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Integrering av tillämpningar för elförsörjning – Systemgränssnitt för distributionssystemstyrning – Del 13: Profilmodeller för vanligt förekommande distributionsnät

*Application integration at electric utilities –
System interfaces for distribution management –
Part 13: Common distribution power system model profiles*

Som svensk standard gäller europastandarden EN IEC 61968-13:2021. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 61968-13:2021.

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English Version

**Application integration at electric utilities - System interfaces for
distribution management - Part 13: Common distribution power
system model profiles
(IEC 61968-13:2021)**

Intégration d'applications pour les services électriques -
Interfaces système pour la gestion de la distribution - Partie
13: Profils de modèle commun de système électrique de
distribution
(IEC 61968-13:2021)

Integration von Anwendungen in Anlagen der
Elektrizitätsversorgung - Systemschnittstellen für
Netzführung - Teil 13: Allgemeine Profile zur Modellierung
von Verteilnetzen
(IEC 61968-13:2021)

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Europäisches Komitee für Elektrotechnische Normung

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

European foreword

The text of document 57/2311/FDIS, future edition 2 of IEC 61968-13, 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 61968-13:2021.

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- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2024-04-20

This document supersedes EN 61968-13:2008 and all of its amendments and corrigenda (if any).

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 61970-600-1 ¹	NOTE	Harmonized as EN IEC 61970-600-1 ²
IEC 61970-600-2 ³	NOTE	Harmonized as EN IEC 61970-600-2 ⁴
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IEC 61968-4:2019	NOTE	Harmonized as EN IEC 61968-4:2019 (not modified)
IEC 61968-8:2015	NOTE	Harmonized as EN 61968-8:2016 (not modified)
IEC 60909 (series)	NOTE	Harmonized as EN 60909 (series)
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IEC 61968-3	NOTE	Harmonized as EN IEC 61968-3
IEC 62559-2:2015	NOTE	Harmonized as EN 62559-2:2015 (not modified)

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² Under preparation. Stage at the time of publication: FprEN IEC 61970-600-1:2021.

³ Under preparation. Stage at the time of publication: IEC PRVC 61970-600-2:2020.

⁴ Under preparation. Stage at the time of publication: FprEN IEC 61970-600-2:2021.

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/TS 61968-2	-	Application integration at electric utilities - System interfaces for distribution management - Part 2: Glossary	-	-
IEC 61968-11	2013	Application integration at electric utilities - System interfaces for distribution management - Part 11: Common information model (CIM) extensions for distribution	EN 61968-11	2013
IEC 61970-301	2020	Energy management system application program interface (EMS-API) - Part 301: Common information model (CIM) base	EN IEC 61970-301	2020
IEC 61970-452	-	Energy management system application program interface (EMS-API) - Part 452: CIM static transmission network model profiles	EN 61970-452	-
IEC 61970-501	2006	Energy management system application program interface (EMS-API) - Part 501: Common Information Model Resource Description Framework (CIM RDF) schema	EN 61970-501	2006
IEC 61970-552	2016	Energy management system application program interface (EMS-API) - Part 552: CIMXML Model exchange format	EN 61970-552	2016
IEC 62325-301	-	Framework for energy market communications - Part 301: Common information model (CIM) extensions for markets	EN IEC 62325-301	-



INTERNATIONAL STANDARD

NORME INTERNATIONALE



Application integration at electric utilities – System interfaces for distribution management –

Part 13: Common distribution power system model profiles

Intégration d'applications pour les services électriques – Interfaces système pour la gestion de la distribution –

Partie 13: Profils de modèle commun de système électrique de distribution

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CONTENTS

FOREWORD.....	25
INTRODUCTION.....	28
1 Scope.....	29
2 Normative references	29
3 Terms, definitions and abbreviated terms	30
3.1 Terms and definitions.....	30
3.2 Abbreviated terms.....	31
4 Use Cases list	31
4.1 Use Cases related to the Common Distribution Power System Model Profiles.....	31
4.2 Use Case overview table.....	34
5 Distribution network modelling specificities and CIM related issues resolved	35
5.1 Feeder modelling	35
5.2 Partial-phase devices modelling.....	36
5.3 Manage LV cables in catalog	37
5.4 Observability Area (informative).....	38
6 CIM Distribution Power System Model Profiles	39
6.1 General.....	39
6.2 Top package General.....	43
6.3 Package Functional	45
6.3.1 General	45
6.3.2 Package Standard	58
6.4 Package ElectricalProperties	151
6.4.1 General	151
6.4.2 Package Standard	154
6.5 Package Topology	180
6.5.1 General	180
6.5.2 Package Standard	181
6.6 Package SteadyStateHypothesis.....	187
6.6.1 General	187
6.6.2 Package Standard	189
6.7 Package StateVariables	201
6.7.1 General	201
6.7.2 Package Standard	203
6.8 Package Geographical	206
6.8.1 General	206
6.8.2 Package Standard	207
6.9 Package DiagramLayout	210
6.9.1 General	210
6.9.2 Package Standard	212
6.10 Package Assets	217
6.10.1 General	217
6.10.2 Package Standard	218
6.11 Package AssetCatalog	228
6.11.1 General	228
6.11.2 Package Standard	233
6.12 Package Customers.....	252

6.12.1	General	252
6.12.2	Package Standard	253
7	Top package DataTypes	259
7.1	General.....	259
7.2	Package PrimitiveTypes.....	259
7.3	Package CIMDataTypes.....	260
7.4	Package CIMEnumerations	261
7.4.1	General	261
7.4.2	AsynchronousMachineKind enumeration.....	262
7.4.3	OrientationKind enumeration	262
7.4.4	AnchorKind enumeration.....	262
7.4.5	UndergroundStructureKind enumeration	262
7.4.6	WindGenUnitKind enumeration	263
7.4.7	SinglePhaseKind enumeration	263
7.4.8	PetersenCoilModeKind enumeration	263
7.4.9	SynchronousMachineKind enumeration	264
7.4.10	UnitSymbol enumeration.....	264
7.4.11	StructureSupportKind enumeration	269
7.4.12	WireMaterialKind enumeration	269
7.4.13	WindingConnection enumeration	270
7.4.14	TransformerControlMode enumeration.....	270
7.4.15	GeneratorControlSource enumeration.....	270
7.4.16	WireUsageKind enumeration	271
7.4.17	InUseStateKind enumeration	271
7.4.18	PhaseCode enumeration	271
7.4.19	SVCControlMode enumeration.....	272
7.4.20	StructureMaterialKind enumeration	272
7.4.21	CurveStyle enumeration	273
7.4.22	DeploymentStateKind enumeration	273
7.4.23	UnitMultiplier enumeration	273
7.4.24	RegulatingControlModeKind enumeration	274
7.4.25	RetiredReasonKind enumeration	275
7.4.26	AssetLifecycleStateKind enumeration	275
7.4.27	PSREventKind enumeration.....	275
7.4.28	Source enumeration	276
7.4.29	AssetKind enumeration.....	276
7.4.30	OperationalLimitDirectionKind enumeration	277
7.4.31	BusbarConfiguration enumeration.....	277
7.4.32	CableShieldMaterialKind enumeration	277
7.4.33	AssetModelUsageKind enumeration.....	277
7.4.34	WireInsulationKind enumeration	278
7.4.35	SynchronousMachineOperatingMode enumeration	278
7.4.36	CableOuterJacketKind enumeration.....	279
7.4.37	CableConstructionKind enumeration	279
7.4.38	HydroPlantStorageKind enumeration	279
7.4.39	BreakerConfiguration enumeration.....	280
7.5	Package CompoundTypes	281
Annex A (informative)	Use case	282
A.1	Overview.....	282

