NASPI Work Group Meeting
Control Room Solutions Task Team (CRSTT)
Monthly Conference Call

Mike Cassiadoro & Jim Kleitsch
November 15, 2017

NASPI *North American SynchroPhasor Initiative*

Agenda

❑ Review Status of CRSTT Work Products

➢ Focus Area Documents

➢ Video Event Files

o Sample video of frequency during a short duration (seconds) pseudo-islanding event that automatically resynchronized

➢ Use Case Papers

o New use case document on identifying potential transformer issues

❑ Ongoing synchrophasor use case – investigating voltage spikes/dips in SE Wisconsin

❑ Adjourn

Focus Area Document Update

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. Oscillation Detection – Plans to post November/December 2017
   - (Nuthalapati –Peak, Dyer –EPG, Blevins and Rjagopalan –ERCOT, Patel -EPRI)

5. **Enhanced State Estimation Survey –Preliminary responses received, more analysis needed.**
   - (Vaiman –V&R Energy, Kleitsch –ATC)

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

New video event file showing frequency data for a pseudo-islanding event and automatic synchronization

2017-11-10_12-38-20.mp4

New Sample Use Case Paper

❑ The following describe the use of synchrophasor data to identify a failing potential transformer at an ATC substation. Please review. We will post to the CRSTT web page after addressing any comments.

Adobe Acrobat Document

Identifying a failing potential transformer

Title	Description
EA002 - Using Synchrophasor Data to Analyze Concurrent Fault Events	A 69Kv line trip occurred during a storm where the fault was cleared properly by the line protective equipment. Within seconds an area generator trip was observed. When comparing the synchrophasor data it was clear that the unit trip occurred within cycles of the transmission fault indicating the two events were most likely related.
EA001 - Using Synchrophasor Data to Analyze Fault Event Causes	A transmission fault was cleared properly by the appropriate line protection equipment. When reviewing the synchrophasor voltage data for the fault from a nearby station (see Figure 1 below) it became obvious that the initiating event for the transmission system fault was most likely on the distribution system. Several multi-phase events were observed where the first of these eventually migrated to a phase to ground transmission fault.
Use Case: GEN-03 – Automatic Voltage Regulator (AVR) Malfunction	NYISO System Operators observed transient voltage oscillations in Supervisory Control and Data Acquisition (SCADA) data. The oscillations lasted for three minutes and appeared on many of the western New York 345 kV busses.
Use Case: GEN-05 – Nuclear Plant Voltage Oscillations	In 2011, the Dominion System Operator requested a nuclear power plant to reduce its terminal voltage by 3 kV during light load conditions.
PMU versus SCADA Video Events Summary	

Synchrophasor Use Case Example

- Investigating voltage spikes on SE Wisconsin System
- Spikes started showing up on 11/2
  - Thursday 11/2/2017 17:25 through Friday 11/3/2017 06:02
  - Friday 11/3/2017 17:56 through Saturday 11/4/2017 05:42
  - Saturday 11/4/2017 17:09 through Monday 11/06/2017 05:02
  - Monday 11/6/2017 17:42 through Tuesday 11/7/2017 06:04
  - Tuesday 11/7/2017 11:42 through Thursday 11/9/2017 06:02
  - Thursday 11/9/2017 15:51 through

- Plots showing the start and stop of one 12 hour event follow:
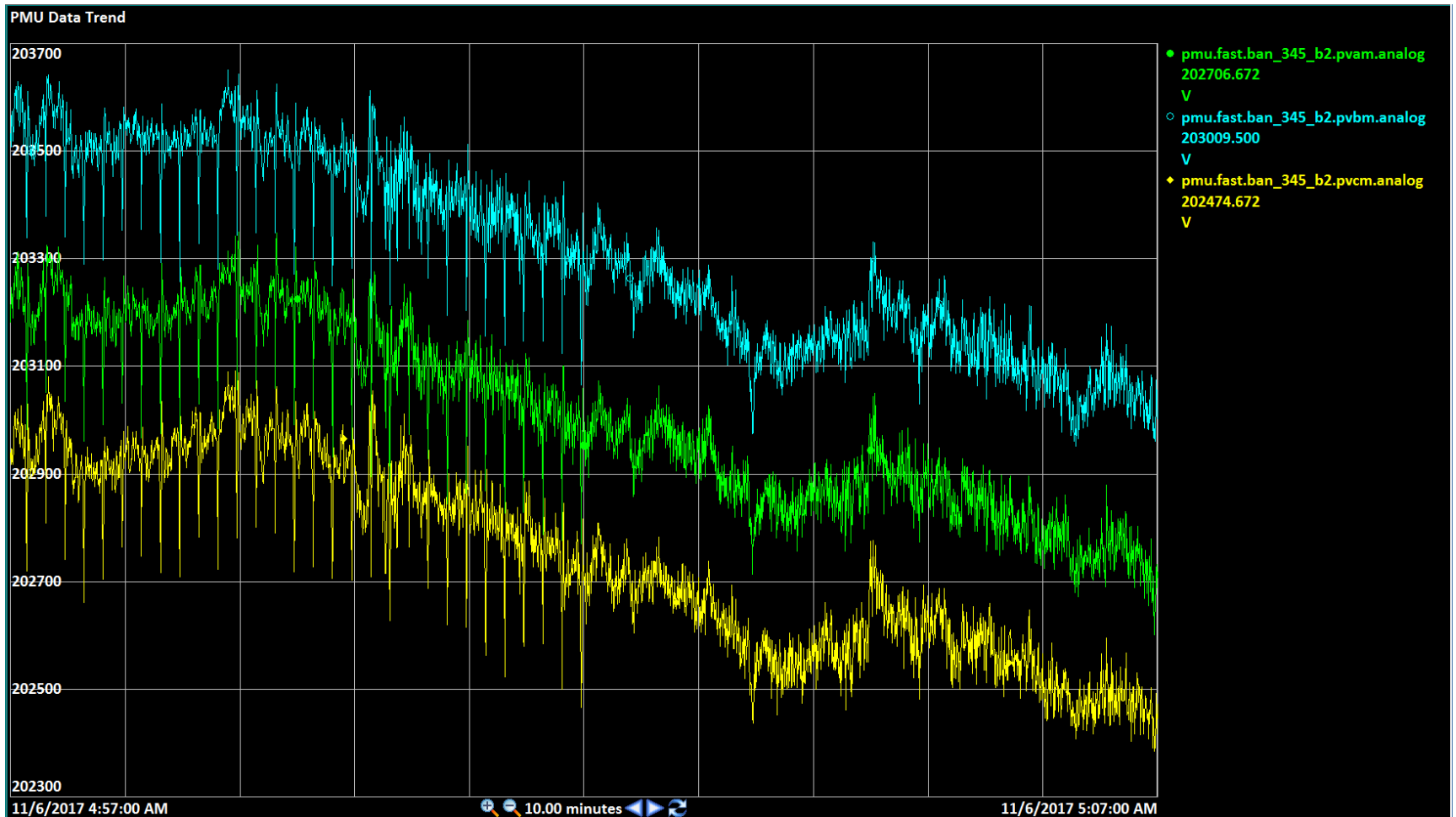- Any ideas what might be causing these?

