Pacific Northwest
NATIONAL LABORATORY

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NASPI Update

October 5, 2021

Jeff Dagle, PE
Chief Electrical Engineer
Electricity Security Group / Resilience Team
Pacific Northwest National Laboratory

U.S. DEPARTMENT OF ENERGY BATTELLE

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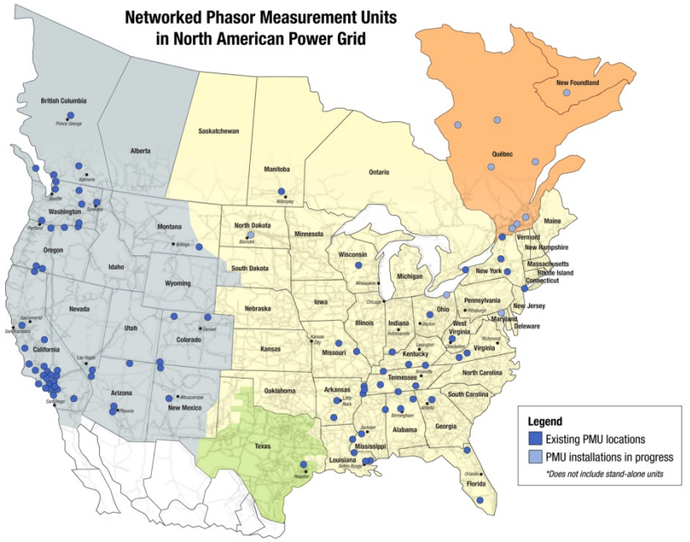
The North American SynchroPhasor Initiative (NASPI)

The U.S. Department of Energy (DOE) and EPRI are working together closely with industry to enable wide-area time-synchronized measurements that will enhance the reliability of the electric power grid through improved situational awareness and other applications.

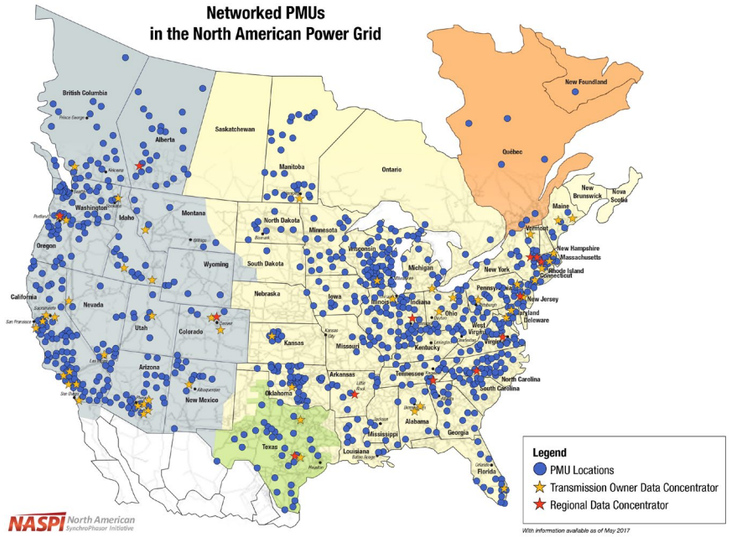
Current and emerging areas of emphasis/focus for NASPI:

- Networking and communications technologies (advanced architectures)
- Statistical analysis and deep learning for extracting actionable information from large datasets
- High-resolution sensors to characterize the transient behavior of inverter-based resources and other fast-acting phenomena

April 2007



May 2017



"Better information supports better - and faster - decisions."

NASPI Status Report

- Prior work group meeting – April 13-15, 2021
  - ✓ High-speed time-synchronized measurements to characterize and mitigate inverter-based resource impacts (multiple sessions)
  - ✓ Statistical analysis and deep learning for extracting actionable information from large datasets
  - ✓ PMU placement and data exchange issues
  - ✓ Oscillations
  - ✓ Distribution system applications
- This work group meeting – October 5-7, 2021
  - ✓ Big data analytics
  - ✓ Edge computing solutions
  - ✓ Measurements of inverter-based resources
  - ✓ Real-time simulators
  - ✓ Data sharing challenges
  - ✓ Control room applications
  - ✓ Oscillations
  - ✓ Inertia monitoring
- Next work group meeting – April 12-14, 2022
  - The NASPI Leadership Team will continue to monitor the Covid situation and determine if this will be an in-person or virtual meeting.