A.2	Provision of DSO network model and state to TSO	282
A.2.1	Description of the use case	282
A.2.2	Diagrams of use case	285
A.2.3	Technical details.....	286
A.2.4	Step by step analysis of use case	286
A.2.5	Information exchanged	291
A.2.6	Requirements (optional)	291
A.2.7	Common terms and definitions.....	291
A.2.8	Custom information (optional).....	291
Annex B (informative)	Extensions and proposals.....	292
B.1	Package Functional	292
B.1.1	Package Standard	292
B.1.2	Package (Informative) InfIEC61970	320
B.1.3	Package (Informative) InfExtensions.....	321
B.2	Package ElectricalProperties	325
B.2.1	General	325
B.2.2	Package Standard	326
B.3	Package Assets	326
B.3.1	Package Standard	326
B.3.2	Package (Informative) InfIEC61968	327
B.3.3	Package (Informative) InfExtensions.....	329
B.4	Package AssetCatalog	332
B.4.1	Package Standard	332
B.4.2	Package (Informative) InfIEC61968	337
B.4.3	Package (Informative) InfExtensions.....	340
B.5	Package Customers – Package Standard – PricingStructure.....	345
B.6	Top package DataTypes	345
B.6.1	Package EntsoeExtensionsTypes	345
B.6.2	Package NEKnoExtensionsTypes	347
Annex C (informative)	CDPSM MV/LV urban and rural network.....	350
Annex D (informative)	CDPSM MV/LV urban network.....	351
Annex E (informative)	CDPSM MV urban and rural network	352
Annex F (informative)	CDPSM usage in H2020 TDX-ASSIST	354
Annex G (informative)	Nuclear distribution network.....	360
Annex H (informative)	Observability Area concept	361
Annex I (informative)	CDPSM to CGMES conversion	363
Annex J (informative)	Norwegian Electrotechnical Committee (NEK) CDPSM Use Cases	365
J.1	General.....	365
J.2	Provision of Network Operator asset model to System Operator and Regulator	365
Bibliography	369
Figure 1	– Feeder containment principles	36
Figure 2	– UML Wire arrangement (informative).....	38
Figure 3	– Main steps for profiling CIM	39
Figure 4	– UML CDPSM profiles (informative).....	40

Figure 5 – CDPSM interoperability scheme	42
Figure 6 – Network Model Management overview	43
Figure 7 – Package diagram General::CDPSM Profiles	44
Figure 8 – Package diagram Functional::Functional	45
Figure 9 – Class diagram Functional::Functional_Core_Base	46
Figure 10 – Class diagram Functional::Functional_Core_connectivity_containment	46
Figure 11 – Class diagram Functional::Functional_Cuts and Jumpers	47
Figure 12 – Class diagram Functional::Functional_DC	47
Figure 13 – Class diagram Functional::Functional_AuxiliaryEquipment	48
Figure 14 – Class diagram Functional::Functional_Equivalent	48
Figure 15 – Class diagram Functional::Functional_Feeder	49
Figure 16 – Class diagram Functional::Functional_Generation	49
Figure 17 – Class diagram Functional::Functional_LoadModel	50
Figure 18 – Class diagram Functional::Functional_MeasControl	50
Figure 19 – Class diagram Functional::Functional_MeasMeas	51
Figure 20 – Class diagram Functional::Functional_Operation	52
Figure 21 – Class diagram Functional::Functional_OperationalLimits	53
Figure 22 – Class diagram Functional::Functional_Protection	53
Figure 23 – Class diagram Functional::Functional_SCADA	54
Figure 24 – Class diagram Functional::Functional_Status	54
Figure 25 – Class diagram Functional::Functional_Transformer	55
Figure 26 – Class diagram Functional::Functional_Wires_Base	56
Figure 27 – Class diagram Functional::Functional_Wires_Regulating	57
Figure 28 – Class diagram Functional::Functional_Wires_Switches	58
Figure 29 – Package diagram ElectricalProperties::ElectricalProperties	151
Figure 30 – Class diagram ElectricalProperties::ElectricalProperties	152
Figure 31 – Class diagram ElectricalProperties::ElectricalProperties_ConductingEquipments	153
Figure 32 – Class diagram Standard::Standard	154
Figure 33 – Package diagram Topology::Topology	180
Figure 34 – Class diagram Topology::Topology	181
Figure 35 – Package diagram SteadyStateHypothesis::SteadyStateHypothesis	187
Figure 36 – Class diagram SteadyStateHypothesis::SteadyStateHypothesis	188
Figure 37 – Class diagram StateVariables::StateVariables	201
Figure 38 – Class diagram StateVariables::StateVariables inheritance	202
Figure 39 – Package diagram StateVariables::StateVariables	202
Figure 40 – Package diagram Geographical::Geographical	206
Figure 41 – Class diagram Geographical::Geographical	207
Figure 42 – Package diagram DiagramLayout::DiagramLayout	210
Figure 43 – Class diagram DiagramLayout::DiagramLayout	211
Figure 44 – Package diagram Assets::Assets	217
Figure 45 – Class diagram Assets::Assets	218
Figure 46 – Package diagram AssetCatalog::AssetCatalog	228

