Update on Synchrophasor Standards and Guides

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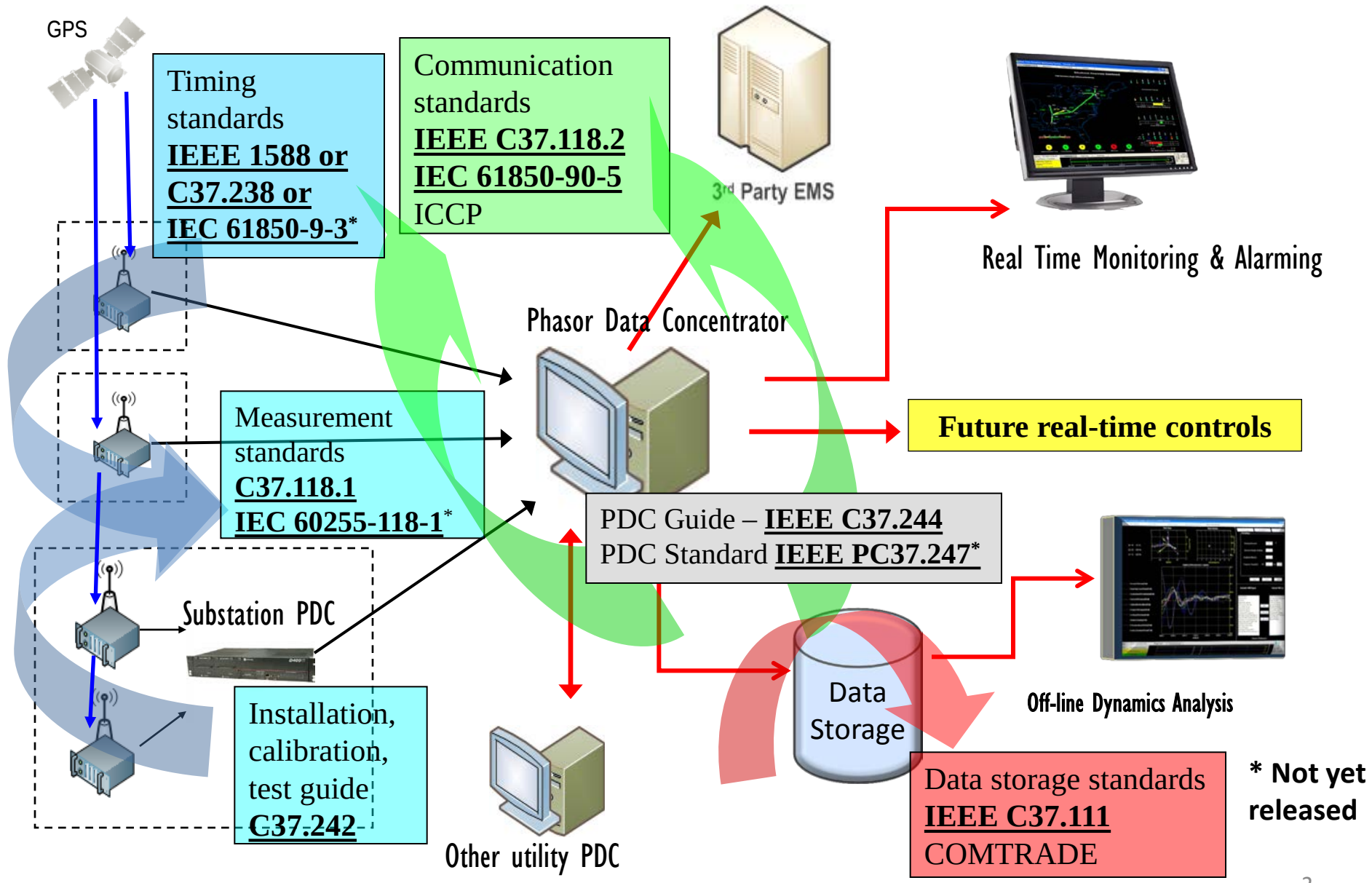
Phasor Measurement Systems



