Pacific Northwest
NATIONAL LABORATORY

NASPI Update

April 15, 2025

Jim Follum
Sensing & Measurement Team
Energy Systems Engineering Group
Pacific Northwest National Laboratory

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The North American SynchroPhasor Initiative (NASPI)

- Our mission
  - Improve electric grid resilience, reliability, security, and affordability by accelerating the adoption and standardization of higher-fidelity time-synchronized measurement technologies, applications, and architectures.
- Our members
  - Volunteer representatives from the utility industry, manufacturers, vendors, academia, national laboratories, government agencies, and standards-making bodies.

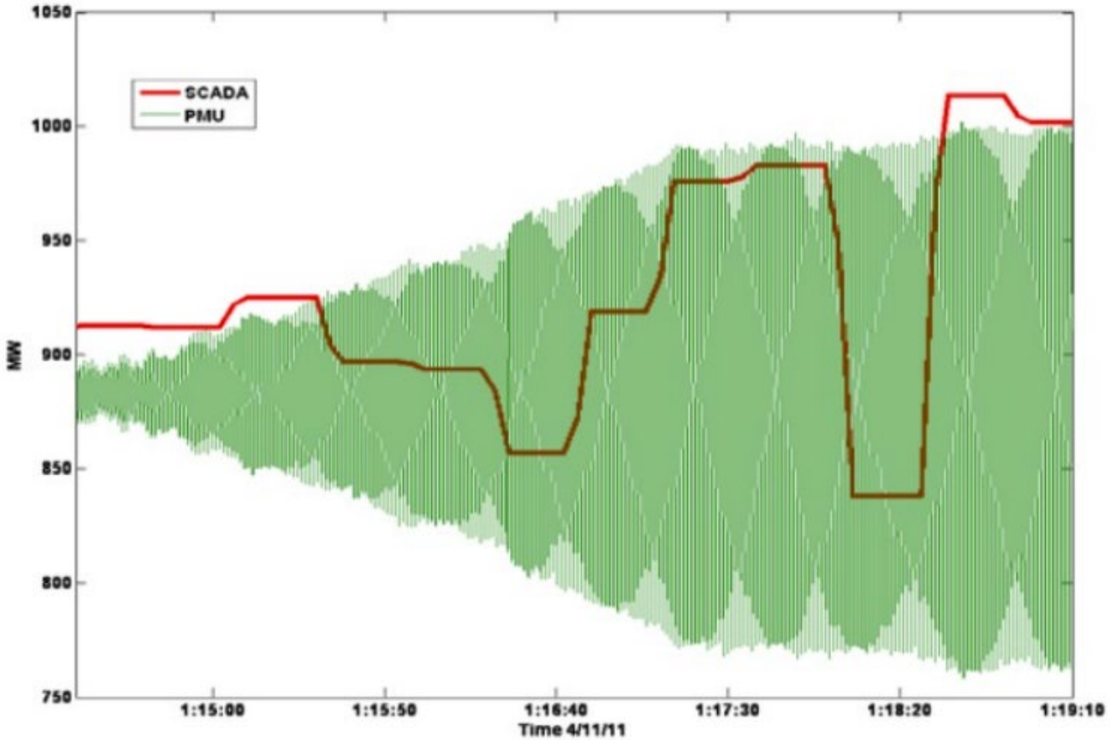
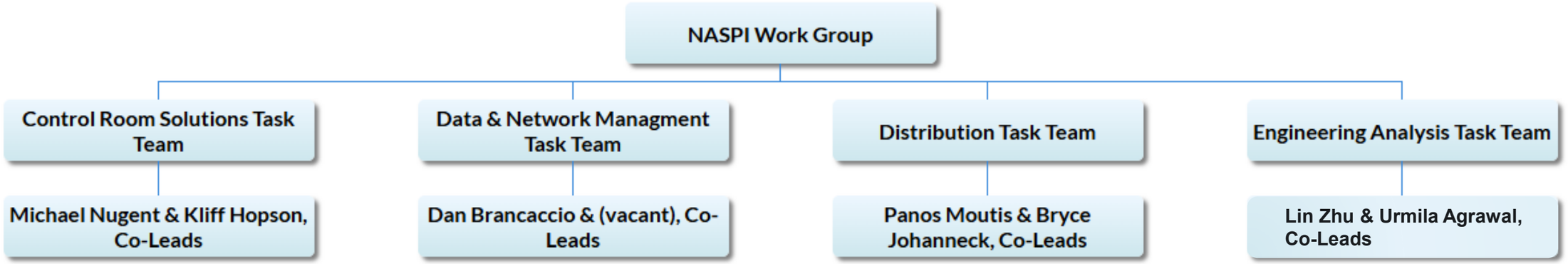