Figure 47 – Class diagram AssetCatalog::AssetCatalog-Operators	229
Figure 48 – Class diagram AssetCatalog::AssetInfo-Model-Constructor relationships	230
Figure 49 – Class diagram AssetCatalog::AssetInfos-Cables	231
Figure 50 – Class diagram AssetCatalog::AssetInfos-Transformers	232
Figure 51 – Class diagram AssetCatalog::AssetInfos Others	233
Figure 52 – Class diagram Customers::Customers	252
Figure 53 – Package diagram Customers::Customers	253
Figure 54 – Package diagram DataTypes::DataTypes	259
Figure 55 – Class diagram PrimitiveTypes::Primitives	259
Figure 56 – Class diagram CIMDataTypes::CIMDataTypes	260
Figure 57 – Class diagram CIMEnumerations::enumerations-CIM	261
Figure 58 – Class diagram CompoundTypes::CompoundTypes	281
Figure B.1 – Class diagram (Informative) InfIEC61970::Functional_WeatherStation	320
Figure B.2 – Class diagram (Informative) InfNEKExtensions::InfNEKSubstation	321
Figure B.3 – Class diagram (Informative) InfNEKExtensions::InfNEKLine	322
Figure B.4 – Class diagram (Informative) InfNEKExtensions::InfNEKAuxiliaryEquipment	322
Figure B.5 – Class diagram (Informative) InfEntsoeExtensions::InfEntsoeRateTemperature	325
Figure B.6 – Class diagram (Informative) InfCDPSMExtensions::InfCDPSMOrganisationRole	329
Figure B.7 – Class diagram (Informative) InfNEKExtensions::InfNEKOrganisationRole	331
Figure B.8 – Class diagram (Informative) InfIEC61968::Catalog-Entries	337
Figure B.9 – Class diagram (Informative) InfIEC61968::ShuntCompensatorInfo	338
Figure B.10 – Class diagram (Informative) InfCDPSMExtensions::InfCDPSMOrganisationRole	340
Figure B.11 – Class diagram (Informative) InfNEKExtensions::InfNEKLine	342
Figure B.12 – Class diagram (Informative) InfNEKExtensions::InfNEKWireEarthInfo	343
Figure C.1 – MV/LV urban and rural network on satellite map	350
Figure D.1 – MV/LV urban network on satellite map	351
Figure E.1 – MV urban and rural network on satellite map	352
Figure F.1 – Tool-set and Data sets used by EDF R&D	355
Figure F.2 – Network Data Set layout without model reductions	356
Figure F.3 – Aggregation of a downstream network	357
Figure F.4 – Result of several aggregations	358
Figure F.5 – DisNetSimpl Model reductions and other options examples	358
Figure F.6 – Network Pre-processing configuration Menu	359
Figure G.1 – Nuclear distribution network	360
Figure H.1 – Concept of observability area	361
Figure H.2 – Possibilities for TSOs data exchange with distribution-connected SGUs	362
Figure I.1 – Principle of PSR related class and Asset related class for CDPSM	363
Figure I.2 – Data Set transformation between CDSPM and CGMES	364
Table 1 – Document overview for IEC 61968-13	28
Table 2 – Identified Business Use Cases	32

Table 3 – Identified requirements	34
Table 4 – Business Use Cases related to CDPSM	34
Table 5 – Attributes of Standard::Accumulator	58
Table 6 – Association ends of Standard::Accumulator with other classes	59
Table 7 – Attributes of Standard::AccumulatorLimit	59
Table 8 – Association ends of Standard::AccumulatorLimit with other classes	59
Table 9 – Attributes of Standard::AccumulatorLimitSet	59
Table 10 – Association ends of Standard::AccumulatorLimitSet with other classes	60
Table 11 – Attributes of Standard::AccumulatorReset	60
Table 12 – Association ends of Standard::AccumulatorReset with other classes	60
Table 13 – Attributes of Standard::AccumulatorValue	61
Table 14 – Association ends of Standard::AccumulatorValue with other classes	61
Table 15 – Attributes of Standard::ACDCConverter	61
Table 16 – Association ends of Standard::ACDCConverter with other classes	62
Table 17 – Attributes of Standard::ACDCTerminal	62
Table 18 – Attributes of Standard::ACLLineSegment	63
Table 19 – Association ends of Standard::ACLLineSegment with other classes	63
Table 20 – Attributes of Standard::ACLLineSegmentPhase	63
Table 21 – Association ends of Standard::ACLLineSegmentPhase with other classes	64
Table 22 – Attributes of Standard::ActivePowerLimit	64
Table 23 – Association ends of Standard::ActivePowerLimit with other classes	64
Table 24 – Attributes of Standard::ActivityRecord	65
Table 25 – Attributes of Standard::Analog	65
Table 26 – Association ends of Standard::Analog with other classes	65
Table 27 – Attributes of Standard::AnalogControl	66
Table 28 – Association ends of Standard::AnalogControl with other classes	66
Table 29 – Attributes of Standard::AnalogLimit	66
Table 30 – Association ends of Standard::AnalogLimit with other classes	67
Table 31 – Attributes of Standard::AnalogLimitSet	67
Table 32 – Association ends of Standard::AnalogLimitSet with other classes	67
Table 33 – Attributes of Standard::AnalogValue	67
Table 34 – Association ends of Standard::AnalogValue with other classes	68
Table 35 – Attributes of Standard::ApparentPowerLimit	68
Table 36 – Association ends of Standard::ApparentPowerLimit with other classes	68
Table 37 – Attributes of Standard::AuxiliaryEquipment	69
Table 38 – Association ends of Standard::AuxiliaryEquipment with other classes	69
Table 39 – Attributes of Standard::BaseVoltage	69
Table 40 – Attributes of Standard::BasicIntervalSchedule	70
Table 41 – Attributes of Standard::Bay	70
Table 42 – Association ends of Standard::Bay with other classes	70
Table 43 – Attributes of Standard::Breaker	71
Table 44 – Association ends of Standard::Breaker with other classes	71
Table 45 – Attributes of Standard::BusbarSection	72

Table 46 – Association ends of Standard::BusbarSection with other classes	72
Table 47 – Attributes of Standard::Clamp	73
Table 48 – Association ends of Standard::Clamp with other classes	73
Table 49 – Attributes of Standard::Command	74
Table 50 – Association ends of Standard::Command with other classes	74
Table 51 – Attributes of Standard::ConductingEquipment	74
Table 52 – Association ends of Standard::ConductingEquipment with other classes	75
Table 53 – Attributes of Standard::Conductor	75
Table 54 – Association ends of Standard::Conductor with other classes	75
Table 55 – Attributes of Standard::ConformLoad	76
Table 56 – Association ends of Standard::ConformLoad with other classes	76
Table 57 – Attributes of Standard::ConformLoadGroup	76
Table 58 – Association ends of Standard::ConformLoadGroup with other classes	77
Table 59 – Attributes of Standard::ConformLoadSchedule	77
Table 60 – Association ends of Standard::ConformLoadSchedule with other classes	77
Table 61 – Attributes of Standard::ConnectivityNode	78
Table 62 – Association ends of Standard::ConnectivityNode with other classes	78
Table 63 – Attributes of Standard::ConnectivityNodeContainer	78
Table 64 – Association ends of Standard::ConnectivityNodeContainer with other classes	78
Table 65 – Attributes of Standard::Connector	79
Table 66 – Association ends of Standard::Connector with other classes	79
Table 67 – Attributes of Standard::Control	79
Table 68 – Association ends of Standard::Control with other classes	80
Table 69 – Attributes of Standard::CsConverter	80
Table 70 – Association ends of Standard::CsConverter with other classes	80
Table 71 – Attributes of Standard::CurrentLimit	81
Table 72 – Association ends of Standard::CurrentLimit with other classes	81
Table 73 – Attributes of Standard::CurrentTransformer	81
Table 74 – Association ends of Standard::CurrentTransformer with other classes	82
Table 75 – Attributes of Standard::Cut	82
Table 76 – Association ends of Standard::Cut with other classes	83
Table 77 – Attributes of Standard::DayType	83
Table 78 – Attributes of Standard::Disconnecter	84
Table 79 – Association ends of Standard::Disconnecter with other classes	84
Table 80 – Attributes of Standard::Discrete	85
Table 81 – Association ends of Standard::Discrete with other classes	85
Table 82 – Attributes of Standard::DiscreteValue	85
Table 83 – Association ends of Standard::DiscreteValue with other classes	86
Table 84 – Attributes of Standard::EarthFaultCompensator	86
Table 85 – Association ends of Standard::EarthFaultCompensator with other classes	86
Table 86 – Attributes of Standard::EnergyArea	87
Table 87 – Attributes of Standard::EnergyConsumer	87

