

NASPI/IEEE Synchro-Waveform State-of-Practice Task Force

Kaustav Chatterjee, PhD

Power Systems Research Engineer

Pacific Northwest National Laboratory

Task Force: Introduction

- Mission:
 - Document the current state-of-practice in deployment of synchro-waveform technology
 - Assess readiness of utilities to integrate synchro-waveforms into operations
- Task Force Team

NASPI/IEEE Synchro-Waveform State-of-Practice Task Force	
NASPI Lead	Kaustav Chatterjee, PNNL
IEEE Liaisons	Hamed Mohsenian-Rad, UCR Jhi-Young Joo, LLNL
Members	Sungyun Choi, Korea University Hassan Ghoudjehbaklou, SDG&E

Scope of Work

- Conduct industry survey of utilities and vendors to gather information on the state of synchro-waveform technology
 - Survey utilities for
 - Current state-of-deployment and use of synchro-waveforms
 - Organizational readiness, barriers to adoption
 - Survey vendors for
 - Available commercial technologies and their capabilities
 - Including solutions for metering, analysis, storage, and streaming
 - Existing partnerships with utilities
- Analyze responses and prepare a comprehensive summary report

Timeline of Survey

Task	Milestone/Deliverable	Timeline
Task 1: Questionnaire	Questionnaire for the survey finalized	[Sept 2025 – Dec 2025]
Task 2: Industry Engagement	Participants from industry identified and emailed survey questions	[Sept 2025 – Jan 2026]
	Survey response collected from participants	[Feb 2026 – Apr 2026]
Task 3: Reporting	Survey response compiled into a summary report	[May 2026 – Sept 2026]

Sample Questions for Survey

- Questions for utilities:

1. What best describes your company?

✓ Transmission utility ✓ Distribution utility ✓ Balancing authority/ISO ✓ Other (Specify)

2. Do you actively gather and use waveform measurements?

✓ Yes/No

3. Do you use time-synchronization for waveform measurements?

✓ Yes/No

4. If Yes, what method do you use for time-synchronization?

✓ GPS ✓ Event-aligned ✓ Others (please specify)

5. Is your waveform recording event-triggered or continuous?

✓ Event-Triggered ✓ Continuous ✓ Both

Sample Questions for Survey

- Questions for utilities:

6. What is the time-resolution of your waveform recording? samples/s

7. If event-triggered, what triggering do you use?

✓ Voltage ✓ Current ✓ Both ✓ Other (Specify)

8. What device do you use for waveform recording?

✓ DFR ✓ PQ Meter ✓ Both ✓ Other (Specify)

9. Do you store waveform records locally or do you stream elsewhere?

10. How long do you retain waveform records?

✓ Less than 30 days ✓ Less than 90 days ✓ Less than 6 months ✓ More than 1 year

11. What applications use waveform measurements?

Sample Questions for Survey

- Questions for vendors:

1. What solutions do you offer for waveform measurements?

- ✓ Metering
- ✓ Analysis platform/software
- ✓ Cloud/storage
- ✓ Streaming/Communication
- ✓ Multiple (specify)
- ✓ Others (specify)

2. If metering, do you support continuous recording and streaming?

- ✓ Yes/No

3. If yes for continuous recording, what is your maximum data resolution?

4. If yes for continuous streaming, what is your highest allowable reporting rate?

5. Where is your product more suited?

- ✓ Transmission
- ✓ Distribution
- ✓ Both



Outreach

- Please volunteer to participate in the survey
- Please let us know of your thoughts on the survey questions

Contact us:

kaustav.chatterjee@pnnl.gov



Thank you