

© Copyright SEK Svensk Elstandard. Reproduction in any form without permission is prohibited.

Integrering av tillämpningar för elförsörjning – Systemgränssnitt för distributionssystemstyrning – Del 4: Gränssnitt för dokumenthantering och asset management

*Application integration at electric utilities –
System interfaces for distribution management –
Part 4: Interfaces for records and asset management*

Som svensk standard gäller europastandarden EN IEC 61968-4:2019. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 61968-4:2019.

Nationellt förord

Europastandarden EN IEC 61968-4:2019

består av:

- **europastandardens ikraftsättningsdokument**, utarbetat inom CENELEC
- **IEC 61968-4, Second edition, 2019 - Application integration at electric utilities - System interfaces for distribution management - Part 4: Interfaces for records and asset management**

utarbetad inom International Electrotechnical Commission, IEC.

Tidigare fastställd svensk standard SS-EN 61968-4, utgåva 1, 2010, gäller ej fr o m 2022-04-12.

ICS 33.200.00

Denna standard är fastställd av SEK Svensk Elstandard, som också kan lämna upplysningar om **sakinnehållet** i standarden.
Postadress: Box 1284, 164 29 KISTA
Telefon: 08 - 444 14 00.
E-post: sek@elstandard.se. Internet: www.elstandard.se

Standarder underlättar utvecklingen och höjer elsäkerheten

Det finns många fördelar med att ha gemensamma tekniska regler för bl a mätning, säkerhet och provning och för utförande, skötsel och dokumentation av elprodukter och elanläggningar.

Genom att utforma sådana standarder blir säkerhetsfordringar tydliga och utvecklingskostnaderna rimliga samtidigt som marknadens acceptans för produkten eller tjänsten ökar.

Många standarder inom elområdet beskriver tekniska lösningar och metoder som åstadkommer den elsäkerhet som föreskrivs av svenska myndigheter och av EU.

SEK är Sveriges röst i standardiseringsarbetet inom elområdet

SEK Svensk Elstandard svarar för standardiseringen inom elområdet i Sverige och samordnar svensk medverkan i internationell och europeisk standardisering. SEK är en ideell organisation med frivilligt deltagande från svenska myndigheter, företag och organisationer som vill medverka till och påverka utformningen av tekniska regler inom elektrotekniken.

SEK samordnar svenska intressenters medverkan i SEKs tekniska kommittéer och stödjer svenska experters medverkan i internationella och europeiska projekt.

Stora delar av arbetet sker internationellt

Utformningen av standarder sker i allt väsentligt i internationellt och europeiskt samarbete. SEK är svensk nationalkommitté av International Electrotechnical Commission (IEC) och Comité Européen de Normalisation Electrotechnique (CENELEC).

Standardiseringsarbetet inom SEK är organiserat i referensgrupper bestående av ett antal tekniska kommittéer som speglar hur arbetet inom IEC och CENELEC är organiserat.

Arbetet i de tekniska kommittéerna är öppet för alla svenska organisationer, företag, institutioner, myndigheter och statliga verk. Den årliga avgiften för deltagandet och intäkter från försäljning finansierar SEKs standardiseringsverksamhet och medlemsavgift till IEC och CENELEC.

Var med och påverka!

Den som deltar i SEKs tekniska kommittéarbete har möjlighet att påverka framtida standarder och får tidig tillgång till information och dokumentation om utvecklingen inom sitt teknikområde. Arbetet och kontakterna med kollegor, kunder och konkurrenter kan gynnsamt påverka enskilda företags affärsutveckling och bidrar till deltagarnas egen kompetensutveckling.

Du som vill dra nytta av dessa möjligheter är välkommen att kontakta SEKs kansli för mer information.

