SLOVENSKI STANDARD
SIST EN IEC 61968-5:2020

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Združevanje aplikacij pri oskrbi z električno enegijo - Sistemski vmesniki za upravljanje distribucije - 5. del: Optimizacija porazdeljenih energijskhi virov

Application integration at electric utilities - System interfaces for distribution management – Part 5: Distributed energy optimization

Intégration d'applications pour les services électriques - Interfaces système pour la gestion de distribution - Partie 5: Optimisation de l'énergie distribuée

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Intégration d'applications pour les services électriques - Interfaces système pour la gestion de distribution - Partie 5: Optimisation de l'énergie distribuée (IEC 61968-5:2020)

Integration von Anwendungen in Anlagen der Elektrizitätsversorgung - Systemschnittstellen für Netzführung - Teil 5: Optimierung dezentraler Energie (IEC 61968-5:2020)

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European foreword

The text of document 57/2223/FDIS, future edition 1 of IEC 61968-5, prepared by IEC/TC 57 “Power systems management and associated information exchange” was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 61968-5:2020.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2021-06-22
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2023-09-22

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The text of the International Standard IEC 61968-5:2020 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 60050-300	-	International Electrotechnical Vocabulary -- Electrical and electronic measurements and measuring instruments - Part 311: General terms relating to measurements - Part 312: General terms relating to electrical measurements - Part 313: Types of electrical measuring instruments - Part 314: Specific terms according to the type of instrument	-	-
IEC/TS 61968-2	-	Application integration at electric utilities -- System interfaces for distribution management - Part 2: Glossary	-	-
IEC 61968-9	2013	Application integration at electric utilities - System interfaces for distribution management - Part 9: Interfaces for meter reading and control	EN 61968-9	2014
IEC 61968-11	-	Application integration at electric utilities - System interfaces for distribution management - Part 11: Common information model (CIM) extensions for distribution	EN 61968-11	-
IEC 61968-100	2013	Application integration at electric utilities - System interfaces for distribution management - Part 100: Implementation profiles	EN 61968-100	2013
IEC 62055-31	-	Electricity metering - Payment systems - Part 31: Particular requirements - Static payment meters for active energy (classes 1 and 2)	EN 62055-31	-
IEC/TR 62051	-	Electricity metering - Glossary of terms	-	-
IEC/TR 62357-1	2016	Power systems management and associated information exchange - Part 1: Reference architecture	-	-

IEEE 1547	2018	IEEE Standard for Interconnection and-Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces	-

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Application integration at electric utilities – System interfaces for distribution management – Part 5: Distributed energy optimization

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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APPLICATION INTEGRATION AT ELECTRIC UTILITIES – SYSTEM INTERFACES FOR DISTRIBUTION MANAGEMENT –

Part 5: Distributed energy optimization

FOREWORD

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International Standard IEC 61968-5 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
57/2223/FDIS	57/2252/RVD

Full information on the voting for the approval of this International Standard 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 list of all parts in the IEC 61968 series, published under the general title *Application integration at electric utilities – System interfaces for distribution management*, can be found on the IEC website.

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.

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

Technology advancements in various types of distributed energy resources (DER), have driven increases in their evaluation and employment by utilities, consumers, and third parties. These DER are often connected to the grid at the distribution level where their presence in large scale or volume could be disruptive if not designed, integrated, and managed properly.

Inverters, the power converter circuits that integrate DER to the grid, are highly-capable devices with fast power controls and no inherent inertia such that they can respond quickly to commands and local conditions. Even small-scale inverters tend to have processing and memory resources and can support a variety of communication protocols and advanced functions. Over the last few years, industry efforts have defined a wide range of standard grid-supportive functions that inverters may provide and standard communication protocols that allow these functions to be remotely monitored and managed.

If these inverter capabilities can be properly exposed and integrated into traditional utility system operations, high penetration DER can be transformed from problematic uncertainties to beneficial tools for distribution management. To achieve these potential benefits, it needs to be possible not just to communicate to individual DER devices using standard protocols, but also for the systems that manage DER, referred to herein as DER Management System or "DERMS", to effectively inform other software applications regarding the resources available and to exchange information that allows the DER to be managed effectively. Additionally, due to scale of some devices, to optimize the management of DER they are managed in aggregate, referred hereafter as "DER group management".

Traditionally, distribution systems have been operated without extensive controls or centralized management. More advanced systems may have On-Load Tap Changing transformers (LTCs) at substations, line regulators, and/or capacitor banks that operate to help optimize distribution voltage and reactive power flow. In many cases, these devices may be fixed or configured to operate autonomously. In a growing number of cases, however, a more central Distribution Management System (DMS) has been used to coordinate their behaviour for a more optimized overall effect. DMS functionality may reside at the utility operations centre, where single, large-scale software manages many circuits, or it may reside in a more limited fashion at the substation or other level, where smaller-scale systems act to manage individual feeders or circuits.

Regardless of the scenario, the present generation of DMS systems is not designed to take advantage of the capabilities that DER may offer. In most cases, DER support within a DMS is limited to monitoring the output of "utility scale" DERs (> one megawatt). In addition, existing industry standards define advanced functions for DER only at the individual device level, and lack the more aggregated, feeder-level representations that are useful for enterprise integration.

This document develops appropriate enterprise-level functions for the integration of distributed energy resources. These functions are intended to work in conjunction with the common functions for smart inverters that have previously been defined.

The high-level use cases that are covered include management of DER group membership, DER group status monitoring, DER group forecasting, and dispatching of real andreactive power and other capabilities of managing DER as aggregated groups.

The IEC 61968 standard, taken as a whole, defines interfaces for the major elements of interface architecture for Distribution Management Systems (DMS). Part 1: *Interface Architecture and General Recommendations*, identifies and establishes requirements for standard interfaces based on an Interface Reference Model (IRM). Parts 3-9 of this standard define interfaces relevant to each of the major business functions described by the Interface Reference Model.