

North American SynchroPhasor Initiative (NASPI)

Performance and Standards Task Team

Progress Report

Damir Novosel, InfraSource

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NASPI Working Group Meeting

Long Beach, CA May 10, 2007



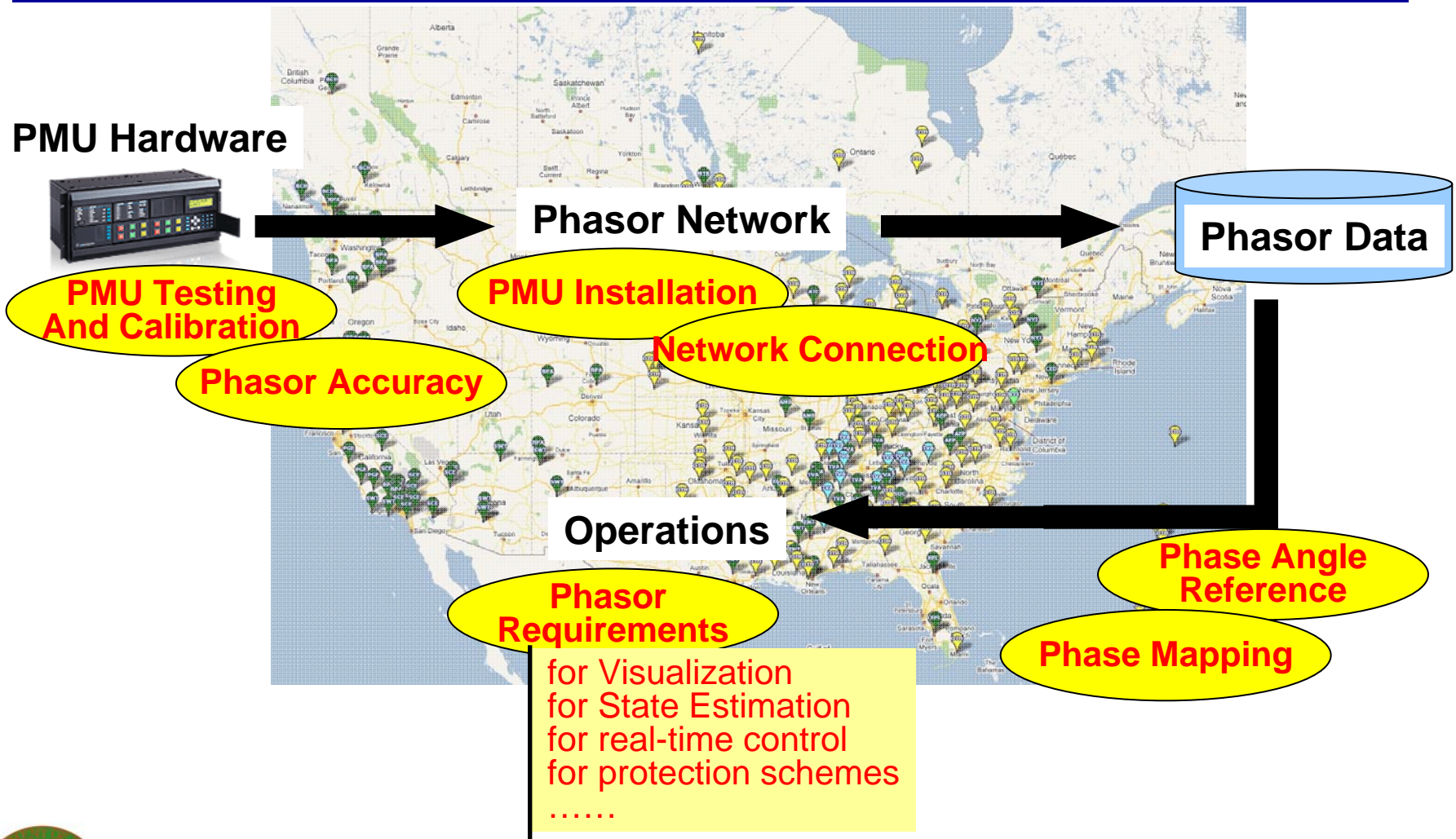
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CONSORTIUM FOR ELECTRIC RELIABILITY TECHNOLOGY SOLUTIONS

