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Smart Grid Interoperable & Conformant (SG-IC) Testing and Certification Scheme Operator Guidelines

National Electrical Manufacturers Association



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Testing and Certification Scheme Operator Guidelines

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1 INTRODUCTION

The Smart Grid Interoperable & Conformant (SG-IC) Testing and Certification Scheme Operator Guidelines were developed by an ANSI committee administered by the National Electrical Manufacturers (NEMA). Hereinafter known as THE SCHEME, this document was created to describe the attributes of a process where stakeholders in the Smart Grid can validate the interoperability of individual grid elements on a consistent, industry-wide basis. The implementation of THE SCHEME promotes the major points that define the Smart Grid adoption process, namely testing and certification, governance, harmonization, and backward compatibility.

THE SCHEME is designed to tie a number of Smart Grid stakeholders together as they relate to the "policy of the United States to support the modernization of the Nation's electricity transmission and distribution system to maintain a reliable and secure electricity infrastructure" as described in Title XIII of the Energy Independence and Security Act of 2007 (PL 110-140, also known as EISA). Significant stakeholders in this endeavor include the US Department of Energy (DOE), the National Institute of Standards and Technology (NIST), US and International Standards Development and Standards Setting Organizations (SDO and SSO, plural SDOs and SSOs)[1], and the individual participants and member companies of the Smart Grid Interoperability Panel (SGIP) and its Smart Grid Testing and Certification Committee (SGTCC).

In order to accomplish its mission under EISA, NIST devised a three-phase plan for implementing Smart Grid (http://www.nist.gov/smartgrid/grid_042109.cfm, searched on May 7, 2012):

a) Engaging utilities, equipment suppliers, consumers, standards developers and other stakeholders to achieve consensus on Smart Grid standards;
b) Launching a formal partnership to facilitate development of additional standards to address remaining gaps and integrate new technologies; and
c) Developing a plan for testing and certification to ensure that Smart Grid equipment and systems conform to standards for security and interoperability.

Following a series of public forums on Smart Grid standards facilitated by NIST, in November 2009 it opted to form the SGIP. As stated on the NIST website (http://www.nist.gov/smartgrid/priority-actions.cfm, searched on May 7, 2012):

> *[The SGIP] engages stakeholders from the entire Smart Grid Community in a participatory public process to identify applicable standards, gaps in currently available standards, and priorities for new standardization activities for the evolving Smart Grid. Thus, the SGIP supports NIST in fulfilling its responsibilities under the 2007 Energy Independence and Security Act.*

The task of creating a written document for achieving the third phase of the NIST plan falls on the SGTCC of the SGIP. Through an extensive public process that was co-chaired by a member of the NIST staff and involved a voluntary workforce from the SGIP membership, the SGTCC published its *Interoperability Process Reference Manual (IPRM),* detailing the "recommendations on process and best practices that enhance the introduction of interoperable products in the marketplace." (SGIP, SGTCC *Interoperability Process Reference Manual,* version 2.0, January 2012).

As it relates to the *IPRM*, the operating units of THE SCHEME consist of:

a) Interoperability Testing and Certification Authorities (ITCA, plural ITCAs) that own and operate implementations of THE SCHEME;

[1] For the purpose of simplicity, this document will refer only to "SSOs" and "standards" when discussing the features of THE SCHEME. Please note that any such reference is equally applicable to SDOs as well as specifications, guidelines, etc.

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b) Accreditation Bodies (AB, plural ABs) that accredit those performing testing and certification activities meeting THE SCHEME requirements;
c) Testing Laboratories (TL, plural TLs) that perform tests under THE SCHEME; and
d) Certification Bodies (CB, plural CBs) that perform and manage the product certification activities under THE SCHEME.

Under THE SCHEME, product certification indicates that representative specimens of the individual grid elements have successfully passed tests to show compliance with the requirements of the relevant SG-IC Test Suite Specifications (TSS, plural TSSs) endorsed by the ITCA, and that continued production of individual grid elements are consistent with those originally submitted under THE SCHEME.

For the purposes of Products being evaluated under THE SCHEME, the Test Suite Specifications (TSS) endorsed by the ITCA will generally center on either an individual standard or specific family of Smart Grid standards. The concept of the TSS encompasses existing testing standards that were previously developed and published by an SDO or it may be developed by a working group constituted by the ITCA.

2 SCOPE

This publication contains a description of the attributes for operating a testing and certification scheme as it relates to establishing the characteristics of “interoperability” between devices and systems associated with the electric grid. For the purpose of this scheme, the term “interoperability” is intended to convey the ability of two or more devices or systems to seamlessly pass electrical current and readily exchange and use information during the course of its normal duty cycle.

2.1 Items considered in-scope include:

a) the identification of use cases for the purpose of testing
b) the selection of standards that apply to that use case
c) the identification of environmental conditions necessary for testing to that use case
d) the identification of a TSS that incorporates all of the above
e) the relationships between the various entities involved in the testing:
    i. ITCA
    ii. AB
    iii. CB
    iv. TL
f) the management aspects associated with the implementation of a testing program based on THE SCHEME:
    i. Handling related families of products
    ii. Exception handling for variations in manufacturing processes
    iii. Grievances against participating entities

2.2 Items considered out-of-scope include:

a) individual testing procedures associated with a TSS
b) specific techniques for accomplishing market surveillance after certification testing