Table 88 – Association ends of Standard::EnergyConsumer with other classes.....	87
Table 89 – Attributes of Standard::EnergyConsumerPhase	88
Table 90 – Association ends of Standard::EnergyConsumerPhase with other classes	88
Table 91 – Attributes of Standard::EnergySource.....	88
Table 92 – Association ends of Standard::EnergySource with other classes	89
Table 93 – Attributes of Standard::Equipment	89
Table 94 – Association ends of Standard::Equipment with other classes.....	90
Table 95 – Attributes of Standard::EquipmentContainer	90
Table 96 – Association ends of Standard::EquipmentContainer with other classes	90
Table 97 – Attributes of Standard::EquivalentEquipment.....	91
Table 98 – Association ends of Standard::EquivalentEquipment with other classes.....	91
Table 99 – Attributes of Standard::EquivalentInjection	91
Table 100 – Association ends of Standard::EquivalentInjection with other classes	92
Table 101 – Attributes of Standard::ExternalNetworkInjection	92
Table 102 – Association ends of Standard::ExternalNetworkInjection with other classes	92
Table 103 – Attributes of Standard::FaultIndicator	93
Table 104 – Association ends of Standard::FaultIndicator with other classes	93
Table 105 – Attributes of Standard::Feeder.....	93
Table 106 – Association ends of Standard::Feeder with other classes	94
Table 107 – Attributes of Standard::Fuse	94
Table 108 – Association ends of Standard::Fuse with other classes.....	95
Table 109 – Attributes of Standard::GeneratingUnit	95
Table 110 – Association ends of Standard::GeneratingUnit with other classes	95
Table 111 – Attributes of Standard::GeographicalRegion	96
Table 112 – Attributes of Standard::Ground	96
Table 113 – Association ends of Standard::Ground with other classes	96
Table 114 – Attributes of Standard::GroundDisconnecter	97
Table 115 – Association ends of Standard::GroundDisconnecter with other classes.....	97
Table 116 – Attributes of Standard::GroundingImpedance	97
Table 117 – Association ends of Standard::GroundingImpedance with other classes	98
Table 118 – Attributes of Standard::HydroGeneratingUnit.....	98
Table 119 – Association ends of Standard::HydroGeneratingUnit with other classes.....	98
Table 120 – Attributes of Standard::HydroPowerPlant.....	99
Table 121 – Association ends of Standard::HydroPowerPlant with other classes	99
Table 122 – Attributes of Standard::HydroPump.....	99
Table 123 – Association ends of Standard::HydroPump with other classes	100
Table 124 – Attributes of Standard::IdentifiedObject	100
Table 125 – Attributes of Standard::Jumper	101
Table 126 – Association ends of Standard::Jumper with other classes.....	101
Table 127 – Attributes of Standard::Junction.....	102
Table 128 – Association ends of Standard::Junction with other classes	102
Table 129 – Attributes of Standard::Limit	102
Table 130 – Attributes of Standard::LimitSet	103

Table 131 – Attributes of Standard::Line	103
Table 132 – Association ends of Standard::Line with other classes	103
Table 133 – Attributes of Standard::LinearShuntCompensator	104
Table 134 – Association ends of Standard::LinearShuntCompensator with other classes	104
Table 135 – Attributes of Standard::LoadArea	104
Table 136 – Attributes of Standard::LoadBreakSwitch	105
Table 137 – Association ends of Standard::LoadBreakSwitch with other classes	105
Table 138 – Attributes of Standard::LoadGroup	105
Table 139 – Association ends of Standard::LoadGroup with other classes	106
Table 140 – Attributes of Standard::Measurement	107
Table 141 – Association ends of Standard::Measurement with other classes	107
Table 142 – Attributes of Standard::MeasurementValue	107
Table 143 – Association ends of Standard::MeasurementValue with other classes	108
Table 144 – Attributes of Standard::MeasurementValueSource	108
Table 145 – Attributes of Standard::Name	108
Table 146 – Association ends of Standard::Name with other classes	108
Table 147 – Attributes of Standard::NameType	109
Table 148 – Association ends of Standard::NameType with other classes	109
Table 149 – Attributes of Standard::NameTypeAuthority	109
Table 150 – Attributes of Standard::NonConformLoad	110
Table 151 – Association ends of Standard::NonConformLoad with other classes	110
Table 152 – Attributes of Standard::NonConformLoadGroup	110
Table 153 – Association ends of Standard::NonConformLoadGroup with other classes	110
Table 154 – Attributes of Standard::NonConformLoadSchedule	111
Table 155 – Association ends of Standard::NonConformLoadSchedule with other classes	111
Table 156 – Attributes of Standard::NonlinearShuntCompensator	111
Table 157 – Association ends of Standard::NonlinearShuntCompensator with other classes	112
Table 158 – Attributes of Standard::OperatingShare	112
Table 159 – Association ends of Standard::OperatingShare with other classes	112
Table 160 – Attributes of Standard::OperationalLimit	113
Table 161 – Association ends of Standard::OperationalLimit with other classes	113
Table 162 – Attributes of Standard::OperationalLimitSet	113
Table 163 – Association ends of Standard::OperationalLimitSet with other classes	114
Table 164 – Attributes of Standard::OperationalLimitType	114
Table 165 – Association ends of Standard::OperationalLimitType with other classes	114
Table 166 – Attributes of Standard::PetersenCoil	115
Table 167 – Association ends of Standard::PetersenCoil with other classes	115
Table 168 – Attributes of Standard::ProtectionEquipment	115
Table 169 – Association ends of Standard::ProtectionEquipment with other classes	116
Table 170 – Attributes of Standard::PSRType	116
Table 171 – Attributes of Standard::PostLineSensor	116