SEK Svensk Elstandard

Box 1284
164 29 Kista
Tel 08-444 14 00
www.elstandard.se

English Version

**Application integration at electric utilities - System interfaces for
distribution management - Part 4: Interfaces for records and
asset management
(IEC 61968-4:2019)**

Intégration d'applications pour les services électriques -
Interfaces système pour la gestion de la distribution - Partie
4: Interfaces pour la gestion des dossiers et des actifs
(IEC 61968-4:2019)

Integration von Anwendungen in Anlagen der
Elektrizitätsversorgung - Systemschnittstellen für
Netzführung - Teil 4: Schnittstellen für Berichtswesen und
Asset Management
(IEC 61968-4:2019)

This European Standard was approved by CENELEC on 2019-04-12. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.



European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 57/2059/FDIS, future edition 2 of IEC 61968-4, 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 61968-4:2019.

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) 2020-01-12
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-04-12

This document supersedes EN 61968-4:2007.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association.

Endorsement notice

The text of the International Standard IEC 61968-4:2019 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.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 61968-1	2012	Application integration at electric utilities - System interfaces for distribution management - Part 1: Interface architecture and general recommendations	EN 61968-1	2013
IEC 61968-3	2017	Application integration at electric utilities - System interfaces for distribution management - Part 3: Interface for network operations	EN IEC 61968-3	2018
IEC 61968-6	2015	Application integration at electric utilities - System interfaces for distribution management - Part 6: Interfaces for maintenance and construction	EN 61968-6	2016
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 ¹	2018	Application integration at electric utilities - System interfaces for distribution management - Part 11: Common information model (CIM) extensions for distribution	EN 61968-11 ²	2017
IEC 61968-100	2013	Application integration at electric utilities - System interfaces for distribution management - Part 100: Implementation profiles	EN 61968-100	2013
IEC 61970-301	2016	Energy management system application program interface (EMS-API) - Part 301: Common information model (CIM) base	EN 61970-301	2017

¹ Under preparation. Stage at the time of publication: IEC/CDV 61968-11:2017.

² Under preparation. Stage at the time of publication: prEN IEC 61968-11:2017.

EN IEC 61968-4:2019 (E)

IEC 62361-100	2016	Power systems management and associated information exchange - Interoperability in the long term - Part 100: CIM profiles to XML schema mapping	EN 62361-100	2016
IEC/TR 62361-103	2018	Power systems management and associated information exchange - Interoperability in the long term - Part 103: Standard profiling	-	-
ISO 55000	2014	Asset management - Overview, principles and terminology	-	-
ISO 55001	2014	Asset management - Management systems - Requirements	-	-
ISO 55002	2014	Asset management - Management systems - Guidelines for the application of ISO 55001	-	-

CONTENTS

FOREWORD.....	8
INTRODUCTION.....	10
1 Scope.....	12
2 Normative references	12
3 Terms and definitions	13
4 Reference and information models	13
4.1 General.....	13
4.2 Reference model.....	13
4.2.1 General	13
4.2.2 Network Operation Monitoring (NMON).....	16
4.2.3 Asset Monitoring and Measurement (AMM).....	16
4.2.4 Asset Decision Support (ADS)	16
4.2.5 Substation and Network Inventory (EINV)	17
4.2.6 Geographical Inventory (GINV)	17
4.2.7 Maintenance and Inspection (MAI).....	17
4.2.8 Work Scheduling and Dispatching (SCHD).....	17
4.3 Interface Reference Model.....	17
4.4 Records and asset management	18
5 Records and asset management message types	19
5.1 General.....	19
5.2 AssetList messages	19
5.2.1 General	19
5.2.2 Applications.....	19
5.2.3 Message format.....	20
5.3 AssetCatalogue messages.....	21
5.3.1 General	21
5.3.2 Applications.....	21
5.3.3 Message format.....	22
5.4 TypeAssetCatalogue messages	27
5.4.1 General	27
5.4.2 Applications.....	27
5.4.3 Message format.....	28
5.5 AssetTemplate messages	30
5.5.1 General	30
5.5.2 Applications.....	30
5.5.3 Message format.....	31
5.6 AssetDetail messages.....	36
5.6.1 General	36
5.6.2 Applications.....	36
5.6.3 Message format.....	37
5.7 AssetHistory message	47
5.7.1 General	47
5.7.2 Applications.....	47
5.7.3 Message format.....	48
5.8 Asset Work History	53
5.8.1 General	53

