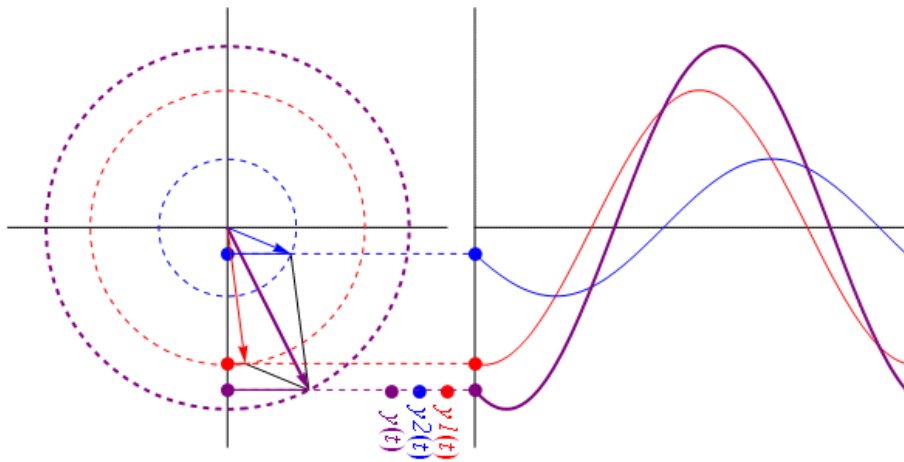


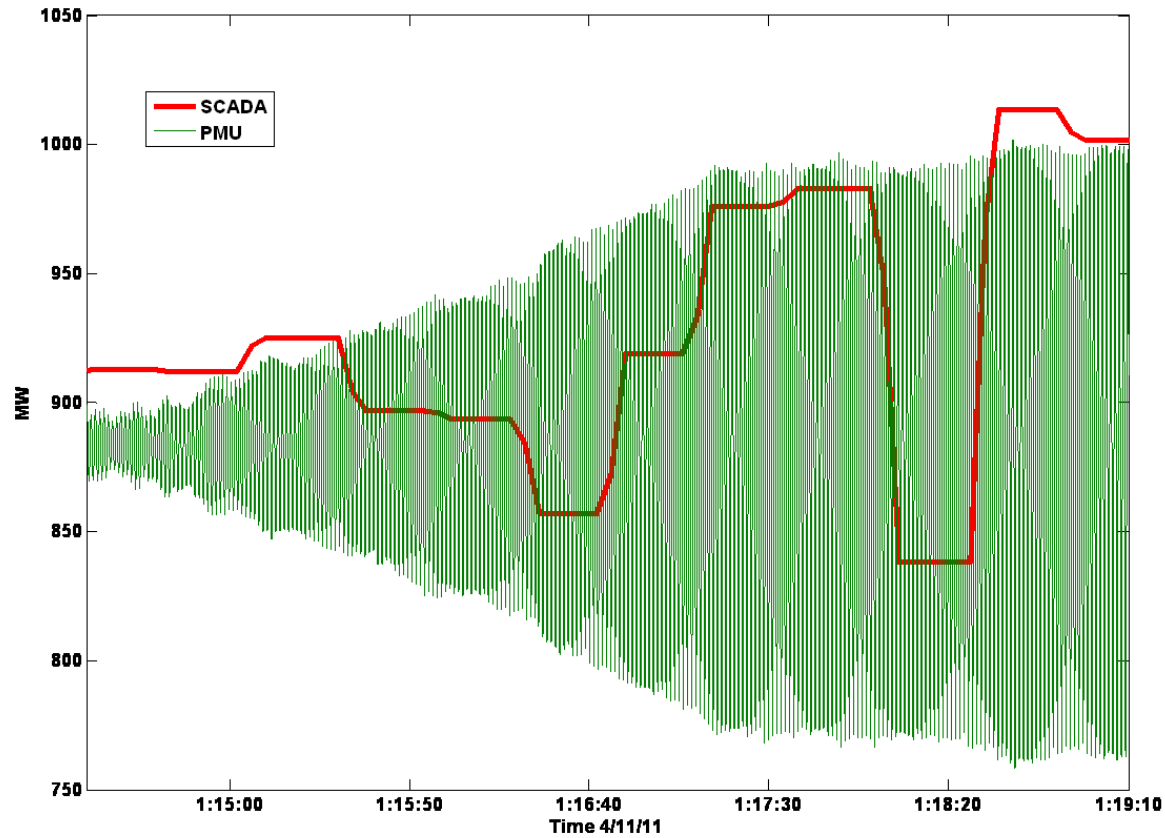
Oscillation Detection and Mitigation at PJM