Standards and Guides – Released

- IEC 61850-90-5
  - Addresses new communication requirements to take advantage of IEC 61850 environment (includes cyber security features)
  - Joint efforts by IEC, IEEE, DOE, NIST, NASPI PSTT, users and vendors
- IEEE C37.118.1-2011 (from IEEE C37.118)
  - Measurement of and requirements for synchrophasors, frequency, & rate of change of frequency (ROCOF)
  - C37.118.1a-2014 includes changes to ROCOF requirements
- IEEE C37.118.2-2011 (from IEEE C37.118)
  - Communication of phasor measurements, message format
- IEEE C37.238-2011
  - The standard profile for use of Precision Time Protocol (IEEE 1588 Ver. 2) for transferring precise time over Ethernet for power system applications
- IEEE C37.111-2013 COMTRADE (IEC 60255-24, Edition 2)

Standards and Guides – Released (Fast Track)

- IEEE C37.242 Guide for Synchronization, Testing, Calibration and Installation of PMUs: ***Started 5/2010, Published 3/2013***
  - Combination of three NASPI PSTT Guides
  - Testing and calibration at the NIST Laboratory
- IEEE C37.244 Guide for PDC Requirements: ***Started 5/2011, Published 5/2013***
  - PDC functional requirements
  - Communication Needs & Requirements
  - Test techniques to verify core Functional Requirements
  - Supports both IEEE C37.118.2 and IEC 61850-90-5

Standards and Guides in Process

- IEC 60255-118-1 under TC 95: IEC synchrophasor measurement standard
  - Based on IEEE C37.118.1
  - Includes use of data from digital instrument transformers (merging units)
  - Joint IEC (TC 95) / IEEE (PES-PSRC) effort
- Revisions to IEEE C37.238-2011
  - The standard profile for use of Precision Time Protocol (IEEE 1588 Ver. 2) for transferring precise time over Ethernet for power system applications
  - Status as of Sep 16, 2015
    - Level 1 profile – IEC/IEEE 61850-9-3
      - Sponsor ballot completed
      - Resolutions to sponsor ballot comments are in progress
    - Level 2 profile – IEEE C37.238
      - Ready for recirculation with draft D15
      - Informative material to be added to next draft to be discussed

Standards and Guides in Process - Continued

- IEEE PSRC H21, “Mapping between IEEE C37.118 and IEC 61850 synchrophasor systems” – on going
  - Will describe use cases, conceptual architecture, and the general mapping considerations
  - Will define the standard mapping of individual data objects, related configurations and naming conventions, and data and message conversion methods
- PC 37.247, “Standard for phasor data concentrators for power systems”
  - Started in 2013
  - Refining C37.244 (PDC Guide) to develop a PDC standard
- Revision to IEEE Std. C37.242
  - A PSRC Task Force approved to create a WG to revise C37.242 (Guide for testing and installation of PMUs)