5.8.2	Applications	53
5.8.3	Message format	53
5.9	AssetPSRDetails message	58
5.9.1	General	58
5.9.2	Applications	58
5.9.3	Message format	59
5.10	AssetProcedures message	85
5.10.1	General	85
5.10.2	Applications	85
5.10.3	Message format	85
5.11	Procedures message	87
5.11.1	General	87
5.11.2	Applications	87
5.11.3	Message format	87
5.12	ProcedureDataSets message	89
5.12.1	General	89
5.12.2	Applications	89
5.12.3	Message format	90
5.13	AssetMeasurements message	95
5.13.1	General	95
5.13.2	Applications	95
5.13.3	Message format	95
5.14	MeasurementDetails message	97
5.14.1	General	97
5.14.2	Applications	97
5.14.3	Message format	97
5.15	MeasurementValues message	103
5.15.1	General	103
5.15.2	Applications	103
5.15.3	Message format	103
5.16	Analytics message	105
5.16.1	General	105
5.16.2	Applications	105
5.16.3	Message format	106
5.17	AssetAnalytics message	108
5.17.1	General	108
5.17.2	Applications	108
5.17.3	Message format	108
5.18	AssetGroupAnalytics message	113
5.18.1	General	113
5.18.2	Applications	113
5.18.3	Message format	114
5.19	AssetHealthEvents message	115
5.19.1	General	115
5.19.2	Applications	115
5.19.3	Message format	116
6	Document conventions	118
6.1	UML diagrams	118
6.2	Message definitions	118

6.2.1	General	118
6.2.2	Mandatory vs. optional.....	118
6.2.3	Verb tense	118
6.3	Synchronous versus asynchronous messages	118
6.4	Depiction of simple acknowledgment messages.....	119
Annex A (normative)	Description of message type verbs.....	120
Annex B (informative)	Use cases	122
B.1	Business use cases	122
B.2	System use cases.....	123
B.2.1	General	123
B.2.2	Analytical evaluation of asset health	123
B.2.3	Replacement of asset	131
Annex C (informative)	Asset management	138
C.1	General.....	138
C.2	Condition-based maintenance (CBM)	138
C.3	Asset management and ISO 55000.....	140
Annex D (informative)	Asset models and information exchange – The case for formal instance templates	143
D.1	CIM asset containment	143
D.2	Common instance templates for interoperability	143
D.2.1	General	143
D.2.2	Instance template documentation	144
D.2.3	Instance templates for breakers.....	145
Annex E (informative)	Asset models and information exchange.....	157
E.1	General.....	157
E.2	Asset replacement	158
E.3	Data for asset condition analytics.....	158
E.4	Data for operational analytics.....	159
Annex F (informative)	Asset measurement models and information exchange.....	161
F.1	General.....	161
F.2	Ad hoc measurements	162
F.3	Online measurements	164
Annex G (informative)	Analytics models and information exchange.....	166
Figure 1	– Illustration of Asset-related message flows.....	14
Figure 2	– Illustration of Measurements-related message flows	15
Figure 3	– Illustration of Analytics-related message flows	16
Figure 4	– AssetList message exchange	20
Figure 5	– AssetList message format	20
Figure 6	– AssetCatalogue message exchange.....	22
Figure 7	– AssetCatalogue message format.....	23
Figure 8	– AssetCatalogue message: Asset element.....	24
Figure 9	– AssetCatalogue message: BusbarSectionInfo element	24
Figure 10	– AssetCatalogue message: PowerTransformerInfo element	25
Figure 11	– AssetCatalogue message: CatalogAssetType element	25
Figure 12	– AssetCatalogue message: Manufacturer element	26

