North American SynchroPhasor Initiative
Working Group Meeting
February 29 & March 1, 2012

Hyatt Regency Orlando Airport
9300 Jeff Fuqua Blvd.
Orlando, FL

This NASPI work group meeting will feature reports and updates on operator training for synchrophasor tools and current research on synchrophasor technology, applications, and data analysis. The meeting will feature keynote speeches from three Fellows of the National Academy of Engineering, who are pioneers of synchrophasor technology development.

There will be a $200 registration fee to cover meeting costs, refreshments and lunch on the two meeting days; **the fee will rise to $300 after February 17, 2012,** and there will be a $50 handling fee for cancellation and refund requests. The meeting registration link is at https://payment.nerc.net/naspi/naspi_.aspx. The Hyatt Regency Orlando Airport is offering NASPI meeting attendees a group rate of $159 per night; **that rate will be available until February 6, 2012**. Please make your hotel reservation through this link: https://resweb.passkey.com/Resweb.do?mode=welcome_gi_new&groupID=8266125,

Final Agenda (2/24/12)

Wednesday, February 29, 2012		
7:30 – 8:00 am	**Registration, refreshments, and networking**	
8:00 – 8:15 am	Welcome, introductions, and logistics review	Jeff Dagle (PNNL) Alison Silverstein (NASPI)
8:15 – 8:30 am	Welcoming keynote	John Odom (FRCC)
8:30 – 8:40 am	NERC update and comments	Bob Cummings (NERC)
8:40 – 8:55 am	DOE Keynote and update	Gil Bindewald (DOE-OE) & Phil Overholt (DOE-OE)
8:55– 10:00 am	Operator training session – vendors talk about training methods • Reflection Software -- Sean Nabors • Synchrophasor-based operator training for effective use of synchrophasor applications -- Guorui Zhang (Quanta Technology) • Electric Power Group -- Jim Dyer	
10:00 – 10:15 am	**Break (refreshments and networking), sponsored by OSIsoft**	

10:15 – 12:00 pm	Research session 1 • Research Keynote – Dr. James Thorp (Virginia Tech) • Research Keynote – Dr. Arun Phadke (Virginia Tech) • Research Keynote – Dr. Edmund Schweitzer (Schweitzer Engineering Laboratories) • Overview of distribution-level phasor measurement applications – Dr. Yilu Liu (University of Tennessee/Oak Ridge National Lab) • GridCloud – Ken Birman & Robbert van Renesse (Cornell University) & Dr. David Bakken, Dr. Anjan Bose & Dr. Carl Hauser (Washington State University)	
12:00 – 1:00 pm	**Lunch (provided)**	
1:00 – 2:20 pm	Training session 2 – users panel on training plans and practices • Entergy – Floyd Galvan • MISO – Kevin Frankeny • WECC – Mike Cassiadoro • PJM – Bill Walker	
	Technical drilldown 1 – oscillation detection applications and research update • Oscillation detection use cases • Research updates	Dmitry Kosterev Mahendra Patel Dan Trudnowski Mani Venkatasubramanian Bernie LeSieutre Chuck Wells
2:20 – 2:35 pm	**Break (refreshments and networking), sponsored by Dominion Virginia Power**	
2:35 – 6:00 pm	Task Team break-out sessions	
	Data & Network Management Task Team • Vahid Madani (PG&E) & Herb Falk (SISCO) -- Making UDP and IP Multicast work with IEC 61850-90-5 • Tim Yardley, Rakesh Bobba, Erich Heine, Jeremy Jones & Kate Morrow (University of Illinois at Urbana-Champaign) -- NASPInet modeling, an exploration of potential realities • Ray Klump & Dr. Zeb Tate (University of Toronto) -- Signal-preserving compression of synchrophasor measurement unit data • Rakesh Bobba, Erich Heine & Tim Yardley (University of Illinois at Urbana-Champaign) – Toward secure and timely exchange of PMU and other power system data	
	Operations Implementation Task Team • Thomas Reitz (Dominion Virginia Power) and David Elizondo (Quanta Technology) -- Plans for the integration of new synchrophasor-based information to the Dominion control room environment – an operator's perspective • Jian Ma, Yuri Makarov, Jeff Dagle & Pengwei Du (PNNL) - An effective tool to monitor power systems dynamics and predict system security trend • Santosh Sambamoorthy (Virginia Tech) -- WAMS-based intelligent load-shedding scheme • Joel Anderson (North Carolina State University) -- WatchDog: a software visualization tool for wide-area monitoring of power systems • Ryan Quint & Noah Badayos (Virginia Tech) -- Implementation of a security-dependability adaptive voting scheme • Meiyan Li (Virginia Tech) -- Transient stability prediction based on synchronized phasor measurements	

