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INTERNATIONAL STANDARD

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Information technology – Home electronic system (HES) application model – Part 3: Model of a demand-response energy management system for HES

ISO/IEC 15067-3:2012(E)

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INFORMATION TECHNOLOGY – HOME ELECTRONIC SYSTEM (HES) APPLICATION MODEL –

Part 3: Model of a demand-response energy management system for HES

FOREWORD

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2) In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

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International Standard ISO/IEC 15067-3 was prepared by subcommittee 25: Interconnection of information technology equipment, of ISO/IEC joint technical committee 1: Information technology.

This International Standard replaces ISO/IEC TR 15067-3, first edition, published in 2000, and constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

– the demand response options have been expanded;
– distributed energy resources such as local generation and storage have been included;
– the terminology for demand response has been aligned with smart grid.

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The list of all currently available parts of the ISO/IEC 15067 series, under the general title *Information technology – Home electronic system (HES) application model*, can be found on the IEC web site.

This International Standard has been approved by vote of the member bodies, and the voting results may be obtained from the address given on the second title page.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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INTRODUCTION

ISO/IEC 15067 currently consists of three parts. All parts were previously published as Technical Reports. ISO/IEC 15067-3, energy management, is being upgraded to a standard at the request of the IEC Standards Management Board study group on energy efficiency (SG1 SMB-SG 1/0027/INF, July 2008, Recommendation 16). Energy management is becoming an essential part of the worldwide development of smart grids for electricity.

Part 2: Lighting model for HES

Part 3: Model of a demand-response energy management system for HES (this document)

Part 4: Model of a security system for HES

SC 25/WG 1, the Home Electronic System (HES) working group, has developed these models to foster interoperability among products from competing or complementary manufacturers. Product interoperability is essential when using home control standards, such as HES. This International Standard defines a standard framework for a generic energy management system and describes the communications services needed. A high-level model for an energy management system using HES is presented.

Homebuilders, suppliers of building materials and consumer product manufacturers all affect energy consumption in buildings. Products and services intended for energy management can be provided by

- programs developed for consumers by electricity suppliers, typically a public utility,
- products purchased by consumers independent of electricity supplier programs.

Various methods for managing the electricity supply network, called the “electricity grid,” have been developed. The goal of these methods is to match the customer demand for power with the available supply. The need for such methods results from

- electric supply limitations,
- public resistance to building large generating plants,
- public concern for environmental pollution, including greenhouse gases,
- public opposition to siting of new transmission lines,
- an anticipated demand for and availability of electricity for charging electric vehicles,
- public interest and support for renewable sources of energy,
- the introduction of distributed energy resources (DER) with local generators such as wind turbines and solar photo-voltaic (PV) panels,
- the variable and unpredictable nature of wind and solar distributed generation with output that may fluctuate with time and weather,
- the development of batteries and other advanced premises storage technologies plus power conditioning and management equipment,
- the introduction of alternative electricity pricing methods or tariffs that encourage efficiency.

The model presented in this standard focuses primarily on methods known as “demand response” (DR). Because demand response systems extend beyond the meter into customer premises, those impacted by demand response technology choices include utilities, third-party suppliers of demand response services, home network developers, appliance and DER manufacturers and consumers. An example of a third-party provider of demand response services is an aggregator serving a large building or neighbourhood.

Three types of DR are specified in this standard: direct control, local control and distributed control. The choice of DR method will vary by utility to achieve the load shape that aligns with supply limitations, transmission and distribution capabilities, regulatory constraints and

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business considerations. However, distributed control offers consumers the most flexibility in adapting appliance operation to constraints imposed by the utility. The various standards developed by JTC 1/SC 25 for the *Home Electronic System* are important for effective distributed control, as specified.

DR is one element in the concept of the “smart grid”. The smart grid for electricity integrates subsystems for generation, transmission, distribution and customer services to improve the reliability and efficiency of electricity systems. The smart grid also extends these subsystems to accommodate distributed energy resources and demand response. A goal of the smart grid is to enable all these subsystems to interoperate using information technology. Therefore, this standard is an important contribution to the smart grid.

As the market develops for energy management products, consumer electronics companies, appliance manufacturers and other residential suppliers may offer products that combine load management using demand response with energy conservation. Energy conservation may offer methods for consumers to reduce energy consumption overall, in addition to reducing consumption at times of peak demand. These methods include products and systems for electricity generation, storage and management. Such products and systems are located on premises and can communicate with other on-premises products and systems in order to interoperate as a larger system. Examples are included in Annex A. Standards for these products are anticipated to expand this energy management model in future updates.