

NASPI Control Room Solutions Task Team Monthly Meeting

**Presenters: Mike Cassiadoro & Jim Kleitsch
January 17, 2018**



Agenda

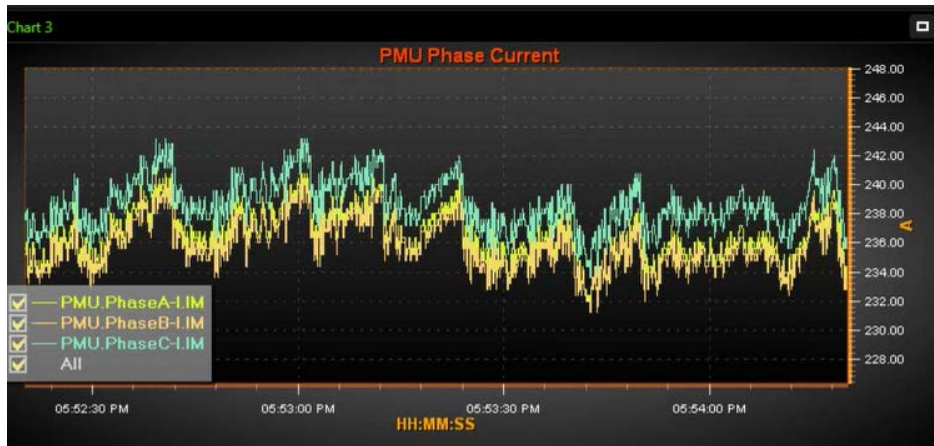
- I. Introductions
- II. Review Status of CRSTT Work Products
 - Focus Area Documents
 - Video Event Files
 - Use Case Documents
- III. Review CSRTT's mission, objectives and goals and discuss potential revisions for 2018
- IV. Consider how CRSTT can work with other NASPI work groups going forward to achieve its goals
- V. Adjourn

Focus Area Documents

- 1. System Islanding Detection and Blackstart Restoration –Posted in June 2015**
 - (Kleitsch –ATC, Cassiadoro –TRS)
- 2. Using Synchrophasor Data for Voltage Stability Assessment –Posted in Nov. 2015**
 - (Farantatos –EPRI, Vaiman –V&R Energy)
- 3. Using Synchrophasor Data for Phase Angle Monitoring –Posted in May 2016**
 - (Cassiadoro –TRS, Nuthalapati -ERCOT)
- 4. Enhanced State Estimation Survey –Preliminary responses received, more analysis needed.**
 - (Vaiman –V&R Energy, Kleitsch –ATC)
- 5. Oscillation Detection – To be submitted to NASPI LT for review. Expected to be posted in Jan./Feb. 2018.**
 - (Nuthalapati –Peak, Dyer –EPG, Blevins and Rjagopalan –ERCOT, Patel -EPRI)
- 6. Determining Disturbance Locations**
 - (Dyer –EPG, Zweigle –SEL Inc., Cassiadoro –TRS)
- 7. Using Synchrophasor Data to Monitor Reactive Power Balancing**
 - (Cassiadoro -TRS, SCE –A.J, Peak RC –Zhang, Vaiman –V&R Energy)

Video Event Files

Objective – Continue building library of events to demonstrate value PMU data provides when analyzing abnormal events and disturbances.



Video
PMU versus SCADA Video Events Summary . Please refer to EPG's template and the Synchrophasor Data File Format .CSV when creating a video event.
Video 1 - Current and voltage oscillations observed on the 138 kV system during testing of new generator controls (65 MW gas turbine). RTDMS PMU vs. SCADA Video 1
Video 2 - Voltage oscillations observed on the 230 kV system when a water pump was taken offline. RTDMS PMU vs. SCADA Video 2
Video 3 - Voltage oscillations observed following the loss of a 345 kV line during a period of high wind generation. RTDMS PMU vs. SCADA Video 3
Video 4 - Real and Reactive Power oscillations observed on the 69 kV system during a period of high wind generation with the plant radially connected (i.e. one of two normal source lines out of service). RTDMS PMU vs. SCADA Video 4
Video 5 - Real and Reactive Power oscillations observed during a period of high wind generation. RTDMS PMU vs. SCADA Video 5
Video 6 - Real Power and voltage oscillations observed following the loss of a large generator. RTDMS PMU vs. SCADA Video 6
Video 7 - Wind farm Oscillation Detection and Mitigation using Synchrophasor Technology Wind Farm Oscillation Detection and Mitigation
Video 8 - A 230kV fault followed by a loss of a large generation plant caused system frequency to drop approximately 72mHz momentarily, while having an impact on nearby system voltages and online generators (Clip 1 , Clip 2 , Clip 3)
Video 9 - Please be patient with the download, the video is very large. This video captures the actual synchronization of a large generator to the electric grid. The windows in the visualization tool capture frequency, output power, voltage angle, and voltage magnitude of the generator and at a reference point on the electric grid.