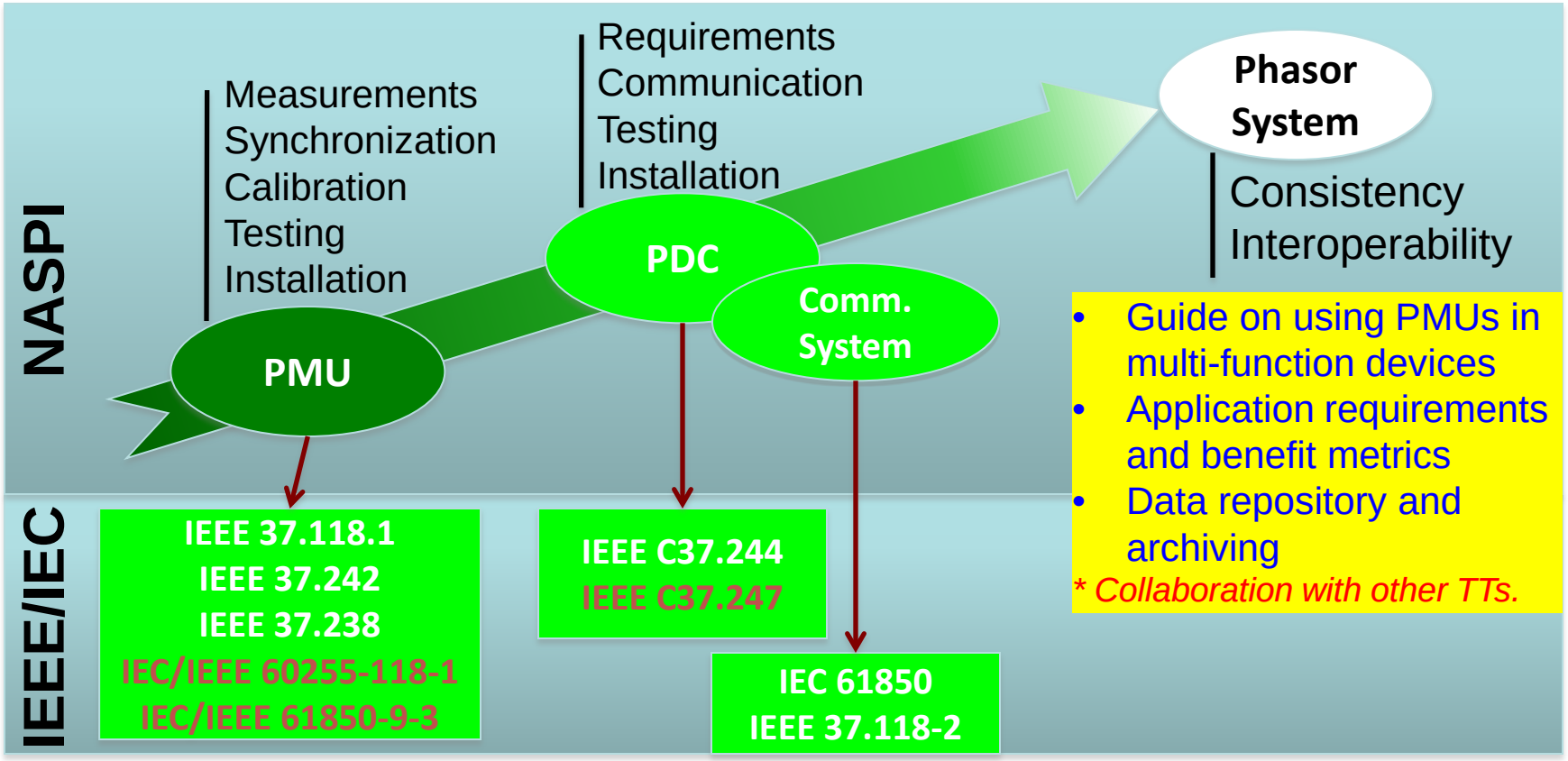
IEEE PES PSRC CTF23:
Coordination of Synchrophasor Related Activities

The Standing Task Force will provide three main functions:

- Liaison with NASPI (specifically the PSTT successor) to keep the PSRC in sync with the changes and needs in the industry with respect to the development and usage of PMU devices.
  - Formalize transfer process of NASPI developed documents to PES PSRC including making recommendations which PRSVTT activities should be transferred to IEEE reports, guides and standards.
- Make recommendations to PSRC for assignments that would require the creation of working groups in PSRC and also recommend what the output of those working groups might be (Guides, reports, etc.) based on the needs of the industry.
- Coordinate related activities with other IEEE PES committees (e.g. PSIM)

Chair: Tony Johnson (Southern California Edison)

Synchrophasor System Standards/Guides Roadmap



NASPI North American SynchroPhasor Initiative

NERC NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

IEC

IEEE

NIST SGIP

Other Relevant Standards / Guides

Approved

- IEEE C37.232-2007, *Recommended Practice for Naming Time Sequence Data Files*
- IEEE C37.239-2010, *Standard for Common Format for Event Data Exchange (COMFEDE) for Power Systems"*
- NERC CIP 2-9, Version #5
- IEEE C37.240-2014, "Standard for Cyber Security Requirements for Substation Automation, Protection and Control Systems"