Image Credit: Dominion Energy

The North American SynchroPhasor Initiative (NASPI)

- Our Task Teams: incubators for new ideas and approaches to solve challenges
  - **Control Room Solutions Task Team (CRSTT):** works to advance the use of real-time applications to improve control room operations and grid resilience and reliability.
  - **Engineering Analysis Task Team (EATT):** develops, tests, and validates engineering applications, assists in their deployment and utilization, and recommends R&D activities.
  - **Data and Network Management Task Team (DNMTT):** provides guidance for data networking, archiving, and access issues, and reviews new archiving and networking technologies.
  - **Distribution Task Team (DisTT):** fosters the use and capabilities of synchronized measurement data at the medium-voltage distribution level.



The North American SynchroPhasor Initiative (NASPI)

- Our Liaisons
  - IEEE Power System Relaying & Control Committee (PSRC) and Power System Communications and Cybersecurity Technical Committee (PSCCC) – Yi Hu
  - NERC Synchronized Measurement Working Group (SMWG) – Clifton Black
  - CIGRE C4/C2.62 – Evangelos Farantatos
  - IEEE PES Task Force on Synchro-Waveforms – Hamed Mohsemian-Rad and Jhi-Young Joo
  - IEEE Forced Oscillation Task Force – Farrokh Aminifar
  - EIDSN – Kent Simendinger

The North American SynchroPhasor Initiative (NASPI)

- Our activities
  - January – Quarterly Task Team Meetings
  - February – Webinar
  - March – Webinar
  - April – In-Person Work Group Meeting
  - May – Webinar
  - June – Webinar
  - July – Quarterly Task Team Meetings
  - August – Webinar
  - September/October – Hybrid Work Group Meeting

  - Task Forces meet as needed

NASPI Webinar Series

Winter Webinar Series

- “Synchro-Waveform Data Analytics Architecture and Big Data Platform for Grid Operations and Situational Awareness”, Hamed Valizadeh and Michael Balestieri, Southern California Edison
  - Joint webinar with the IEEE Synchro-Waveforms Task Force
- “Hydro Power Plant Operation Signature Measurements for Grid Inertia Estimation”, Dr. Yilu Liu, University of Tennessee Knoxville and Oak Ridge National Laboratory

Summer Webinar Series – Topics to be announced soon!