Use Case Documents

Objective – Develop docs that demonstrate ways that grid operators and electric utilities are using synchrophasor data to provide operational value.

Event ID	Event	Event Category	Entities Involved	Event Description	Extended Description in Related NASPI Technical Paper	Safety Impact	Reliability Impact	Budgetary Impact
TE02	Failing potential transformer	Transmission Equipment	ATC	Abnormal voltage signature found while reviewing PMU data led to discovery of a failing potential transformer which was subsequently isolated and replaced.	p.38	The utility avoided safety risk to personnel that might have been in close proximity to the PT during its failure.		Utility avoided costs associated with customer minutes of interruption that would have resulted from the potential transformer's failure had the condition not been identified and a mobile transformer placed in service to facilitate the outages necessary for its replacement.
TE03	Loose connections in potential circuits	Transmission Equipment	OG&E	Fluctuations observed in positive sequence voltage data collected from PMUs led to discovery of a loose fuse connection in a CCVT safety switch. PMU data has been used in a similar fashion to reveal faulty terminations, animal-damaged conductor and contact corrosion.	p.40			Utility avoided costs associated with equipment damage and customer minutes of interruption that might have resulted had the issues not been addressed.

NASPI Vision and Mission

Vision – Improve power system reliability through wide-area measurement, monitoring and control.

Mission – Create a robust, widely available and secure synchronized data measurement infrastructure for the interconnected North American electric power system with associated analysis and monitoring tools for better planning and operation, and improved reliability.

CRSTT Mission Statement

The CRSTT's mission is to work collectively with other NASPI task teams to advance the use of real-time synchrophasor apps for the purpose of improving control room operations and grid reliability. This team will utilize its experience and regional diversity to provide advice, direction, support and guidance to NASPI stakeholders involved in the development and implementation of real-time synchrophasor apps.

CRSTT Objectives

- Advance synchrophasor applications in the control room environment.
- Provide guidance on best practices.
- Identify issues that impede implementation.
- Ensure synchrophasor-based application training is available to end users.
- Promote operational event analysis to demonstrate the value of synchrophasor technology.

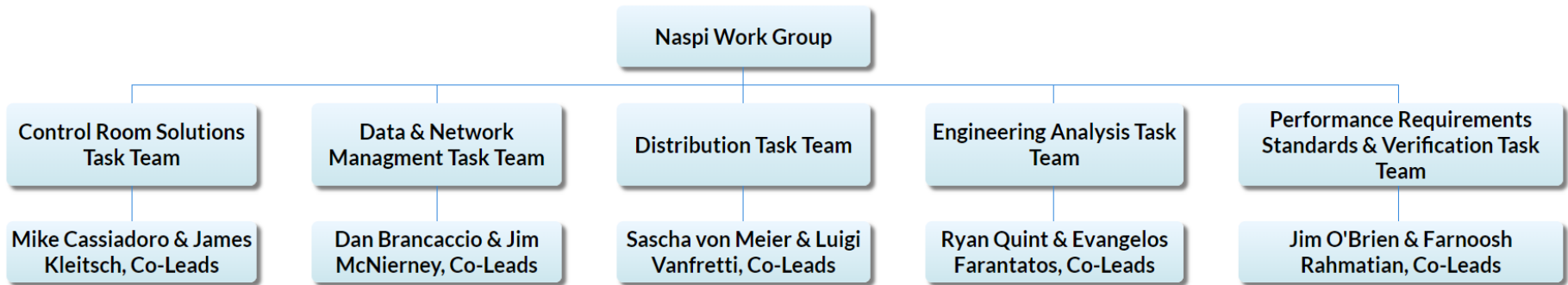
CRSTT Goals

- Develop a series of use case summary docs that define how grid operators and electric utilities are using synchrophasor data to provide operational value.
- Prioritize and complete the remaining focus area documents.
- Create additional video event files for use cases and simulated events.

CRSTT Goals (Cont.)

- Gather operator feedback on synchrophasor applications (best practices).
- Support the development of synchrophasor-related training for operations staff.
- Develop a series of Lessons Learned documents related to the use of synchrophasor technology in the operations environment.

NASPI Task Teams



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**Next NASPI CRSTT Conference Call: February 21, 2017.
Next NASPI WG Meeting: April 2017 in Albuquerque, NM.**