

Formula 1

Content placeholder

Formula 2

Content placeholder

Detailed Explanation

IEEE 1547.4-2023 establishes a standardized, modular architecture for DER Aggregators—logical or physical entities that pool, manage, and dispatch distributed energy resources under utility or market operator direction. Unlike standalone DER interconnection (covered by IEEE 1547.1), this standard focuses on the aggregator as an intermediary layer that abstracts heterogeneous DERs into a unified, controllable resource capable of participating in ancillary services, demand response, and wholesale markets. The Conformance Test Plan (CTP) provides detailed, repeatable test cases—including functional, communication, cybersecurity, and performance validation—to verify compliance across four key domains: (1) aggregator-to-DER interface (e.g., IEEE 2030.5, SunSpec Modbus), (2) aggregator-to-grid operator interface (e.g., IEEE 2030.5 DERMS profile, IEC 61850-7-420), (3) internal coordination logic (e.g., state estimation, constraint-aware dispatch), and (4) resilience and fault handling (e.g., loss-of-communication fallback, islanding detection coordination). The CTP mandates traceability to specific clauses of IEEE 1547.4-2023 and requires documented evidence of test execution, including environmental setup, stimulus inputs, observed outputs, and deviation analysis. It supports regulatory harmonization by enabling consistent evaluation across jurisdictions and forms the foundation for certification programs administered by accredited laboratories (e.g., UL, Intertek) and recognized testing bodies.

Key Components

#	Component
1	Functional Conformance Tests

#	Component
2	Communication Interface Verification
3	Cybersecurity & Data Integrity Validation

Applications

#	Application
1	Third-party certification of commercial DER aggregator platforms
2	Regulatory approval for aggregator participation in ISO/RTO markets
3	Interoperability validation during utility-scale DER fleet integration

Related Concepts

#	Concept
1	IEEE 1547.1-2018 (Interconnection Standard)
2	IEEE 2030.5 (Smart Energy Profile)
3	IEC 61850-7-420 (Distributed Energy Resources Logic Nodes)

Tags

DER Aggregation, Grid Interoperability, Conformance Testing

IEEE 1547.4-2023 DER Aggregator Conformance Test Plan (PDF)