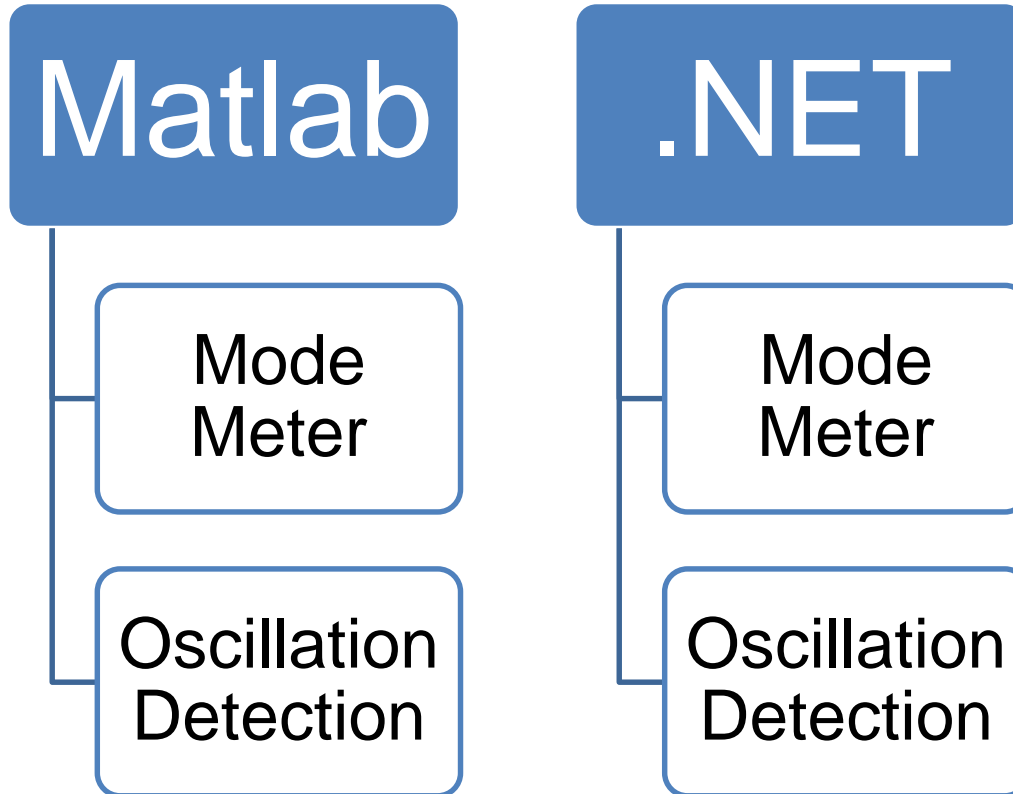


NASPI
International Synchrophasor Symposium
March 24, 2016

Jing Liu
PJM Interconnection

- Why Oscillation Detection
- Algorithm Testing
- Testing Methodology & Results
- Oscillation Mitigation at PJM