- May 28
- June 25
- August 27

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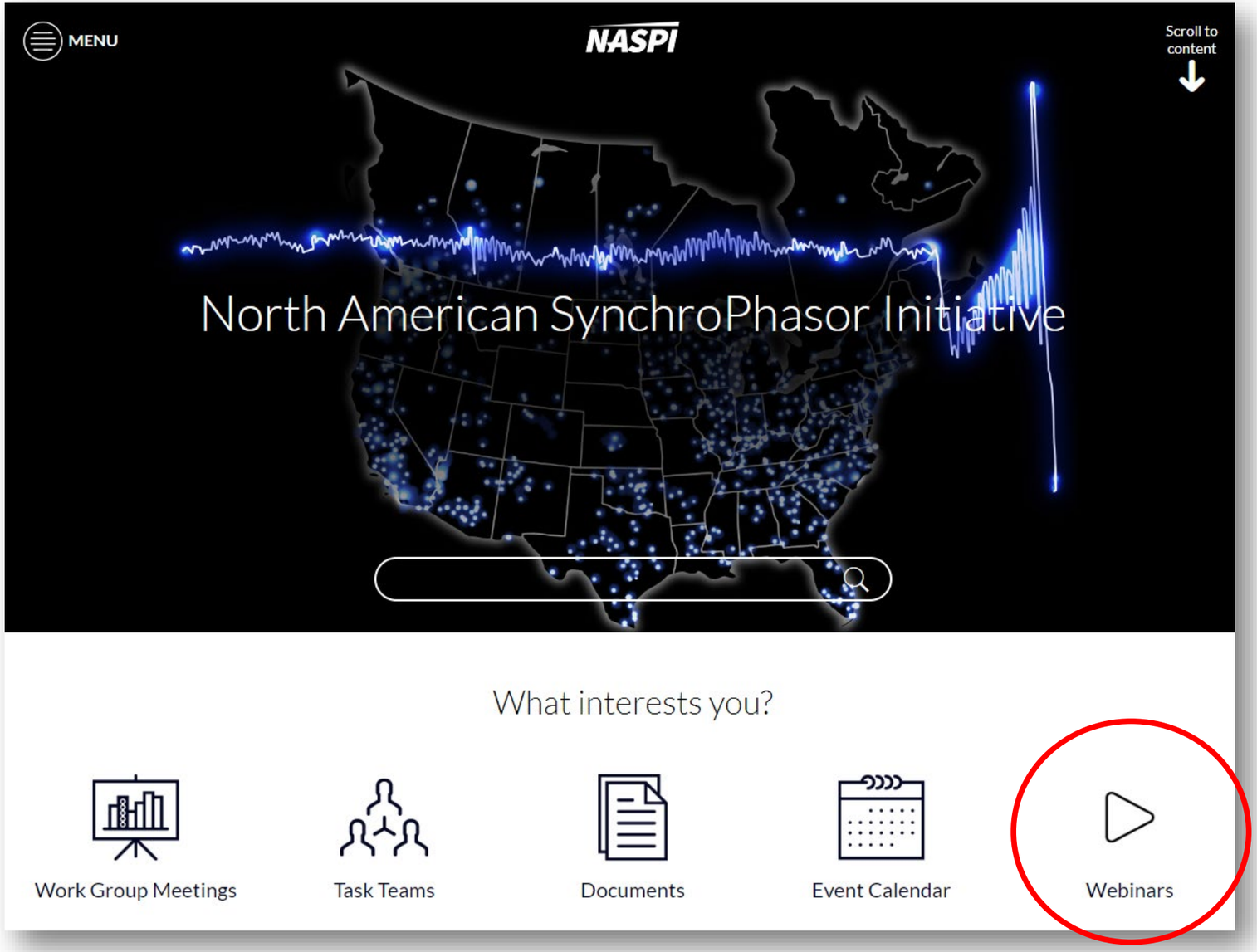
NASPI Webinar Series

Webinar materials are available at www.naspi.org/webinars



NASPI Task Team Virtual Meeting Series

January Meeting Recap

Wednesday, January 29, 2025 (Pacific Time)	
Control Room Solutions Task Team (CRSTT) The CRSTT works to advance the use of real-time applications to improve control room operations and grid resilience and reliability.	
9:00 – 9:10 am	Welcome – CRSTT Co-Leads Mike Nugent (SPP) and Kliff Hopson (BPA)
9:10 – 9:20 am	NASPI Work Group Updates – Jim Follum (PNNL)
9:20 – 9:45 am	Effective Forced Oscillation Mitigation using Interconnection-Wide Notifications and Reliability Coordinators' Internal Monitoring Tools – Shuchismita Biswas (PNNL)
9:45 – 10:45 am	Real-Time Monitoring Requirements SAR Discussion
10:45 – 11:00 am	White Paper on Control Room Integration Challenges – Update
Engineering Analysis Task Team (EATT) EATT develops, tests, and validates engineering applications, assists in their deployment and utilization, and recommends R&D activities.	
11:00 – 11:05 am	Welcome – EATT Co-Leads Urmila Agrawal (EPE Consulting) and Lin Zhu (EPRI)
11:05 – 11:15 am	NASPI Work Group Updates – Jim Follum (PNNL)
11:15 – 11:50 pm	IBR Performance Response and Analytics Monitoring (IPRAM) Task Force Update – Priya Mana (PNNL)
11:50 – 12:50 pm	Oscillation Panel • Electromechanical and Forced Oscillations – Dan Trudnowski (Montana Tech) • Subsynchronous Oscillations – Urmila Agrawal (EPE Consulting)
12:50 – 1:00 pm	Discussion: Future Work Topics

