NASPI North American
SynchroPhasor Initiative

NASPI Work Group Meeting
October 19-20, 2016
8am – 5pm

Seattle Marriott Waterfront Hotel
2100 Alaskan Way
Seattle, Washington USA
206-443-5000

This meeting will feature technical sessions and presentations on phase angle calculation and use, system protection, time synchronization, updates on the current Department of Energy synchrophasor research projects, and other current synchrophasor applications. DOE Assistant Secretary Pat Hoffman will deliver our keynote speech.

Final Agenda

Wednesday, October 19, 2016		
7:00 - 8:00 am	**Registration in Grand Pacific Foyer**	
	Coffee & networking in Grand Pacific Foyer A-D	
	Meeting in Grand Pacific A-D	
8:00 - 8:15 am	Welcome, introductions, and logistics review	Jeff Dagle (PNNL) Alison Silverstein (NASPI)
8:15 – 9:00 am	Perspectives from the U.S. Department of Energy	Assistant Secretary Patricia Hoffman
9:00 - 9:20 am	NASPI Awards	Assistant Secretary Patricia Hoffman & Alison Silverstein (NASPI)
9:20 - 10:10 am	Session 1 – Big picture synchrophasor uses - Peak Reliability synchrophasor technology implementation roadmap and recent progress – Hongming Zhang & Brett Wangen (Peak Reliability) - Reducing false alarms and identifying fault type & location with advanced analytics on PMU data – Brad Klenz & Greg Link (SAS Institute), Kat Sico & Mark Matthews (Duke Energy), Anya McGuirk & Arnie deCastro (SAS Institute)	
10:10 – 10:25 am	**Break & refreshments – Grand Pacific Foyer**	

10:25 am - 12:00 pm	Session 2 – Synchrophasors for system protection Moderator – Matthew Rhodes (Salt River Project) - Use of Synchrophasor Measurements in Protective Relaying Applications – Jim O'Brien (Duke Energy) for PSRC - Reassessing synchrophasor technology for system protection – Matthew Rhodes (SRP) - Synchrophasor uses – utility examples (10 minutes each) - Dominion Virginia Power – line impedance – Kyle Thomas - Bonneville Power Administration – RAS – Dmitry Kosterev - Peak Reliability -- Angle separate limit calculation for WECC path & IROL stress monitoring – Hongming Zhang
12:00 - 1:00 pm	**Lunch (provided, sponsored by IEEE-SA) in Grand Pacific E-G** ◆IEEE IEEE STANDARDS ASSOCIATION
1:00 - 2:00 pm	Session 3 – Updates - Synchrophasor Standards – Tony Johnson (SCE) - Synchrophasor data quality and Phasor Applications Requirements Task Force plans – Frank Tuffner (PNNL) - NERC Synchronized Measurement Subcommittee and NERC PPMV Reliability Guideline – Ryan Quint (NERC) - WECC Joint Synchronized Information Subcommittee – Steve Yang (BPA)
2:00 - 3:15 pm	Session 4 – Phase angle calculation and uses Moderators – Ryan Quint & Mike Cassiadoro - Phase angle calculation and unwrapping and why it matters – EATT technical paper – Ryan Quint (NERC) & Ken Martin (EPG) - Phase angle monitoring – CRSTT technical paper overview & list of vendor applications – Mike Cassiadoro (Total Reliability Solutions) & NDR Nuthalapati (Texas A&M University) - NERC's phase angle monitoring technical paper – Ryan Quint (NERC)
3:15 - 3:30 pm	**Break (refreshments and networking) – Grand Pacific Foyer**
3:30 - 6:00 pm Task Team break-outs	**Control Room Solutions Task Team** - Automatic disturbance and oscillation detection at SDG&E and SRP – Jared Bestbreuer (Schweitzer Engineering Laboratories, Inc.), Tariq Rahman, Dan Eklund & Subburaman Sankaran (San Diego Gas & Electric) and Ellery Blood & Greg Zweigle (SEL) - Data analytics study of FNET/GridEye measurement – Yong Liu, Yilu Liu, Ling Wu, Dao Zhou & Jiahui Guo (University of Tennessee Knoxville & Oak Ridge National Lab) - PJM Operator Training Simulator – Emanuel Bernabeu - State Estimation Survey (Marianna Vaiman, Jim Kleitsch, Mike Cassiadoro) - CRSTT business