Performance and Standards Task Team

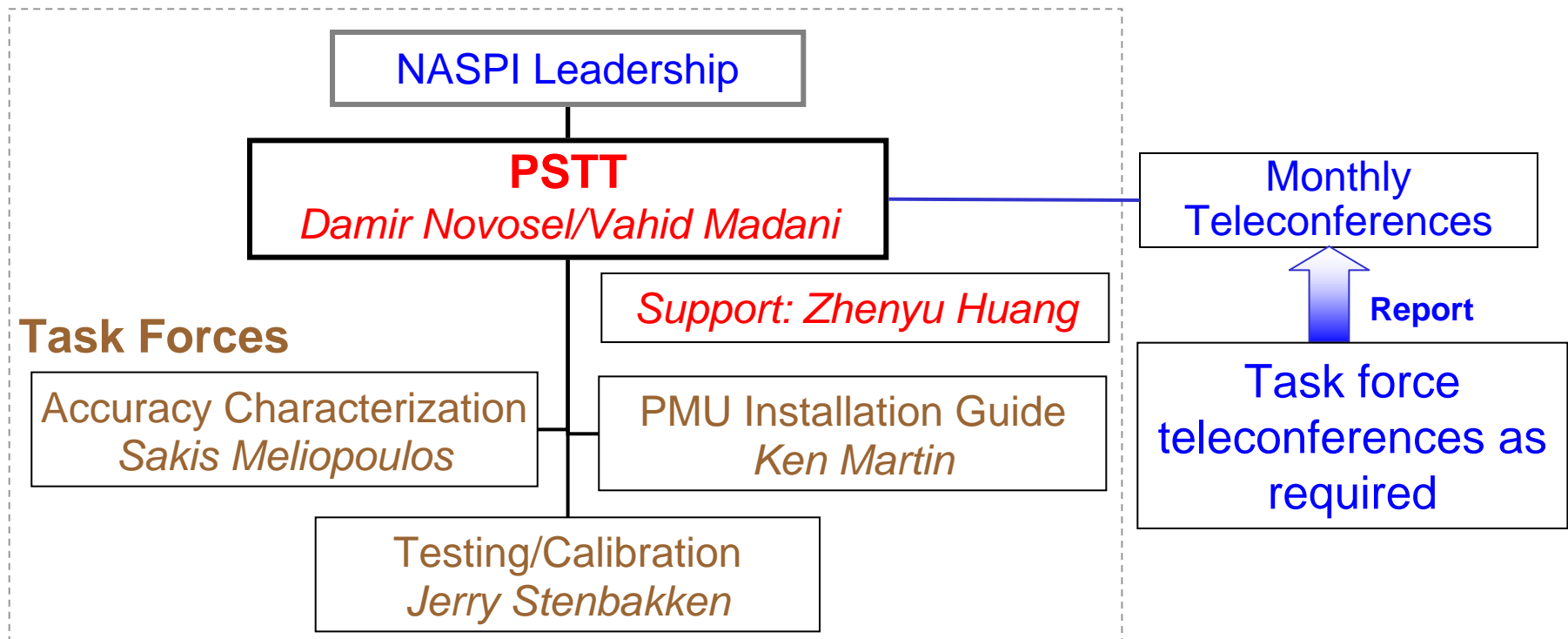
The scope of the Performance and Standards Task Team includes coordinating and acting as **liaison to standards efforts** and determining consistent and satisfactory performance of synchronized measurement devices and systems by creating **guidelines and reports** in accordance with best practices.



Overview of PSTT Activities



PSTT Organization and Present Activities



Task Team Members: ~80 total, ~30 active

http://phasors.pnl.gov/resources_performance.html
<http://www.eippshare.org/prtt/default.aspx>



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Past Accomplishments

Phasor Requirements for Raw Data Utilization

Sakis Meliopoulos

Phasor Requirements for State Estimation

Lucy Wu

Eastern Interconnection Phase Angle Reference

Henry Huang/Ritchie Carroll

Phase Inconsistency with Phase Mapping Examples

Virgilio Centeno/Henry Huang

PMU Installation/Commissioning/Maintenance Survey and Summary

Virgilio Centeno

PMU Acceptance Checklist for Connecting to SuperPDC

Ritchie Carroll

IEDs with Integrated PMU Functionality

(status, issues, factors affecting selection, and recommendations)

Damir Novosel/Yi Hu

Documents posted @ http://phasors.pnl.gov/resources_performance.html



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Current Activities: PMU System Testing and Calibration Guide

- **Goal:** Develop Guide for Testing Procedures and Calibration to support inter-operability and prevent incompatibility → “NERC Standard” and input to 37-118
- **Contents:**
 - Testing equipment
 - Types of tests and Methods for performing the tests
 - SynchroPhasor message format
- **Users:**
 - Manufacturers: phasor product design and certification
 - Utility Engineers: phasor product selection and phasor applications
- **Current Status:**
 - Draft in the final round of review – Target completion date [June 2007](#)
- **Team:**

