

# IEEE – Conformity Assessment Program

Jason Allnutt

IEEE Conformity Assessment Program Specialist

March 22<sup>nd</sup>, 2017

# IEEE – Standards Association

- The IEEE Standards Association (IEEE-SA) is a leading consensus building organization that nurtures, develops and advances global technologies, through IEEE
- The IEEE-SA Standards Board oversees the IEEE standards development process – all standards development is facilitated by volunteers
- IEEE-SA is responsible for over 1300 active standards and another 500+ under development



# IEEE – Conformity Assessment Program (ICAP)

**Mission:** ICAP develops and implements programs that couple standards development activities with conformity assessment activities, which help to accelerate market adoption while reducing implementation costs.

Conformity Assessment is the process or processes that are used to demonstrate that a product or service meets specified requirements (set forth in Standards, Test Plans, etc.)

## ICAP Power Portfolio:

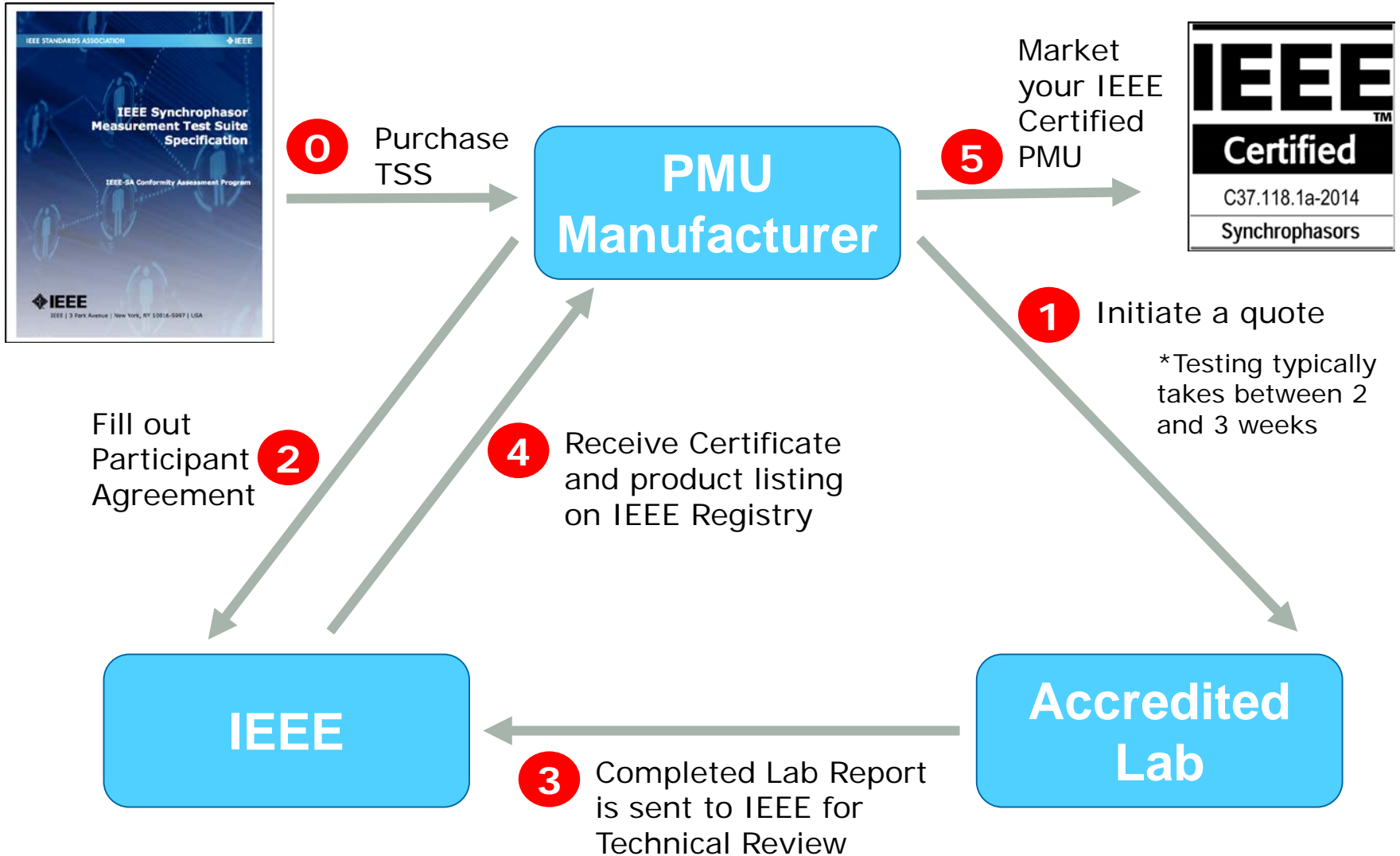
- Phasor Measurement Unit (PMU) – IEEE C37.118
- IEEE Nuclear Equipment Standards – IEEE P60780 – 323
- PTP Power Profile – IEEE C37.238
- COMTRADE
- EV Charging
- Distributed Energy Interconnects – IEEE 1547.1