Figure 13 – Type Asset Catalogue message exchange	28
Figure 14 – TypeAssetCatalogue message format	29
Figure 15 – Asset Template query exchange	30
Figure 16 – Asset template creation exchange	31
Figure 17 – AssetTemplate message showing the AssetContainer element.....	32
Figure 18 – AssetTemplate message showing the Asset and Medium elements	33
Figure 19 – AssetTemplate message showing the Bushing, InterrupterUnit, and OperatingMechanism elements	34
Figure 20 – Asset Detail message exchange.....	37
Figure 21 – Asset Detail message format.....	37
Figure 22 – AssetDetail message: Asset element.....	38
Figure 23 – AssetDetail message: AssetDeployment element (included in the Asset element shown in Figure 22)	39
Figure 24 – AssetDetail message: SwitchOperationSummary element (included as BreakerOperation association within the Asset element shown in Figure 22).....	40
Figure 25 – AssetDetail message: Location element	41
Figure 26 – AssetDetail message: Ownership element.....	42
Figure 27 – AssetDetail message: Joint element	43
Figure 28 – AssetDetail message: Streetlight element	44
Figure 29 – AssetDetail message: Structure element	45
Figure 30 – AssetDetail message: StructureSupport element	46
Figure 31 – Asset History message exchange.....	48
Figure 32 – AssetHistory message format.....	49
Figure 33 – AssetHistory message: ActivityRecord element	50
Figure 34 – AssetHistory message: FailureEvent element.....	51
Figure 35 – AssetHistory message: Author element	52
Figure 36 – Asset Work History message exchange.....	53
Figure 37 – AssetWorkHistory message format.....	54
Figure 38 – AssetWorkHistory message: WorkTask element.....	55
Figure 39 – AssetWorkHistory message: MaintenanceWorkTask element	56
Figure 40 – AssetWorkHistory message: RepairWorkTask element.....	57
Figure 41 – AssetPSRDetails message exchange 1	59
Figure 42 – AssetPSRDetails message exchange 2	59
Figure 43 – AssetPSRDetails message format	60
Figure 44 – AssetPSRDetails message: ACLineSegment element.....	61
Figure 45 – AssetPSRDetails message: Accumulator element	62
Figure 46 – AssetPSRDetails message: AsynchronousMachine element.....	63
Figure 47 – AssetPSRDetails message: Breaker element	64
Figure 48 – AssetPSRDetails message: BusbarSection element	65
Figure 49 – AssetPSRDetails message: Clamp element.....	66
Figure 50 – AssetPSRDetails message: CompositeSwitch element	67
Figure 51 – AssetPSRDetails message: EnergyConsumer element.....	68
Figure 52 – AssetPSRDetails message: EnergySource element.....	69
Figure 53 – AssetPSRDetails message: ExternalNetworkInjection element	70