	Data & Network Management Task Team • Cloud-based synchrophasor data architecture – Xiaochuan Luo, Frankie Zhang & Eugene Litvinov (ISO-NE), Ken Birman, David Bindel, Theo Gkountouvas & Weijia Song (Cornell University), Dave Anderson, Carl Hauser & Anjan Bose (Washington State University) • WAMS in the sky – Manu Parashar, Douglas Wilson, Nischal Dahal, Andrew Gillies & Kristen Sanderson (GE Grid Solutions) • PMU registry in Peak Reliability – Jiawei "Alex" Ning, Todd McCune (Peak Reliability) • Data Delivery Efficiency Improvements, New Technology Value Phasor Gateway using GEP protocol in comparison to C37.118 – Ritchie Carrol (GPA) • DNMTT business
	Distribution Task Team • Phasor Measurement: A Short History of the Technology and the Standards – Harold Kirkham (PNNL) • Using micro-PMU data for a data-driven solution to geomagnetic disturbances – Sean Murphy & Jerry Schuman (PingThings) • Catching falling conductors in mid-air: detecting and tripping broken distribution circuit conductors at protection speeds - Tariq Rahman (SDG&E) and Kamal Garg (SEL) • DisTT business
	Engineering Analysis Task Team • Failure diagnosis in transmission protection system using synchrophasor data – Bo Cui, Anurag Srivastava & P. Bannerjee (Washington State University) • PMU emulator for power system dynamics simulators and model validation – Hyojong Lee, Anurag Srivastava, P. Banerjee (Washington State University) & Evangelos Farantatos & Mahendra Patel (EPRI) • Enhanced algorithms for real-time stability tracking – Tim Gubitz, Kat Sico (Duke Energy) and Aranya Chakrabortty (North Carolina State University) • EATT business
	Performance, Requirements, Standards & Verification Task Team • Testing M-class PMUs for Power Grid Corp. of India – Rahul Choubey, M.K. Kumar, B.N. DeBhowmick, S.B.R. Rao & P.S. Chauhan (PowerGrid India) • PMU Data Archive Walker and Event Detection Application – Frank Tuffner, Jim Follum, Tao Fu & Pavel Etingov (PNNL) • Synchrophasor Data Under Fault Conditions – Krish Narendra (ERL Phase) • PRSVTT business
6:00 - 8:00 pm	**Reception – Grand Pacific Foyer**

Thursday, October 20, 2016	
7:00 - 8:00 am	**Coffee & networking in Grand Pacific Foyer A-D**
8:00 – 9:00 am	Task Team report-outs • CRSTT • DNMTT • DisTT • EATT • PRSVTT

9:00 - 10:00 am	Session 5 – Time synchronization • NASPI Time Synchronization Task Force report – Alison Silverstein (NASPI) • Mitigating GPS vulnerabilities to maintain synchrophasor timing requirements -- Ben Rowland (Schweitzer Engineering Lab) • eLoran signal to support NASPI timing requirements – Jason Berger & Mark Lorenz (Harris Corp.) and Stephen Bartlett (Ursanav)
10:00 - 10:15 am	**Break (refreshments and networking) – Grand Pacific Foyer**
10:15 am - 12:15 pm	Session 6 – Current Department of Energy synchrophasor research • The success of the Phasor Simulation for Operator Training – Neeraj Nayak (Electric Power Group) • Direct non-iterative state estimator – Dino Lelic (Quanta Technology) • Integration of PMU Data in the Control Room – Brett Wangen (Peak Reliability) • Building Grid Operator Monitoring and Control Assistant based on Synchrophasor Data - Marianna Vaiman (V&R Energy) • Grid awareness with SynchroVIEEU – Dora Nakafuji, Lisa Dangelmaier & Robert Kaneshiro, (Hawaii Electric Light Company), Jared Bestebreur, Michael Rourke & Greg Zweigle (Schweitzer Engineering Laboratories, Inc.) • OpenECA project update – Ritchie Carroll (Grid Protection Alliance) • Grid Stability Awareness System (GSAS) - A comprehensive software suite for stability monitoring and analysis based on synchrophasor measurement – Jian Ma (Burns & McDonnell)
12:15 - 1:15 pm	**Lunch (provided) in Grand Pacific E-G**
1:15 - 3:10 pm	Session 7 – Advanced technical opportunities and uses • Considerations for synchrophasor systems and NERC CIP standards – Ryan Quint (NERC), Ken Martin (Electric Power Group) & NDR Nuthalapati (Texas A&M University) • Enhanced reactive margin analysis using synchrophasors – Vahid Madani (PG&E), Rahul Anilkuman, Tony Jiang & Damir Novosel (Quanta Technology) & Vijay Sukhavasi & Anil Jampala (GE Grid Solutions) • System level validation of dynamics using PMU data, automated tools, and visualization -- Komal S. Shetye & Thomas J. Overbye (University of Illinois at Urbana-Champaign) • Early warning signs of instability in the statistical properties of PMU data – Paul Hines, Samuel Chevalier (University of Vermont) & Konstantin Turitsyn (Massachusetts Institute of Technology) • Real-time PMU-assisted Available Transfer Capability (ATC) computation beyond on-line computation of transfer limits – Hsiao-Dong Chiang (Cornell University & Bigwood Systems)
3:10 - 3:25 pm	**Break (refreshments and networking) –**
3:25 - 5:00 pm	Session 8 – Interesting synchrophasor applications • Oscillation detection at BPA – Matt Donnelly (Montana Tech), Dmitry Kosterev, Jim Burns, Nick Lietschuh, John Anasis & Ashley Donahoo (Bonneville Power Administration) • PMU-based frequency response characterization – Vahid Madani (PG&E) and Gurudatha Pai & Manu Parashar (GE Grid Solutions) • Development of a phasor-driven tool for adaptive stability model calibration using GE PSLF – Ruisheng Diao (PNNL) • Oscillation baselining and analysis tool – Pavel Etingov, Frank Tuffner & James Follum (PNNL), Dmitry Kosterev & Gordon Matthews (BPA) & Bernie Lesieutre (University of Wisconsin-Madison)
5:00 pm	Meeting adjourns