Table 172 – Association ends of Standard::PostLineSensor with other classes	117
Table 173 – Attributes of Standard::PotentialTransformer	117
Table 174 – Association ends of Standard::PotentialTransformer with other classes	117
Table 175 – Attributes of Standard::PowerSystemResource.....	118
Table 176 – Association ends of Standard::PowerSystemResource with other classes	118
Table 177 – Attributes of Standard::PowerTransformer	120
Table 178 – Association ends of Standard::PowerTransformer with other classes.....	120
Table 179 – Attributes of Standard::PowerTransformerEnd.....	121
Table 180 – Association ends of Standard::PowerTransformerEnd with other classes.....	121
Table 181 – Attributes of Standard::ProtectedSwitch.....	122
Table 182 – Association ends of Standard::ProtectedSwitch with other classes	122
Table 183 – Attributes of Standard::PSREvent.....	122
Table 184 – Association ends of Standard::PSREvent with other classes.....	123
Table 185 – Attributes of Standard::RaiseLowerCommand.....	123
Table 186 – Association ends of Standard::RaiseLowerCommand with other classes	123
Table 187 – Attributes of Standard::RatioTapChanger	124
Table 188 – Association ends of Standard::RatioTapChanger with other classes	124
Table 189 – Attributes of Standard::Recloser	124
Table 190 – Association ends of Standard::Recloser with other classes.....	125
Table 191 – Attributes of Standard::RegularIntervalSchedule.....	125
Table 192 – Attributes of Standard::RegularTimePoint.....	125
Table 193 – Association ends of Standard::RegularTimePoint with other classes.....	126
Table 194 – Attributes of Standard::RegulatingCondEq.....	126
Table 195 – Association ends of Standard::RegulatingCondEq with other classes	126
Table 196 – Attributes of Standard::RegulatingControl.....	127
Table 197 – Association ends of Standard::RegulatingControl with other classes.....	127
Table 198 – Attributes of Standard::RegulationSchedule.....	128
Table 199 – Association ends of Standard::RegulationSchedule with other classes	128
Table 200 – Attributes of Standard::RemoteControl	128
Table 201 – Association ends of Standard::RemoteControl with other classes	128
Table 202 – Attributes of Standard::RemotePoint.....	129
Table 203 – Attributes of Standard::ReportingGroup	129
Table 204 – Attributes of Standard::RotatingMachine.....	129
Table 205 – Association ends of Standard::RotatingMachine with other classes	130
Table 206 – Attributes of Standard::Season.....	130
Table 207 – Attributes of Standard::SeasonDayTypeSchedule.....	131
Table 208 – Association ends of Standard::SeasonDayTypeSchedule with other classes	131
Table 209 – Attributes of Standard::Sectionaliser.....	131
Table 210 – Association ends of Standard::Sectionaliser with other classes	132
Table 211 – Attributes of Standard::Sensor.....	132
Table 212 – Association ends of Standard::Sensor with other classes	132
Table 213 – Attributes of Standard::SetPoint	133

Table 214 – Association ends of Standard::SetPoint with other classes	133
Table 215 – Attributes of Standard::ShuntCompensator	133
Table 216 – Association ends of Standard::ShuntCompensator with other classes.....	134
Table 217 – Attributes of Standard::SolarGeneratingUnit	134
Table 218 – Association ends of Standard::SolarGeneratingUnit with other classes	134
Table 219 – Attributes of Standard::StaticVarCompensator.....	135
Table 220 – Association ends of Standard::StaticVarCompensator with other classes.....	135
Table 221 – Attributes of Standard::StationSupply	136
Table 222 – Association ends of Standard::StationSupply with other classes	136
Table 223 – Attributes of Standard::StringMeasurement	136
Table 224 – Association ends of Standard::StringMeasurement with other classes	137
Table 225 – Attributes of Standard::StringMeasurementValue.....	137
Table 226 – Association ends of Standard::StringMeasurementValue with other classes	137
Table 227 – Attributes of Standard::SubGeographicalRegion	137
Table 228 – Association ends of Standard::SubGeographicalRegion with other classes.....	138
Table 229 – Attributes of Standard::SubLoadArea.....	138
Table 230 – Association ends of Standard::SubLoadArea with other classes	138
Table 231 – Attributes of Standard::Substation	138
Table 232 – Association ends of Standard::Substation with other classes	139
Table 233 – Attributes of Standard::SurgeArrester	139
Table 234 – Association ends of Standard::SurgeArrester with other classes.....	139
Table 235 – Attributes of Standard::Switch	140
Table 236 – Association ends of Standard::Switch with other classes	140
Table 237 – Attributes of Standard::SwitchPhase.....	141
Table 238 – Association ends of Standard::SwitchPhase with other classes	141
Table 239 – Attributes of Standard::SwitchSchedule	142
Table 240 – Association ends of Standard::SwitchSchedule with other classes.....	142
Table 241 – Attributes of Standard::SynchronousMachine	142
Table 242 – Association ends of Standard::SynchronousMachine with other classes	143
Table 243 – Attributes of Standard::TapChanger	143
Table 244 – Association ends of Standard::TapChanger with other classes	143
Table 245 – Attributes of Standard::TapChangerControl	144
Table 246 – Association ends of Standard::TapChangerControl with other classes	144
Table 247 – Attributes of Standard::TapSchedule	144
Table 248 – Association ends of Standard::TapSchedule with other classes	145
Table 249 – Attributes of Standard::Terminal	145
Table 250 – Association ends of Standard::Terminal with other classes.....	145
Table 251 – Attributes of Standard::ThermalGeneratingUnit.....	146
Table 252 – Association ends of Standard::ThermalGeneratingUnit with other classes	146
Table 253 – Attributes of Standard::TransformerEnd.....	146
Table 254 – Association ends of Standard::TransformerEnd with other classes	147
Table 255 – Attributes of Standard::ValueAliasSet	147
Table 256 – Attributes of Standard::ValueToAlias	147

