

**NASPI-NREL
SYNCHROPHASOR TECHNOLOGY AND
RENEWABLES INTEGRATION WORKSHOP
Hyatt Regency Denver Tech Center
Grand Mesa Room
Denver, CO**

**JUNE 7, 2012
8:30am – 12:00pm**

On the day after the North American SynchroPhasor Initiative meeting (on June 5-6 at the Hyatt Regency Denver Tech Center), this workshop will bring together electric industry synchrophasor experts, utility and RTO-ISO leaders at the forefront of renewables use, and NREL experts on renewable energy development and integration. The goal of the workshop is to find opportunities to share and leverage information and insights in each community in ways that advance and accelerate renewables use and grid reliability with phasor technology.

Format – very short presentations in panel format for show-and-tell portions, followed by facilitated discussion on focused topics

Meeting registration -- [NASPI NREL Workshop Registration](#)

AGENDA (speaker confirmations on-going)

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|---------|--|
| 8:30 am | Introductions |
| 8:45 am | Introduction to synchrophasor technology – Jeff Dagle (PNNL) |
| 8:55 am | Challenges – Dave Corbus (NREL), Kara Clark (NREL), Mike McMullen (MISO), Bob Zavadil (Enernex), John Adams (ERCOT), Karen Forsten (EPRI)
Charlie Smith (UVIG) -- moderator |
- Magnitude of renewables on-line today and coming (5 minutes)
 - Key characteristics of variable generation that create challenges for grid operation (10 minutes)
 - What do we know now about integrating renewables?
 - What do we not know yet that we want to figure out?

- What renewable integration problems are being worked on that phasor data could help solve?
- What insights or projects do renewables research folks have that could be useful for phasor experts trying to support operations people?
- Discussion

9:40 am Break

10:00 am Tools -- Austin White (OG&E), Mike McMullen (MISO), Louis Signoretty (Alstom), Yingchen Zhang (NREL), Jason Banks (NREL), John Adams (ERCOT)
Alison Silverstein (NASPI) -- moderator

- What synchrophasor tools are we using now?
- What synchrophasor tools do we need or want but don't have yet?
- What renewable integration tools and methods are now being used that phasor data could make better?
- Discussion

11:30am Next steps
Alison Silverstein (NASPI) & Dave Corbus (NREL) -- moderators

12:00 pm Adjourn

Topics we expect to come up:

- Phasor-data-based grid monitoring and state estimation
- Fault location
- Real-time monitoring of primary frequency
 - determination of variable generation impacts on primary frequency and inertia
 - oscillation detection and damping
 - assessing real-time inertia
- Active, automated control of wind and solar plants using PMU data collection and feedback
- Real-time monitoring, switching and controls for plant-side and grid-side equipment
 - Storage devices
 - Power electronics, SMES, DSMES, SVCs
 - Switches
- Available Transmission Capacity determination, dynamic line ratings and congestion management using both real-time monitoring and dynamic controls
- Monitoring and screening renewable energy "events" using phasor data

- Equipment and control diagnostics on renewable plants and on plants providing primary frequency response (e.g., stabilizers)
- Voltage monitoring of renewable energy systems using PMUs
- Model validation for renewable energy plants (units v. plants)
- Improving wind and solar forecasting
- Operations prediction – what actions can operators take to resolve problems identified by the tools above?

WORKSHOP COORDINATORS

- Alison Silverstein, NASPI Project Manager -- alisonsilverstein@mac.com
- Dave Corbus, NREL Program Manager, Electric Systems – david_corbus@nrel.gov

If you are interested in the NASPI Work Group meeting that will be held on June 5-6, the meeting agenda is posted at [NASPI Work Group Meeting Registration](#)