	Performance Standards Task Team • Q. Zhang, Dr. V. Vittal, Dr. G. Heydt (Arizona State University), N. Logic & S. Sturgill (Salt River Project) -- Analysis of synchronization and accuracy of PMU measurements in an operational power system • Kunal S. Dekhane, Vijay Krishna & Dr. Gerardo Sanchez (Virginia Tech) -- The Virginia Tech PMU and PDC test system • Erich Heine (University of Illinois at Urbana-Champaign) -- PMU time source security: attacks, detection and prevention regarding PMU time sources
	Planning Implementation Task Team • Dr. Wei-Jen Lee (University of Texas at Arlington) – PMU-based generator parameter identification • Anamitra Pal (Virginia Tech) -- A robust control technique for damping low-frequency oscillations in the WECC • Rui Sun (Virginia Tech) -- Wide-area system islanding contingency detection and warning scheme with the implementation of synchrophasor measurements • David Mazur & Dr. Jaime De La Ree (Virginia Tech) -- Rotor angle measurement of synchronous machines
	Research Initiatives Task Team • Mutmainna Tania (Virginia Tech) -- Adaptive loss of field relay protection • Dalibor Brnobic (Studio Elektronike Rijeka, University of Rijeka) -- WAMSTER: practical experiences gained in 2011 • Dr. Lingling Fan (Universi**t**y of South Florida) -- Electromechanical dynamic state and parame**t**er estimati**o**n using PMU data • Kevin Jones (Virginia Tech) -- Three-phase linear tracking state estimator: development and implementation • Scott Backhaus (Los Alamos National Lab) – Extracting transient grid dynamics from grid frequency noise • Zhongyu Wu, R. Sun and Dr. A. G. Phadke (Virginia Tech) – Three-phase instrument transformers calibration with synchrophasors • Isabelle Snyder (Oak Ridge National Laboratory) – Accuracy of line parameters calculation from synchrophasor data and implication for transmission and distribution applications
6:00 – 8:00 pm	**Reception and poster session, sponsored by …** **Poster presentations:** • Nischal Dahal, Roger King & Tommy Morris (Mississippi State University) – Event stream processing for improved situational awareness in the smart grid • Yufan Guan & Dr. Mladen Kezunovich (Texas A&M University) – Verifying interoperability and application performance of system solution containing PMUs, PDCs and communication networks • Xinyu Tony Jiang & Dr. Joe Chow (Rensselaer Polytechnic) & Bruce Fardanesh, Deepak Maragal & George Stefopolous (New York Power Authority) – Measurement-based, non-iterative state calculation for power networks • Dr. Mladen Kezunovich (Texas A&M University) – Synchrophasors and the Smart Grid • Soobae Kim & Dr. Thomas Overbye (University of Illinois at Urbana-Champaign) – Evaluation of the performance of Thevenin equivalent method based on PMU measurements for transient stability analysis • Anaupama Konara (University of Manitoba) & I. T. Fernando (Manitoba Hydro) – Damping control using wide-area synchronous phasor measurements

	• Rujiroj Leelaruji, Dr. Luigi Vanfretti & Shoaib Almas (KTH Royal Institute of Technology, Stockholm) – Voltage stability monitoring using sensitivities computed from synchronized phasor measurement data • David Mazur & Ryan Quint (Virginia Tech) – Programmable automation controller synchronization applied to power system relaying • P.G. McLaren, M. Steurer, R. Meeker & O. Faruque (Florida State University) – A wide-area differential protection scheme based on current phasors • Karl Reinhard (University of Illinois at Urbana-Champaign) – On data quality and availability modeling of power grid phasor measurements • Greg Zweigle (Schweitzer Engineering Laboratories) – Real-time synchrophasor control system architecture

Thursday, March 1, 2012		
7:30 – 8:00 am	**Refreshments and networking**	
8:00 – 8:10 am	NASPI Project Manager Update	Alison Silverstein (NASPI)
8:10 – 10:00 am	Research presentations session 2 • Synchrophasor state estimation with error correction – Scott G. Ghiocel & Dr. Joe Chow (Rensselaer Polytechnic) & George Stefopoulos, Bruce Fardenesh & Deepak Maragal (New York Power Authority) • Synchrophasor application to fault location: a new approach – Eithar Nashwati (Oncor) & Dr. Wei-Jen Lee (University of Texas at Arlington) • Locating line outages in a specific area of a power system from area PMUs – Hussam Sehwail & Dr. Ian Dobson (Iowa State University) • Cyber-security testing of phasor measurement units and phasor data concentrators – Thomas Morris, Shengyi Pan, Roger King & Nicolas Younan (Mississippi State University) & Mark Freund, Max Atroshenko & Vahid Madani (Pacific Gas & Electric) • Utility ID naming conventions update – Dan Brancaccio (Bridge Energy Group)	
10:00 – 10:15 am	**Break (refreshments and networking), sponsored by Alstom Grid**	
10:15 – 11:00 am	Technical drill-down 2 – Achieving high-quality, high-speed, end-to-end data delivery	Harris Corp.
11:00 – 12:00 pm	Research presentations session 3 • On the existence of dominant inter-area oscillation paths in large interconnected power networks – Yuwa Chompoobutrgool & Dr. Luigi Vanfretti (KTH Royal Institute of Technology) • Fast real-time oscillation detection – Dr. Dan Trudnowski (Montana Tech) • Analysis of subsynchronous oscillations at Oklahoma Gas & Electric – Hamed Khalilinia & Zaid Tashman (Washington State University), Austin White & Steve Chisholm (Oklahoma Gas & Electric)	
12:00 – 1:00 pm	**Lunch (provided)**	

1:00 – 2:45 pm	Research presentations 3 • Report from the IEEE PES CAMS Task Force for the Understanding, Prediction, Mitigation and Restoration of Cascading Failures – Marianna Vaimann (V&R Energy) • Adapting from centralized to distributed algorithms for PMU data analysis – Dr. Aranya Chakrabortty (North Carolina State University) • Power grid simulator (GridSim) – Dr. Mani Venkatasubramanian, David Anderson, Chuanlin Zhao, Dr. Carl Hauser, Dr. David Bakken & Dr. Anjan Bose (Washington State University) • A novel disturbance recording and playback scheme via a distributed dynamic state estimator – Dr. Sakis Meliopoulos, George Cokkinides, Renke Huang & Evangelos Farantatos (Georgia Institute of Technology) • Baselining PMU data using statistical analysis tools – Tom Ferryman (PNNL)
2:45 – 4:00 pm	Task Team Report-outs
4:00 pm	Adjourn

NASPI is very grateful to Oncor Electric Delivery, V & R Energy and Dominion Virginia Power for contributing to housing scholarships for many of the students participating in this NASPI meeting.