[Jerry Stenbakken/NIST \(Lead\)](#), Ken Martin/BPA, John Hauer/PNNL, Henry Huang/PNNL, Yi Hu/KEMA, Virgilio Centeno/Virginia Tech, Sakis Meliopoulos/Georgia Tech, Ray Hayes/AEP, Krish Narendra/NXTPHASE, Mladen Kezunovic/Texas A&M, Tony Ranson/Metha Tech, Armando Guzman/SEL, Tony Weeks/Manitoba Hydro, Sandra Affare/TVA, John Hauer, PNNL, Chris Anderson, SEL; Bogdan Kasztenny, GE; Tony Weekes, Manitoba Hydro; Bill Dickerson, Arbiter



Current Activities: SynchroPhasor Accuracy Characterization

- **Goal:** Characterize phasor accuracy in the instrumentation channel including PTs/CTs, instrumentation, communication links, and PMUs
- **Contents:**
 - Characterization of GPS-synchronized measurement devices
 - Characterization of instrumentation channels
 - Characterization of instrumentation transformers (CT, VT, CCVT, MOCT, EOVT)
 - Instrumentation Nominal Precision/Standards
- **Users:**
 - Utility Engineers: phasor system deployment
- **Current Status:**
 - Draft ready for approval – Target completion date [June 2007](#)
- **Team:**

[Sakis Meliopoulos/Georgia Tech \(Lead\)](#), George Cokkinides/Georgia Tech, Damir Novosel/IFS, Bruce Fardanesh/NYPA, Henry Huang/PNNL, Matthew Ford/SEL, Fahrudin Mekic/ABB, Ullattil Manmandhan/ABB, Ray Hayes/AEP, Jim Hackett/Mehta Tech, Steve Widergren/PNNL, Jerry Stenbakken/NIST, Virgilio Centeno/Virginia Tech, Mohsen Zamzam/ConEd, Ken Martin/BPA, Tony Weekes/Manitoba Hydro, Jonathan Prater/TVA



Current Activities:

PMU Installation/Commissioning/Maintenance Guide

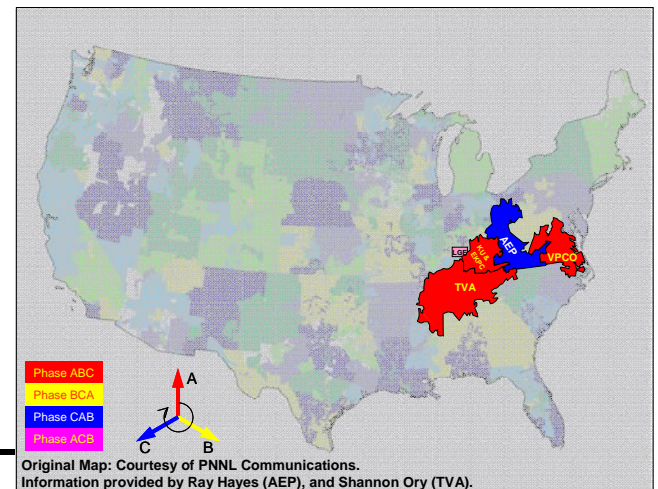
- **Goal:** provide guidelines for PMU installation/commissioning/maintenance
- **Contents:**
 - Part I: PMU acceptance test May 2006
 - Part II: PMU installation procedures June 2007
 - Part III: PMU maintenance procedures September 2007
 - Part IV: PMU commissioning procedures February 2008
- **Users:**
 - Manufacturers: phasor system support
 - Utility Engineers: phasor system deployment
- **Current Status:**
 - Part II draft approved by PSTT - Target completion date June 2007
- **Team:**

Ken Martin/BPA (Lead), Ritchie Carroll/TVA, Henry Huang/PNNL, Virgilio Centeno/Virginia Tech, Damir Novosel/IFS, Yi Hu/KEMA, Ray Hayes/AEP, Shannon Ory/TVA, Sandra Affare/TVA, Jerry Stenbakken/NIST, Krish Narendra/NxtPhase



Recent Highlights

- Developed a summary of issues and opportunities with IEDs with phasor capabilities: starting point for further work.
- PMU Testing Guide – Meeting at the IEEE PSRC meeting in conjunction with C37-118 WG.
- PSTT developed phase mapping examples and made recommendations to NERC for continuation of phase mapping.
- Identified a critical issue with IEEE 37.118 on configuration frame transfer important for interconnecting PMUs to TVA SuperPDC.
- Actively utilize NASPI PSTT SharePoint site for document development and review. 25 PSTT members have access. Posted documents:
 - PMU Testing Guide
 - PMU Installation Guide – Part II
 - SynchroPhasor Accuracy Characterization
- [Use LiveMeeting for teleconferences.](#)



Potential Future Activities

- Expend guidelines for using IEDs with Integrated PMU Functionality
- Issues with “**Dynamic Phasors**”
- Phasor Requirements for System Integrity Protection Schemes
- Phasor Requirements for Real-Time Control
- Technical Specifications for New-Generation Control Room Functions

(Linkage and coordination with other Task Teams)



Questions?