# ICAP Phasor Measurement Unit (PMU) Conformity Assessment Program



- Purpose of the program is to enable PMU Manufacturers to demonstrate conformance to IEEE C37.118.1a – 2014
- The Steering Committee (SC), which consists of volunteer Subject Matter Experts in the power and energy field, has worked since 2012 to develop and approve the main requirements of the program.
- In addition to the program details the SC has also created the *IEEE Synchrophasor Measurement Test Suite Specification* (TSS) available for purchase through IEEE
- Consumers Energy (Jackson, MI) was the first ICAP Accredited Lab and offers complete testing capabilities to the TSS
  - First certified PMU in early 2016
  - More Info on Consumers Energy at [www.laboratoryservices.com](http://www.laboratoryservices.com)

# PMU Certification Process



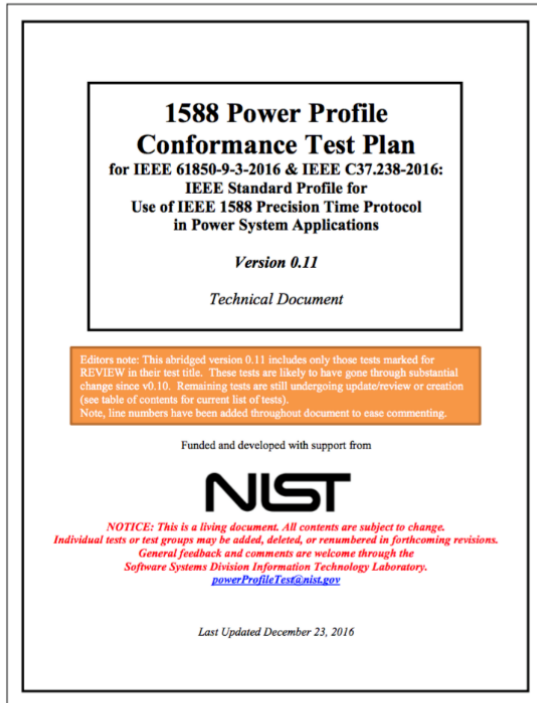
# What does IEEE PMU Certification provide?

- Provides assurance to end-users that certified PMU's conform to the requirements of IEEE C37.118.1a – 2014.
- Confirmation of accurate PMU estimations.
- Addition to the IEEE Registry for certified products, allowing purchasers an easy and quick resource to find compliant devices.
- Insight to improvements to C37.118 standard in the future with real-world test results to confirm.



# ICAP 1588 Power Profile Certification

1588 Power Profile Test Plan



National Institute of Standards and Technology  
and UNH Interoperability Laboratory

1

1588 Power Profile Conformance Test Plan  
version 0.11

Provide assurance of conformance, interoperability, and integrity of IEEE 1588 Power Profile Devices



- Steering Committee comprised of industry stakeholders from manufacturers, utilities and standards developers are leading the effort.
- UNH-IoL has been developing the TSS along with NIST's assistance and input from the SC.
- Interoperability tests and event are an expectation for certifying PTP Power Profile devices.
- Pilot testing for CA should commence by the end of 2017.

# Highlights of Power Profile TSS

- Conformance tests for:
  - IEEE C37.238-2011 and 2016 (draft), revised standard anticipated in 2017
  - IEC 61850-9-3 (2016)
- Future support:
  - holdover
  - redundancy support
  - timing discontinuity support
  - security
- Validate test methods support interoperability at plug-fests and interoperability test events
  - Can the end-to-end system support industry performance requirements?
  - Do conformity tests cover the basis to ensure systems interoperability?



**NIST**



# Application Drivers for 1588 Power Profile

Grid application	Timing requirements	Relative or absolute time count
Sequence of events recorder	50 $\mu$ s to 2 ms time accuracy	absolute
Differential fault recorder	50 $\mu$ s to 1 ms time accuracy	typically relative
Protection relays	10 to 20 $\mu$ s time accuracy	relative
Synchrophasor	Better than 1 $\mu$ s time accuracy 30 to 120 Hz reporting rate	absolute
Traveling wave fault recorder	100 to 500 ns time accuracy	absolute
Micro-PMUs (sample at 512 samples/cycle)	Better than 1 $\mu$ s time accuracy	absolute
Communications protocols		
Substation local area network communication protocols (IEC 61850 GOOSE)	100 $\mu$ s to 1 ms synchronization accuracy	absolute
Substation local area networks (IEC 61850 Sample Values, 4800 frames/s)	1 $\mu$ s	absolute

Source: Marc Weiss, Alison Silverstein, Francis Tuffner, and Ya-Shian Li-Baboud. "The use and challenges of precise time in electric power synchrophasor systems," *ION ITM and PTTI Meetings*, Feb. 2017.

# Thank you

For any further details please contact the ICAP team.

Jason Allnutt – Conformity Assessment Program Specialist  
J.Allnutt@IEEE.org

Ravi Subramaniam – Conformity Assessment Program Director  
R.Subramaniam@ieee.org

[standards.ieee.org/icap](http://standards.ieee.org/icap)