Table 257 – Association ends of Standard::ValueToAlias with other classes	147
Table 258 – Attributes of Standard::VoltageLevel.....	148
Table 259 – Association ends of Standard::VoltageLevel with other classes	148
Table 260 – Attributes of Standard::VoltageLimit	148
Table 261 – Association ends of Standard::VoltageLimit with other classes	149
Table 262 – Attributes of Standard::VsConverter	149
Table 263 – Association ends of Standard::VsConverter with other classes	149
Table 264 – Attributes of Standard::WaveTrap.....	150
Table 265 – Association ends of Standard::WaveTrap with other classes.....	150
Table 266 – Attributes of Standard::WindGeneratingUnit	150
Table 267 – Association ends of Standard::WindGeneratingUnit with other classes	151
Table 268 – Attributes of Standard::ACDCCConverter	154
Table 269 – Attributes of Standard::ACLLineSegment.....	155
Table 270 – Attributes of Standard::ACLLineSegmentPhase	155
Table 271 – Association ends of Standard::ACLLineSegmentPhase with other classes.....	155
Table 272 – Attributes of Standard::Breaker	156
Table 273 – Attributes of Standard::BusbarSection	156
Table 274 – Attributes of Standard::ConductingEquipment.....	156
Table 275 – Attributes of Standard::Conductor.....	157
Table 276 – Attributes of Standard::ConformLoad.....	157
Table 277 – Association ends of Standard::ConformLoad with other classes.....	157
Table 278 – Attributes of Standard::Connector.....	157
Table 279 – Attributes of Standard::CsConverter	158
Table 280 – Attributes of Standard::Curve	158
Table 281 – Attributes of Standard::CurveData	158
Table 282 – Association ends of Standard::CurveData with other classes.....	158
Table 283 – Attributes of Standard::Disconnecter	159
Table 284 – Attributes of Standard::EarthFaultCompensator.....	159
Table 285 – Attributes of Standard::EnergyConsumer	160
Table 286 – Association ends of Standard::EnergyConsumer with other classes.....	160
Table 287 – Attributes of Standard::EnergySource.....	160
Table 288 – Attributes of Standard::Equipment	161
Table 289 – Attributes of Standard::EquivalentEquipment.....	161
Table 290 – Attributes of Standard::EquivalentInjection	161
Table 291 – Attributes of Standard::ExternalNetworkInjection	162
Table 292 – Attributes of Standard::Fuse	162
Table 293 – Attributes of Standard::GeneratingUnit	163
Table 294 – Attributes of Standard::GroundDisconnecter.....	163
Table 295 – Attributes of Standard::GroundingImpedance	164
Table 296 – Attributes of Standard::HydroGeneratingUnit.....	164
Table 297 – Attributes of Standard::IdentifiedObject	164
Table 298 – Attributes of Standard::Jumper	165
Table 299 – Attributes of Standard::LinearShuntCompensator	165

Table 300 – Attributes of Standard::LoadBreakSwitch.....	165
Table 301 – Attributes of Standard::LoadResponseCharacteristic	166
Table 302 – Attributes of Standard::Name.....	167
Table 303 – Association ends of Standard::Name with other classes	167
Table 304 – Attributes of Standard::NonConformLoad.....	168
Table 305 – Association ends of Standard::NonConformLoad with other classes	168
Table 306 – Attributes of Standard::PowerSystemResource.....	168
Table 307 – Attributes of Standard::PetersenCoil.....	169
Table 308 – Attributes of Standard::PowerTransformerEnd.....	170
Table 309 – Attributes of Standard::ProtectedSwitch.....	170
Table 310 – Attributes of Standard::RatioTapChanger	171
Table 311 – Attributes of Standard::Recloser	171
Table 312 – Attributes of Standard::RegulatingCondEq.....	172
Table 313 – Attributes of Standard::RotatingMachine.....	172
Table 314 – Attributes of Standard::Sectionaliser.....	172
Table 315 – Attributes of Standard::ShuntCompensator	173
Table 316 – Attributes of Standard::SolarGeneratingUnit	173
Table 317 – Attributes of Standard::StaticVarCompensator.....	174
Table 318 – Attributes of Standard::StationSupply	174
Table 319 – Association ends of Standard::StationSupply with other classes	174
Table 320 – Attributes of Standard::Switch	175
Table 321 – Attributes of Standard::SwitchPhase.....	175
Table 322 – Association ends of Standard::SwitchPhase with other classes	175
Table 323 – Attributes of Standard::SynchronousMachine	176
Table 324 – Attributes of Standard::TapChanger	176
Table 325 – Attributes of Standard::TapChangerControl	177
Table 326 – Attributes of Standard::ThermalGeneratingUnit.....	177
Table 327 – Attributes of Standard::TransformerEnd.....	178
Table 328 – Attributes of Standard::VoltageLevel.....	178
Table 329 – Attributes of Standard::VsConverter	178
Table 330 – Association ends of Standard::VsConverter with other classes	179
Table 331 – Attributes of Standard::VsCapabilityCurve	179
Table 332 – Attributes of Standard::WindGeneratingUnit	179
Table 333 – Attributes of Standard::ACDCTerminal.....	182
Table 334 – Attributes of Standard::BaseVoltage	182
Table 335 – Attributes of Standard::ConnectivityNode	182
Table 336 – Association ends of Standard::ConnectivityNode with other classes	183
Table 337 – Attributes of Standard::ConnectivityNodeContainer	183
Table 338 – Attributes of Standard::IdentifiedObject	183
Table 339 – Attributes of Standard::Name.....	184
Table 340 – Association ends of Standard::Name with other classes	184
Table 341 – Attributes of Standard::NameType	184
Table 342 – Association ends of Standard::NameType with other classes.....	185

Table 343 – Attributes of Standard::NameTypeAuthority	185
Table 344 – Attributes of Standard::Terminal	185
Table 345 – Association ends of Standard::Terminal with other classes	185
Table 346 – Attributes of Standard::TopologicalNode.....	186
Table 347 – Association ends of Standard::TopologicalNode with other classes	186
Table 348 – Attributes of Standard::AsynchronousMachine.....	189
Table 349 – Attributes of Standard::Breaker	189
Table 350 – Attributes of Standard::ConformLoad.....	190
Table 351 – Attributes of Standard::Cut	190
Table 352 – Attributes of Standard::Disconnecter	190
Table 353 – Attributes of Standard::EnergyConsumer	191
Table 354 – Attributes of Standard::EnergyConsumerPhase	191
Table 355 – Attributes of Standard::EnergySource.....	192
Table 356 – Attributes of Standard::Equipment	192
Table 357 – Attributes of Standard::EquivalentInjection	192
Table 358 – Attributes of Standard::Fuse	193
Table 359 – Attributes of Standard::GroundDisconnecter	193
Table 360 – Attributes of Standard::IdentifiedObject	193
Table 361 – Attributes of Standard::Jumper	194
Table 362 – Attributes of Standard::LinearShuntCompensator	194
Table 363 – Attributes of Standard::LoadBreakSwitch.....	194
Table 364 – Attributes of Standard::NonConformLoad.....	195
Table 365 – Attributes of Standard::RatioTapChanger	195
Table 366 – Attributes of Standard::Recloser	195
Table 367 – Attributes of Standard::RegulatingCondEq.....	196
Table 368 – Attributes of Standard::RegulatingControl.....	196
Table 369 – Attributes of Standard::RotatingMachine.....	197
Table 370 – Attributes of Standard::Sectionaliser.....	197
Table 371 – Attributes of Standard::ShuntCompensator	198
Table 372 – Attributes of Standard::StationSupply	198
Table 373 – Attributes of Standard::Switch	198
Table 374 – Attributes of Standard::SynchronousMachine	199
Table 375 – Attributes of Standard::TapChanger	199
Table 376 – Attributes of Standard::TapChangerControl	200
Table 377 – Attributes of Standard::SvInjection.....	203
Table 378 – Association ends of Standard::SvInjection with other classes	203
Table 379 – Attributes of Standard::SvPowerFlow.....	204
Table 380 – Association ends of Standard::SvPowerFlow with other classes	204
Table 381 – Attributes of Standard::SvShuntCompensatorSections.....	204
Table 382 – Association ends of Standard::SvShuntCompensatorSections with other classes	204
Table 383 – Attributes of Standard::SvStatus.....	205
Table 384 – Association ends of Standard::SvStatus with other classes	205