Figure 54 – AssetPSRDetails message: FrequencyConverter element	71
Figure 55 – AssetPSRDetails message: GroundingImpedance element	72
Figure 56 – AssetPSRDetails message: NonRotatingEnergy element	73
Figure 57 – AssetPSRDetails message: PetersenCoil element.....	74
Figure 58 – AssetPSRDetails message: PowerTransformer element.....	75
Figure 59 – AssetPSRDetails message: PowerTransformerEnd element.....	76
Figure 60 – AssetPSRDetails message: TransformerTank element.....	77
Figure 61 – AssetPSRDetails message: ProtectedSwitch element	78
Figure 62 – AssetPSRDetails message: SeriesCompensator element	79
Figure 63 – AssetPSRDetails message: ShuntCompensator element.....	80
Figure 64 – AssetPSRDetails message: StaticVarCompensator element.....	81
Figure 65 – AssetPSRDetails message: Switch element	82
Figure 66 – AssetPSRDetails message: SynchronousMachine element	83
Figure 67 – AssetPSRDetails message: TapChanger element	84
Figure 68 – AssetProcedures message exchange	85
Figure 69 – AssetProcedures message format	86
Figure 70 – Procedures message format.....	88
Figure 71 – Procedures message format: AssetTemperaturePressureAnalog element	89
Figure 72 – ProcedureDataSets message exchange	90
Figure 73 – ProcedureDataSets message format	91
Figure 74 – ProcedureDatasets message: AnalogValue element.....	92
Figure 75 – ProcedureDataSets message: LabTestDataSet element.....	93
Figure 76 – ProcedureDataSets message format: Specimen element.....	94
Figure 77 – Asset Measurements message exchange.....	95
Figure 78 – AssetMeasurements message format	96
Figure 79 – MeasurementDetails message format.....	98
Figure 80 – MeasurementDetails message format: Analog element.....	99
Figure 81 – MeasurementDetails message format: CalculationMethodHierarchy element.....	100
Figure 82 – MeasurementDetails message format: AssetTemperaturePressureAnalog element.....	101
Figure 83 – MeasurementDetails message format: TestStandard element.....	102
Figure 84 – MeasurementValues message format.....	104
Figure 85 – Analytics message exchanges.....	106
Figure 86 – Analytics message format	107
Figure 87 – AssetAnalytics message format 1.....	109
Figure 88 – AssetAnalytics message format 2.....	110
Figure 89 – AssetAnalytics message format: AnalyticScore element	111
Figure 90 – AssetAnalytics message format: HealthScore element	111
Figure 91 – AssetAnalytics message format: RiskScore element.....	112
Figure 92 – AssetGroupAnalytics message format	114
Figure 93 – AssetHealthEvents message exchanges	116
Figure 94 – AssetHealthEvents message format	117
Figure B.1 – IEC 62913 Conceptual model (source: IEC 62913-1)	122

Figure B.2 – Brief description of the use case on "decide asset renewal priorities and optimise maintenance programmes" (source: IEC 62913-2-1).	123
Figure C.1 – Illustration of condition-based maintenance (CBM)	138
Figure C.2 – Illustration of asset management	140
Figure C.3 – ISO 55000/1/2 asset management concept and clauses.	141
Figure D.1 – Asset component flexibility provided by CIM	143
Figure D.2 – Classes utilized in common instance templates	144
Figure D.3 – SF ₆ dead tank breaker variants	146
Figure D.4 – Common instance template for SF ₆ dead tank breaker with 1 tank, 1 mechanism, single breaks.....	146
Figure D.5 – Common instance template for SF ₆ dead tank breaker with 3 tanks, 1 mechanism, single breaks.....	147
Figure D.6 – Common instance template for SF ₆ dead tank breaker with 3 tanks, 3 mechanisms, double breaks.....	148
Figure D.7 – SF ₆ live tank breaker variants	148
Figure D.8 – Common instance template for SF ₆ live tank breaker with 3 insulating stacks on one base, 1 mechanism, single breaks.....	149
Figure D.9 – Common instance template for SF ₆ live tank breaker with 6 insulating stacks on 3 bases, 3 mechanisms, 4 breaks	150
Figure D.10 – Bulk oil breaker variants	150
Figure D.11 – Common instance template for bulk oil breaker with 1 tank, 1 mechanism	151
Figure D.12 – Common instance template for bulk oil breaker with 3 tanks, 1 mechanism	152
Figure D.13 – Minimum oil breaker variants	153
Figure D.14 – Common instance template for minimum oil breaker with 3 insulating stacks on one base, 1 mechanism, single break.....	154
Figure D.15 – Air blast breaker variants	154
Figure D.16 – Common instance template for air blast breaker with 3 insulating stacks on one base, 1 mechanism, double breaks	155
Figure D.17 – Common instance template for air blast breaker with 9 insulating stacks on 3 bases, 3 mechanisms, 6 breaks	156
Figure E.1 – Information exchange for asset replacement.....	158
Figure E.2 – Information exchange for asset condition data	159
Figure E.3 – Information exchange for operational analytics	160
Figure F.1 – Diagram illustrating objects instantiated for lab testing.....	162
Figure F.2 – Typical message exchanges for ad-hoc measurements	163
Figure F.3 – Objects instantiated for DGA monitoring.....	164
Figure F.4 – Message exchanges for online measurements	165
Figure G.1 – Illustrative analytics information exchange.....	167
Table 1 – Document overview for IEC 61968-4	11
Table 2 – Business functions and abstract components	18
Table A.1 – Normative definitions of verbs.....	120
Table D.1 – Salient characteristics for each transmission breaker family.....	145