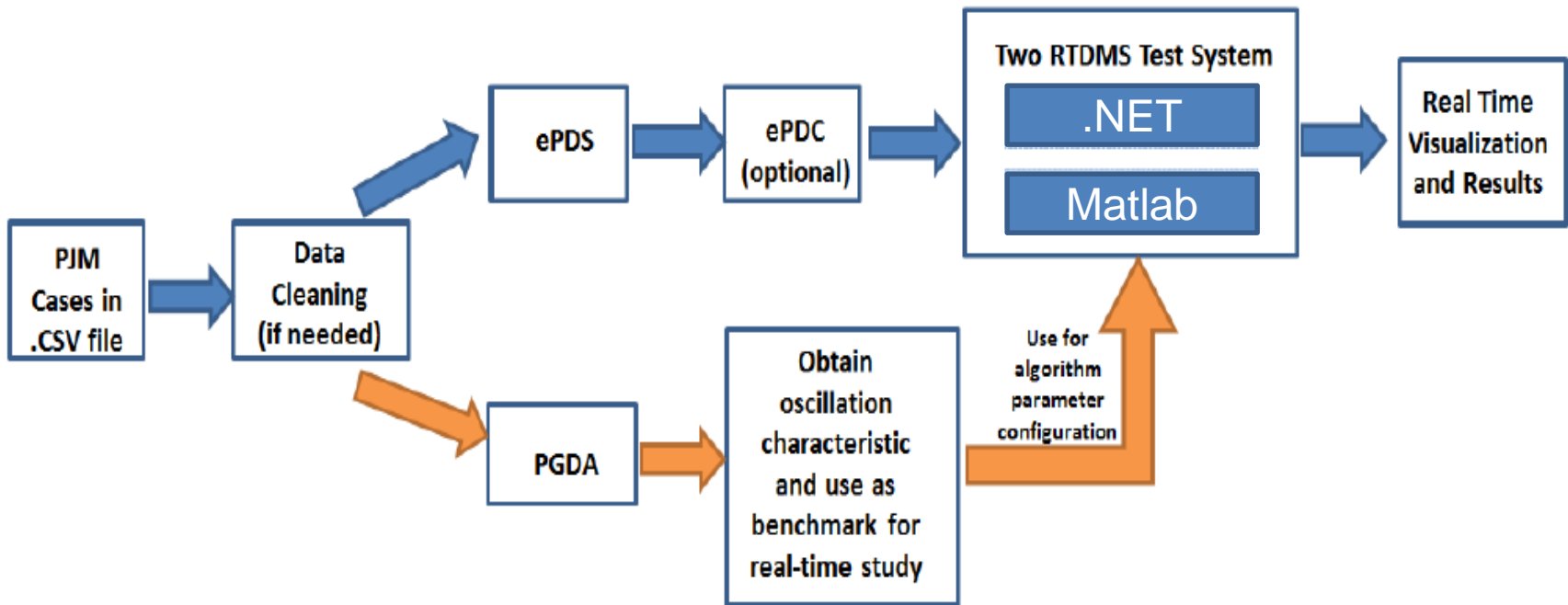




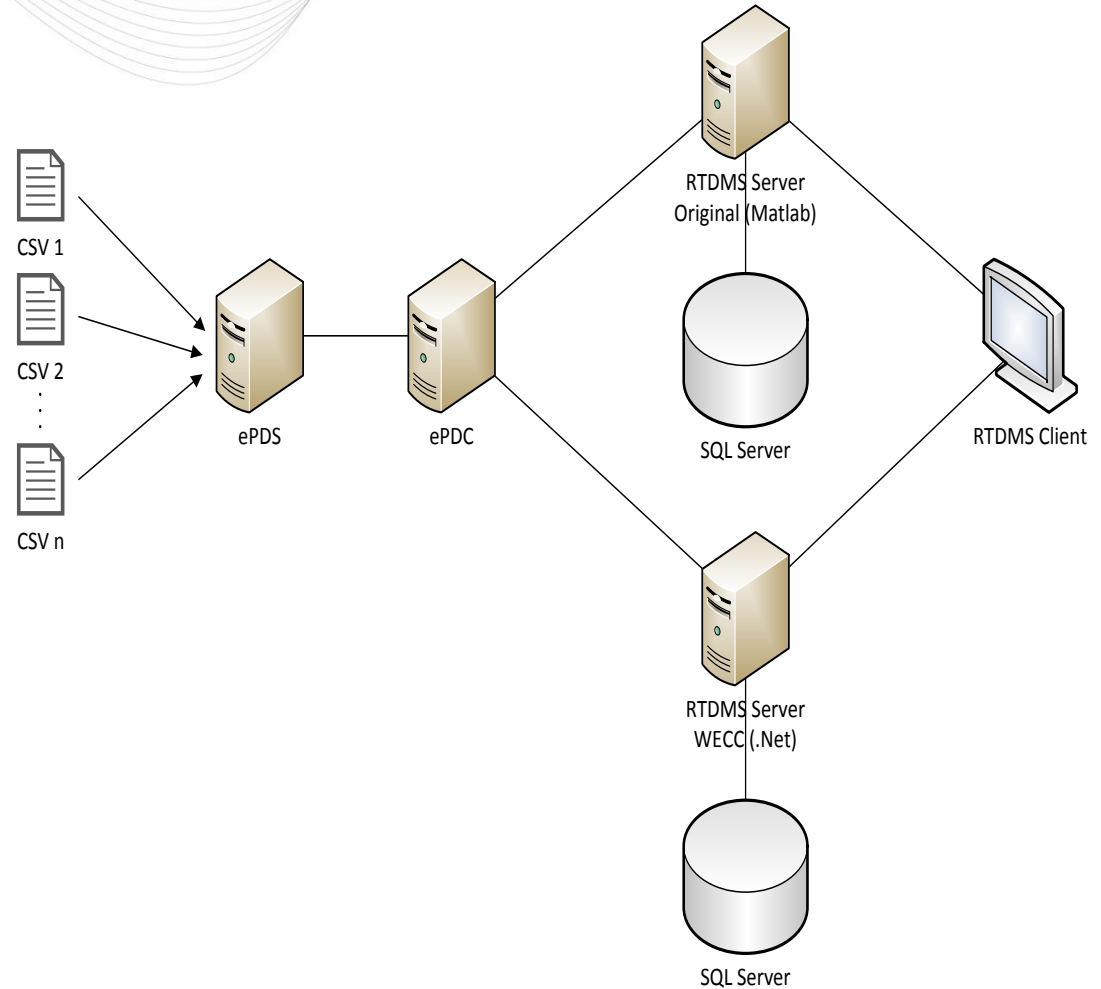
 Electric Power Group



An analysis process flow diagram is shown below:



- Isolated environment
- Virtual machines
- Highly flexible
- Simulated data
- Collaborative
- Future applications
- Data is local