Thursday, January 30, 2025 (Pacific Time)	
Distribution Task Team (DisTT) DisTT fosters the use and capabilities of synchronized measurement data at the medium-voltage distribution level.	
9:00 – 9:05 am	Welcome – DisTT Lead Panos Moutis (City College of New York)
9:05 – 9:15 am	NASPI Work Group Updates – Jim Follum (PNNL)
9:15 – 9:45 am	Interview of Utility Lead on the Monitoring of Low-Voltage Distribution Systems – Smart meters, SCADA & the potential of PMUs and WMUs - Nikos Hatziargyriou (National Technical University of Athens, Greece)
9:45 – 11:00 am	Developing Material for Promoting Synchronized Measurement Among Distribution System Stakeholders – Discussion
Data and Network Management Task Team (DNMTT) DNMTT provides guidance for data networking, archiving, and access issues, and reviews new archiving and networking technologies.	
11:00 – 11:05 am	Welcome – DNMTT Lead Dan Brancaccio (Quanta)
11:05 – 11:15 am	NASPI Work Group Updates – Jim Follum (PNNL)
11:15 – 12:15 pm	STTP Use Case: Backfilling Data from Substation PDCs – Ritchie Carroll (GPA)
12:15 – 12:45 pm	PMU Data Quality Monitoring Experience – Kliff Hopson (BPA)
12:45 – 1:00 pm	Discussion: Future Work Topics

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Save the Date

The next NASPI Virtual Task Team Meetings will be held:

July 16-17, 2025

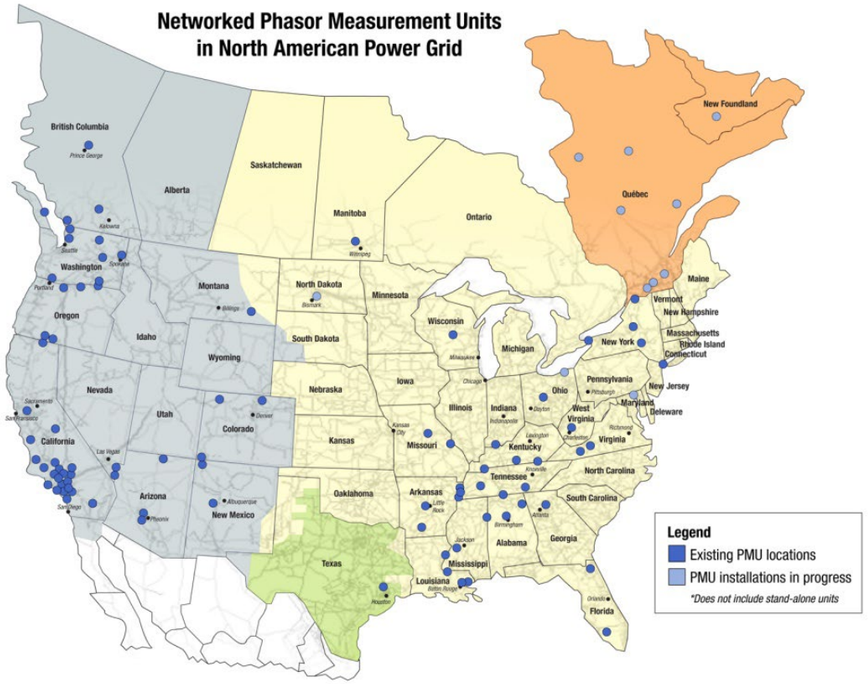
Virtual

Agendas and registration links will be posted soon!

