

PDCs Today – NASPI – IEEE Draft PDC Requirements Guide

**NASPI WG Meeting
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NASPI-PSTT PDC Guide

- Three main parts:
 - PDC Functional and Performance Requirements Guide
 - Synchrophasor System Communications Guide (PDC/PMU and PDC/PDC Communication Guide)
 - PDC Test Methods
- Supported by NIST for accelerated development
- Several review sessions within PSTT and NASPI
- Combined as one document for IEEE PSRC C4
 - IEEE PC37.244 – PDC Guide

Status and Update Summary

- PDC Functional and Performance Requirements
 - Distribution and reviews in 1/2011
- Synchrophasor System Communications
 - Distribution and reviews in 2/2011
- PDC Test Requirements
 - Distribution and reviews in 4/2011
- In person discussions at NASPI-PSTT Session – 2/23/2011 (Dallas, TX)
- Several revisions and various inputs
- Near final version distributed to NASPI-PSTT containing all three parts as individual sections – 5/4/2011
 - Comments by – 5/15/2011

Status and Update Summary – 2

- The latest draft containing all 3 parts delivered to IEEE PSRC WG C4 – 5/15/2011
 - WG C4
 - First official WG session – 5/16/2011, Asheville, NC – double session
 - Chair – Galina Antonova
 - Vice Chair – Vasudev Gharpure
 - A task force was assigned to integrate the three documents into one and remove any repetitions (the Combined Guide).
 - Combined Guide was distributed to the WG members on 6/2/2011, review call on 6/13/2011

PDC Functional and Performance Requirements Guide

Focused on core PDC functions

■ Core functions

- Data Alignment
- Format Conversion
- Coordinate conversion
- Latency calculation
- Data Re-sampling
- Data Validation
- Internal buffering/storage
- Configuration Validation
- Phase and Amplitude Adjustment

■ Other functions

- Data Storage and Retrieval
- PMU/PDC Performance Monitoring
- Event Detection
- Phasor Data Gateway
- PDC Robustness
- Synchrophasor System Latency Measurements

Synchrophasor System Communications – 1

- Data Flow Management – Serving real-time applications versus non-real time applications
- Definitions / abilities needed:
 - Wait / Late / Missing Time
 - Missing Count
 - Absent data indication
 - Late / Old / Missing / Lost Data
 - Alert
 - Data Quality Marking

Synchrophasor System Communications – 2

- System Configuration Management: New definitions / capabilities needed
 - Hierarchical Configuration Change Management (Add / Remove: Signals, PMUs, PDCs)
 - Messages defined for
 - Change request / Acknowledgements / Information
 - Splitting change requests to branches
 - Time delays defined for
 - Change commencement / detection / indication
 - Automatic Reconnection

PDC Testing Guide (Techniques for Testing PDCs)

- Driven by PDC Functional and Performance Requirements
 - Focus on testing requirements to verify core PDC functions, generally addressing the following performance measures:
 - Loss of data
 - Quality of data
 - Conversion of data formats
 - Communication protocol conversion
 - Data stream aggregation
 - Decimation
 - Interpolation
 - Internal latency
 - Scaling up number of I/O channels
 - Loss of GPS signal
 - Loss of communication (downstream, upstream)
 - Accuracy of the coordinate system conversion
 - Data overflow
 - Cyber security robustness
- Specific testing requirements are driven by actual system specifications.

PDC Testing Guide – 2

- Major sections include
 - Relevant standards, on-going work at IEEE PSRC, and related standards coordination
 - PDC connection architecture
 - Types of tests
 - Test interfaces
 - Test set-up options
 - Performance measures
 - Test reporting
 - Testing tools

PSRC Working Group C4 – PC37.244

- First WG meeting took place in Asheville at PSRC, 5/16/2011
- 3 NASPI documents are now consolidated into one coordinated draft
- Next discussion items (**input from NASPI attendants would be much appreciated**):
 - a) PDC concept (required and desired features)
 - b) Document outline (what to add / remove / converge)
- Next meeting is a telecom next week (likely Monday June 13, to be confirmed) => those interested could contact the chair or co-chair (Galina Antonova / Vasudev Gharpure)

PSRC Working Group C4 – PC37.244

- Present organization of the draft PDC Guide (consolidated document)
 1. Scope and Purpose
 2. References
 3. Definitions and Acronyms
 4. Synchrophasor Systems (background)
 5. PDC Functional Requirements
 6. Performance Requirements for Main PDC Functions
 7. Other PDC Functions
 8. Testing
 9. Annex A: Relevant standards
 10. Annex B: Related Standards Coordination
 11. Annex C Data Filtering for Data Re-sampling