

NASPI Control Room Solutions Task Team Monthly Meeting

**Presenters: Mike Cassiadoro & Jim Kleitsch
July 18, 2018**



Agenda

- I. Introductions
- II. Review meeting minutes from June 2018 call
- III. Provide update on Disturbance Location document
- IV. Discuss Fall 2018 NASPI Work Group Meeting
- V. Recurring request for:
 - Focus Area Documents
 - Video Event Data
 - Use Case Document Ideas
- VI. Adjourn

CRSTT June 2018 Meeting Minutes

Action Items

- **NDR and Mike** will take another look at updating the Phase Angle Monitoring spreadsheet and possibly update the paper in an effort to keep the CRSTT documents current. ([Download](#) the paper).
- **NDR** to check with Peak on sharing an event video – in progress. NDR will let us know when Peak is ready.
- **Tom** will reach out to Allen Goldstein (NIST) for possible coordination between the CRSTT and other organizations such as IEEE and IEC activities. Mike asked back in May 2018 how should CRSTT coordinate or work with other industry bodies (e.g. IEEE, etc.)? The reason is so that CRSTT would have a presence at those types of meetings and conferences. Tom suggested to Mike that we connect with Allen to tie into IEEE and IEC activities.
- **Mahendra** will reach out to the PRSVTT on task team collaboration during the October 2018 meeting
- **All:** Mike is looking for people willing to serve on a panel at the Oct. 2018 NASPI WG mtg. in Philly to discuss specific uses of synchrophasor technology in the control room (e.g., enhanced state estimation, oscillation detection, etc.). If you are interested, please let Mike know.

CRSTT June 2018 Meeting Minutes (Cont.)

Meeting Notes

- NDR reported that 8/15 vendor/developer and 11/28 user responses for the “Determining Disturbance Location Survey” have been returned. Another reminder for the outstanding responses will be sent next week. First draft of report will be ready by the next conference call.
- Mahendra asserted that he would like to know what level of maturity for the use cases.
- NASPI Work Group meeting will be October 23-24, 2018 in Philly.
- CRSTT panel session at the NASPI Work Group breakout in conjunction with PRSVTT; use of synchrophasor technology in the control room. Figure out what this might mean (e.g. state estimation, etc.). Mike and Jim to decide on content and what that session may look like.
- Slava mentioned that we might want to consider a CIP discussion at a future CRSTT session as that seems to be a topic of great interest to folks trying to roll out the technology. If/when the NERC SMS publishes their findings that might prove to be interesting to go over at a high level.
- Slava also mentioned that their oscillation source detection tool might be worth discussing if/when they determine they can use it in real time.
- The CRSTT needs to decide whether or not to pursue the next focus area document – “Using Synchrophasor Data to Monitor Reactive Power Balancing.” Are there other topic areas that we should take a look at?
- Video event files will still be maintained. If you would like to share an event please contact either Mike, Jim, or Teresa for assistance.

Fall 2018 NASPI WG Mtg. Discussion

- ❑ Next NASPI meeting scheduled the week of October 22nd in Philadelphia, PA.
- ❑ NECR SMS Meeting to be held in same area after NASPI meeting.
- ❑ CRSTT to participate in joint panel session on Use of Synchrophasor Technology to Determine Disturbance Location.

CRSTT to discuss potential topics for a joint panel during the breakout session (e.g., Enhanced State Estimation).

Focus Area Documents

Determining Disturbance Locations (Nuthalapati –Peak Reliability)

- Survey distributed to industry by NDR.
- Collecting responses now.
- Present final version at Fall 2018 Work Group meeting?

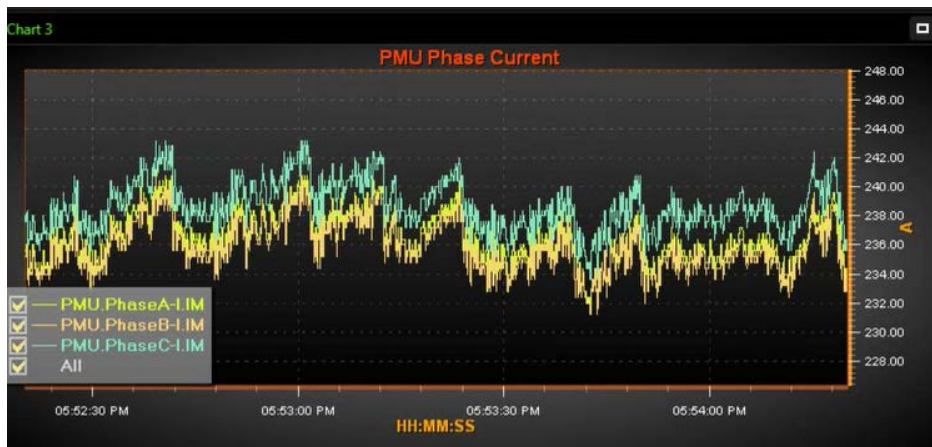
Using Synchrophasor Data to Monitor Reactive Power Balancing

- (Cassiadoro -TRS, Peak RC –Zhang, Vaiman –V&R Energy)
- No significant progress to date

CRSTT to discuss other topics that should be addressed.

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.

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Next NASPI CRSTT Conference Call: August 15, 2018

Next NASPI WG Meeting: October 2018 in Philadelphia