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**APPLICATION INTEGRATION AT ELECTRIC UTILITIES –
SYSTEM INTERFACES FOR DISTRIBUTION MANAGEMENT –****Part 4: Interfaces for records and asset management**

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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

This second edition cancels and replaces the first edition published in 2007. This edition constitutes a technical revision.

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

- a) removal of edition 1 profiles whose functionality has been superseded by other parts of IEC 61970 and IEC 61968 standards. In particular, NetworkDataSet and ChangeSet have been superseded by standards such as CDPSM (IEC 61968-13) and other ongoing efforts such as change modelling; and Presentation has been superseded by Diagram Layout Profile (IEC 61970-453);
- b) revision of the edition 1 profiles AssetList, AssetCatalogue and TypeAssetCatalogue to realign with current use cases and the latest CIM UML release. These profiles are based

on an old version of CIM UML and many of the classes in these profiles are no longer in the recent CIM UMLs;

- c) addition of several new profiles to enable the exchange of asset condition data, analytics results and alerts, assets' physical, functional and lifecycle details, and assets' work;
- d) informative annexes on how this document can be used to enable strategic asset management;
- e) informative annexes with illustrative examples for the application of this document;
- f) scope coordinated with IEC 61968-13 where applicable;
- g) use cases in IEC 62559-2 use case template;
- h) traceability of use cases to IEC 62913-2-1 use cases.

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

FDIS	Report on voting
57/2059/FDIS	57/2074/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.

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

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

As used in IEC 61968, a DMS consists of various distributed application components for the utility to manage electrical distribution networks. These capabilities include monitoring and control of equipment for power delivery, management processes to ensure system reliability, voltage management, demand-side management, outage management, work management, automated mapping and facilities management.

This series of standards is limited to the definition of interfaces and is implementation independent. They provide for interoperability among different computer systems, platforms, and languages. Methods and technologies used to implement functionality conforming to these interfaces are considered outside of the scope of these standards; only the interface itself is specified in these standards.

The purpose of this part of IEC 61968 is to define a standard for the integration of Records and Asset Management (AM), which would include Geographic Information Systems and Asset Risk Management Systems, with other systems and business functions within the scope of IEC 61968. The scope of this document is the exchange of information between Records and Asset Management Systems and other systems within the utility enterprise. The specific details of communication protocols those systems employ are outside the scope of this document. Instead, this document will recognize and model the general capabilities that can be potentially provided by records and asset management systems including asset risk assessment, asset planning, and condition-based asset management. In this way, this document will not be impacted by the specification, development and/or deployment of next generation records and asset management systems, either through the use of standards or proprietary means.