NASPI 2021 Webinar Series

- Jan 27 – Merging Units - Evandro de Oliveira, Galina Antonova, and Bharadwaja Vasudevan
- Feb 24 – Synchrophasor Cybersecurity for Grid Operations - Scott Mix
- Mar 31 – Synchronized Measurements in Distribution Systems - Paul Pabst and Kevin Chen
- May 26 – Digital Voltage and Current Sensors – Farnoosh Rahmatian
- June 30 – System Inertia Monitoring - CRSTT
- July 28 – FOA 1861 Awardees report out on Machine Learning and Artificial Intelligence – Sandra Jenkins
- August 25 – Human-Machine Teaming and the Cognitive Science of Real-Time Operations – Eric Andersen

All webinar materials are available at www.naspi.org/webinars

The NASPI Technical Task Teams

- Control Room Solutions
  - Jim Kleitsch
  - Cody Parker
- Data & Network Management
  - Dan Brancaccio
- Distribution
  - Sascha von Meier
  - Dan Dietmeyer
- Engineering Analysis
  - Evangelos Farantatos
  - Matthew Rhodes
- Performance Requirements, Standards & Verification
  - Jim O'Brien
  - Farnoosh Rahmatian

Control Room Solutions Task Team

- System Inertia Monitoring use case
- Time synchronized measurements simulation training virtual course. Hope to get the course face to face again as the country opens
- Coordination with DisTT
- Michael Cassiadoro stepped down as a co-lead and replaced by Cody Parker (SPP)
- NASPI WG Spring 2022 panel session with operations personnel presenting

Data and Network Management Task Team

- Synchrophasor Archive and Network Strategy Task Force (SANSTF) co-led by Laurel Dunn and Manjari Asawa are working on a Synchrophasor Application-Based Guide for Archive and Network Strategies (SABGANS)
- Renewed focus on data exchange formats, naming conventions and clock issues
- Investigation of network architecture for synchrophasor edge computing solutions
- Looking for new co-lead

Distribution Task Team

- Use Case documents development with CRSTT
- Provided feedback on “Distribution Synchronized Measurements Roadmap” – Draft Final Report, Quanta Technology and Oak Ridge National Laboratory

Engineering Analysis Task Team

- Shaun Murphy stepped down as co-lead and was replaced by Matthew Rhodes
- Continues to make progress on the white paper, “Advanced Model Validation & Calibration” led by Honggang Wang

Performance Standards, Requirements & Verification Task Team

- Survey of PMU connected instrument transformers
- Development of three white papers nearing completion:
  - Survey of Existing PMU Applications Around the World and Classification
  - Analyzing Synchrophasor Performance Requirements for Synchrophasor based Control Applications
  - Data Quality Impacts on Synchrophasor based Control Applications

IEEE-NASPI Oscillation Source Location Contest

Congratulation to the Oscillation Source Location Contest Winners!

- Tied for First Place: Team RPI – from Rensselaer Polytechnic Institute
  - Denis Osipov
  - Stavros Konstantinopoulos
  - Joe Chow
- Tied for First Place: Team Woodpecker – from General Electric
  - Honggang Wang
  - Shaopeng Liu
  - Gang Zheng
- Third Place: Team FIUBA – from University of Buenos Aires
  - Pablo Gill Estevez
  - Pablo Marchi
  - Cecilia Galarza

NASPI Path Forward

- Continue to support and liaison with industry
  - Various IEEE Standards activities
  - North American Electric Reliability Corporation
    - ✓ Synchronized Measurement Working Group
  - Western Electricity Coordinating Council
    - ✓ Joint Synchronized Information Subcommittee
- Anticipating no substantial structural changes to the NASPI leadership team, industry-led task teams, or meeting tempo (plan to resume twice per year)
  - Maintain approximately equal representation among utilities, vendors, and academia, which has been a unique attribute and key value proposition for NASPI
- Current and emerging areas of emphasis/focus for NASPI:
  - Networking and communications technologies (advanced architectures)
  - Statistical analysis and deep learning for extracting actionable information from large datasets
  - High-resolution sensors to characterize the transient behavior of inverter-based resources and other fast-acting phenomena

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Thank you