IEEE std P1815.2: From Codes to Code

Tylor Slay, Engineer PNNL
Jaime Kolln, Sr. Engineer, PNNL

IEEE std 1815-2015
- Protocol Certification
- SAv5 (optional)
- SAv6 (fix issues in SAv5)

DNP3 App Note-2018
- Semantic specification for DNP
- Adopted by IEEE std 1547-2015

MESA DER
- Maps semantics to IEC 61850-7-420
- Extends control modes beyond IEEE std 1547.1-2018 towards IEEE std 2800
- New Scheduling and Curve control points

IEEE std 1815.2
- Adopts MESA-DER to become the standard for DNP3 communication
- Identified DNP3 point errors in IEEE std 1547.1-2018 which will be addressed in the next revision

MESA-DER Testing and Certification Program

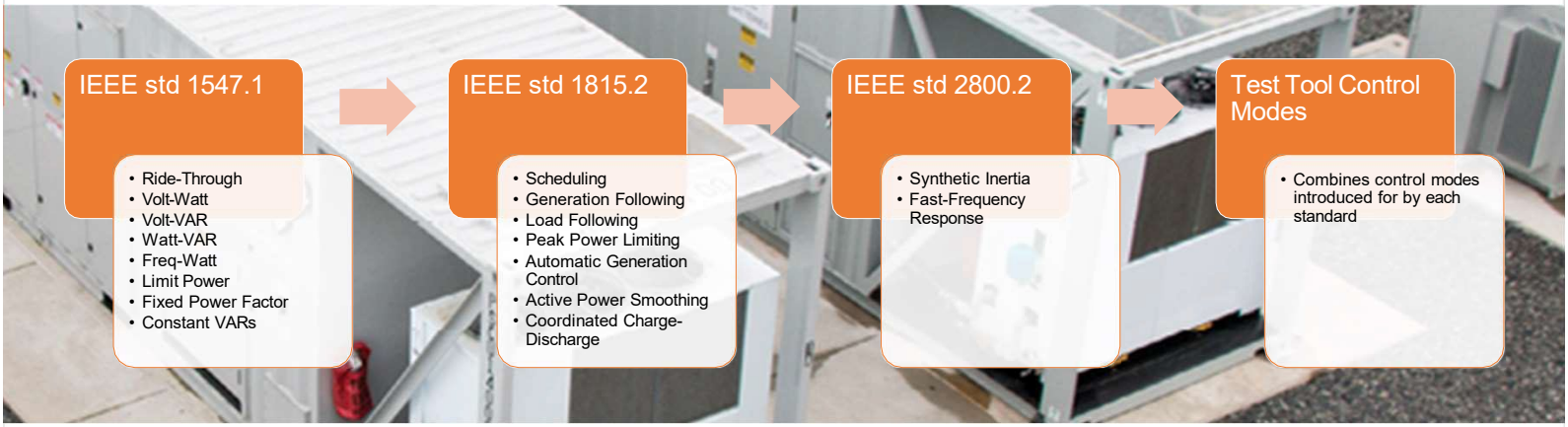
Pacific Northwest National Laboratory (PNNL) is supporting Modular Energy System Architecture (MESA) Alliance to develop their Energy Storage System (ESS) testing and certification program for MESA-DER soon to become IEEE std 1815.2. MESA's Testing and Certification Working Group, led by PNNL, is comprised of utilities, vendors, and other stakeholders with the goal of improving flexibility through interoperability, reducing integration costs, and ensuring systems and components interact and perform reliably.

MESA Test Tool (v1)

- MESA Alliance funded the development by Triangle Microworks to test protocol level interoperability between DNP3 Control Stations and Outstations using MESA-DER.
- Developed with revenue share, but unlikely to recuperate costs to develop.
- Restricted access to full source code to modify as revisions to IEEE std 1547.1, 1815.2, and 2800.2 are made.
- High overhead cost for contracted modifications.

MESA Test Tool (v2)

- Opensource developed and maintained by PNNL/MESA working group.
- Uses Step Func I/O formally OpenDNP3 library written in Rust aligning with Back to Building Blocks report guidance to use "memory safe programming languages".
- Allow working groups to test and validate new control modes and modifications to the standard as they are discussed.
- Integrate with PNNL's VOLTTRON/GridAPPS-D platforms to further support new control mode through the ongoing development of IEEE std 1547.1, 1815.2, and 2800.2.



Key Benefits

- Stand alone DNP3 Control Station and DNP3 Outstation can be integrated with Volttron and GridAPPS-D opensource platforms, reducing cost to validate.
- Decrease integration costs of energy storage systems and stimulate development of industry applications through opensource development.
- Validates application of standards to increase industry confidence, especially the more flexible control modes such as multiplexed schedules/curves which enhance value stacking of energy resources.
- Evaluate new control modes through simulated environments when addressing gaps identified by industry
- Evaluate Security Specification SAv6 for DNP3

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This project advances the applications that enable the deployment and value stacking of energy storage technologies which are crucial to meeting the Administration's goal of providing affordable, secure, and resilient energy..

For additional information, contact:
Tylor Slay
+1 (509) 375-2389
Tylor.Slay@pnnl.gov

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