standard including station bus details, GOOSE and GSE messaging, and a brief description of Process Bus implementation.

The implementation of this standard imposes new methods for testing relays that are compliant with this standard. Details of testing such relays and IEDs (Intelligent Electronic Devices) will be presented.

After attending this tutorial, the audience will take away a very good conceptual knowledge of the IEC 61850 standard with the advantages and challenges posed in its implementation.