Synchrophasor Use Case Example (cont'd)

Start of event
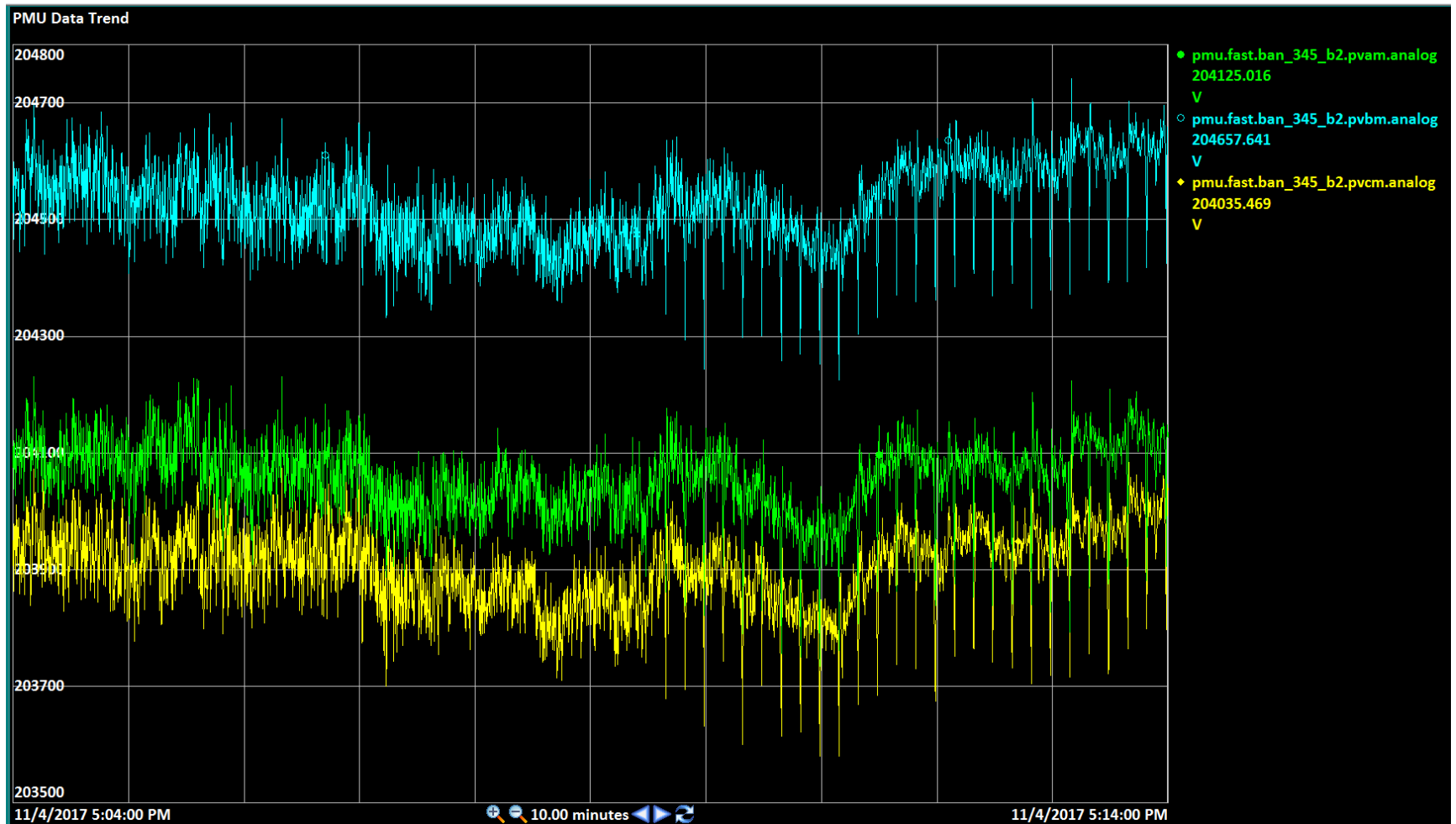
Synchrophasor Use Case Example (cont'd)

End of event

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Next CRSTT Conference Call: December 20, 2017 @ 1230 PT.