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Industrial-process measurement, control and automation – Part 1: system interface between industrial facilities and the smart grid

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FOREWORD

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Technical specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62872-1, which is a technical specification, has been prepared by IEC technical committee 65: Industrial-process measurement, control and automation.

This first edition edition cancels and replaces IEC TS 62872, published in 2015. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC TS 62872:

- Normative references, Terms and definitions, and Abbreviations were updated;
- Subclause 5.1 was reformulated with price-based and incentive-based demand response;
- Subclause 5.8.3 “Example of data and data type” was added;
- New actors were added in Annex A;
- Use cases FG-7xx and FG-8xx were added in Annex A;
- Annex B “Use cases of incentive-based DR programs” was added.

The text of this Technical Specification is based on the following documents:

Enquiry draft	Report on voting
65/731/DTS	65/743/RVDTS

Full information on the voting for the approval of this Technical Specification can be found in the report on voting indicated in the above table.

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

A review of this document will be carried out not later than 3 years after its publication with the options of: extension for another 3 years; conversion into an International Standard; or withdrawal.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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.

INTRODUCTION

The World Energy Outlook 2017 [19][1] reported that industry consumed over 40 % of world electricity generation in 2015. Furthermore, industry itself is a significant generator of internal power, with many facilities increasingly implementing their own generation, co-generation and energy storage resources. As a major energy consumer, the ability of some industries to schedule their consumption can be used to minimize peak demands on the electrical grid. As an energy supplier, industries with in-house generation or storage resources can also assist in grid load management. While some larger industrial facilities already manage their use and supply of electric power, more widespread deployment, especially by smaller facilities, will depend upon the availability of a readily available standard interface between industrial automation equipment and the “smart grid”.

NOTE In this document “smart grid” is used to refer to the external-to-industry entity with which industry interacts for the purpose of energy management. In other documents this term can be used to refer to all of the elements, including internal industrial energy elements, which work together to optimize energy generation and use.

Industry is a major consumer of electric power and in many cases this consumption can be scheduled to assist in minimizing overall peak demands on the smart grid. In addition, many industrial facilities have in-house generation or storage resources. These facilities can assist in smart grid load and supply management. For example, in-house generation can supply energy to the smart grid and to the facility. Furthermore, storage resources can assist in smart grid load management. While some larger industrial facilities already manage their use and supply of electric power, more widespread deployment, especially by smaller facilities, will depend upon the availability of readily available standard automated interfaces.

Standards are already being developed for home and building automation interfaces to the smart grid; however, the requirements of industry differ significantly and are addressed in this document. For industry, the planning of energy resources and production processes are under the responsibility of the facility energy planner and production planner and the operations are under the responsibility of the facility energy operator and production operator.

Incorrect operation of a resource could impact the safety of personnel, the facility, the environment or lead to production failure and equipment damage. In addition, larger facilities may have in-house production planning capabilities which might be co-ordinated with smart grid planning, to allow longer term energy planning.

[1] Numbers in square brackets refer to the Bibliography.

INDUSTRIAL-PROCESS MEASUREMENT, CONTROL AND AUTOMATION –

Part 1: system interface between industrial facilities and the smart grid

1 Scope

This part of IEC 62872 defines the interface, in terms of information flow, between industrial facilities and the “smart grid”. It identifies, profiles and extends where required, the standards needed to allow the exchange of the information needed to support the planning, management and control of electric energy flow between the industrial facility and the smart grid.

The scope of this document specifically excludes the protocols needed for the direct control of energy resources within a facility where the control and ultimate liability for such control is delegated by the industrial facility to the external entity (e.g. distributed energy resource (DER) control by the electrical grid operator).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62264-1:2013, *Enterprise-control system integration – Part 1: Models and terminology*

IEC 62443 (all parts), *Industrial communication networks – Network and system security*

IEC TS 62443-1-1:2009, *Industrial communication networks – Network and system security – Part 1-1: Terminology, concepts and models*

IEC 62443-2-1, *Industrial communication networks – Network and system security – Part 2-1: Establishing an industrial automation and control system security program*

IEC TR 62443-3-1, *Industrial communication networks – Network and system security – Part 3-1: Security technologies for industrial automation and control systems*

IEC 62443-3-3, *Industrial communication networks – Network and system security – Part 3-3: System security requirements and security levels*