

Real-time Application of PMUs to Improve Reliability Task Force (RAPIR) Draft Charter

Purpose and Deliverables

The purpose of the Task Force is to evaluate existing and future system operation applications of phasor measurement units (PMU) in the context of bulk power system reliability. The Task Force will prepare a document that, from a bulk power system reliability perspective, reviews existing PMU industry applications and identifies other high-value uses for system operations. The document will include:

1. High-level review of PMU technology;
2. Industry survey of current bulk power system reliability operational applications;
3. Investigation of other high-value applications of PMU technologies in system operations;
4. Evaluation of those NERC's Reliability Standards that have applicability and identify any gaps;
5. NERC coordination activities and a work plan identifying any additional work required forward; and
6. Conclusions and recommendations.

Approach and Milestones

The Task Force will report to the Operating Committee (OC). The following draft schedule is envisioned:

- Provide updates to both the OC and PC at their September 2009 meetings;
- Submit a draft report for comments at the OC and PC meetings in December, and
- Receive final approval of the report in February 2010.

Background

SynchroPhasors are precise measurements of certain parameters on the electricity grid, now available from grid monitoring devices called phasor measurement units (PMUs). PMUs measure voltage, current and frequency at high speeds of 30 observations per second, compared to conventional monitoring technologies (such as SCADA) that measure once every four seconds. Each phasor measurement is time-stamped according to the universal time standard, so measurements taken by PMUs in different locations or with different owners can all be synchronized and time-aligned. This lets synchrophasor measurements be combined to provide a precise, comprehensive view of an entire

interconnection. Monitoring and analysis of these measurements lets observers identify changes in grid conditions, including the amount and nature of stress on the system, to better maintain and protect grid reliability.

Phasor data is being used increasingly by individual utilities to manage real-time grid operations. In California, phasor data drives the automated control of Southern California Edison's Static Var Compensator (SVC) device for reactive power support; Bonneville Power Authority (BPA) uses phasor data for real-time stability and controls. The California ISO, BPA, American Electric Power (AEP) and Tennessee Valley Authority (TVA) are working to incorporate real-time phasor data into their state estimation tools to get more accurate and higher sampling rates than their SCADA systems can provide. After Hurricane Gustav struck the Gulf Coast in 2008, Entergy used its PMUs and analytical tools to manage both system separation and islanding and later system restoration. The California ISO and ERCOT are considering the use of phasor data to better monitor real-time intermittent generation and integrate those resources economically while protecting bulk power system reliability. In addition, data from PMUs can improve operators' understanding of inter-area oscillatory modes and how to dampen and stabilize frequency oscillations.

Membership

NERC will seek membership from industry subject experts, with final selection agreed to by the officers of the Operating Committee. Members must be willing to commit their time to participate in the task force discussions and contribute to writing the final report.

Initially, the Task Force will be organized as outlined below with additional experts added with the concurrence of the Planning Committee's Officers.

- Leadership Team
- Chair
- Vice Chair (if required)
- Members
- Observers
- NERC Staff