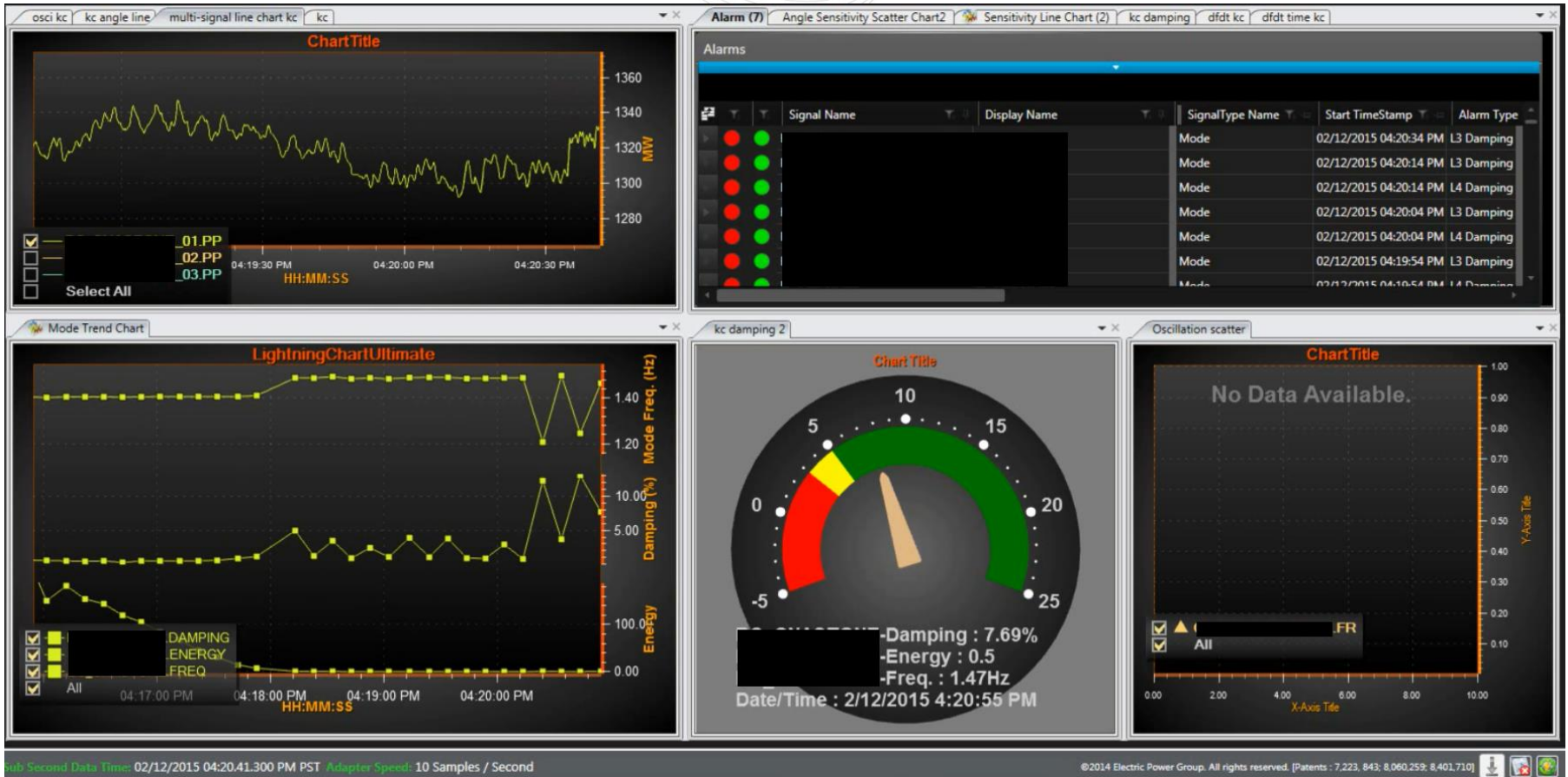
MATLAB → Production System @ PJM

- Accurate Mode Meter results
- Oscillation Detection not effective due to difficulties to trigger events

.NET → Test System @ PJM

- Similar Mode Meter results
- Oscillation Detection Working, but only alarms based on Energy index, requires baselining of Energy index
- Other bug & issues at the time





MW swing



Damping decrease & Energy increase

Alarming through PJM's *Intelligent Event Processor (IEP)*.

A situational awareness tool that provides guidance to operators based upon recognition of a given combination of system topology, alarms, flow, status, etc, including a feed from EPG's RTDMS system around Mode Meter issues.



- Mode Meter algorithm in place within production RTDMS to help identify oscillatory issues in 2015 Q2
- Operator Training in 2015 Q3 (all dispatch teams, covered additional PMU basics, video simulation)
- The Intelligent Event Processor (IEP) oscillatory mode detection rules have been published in production in alignment with the PJM Transmission Operations Manual procedure around Oscillation Mitigation approved and published in December 2015.



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