

Energy Storage Reliability Standards Activities

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PROJECT PROFILE

Topic: Energy Storage Standards Support | Vertical: Safety and Reliability
Strategic Pathway: Optimize and Grow
Project start and finish: FY25-FY26

PROBLEM

- Standards are needed for reliable and affordable DER integration.
- Evolving standards require a flexible and maintainable validation platform.

APPROACH

- IEEE std 1547.1a:** integrates corrections identified from UL 1741 3rd Ed (**ballot closes 29, Jun 2026**)
- IEEE std 2030.5.1:** Common Smart Inverter Profile 2.1 as an IEEE Standard
- IEEE std 2030.14:** functional specification for alternate and multi-source generation
- IEEE std 2688:** recommended practice for energy storage management systems
- IEEE std 2800.2:** test procedures and test criteria for grid-forming equipment
- IEEE std 3434:** guidance for the five life-cycle phases of energy storage systems

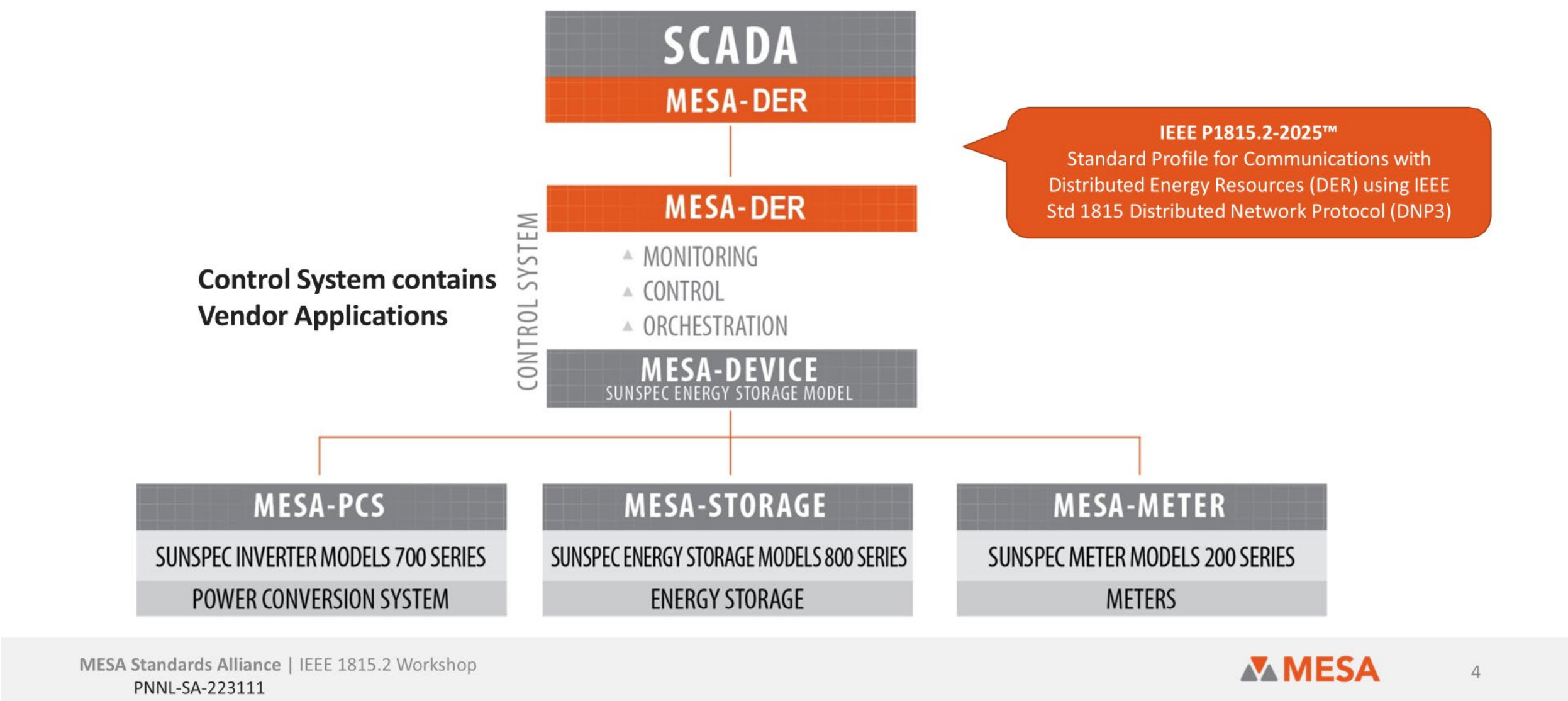
Active PARs for revision:

- IEEE std 1547:** Standard for Interconnection and Interoperability of DERs with Associated Electric Power Systems Interfaces
- IEEE std 1547.4:** Guide for Design, Operation, Integration and Interoperability of Intentional Electric Power Systems Islands
- IEEE std 1547.7:** Guide for Conducting Impact Studies for DER Interconnection
- IEEE std 1815:** Standard for Electric Power Systems Communications – DNP3
- IEEE std 2686:** Recommended Practice for Battery Management Systems in Stationary Energy Storage Applications

Alliance Activities:

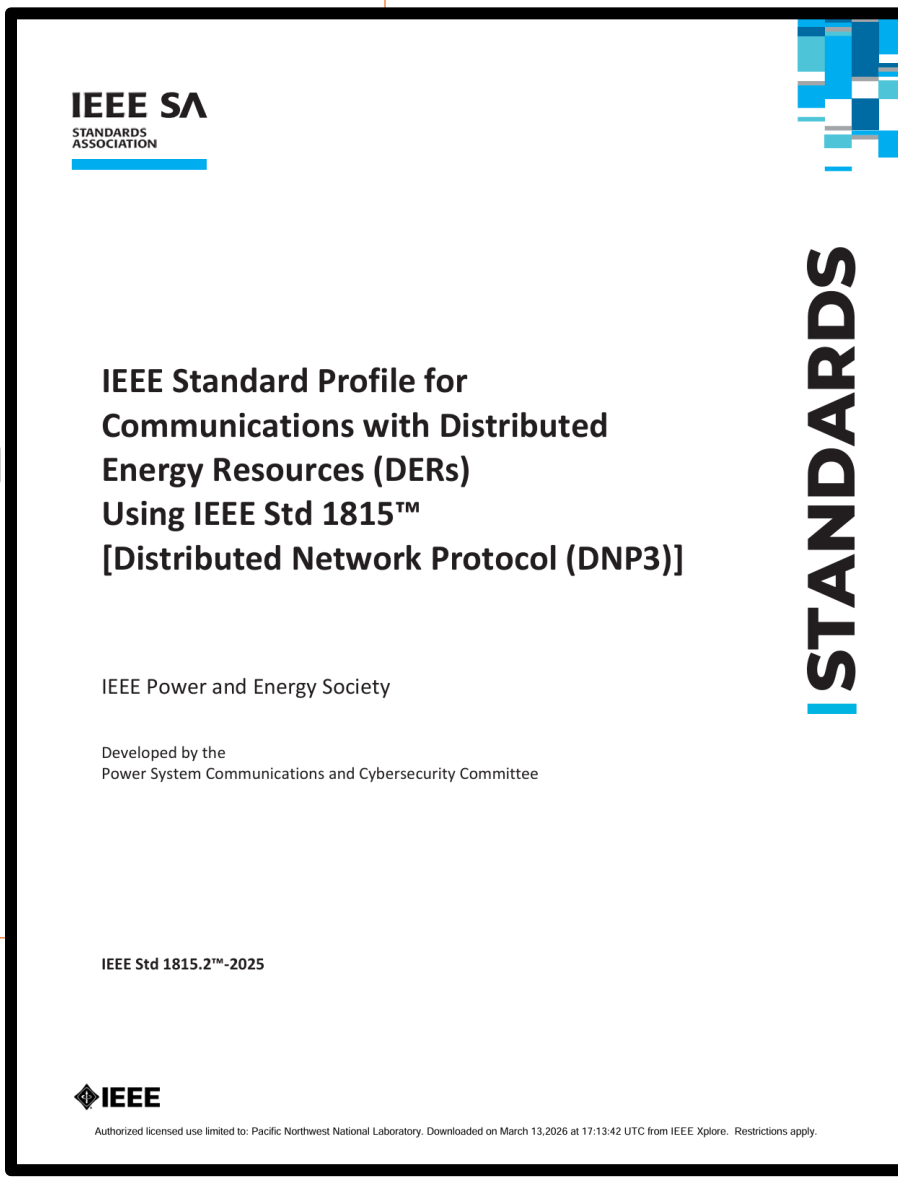
- Modular Energy System Architecture (MESA): chair for T&C working group

Where does MESA Work? Scope of MESA Specifications



RESULTS

- MESA working group has identified numerous technical issues address in IEEE std 1815.2.
- (related project)** IEEE std 1815.2 Test Tool v0.2.0 has been release covering all semantic testing.
- (related project)** PNNL's Interoperability agent has been release for the IEEE std 1547 protocols.
- IEEE std 1815.2 Published**



CONCLUSIONS & IMPACT

- Alliances reduce the time and complexity of a formal standards organization process.
- Standards allows inclusion in procurement language, mandate in interconnection policy, and creation of recognized test procedures.
- This work supports broader adoption of energy storage and grid-interactive systems.

FUTURE DIRECTIONS

- Continue support for new standards and revisions to increase clarity and resolve technical issues.
- Evaluate control modes outlined by revisions and new standards using advanced tooling.

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