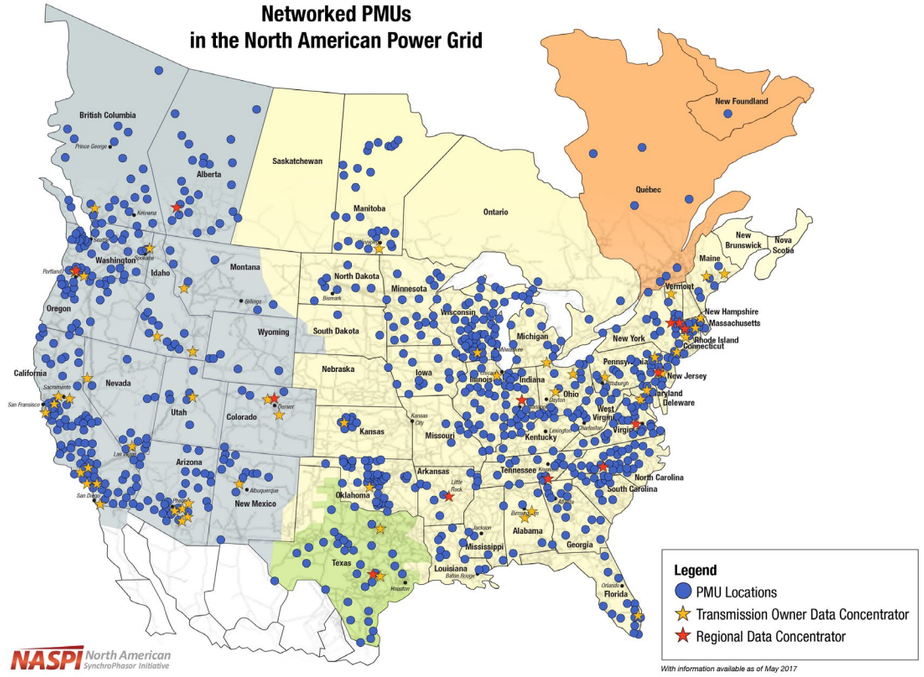
The North American SynchroPhasor Initiative (NASPI)

- Our history
  - Since 2003, NASPI has been instrumental in advancing the deployment of phasor measurement units (PMUs) and related synchrophasor technology.

April 2007



May 2017



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The North American SynchroPhasor Initiative (NASPI)

- Current areas of interest include:
  - Higher fidelity technologies, including synchro-waveform measurements
  - Power system data quality
  - Oscillation analysis (inter-area, subsynchronous, etc.)
  - Multi-sensor analytics
  - Characterizing the transient behavior of IBRs and other fast-acting phenomena
  - Statistical analysis and deep learning to extract actionable information from large datasets
  - Networking and communications technologies (advanced architectures)

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Electric Power Group

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Tuesday's Agenda – April 15

	Session 1 – Power System Dynamics and Contingency Analysis
9:40 – 10:00 am	Utilization of Synchrophasors for Monitoring System Disturbances at CAISO – David Daigle, California ISO
10:00 – 10:20 am	Field Deployment and Demonstration of an Adaptive Wide-Area Oscillation Damping Controller at the Italian Power Grid – Lin Zhu, Electric Power Research Institute
10:20 – 10:40 am	**Break – 20 Minutes**
10:40 – 11:00 am	Scalable Implementation and Deployment of RTLSE and RTLSE-based Contingency Analysis for Transmission Systems – Mohammadreza Maddipour Farrokhifard, GE Vernova
	Session 2 – Synchro-Waveform Applications
11:00 – 11:20 am	Investigating Power System Oscillations Using Waveform (POW) Data – Wilsun Xu, University of Alberta
11:20 – 11:40 am	Next-level WAMS Based on Synchro-waveform to Address Emerging Stability Issues – Sungyun Choi, Korea University
11:40 – 12:00 pm	Advancing Power Quality Awareness with High-Resolution Continuous Waveform Recording –Jared Bestebreur, Schweitzer Engineering Laboratories
12:00 – 1:00 pm	**Lunch**

Tuesday's Agenda – April 15 cont.

	Session 3 – Inertia Estimation
1:00 – 1:20 pm	Real-time Inertia Estimation in Kauai Island Using Probing-based Method: Field Implementation and Demonstration – Xinlan (Cici) Jia, University of Tennessee, Knoxville
1:20 – 1:40 pm	Active and Localized Measurement of Grid Inertia – Alexandra von Meier, Independent Consultant, and Antonio Enas, Reactive Technologies
	Session 4 - Technology Partner Flash talks (5 minutes talk)
1:40 – 2:20 pm	• MathWorks • Schweitzer Engineering Laboratories • Data Society • Electric Power Group • Meinberg • Oscilloquartz • PingThings
2:20 – 2:40 pm	**NASPI Awards Ceremony**
2:40 – 3:00 pm	**Break – 20 Minutes**

Tuesday's Agenda – April 15 cont.