Table 385 – Attributes of Standard::SvTapStep.....	205
Table 386 – Association ends of Standard::SvTapStep with other classes	205
Table 387 – Attributes of Standard::SvVoltage	205
Table 388 – Association ends of Standard::SvVoltage with other classes.....	206
Table 389 – Attributes of Standard::CoordinateSystem	207
Table 390 – Attributes of Standard::IdentifiedObject	208
Table 391 – Attributes of Standard::Location	208
Table 392 – Association ends of Standard::Location with other classes	209
Table 393 – Attributes of Standard::PositionPoint	209
Table 394 – Association ends of Standard::PositionPoint with other classes	209
Table 395 – Attributes of Standard::ServiceLocation.....	210
Table 396 – Association ends of Standard::ServiceLocation with other classes.....	210
Table 397 – Attributes of Standard::Diagram.....	212
Table 398 – Association ends of Standard::Diagram with other classes	212
Table 399 – Attributes of Standard::DiagramObject.....	213
Table 400 – Association ends of Standard::DiagramObject with other classes	213
Table 401 – Attributes of Standard::DiagramObjectPoint.....	214
Table 402 – Association ends of Standard::DiagramObjectPoint with other classes	214
Table 403 – Attributes of Standard::DiagramObjectStyle.....	214
Table 404 – Attributes of Standard::DiagramStyle	214
Table 405 – Attributes of Standard::IdentifiedObject	215
Table 406 – Attributes of Standard::TextDiagramObject.....	215
Table 407 – Association ends of Standard::TextDiagramObject with other classes.....	215
Table 408 – Attributes of Standard::VisibilityLayer	216
Table 409 – Association ends of Standard::VisibilityLayer with other classes	216
Table 410 – Attributes of Standard::Asset	219
Table 411 – Association ends of Standard::Asset with other classes.....	220
Table 412 – Attributes of Standard::AssetContainer	220
Table 413 – Association ends of Standard::AssetContainer with other classes.....	221
Table 414 – Attributes of Standard::AssetDeployment.....	221
Table 415 – Association ends of Standard::AssetDeployment with other classes	221
Table 416 – Attributes of Standard::AssetOrganisationRole	222
Table 417 – Association ends of Standard::AssetOrganisationRole with other classes	222
Table 418 – Attributes of Standard::AssetOwner	222
Table 419 – Association ends of Standard::AssetOwner with other classes.....	222
Table 420 – Attributes of Standard::AssetUser.....	223
Table 421 – Association ends of Standard::AssetUser with other classes	223
Table 422 – Attributes of Standard::IdentifiedObject	223
Table 423 – Attributes of Standard::Organisation	224
Table 424 – Attributes of Standard::OrganisationRole.....	224
Table 425 – Association ends of Standard::OrganisationRole with other classes.....	224
Table 426 – Attributes of Standard::Ownership	225
Table 427 – Association ends of Standard::Ownership with other classes	225

Table 428 – Association ends of Standard::PowerSystemResource with other classes	225
Table 429 – Attributes of Standard::Structure	226
Table 430 – Association ends of Standard::Structure with other classes	226
Table 431 – Attributes of Standard::StructureSupport	227
Table 432 – Association ends of Standard::StructureSupport with other classes	227
Table 433 – Attributes of Standard::AssetInfo	234
Table 434 – Attributes of Standard::BusbarSectionInfo	234
Table 435 – Attributes of Standard::CableInfo	234
Table 436 – Attributes of Standard::CatalogAssetType	235
Table 437 – Association ends of Standard::CatalogAssetType with other classes	235
Table 438 – Attributes of Standard::CurrentTransformerInfo	235
Table 439 – Attributes of Standard::EndDeviceInfo	236
Table 440 – Attributes of Standard::IdentifiedObject	236
Table 441 – Attributes of Standard::Manufacturer	237
Table 442 – Association ends of Standard::Manufacturer with other classes	237
Table 443 – Attributes of Standard::Name	237
Table 444 – Association ends of Standard::Name with other classes	237
Table 445 – Attributes of Standard::NameType	238
Table 446 – Association ends of Standard::NameType with other classes	238
Table 447 – Attributes of Standard::NameTypeAuthority	238
Table 448 – Attributes of Standard::NoLoadTest	239
Table 449 – Association ends of Standard::NoLoadTest with other classes	239
Table 450 – Attributes of Standard::OperatingParticipant	239
Table 451 – Association ends of Standard::OperatingParticipant with other classes	239
Table 452 – Attributes of Standard::Organisation	240
Table 453 – Association ends of Standard::Organisation with other classes	240
Table 454 – Attributes of Standard::OrganisationRole	240
Table 455 – Association ends of Standard::OrganisationRole with other classes	240
Table 456 – Attributes of Standard::OverheadWireInfo	241
Table 457 – Attributes of Standard::ParentOrganization	241
Table 458 – Association ends of Standard::ParentOrganization with other classes	241
Table 459 – Attributes of Standard::PerLengthImpedance	242
Table 460 – Association ends of Standard::PerLengthImpedance with other classes	242
Table 461 – Attributes of Standard::PerLengthLineParameter	242
Table 462 – Association ends of Standard::PerLengthLineParameter with other classes	242
Table 463 – Attributes of Standard::PerLengthPhaseImpedance	243
Table 464 – Association ends of Standard::PerLengthPhaseImpedance with other classes	243
Table 465 – Attributes of Standard::PerLengthSequenceImpedance	243
Table 466 – Association ends of Standard::PerLengthSequenceImpedance with other classes	244
Table 467 – Attributes of Standard::PhaseImpedanceData	244
Table 468 – Association ends of Standard::PhaseImpedanceData with other classes	244
Table 469 – Attributes of Standard::PowerTransformerInfo	244

