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Assessment of DER Interconnection Installation for Conformance with IEEE Std 1547

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Assessment of DER Interconnection Installation for Conformance with IEEE Std 1547

Abstract

Standards and codes establish the functional performance requirements of equipment interconnecting Distributed Energy Resources (DERs) with an Electric Power System (EPS). Nationally Recognized Testing Laboratories (NRTLs) evaluate equipment for safety and compliance with applicable standards and codes. Equipment meeting these requirements are then listed as suitable for their intended use in compliance with the applicable requirements. The EPS operator enters into a binding agreement with the DER operator for interconnection with the EPS at a specific site to meet the requirements of the EPS infrastructure at that location. IEEE Conformity Assessment Program proposes a process and procedure to ensure compliance with the applicable standards and the interconnection agreement.

1. Introduction

The IEEE DER interconnection standards (IEEE Std 1547 [4] and IEEE Std 1547.1 [6]) sufficiently define the functional requirements for the proper interconnection of DER with an Area EPS. IEEE Std 1547 specifies the functional requirements for interconnection including design, production, and installation commissioning evaluation. IEEE Std 1547.1 specifies the equipment conformance test and evaluation procedures. Compliance with the National Electric Code® (NEC®, NFPA 70 [7]) requires that components, subsystems, and systems installed in on-premises wiring systems are evaluated for safety and their intended use by a NRTL. Evidence of successful evaluation is confirmed by a NRTL marking label on these items. The presence of this marking label only confirms that the items have met the requirements of the design and production tests.

The interconnection of a DER with an EPS can have a detrimental effect on the reliability of that power source. To ensure the safe and proper operation of the interconnected sources at their location in the EPS infrastructure, the EPS and DER operators enter into a binding interconnection agreement. In addition to the required equipment listings, this agreement will list any additional requirements to ensure safe and reliable interconnection performance.

The process begins with a thorough examination of the interconnection system for completeness and compliance with the interconnection agreement and all Authorities Having Jurisdiction's (AHJ's) regulatory requirements. Next, verification needs to be made that the components of the interconnection system are compliant with the functional requirements of IEEE Std 1547 [4]. Confirmation of conformity is established by compliance with IEEE Std 1547.1 [6]. For inverters and converters, proof of confirmation and safety evaluation are evidenced by listing for their intended use to UL 1741 [8]. Other components of the system are evaluated to their relevant standards and listed for the intended use. Next, the installation is evaluated for compliance with applicable codes such as the NEC [7] or other applicable codes and standards.[1] IEEE is establishing a program that will ultimately lead to the issuance of an Assurance Certificate confirming interconnection conformance.

2. Background

To bring focus to the remainder of this paper, it will serve well to put forth the context of some terms that will be used.

- *AHJ*—An agency such as a Municipality, State Regulatory body, or others having jurisdiction over various aspects of a DER interconnection installation.

[1] In the European Union, the applicable standard is IEC 60364 [3], Electrical Installations for Buildings as supplemented by each member country to account for differences in electric systems.

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