The IEC 61968 series of standards is intended to facilitate inter-application integration as opposed to intra-application integration. Intra-application integration is aimed at programs in the same application system, usually communicating with each other using middleware that is embedded in their underlying runtime environment, and tends to be optimised for close, real-time, synchronous connections and interactive request/reply or conversation communication models. IEC 61968, by contrast, is intended to support the inter-application integration of a utility enterprise that needs to connect disparate applications that are already built or new (legacy or purchased applications), each supported by dissimilar runtime environments. Therefore, these interface standards are relevant to loosely coupled applications with more heterogeneity in languages, operating systems, protocols and management tools. This series of standards is intended to support applications that need to exchange data every few seconds, minutes, or hours rather than waiting for a nightly batch run. This series of standards, which are intended to be implemented with middleware services that exchange messages among applications, will complement, not replace, utility data warehouses, database gateways, and operational stores.

As used in IEC 61968, a Distribution Management System (DMS) consists of various distributed application components for the utility to manage electrical distribution networks. These capabilities include monitoring and control of equipment for power delivery, management processes to ensure system reliability, voltage management, demand-side management, outage management, work management, automated mapping and facilities management. Standard interfaces are defined for each class of applications identified in the Interface Reference Model (IRM), which is described in IEC 61968-1.

This part of IEC 61968 contains the clauses listed in Table 1.

Table 1 – Document overview for IEC 61968-4

Clause	Title	Purpose
1	Scope	The scope and purpose of the document are described.
2	Normative references	Documents that contain provisions which, through reference in this text, constitute provisions of this International Standard.
3	Terms and definitions	Description of concepts and terms pertinent to records and asset management.
4	Reference and information models	Description of general approach to records and asset management systems, reference model, use cases, interface reference model, records and asset management functions and components, message type terms and static information model.
5	Records and asset management message types	Message types related to the exchange of information for documents related to records and asset management.
Annex A	Description of message type verbs	Description of the verbs that are used for the message types.
Annex B	Use cases	Description of use cases pertaining to this standard.
Annex C	Asset management	Description of an example asset management framework that leverages this standard.
Annex D	Asset models and information exchange – The case for formal instance templates	Description of the use of CIM to model typical electrical power utility assets.
Annex E	Asset Models and information exchange	Illustration of asset related messages and typical information exchanges.
Annex F	Asset measurements models and information exchange	Illustration of asset measurements related messages and typical information exchanges.
Annex G	Analytics models and information exchange	Illustration of asset analytics related messages and typical information exchanges.

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

Part 4: Interfaces for records and asset management

1 Scope

This part of IEC 61968 specifies the information content of a set of message types that can be used to support many of the business functions related to records and asset management. Typical uses of the message types defined in this document include network extension planning, copying feeder or other network data between systems, network or diagram edits and asset inspection. Message types defined in other parts of IEC 61968 may also be relevant to these use cases.

2 Normative references

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.

IEC 61968-1:2012, *Application integration at electric utilities – System interfaces for distribution management – Part 1: Interface architecture and general recommendations*

IEC 61968-3:2017, *Application integration at electric utilities – System interfaces for distribution management – Part 3: Interface for network operations*

IEC 61968-6:2015, *Application integration at electric utilities – System interfaces for distribution management – Part 6: Interfaces for maintenance and construction*

IEC 61968-9:2013, *Application integration at electric utilities – System interfaces for distribution management – Part 9: Interfaces for meter reading and control*

IEC 61968-11:2018, *Application integration at electric utilities – System interfaces for distribution management – Part 11: Common information model (CIM) extensions for distribution*

IEC 61968-100:2013, *Application integration at electric utilities – System interfaces for distribution management – Part 100: Implementation profiles*

IEC 61970-301:2016, *Energy management system application program interface (EMS-API) – Part 301: Common information model (CIM) base*

IEC 62361-100:2016, *Power systems management and associated information exchange – Interoperability in the long term – Part 100: CIM profiles to XML schema mapping*

IEC TR 62361-103:2018, *Power systems management and associated information exchange – Interoperability in the long term – Part 103: Standard profiling*

ISO 55000:2014, *Asset management – Overview, principles and terminology*

ISO 55001:2014, *Asset management – Management systems – Requirements*

ISO 55002:2014, *Asset management – Management systems – Guidelines for the application of ISO 55001*