	Session 5 - Task Team Breakout Sessions
3:00 – 5:00 pm	Control Room Solutions Task Team (CRSTT) – Turquoise Conference Room Mike Nugent and Kliff Hopson • Dominion Energy's WAMS Deployment for Operations – Samantha Whalen, Electric Power Group and Emmanuel Oleka, Dominion Energy • Discussion on a SAR proposal for real-time stability monitoring – Kevin Ostash, Manitoba Hydro
	Data & Network Management Task Team (DNMTT) – Sapphire Conference Room Dan Brancaccio • A Synchrophasor Stream Processing Pipeline Architecture for Near-Real-Time Applications – Daniel Villegas, University of Manitoba • Computer Scientist's Critique of MPLS, IEC 61850, and STTP – Dave Bakken, Washington State University
	Distribution Task Team (DisTT) – Topaz Conference Room Panos Moutis and Bryce Johanneck
	Engineering Analysis Task Team (EATT) – Plymouth Ballroom Urmila Agrawal and Lin Zhu • Setting Thresholds for the RMS-Energy Oscillation Detector – Jim Follum, Pacific Northwest National Laboratory • Update and discussion on the IBR Performance Response and Analytics Monitoring (IPRAM) Task Force – Priya Mana, Pacific Northwest National Laboratory • Discussion on oscillation report update • Open discussion on potential new topics
5:00 – 7:30 pm	**NASPI Reception, Vendor Show**

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Wednesday's Agenda – April 16

8:00 – 9:00 am	**Registration and coffee**
	Session 6 – NASPI Task Team Updates (10 minutes each) Panel Session
9:00 – 9:50 am	• CRSTT – Michael Nugent and Kliff Hopson • DNMTT – Dan Brancaccio • DisTT – Panos Moutis and Bryce Johanneck • EATT – Urmila Agrawal and Lin Zhu
	Session 7 – Organization Updates (10 minutes each)
9:50 – 10:40 am	• IEEE PSRC/PSCCC – Yi Hu • NERC SMWG – Clifton Black • CIGRE C4/C2.62 – Evangelos Farantatos • IEEE Synchro-Waveform Task Force – Hamed Mohsenian-Rad and Jhi-Young Joo • IEEE Forced Oscillation Task Force – Farrokh Aminifar
10:40 – 11:00 am	**Break – 20 minutes**
	Session 8 – Utility Success Stories
11:00 – 11:20 am	Inverter-Induced Forced Oscillation Source Location Estimation Using Synchrophasors: SRP Case Study – Lin Zhu, EPRI
11:20 – 11:40 am	Beyond Oscillations: Atypical Responses from a Real-World Solar PV Plant – Chetan Mishra, Dominion Energy
11:40 – 12:00 pm	Power system monitoring status of Korea based on PMU data and application – Minhan Yoon, Kwangwoon University
12:00 – 1:00 pm	**Lunch – 1 hour**

Wednesday's Agenda – April 16 cont.

1:00 – 1:15 pm	Formation of the Role-Based Synchrophasor Training Task Force – Clifton Black, NERC SMWG Chair, and Eric Andersen, Pacific Northwest National Laboratory
	Session 9 – Timing, Protocols, and Data Management
1:15 – 1:35 pm	Low Earth Orbit Time Sourcing- Resilient alternative to GPS for critical timing – Rick Knea Oscilloquartz
1:35 – 1:55 pm	Overview of the IEEE Standard 2664: "IEEE Standard for Streaming Telemetry Transport Protocol (STTP)" – Ritchie Carroll, Grid Protection Alliance
1:55 – 2:15 pm	Complementary Timing in a Transmission Utility Environment – Carol Larvick, Pacific Northwest National Laboratory
2:15 – 2:35 pm	Third-Party Sensor Data as a Service – Aaron Wilson, Oak Ridge National Laboratory
2:35 – 3:00 pm	**Break 25 minutes**

Wednesday's Agenda – April 16 cont.

