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NEMA SG-AMI 1-2009 (R2015, R2020)

Standard for Requirements for Smart Meter Upgradeability

National Electrical Manufacturers Association

NEMA Smart Grid Standards Publication SG-AMI 1-2009 (R2015, R2020)

Requirements for Smart Meter Upgradeability

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Foreword

Proposed or recommended revisions should be submitted to:

NEMA Technical Operations Department
National Electrical Manufacturers Association
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This smart grid Standards publication is supported by the Electricity Metering Section of the National Electrical Manufacturers Association. Approval of this Standard does not necessarily imply that all voting classification Members voted for its approval or participated in its development. At the time it was approved, the Electricity Metering Section had the following Members:

Elster Solutions—Raleigh, NC
General Electric—Atlanta, GA
Itron, Inc.—Liberty Lake, WA
Landis+Gyr—Lafayette, IN

The draft "Requirements for Smart Meter Upgradeability" was developed by a team of meter manufacturers and electric utilities in an effort to provide guidance to utilities, state commissions, and others that want to deploy Advanced Metering Infrastructure prior to completion of the Standards work identified in the National Institute of Standards and Technology (NIST) Smart Grid Interoperability Roadmap. NEMA would like to thank all the Members of the NIST/NEMA Smart Grid Meter Task Team that participated in this effort, including:

John Caskey, Team Leader

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Introduction

Creating a secure, connected, and interoperable smart grid is a top national priority. Title XIII (Smart Grid) of The Energy Independence and Security Act of 2007 requests that the National Institute of Standards and Technology (NIST) develop a smart grid interoperability roadmap and also coordinate the development of smart grid interoperability Standards. NEMA, the National Electrical Manufacturers Association, was requested to support NIST in the development of the Roadmap as well as smart grid Standards. As part of the roadmap process, NIST conducted three workshops to obtain input from smart grid stakeholders to help develop the smart grid interoperability roadmap. This roadmap will summarize the current state of smart grid–related Standards and identify gaps in Standards that need to be addressed. The roadmap will also include a list of Standard-related tasks that need to be completed to ensure the interoperability of smart grid.

The United States Department of Energy (DOE) is also tasked with helping the nation deploy smart grid and through its effort on modern grid identified the following characteristics for smart grid:

a. Enable consumer participation
b. Accommodate generation and storage
c. Enable new products and services
d. Provide power quality
e. Optimize asset utilization
f. Anticipate and respond to system disturbances
g. Operate against physical and cyber attacks

Several of the tasks identified in the draft roadmap as well as several of the characteristics noted above directly relate to modifying existing meter and Advanced Metering Infrastructure (AMI) Standards. However, it may take years to complete the tasks associated with smart meters and AMI systems.

To forward the development and deployment of smart grid, many electric utilities are looking to make their Advanced Metering Infrastructure (AMI) and smart meter investments now as a precursor or enabler to additional smart grid, energy management, and consumer participation initiatives.

One of the critical issues facing these electric utilities and their regulators is determining if technologies or solutions utilities select will forward interoperability and comply with the to-be-established national Standards. Further, many utilities want to ensure that the system they select will allow for evolution and growth as smart grid Standards evolve.

An important way to allow for investment in and deployment of smart metering to continue at the aggressive pace the nation demands and industry requires is to build a set of upgradeability requirements, allowing utilities to mitigate the risk of predicting the future and install a system that allows for flexibility and upgradeability to comply with emerging requirements for the smart grid.

The following serves as a key set of requirements for smart meter upgradeability. These requirements should be used by smart meter suppliers, utility customers, and key constituents, such as regulators, to guide both development and decision making as related to smart meter upgradeability.

The purpose of this document is to define requirements for smart meter firmware upgradeability in the context of an AMI system for industry stakeholders such as regulators, utilities, and vendors.

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Section 1
General

1.1 Scope

NEMA SG-AMI 1 defines requirements that include secure local and remote upgrades of smart meter:

a. Metrology;
b. AMI applications;
c. AMI communications;
d. HAN applications; and
e. HAN communications.

Upgrading of devices other than smart meters is beyond the scope of this document.