	Session 10 – IBR Analysis
3:10 – 3:30 pm	Bayesian Optimization Approach for DER Dynamic Model Calibration – Pavel Etingov, Pacific Northwest National Laboratory
3:30 – 3:50 pm	Real-Time Inertia and System Strength Measurement and Intelligence for Improving Control Room Operations and Grid Reliability – Neeraj Nayak, Electric Power Group
	Session 11 – Advanced Applications
3:50 – 4:10 pm	Protecting and Monitoring Transmission Lines with Enhanced Power Flow – Daniel L. Ransom, GE Vernova
4:10 – 4:30 pm	Synchrophasor-based Power Flow and Contingency Analysis for Dominion Energy Power Grid – Sebastian Martinez-Lizana, Electric Power Group, and Angel Gonzalez-Vera, Dominion Energy
4:30 – 4:45 pm	Closing remarks, open discussion, next steps – moderated by Jim Follum
4:45 pm	**Adjourn**

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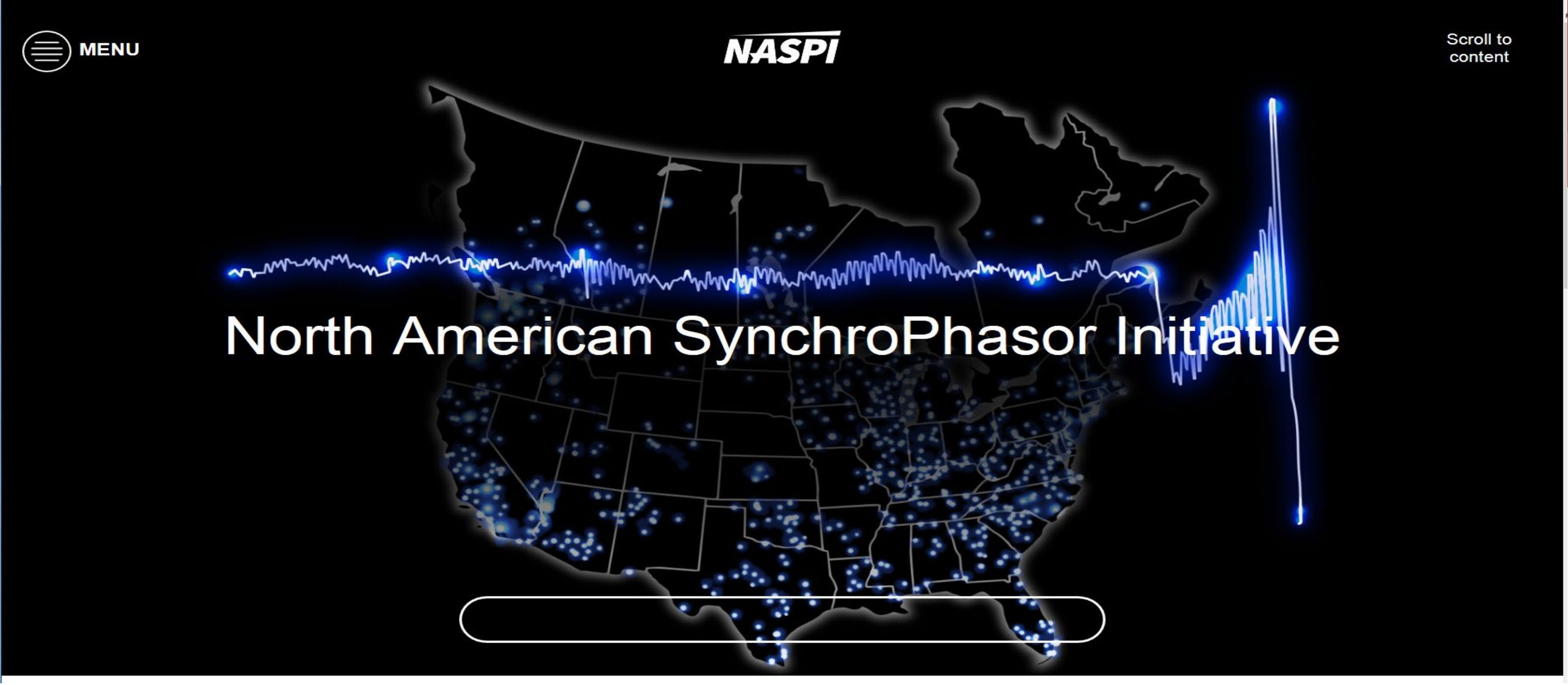
Save the Date

The next NASPI Hybrid Work Group Meeting and Vendor Show will be held:

September 23-24, 2025

Charlotte, NC

Note: The NERC SMWG is planned for September 25, 2025



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Thank you