Table 470 – Attributes of Standard::ProductAssetModel.....	245
Table 471 – Association ends of Standard::ProductAssetModel with other classes	245
Table 472 – Attributes of Standard::ShortCircuitTest.....	245
Table 473 – Association ends of Standard::ShortCircuitTest with other classes	246
Table 474 – Attributes of Standard::ShuntCompensatorInfo	246
Table 475 – Association ends of Standard::ShuntCompensatorInfo with other classes.....	246
Table 476 – Attributes of Standard::SwitchInfo.....	247
Table 477 – Attributes of Standard::TapChangerInfo.....	247
Table 478 – Attributes of Standard::TransformerEndInfo.....	248
Table 479 – Association ends of Standard::TransformerEndInfo with other classes.....	248
Table 480 – Attributes of Standard::TransformerTankInfo	249
Table 481 – Association ends of Standard::TransformerTankInfo with other classes	249
Table 482 – Attributes of Standard::TransformerTest	249
Table 483 – Attributes of Standard::WireAssemblyInfo.....	249
Table 484 – Attributes of Standard::WireInfo.....	250
Table 485 – Association ends of Standard::WireInfo with other classes	250
Table 486 – Attributes of Standard::WirePhaseInfo	250
Table 487 – Association ends of Standard::WirePhaseInfo with other classes.....	250
Table 488 – Attributes of Standard::WirePosition	251
Table 489 – Association ends of Standard::WirePosition with other classes.....	251
Table 490 – Attributes of Standard::WireSpacingInfo	251
Table 491 – Attributes of Standard::WorkLocation	253
Table 492 – Association ends of Standard::WorkLocation with other classes	254
Table 493 – Attributes of Standard::PowerSystemResource.....	254
Table 494 – Attributes of Standard::Agreement.....	254
Table 495 – Attributes of Standard::ConductingEquipment.....	255
Table 496 – Attributes of Standard::CustomerAgreement.....	255
Table 497 – Association ends of Standard::CustomerAgreement with other classes.....	255
Table 498 – Attributes of Standard::EnergyConsumer	255
Table 499 – Attributes of Standard::EnergySource.....	256
Table 500 – Attributes of Standard::EquivalentInjection	256
Table 501 – Attributes of Standard::Document	256
Table 502 – Attributes of Standard::IdentifiedObject	257
Table 503 – Attributes of Standard::Location	257
Table 504 – Association ends of Standard::Location with other classes	257
Table 505 – Attributes of Standard::PricingStructure.....	258
Table 506 – Attributes of Standard::ServiceLocation	258
Table 507 – Association ends of Standard::ServiceLocation with other classes.....	258
Table 508 – Literals of CIMEnumerations::AsynchronousMachineKind.....	262
Table 509 – Literals of CIMEnumerations::OrientationKind.....	262
Table 510 – Literals of CIMEnumerations::AnchorKind.....	262
Table 511 – Literals of CIMEnumerations::UndergroundStructureKind	263
Table 512 – Literals of CIMEnumerations::WindGenUnitKind	263

Table 513 – Literals of CIMEnumerations::SinglePhaseKind	263
Table 514 – Literals of CIMEnumerations::PetersenCoilModeKind	264
Table 515 – Literals of CIMEnumerations::SynchronousMachineKind	264
Table 516 – Literals of CIMEnumerations::UnitSymbol	264
Table 517 – Literals of CIMEnumerations::StructureSupportKind	269
Table 518 – Literals of CIMEnumerations::WireMaterialKind	270
Table 519 – Literals of CIMEnumerations::WindingConnection.....	270
Table 520 – Literals of CIMEnumerations::TransformerControlMode	270
Table 521 – Literals of CIMEnumerations::GeneratorControlSource.....	271
Table 522 – Literals of CIMEnumerations::WireUsageKind.....	271
Table 523 – Literals of CIMEnumerations::InUseStateKind	271
Table 524 – Literals of CIMEnumerations::PhaseCode.....	272
Table 525 – Literals of CIMEnumerations::SVCControlMode	272
Table 526 – Literals of CIMEnumerations::StructureMaterialKind	273
Table 527 – Literals of CIMEnumerations::CurveStyle.....	273
Table 528 – Literals of CIMEnumerations::DeploymentStateKind	273
Table 529 – Literals of CIMEnumerations::UnitMultiplier	274
Table 530 – Literals of CIMEnumerations::RegulatingControlModeKind	274
Table 531 – Literals of CIMEnumerations::RetiredReasonKind.....	275
Table 532 – Literals of CIMEnumerations::AssetLifecycleStateKind	275
Table 533 – Literals of CIMEnumerations::PSREventKind.....	276
Table 534 – Literals of CIMEnumerations::Source.....	276
Table 535 – Literals of CIMEnumerations::AssetKind	276
Table 536 – Literals of CIMEnumerations::OperationalLimitDirectionKind	277
Table 537 – Literals of CIMEnumerations::BusbarConfiguration	277
Table 538 – Literals of CIMEnumerations::CableShieldMaterialKind	277
Table 539 – Literals of CIMEnumerations::AssetModelUsageKind.....	278
Table 540 – Literals of CIMEnumerations::WireInsulationKind	278
Table 541 – Literals of CIMEnumerations::SynchronousMachineOperatingMode.....	279
Table 542 – Literals of CIMEnumerations::CableOuterJacketKind	279
Table 543 – Literals of CIMEnumerations::CableConstructionKind	279
Table 544 – Literals of CIMEnumerations::HydroPlantStorageKind	280
Table 545 – Literals of CIMEnumerations::BreakerConfiguration.....	280
Table B.1 – Attributes of Standard::ACDCConverter	292
Table B.2 – Association ends of Standard::ACDCConverter with other classes	292
Table B.3 – Attributes of Standard::ACLLineSegment	293
Table B.4 – Association ends of Standard::ACLLineSegment with other classes	293
Table B.5 – Attributes of Standard::AuxiliaryEquipment	293
Table B.6 – Association ends of Standard::AuxiliaryEquipment with other classes	293
Table B.7 – Attributes of Standard::Bay	294
Table B.8 – Association ends of Standard::Bay with other classes	294
Table B.9 – Attributes of Standard::Breaker	294
Table B.10 – Association ends of Standard::Breaker with other classes.....	294

Table B.11 – Attributes of Standard::BusbarSection.....	294
Table B.12 – Association ends of Standard::BusbarSection with other classes	295
Table B.13 – Attributes of Standard::Clamp	295
Table B.14 – Association ends of Standard::Clamp with other classes	295
Table B.15 – Attributes of Standard::ConductingEquipment	295
Table B.16 – Association ends of Standard::ConductingEquipment with other classes	295
Table B.17 – Attributes of Standard::Conductor	296
Table B.18 – Association ends of Standard::Conductor with other classes	296
Table B.19 – Attributes of Standard::ConformLoad	296
Table B.20 – Association ends of Standard::ConformLoad with other classes	296
Table B.21 – Attributes of Standard::Connector	296
Table B.22 – Association ends of Standard::Connector with other classes	297
Table B.23 – Attributes of Standard::CsConverter.....	297
Table B.24 – Association ends of Standard::CsConverter with other classes.....	297
Table B.25 – Attributes of Standard::CurrentTransformer.....	297
Table B.26 – Association ends of Standard::CurrentTransformer with other classes.....	297
Table B.27 – Attributes of Standard::Cut.....	298
Table B.28 – Association ends of Standard::Cut with other classes.....	298
Table B.29 – Attributes of Standard::Disconnecter	298
Table B.30 – Association ends of Standard::Disconnecter with other classes.....	298
Table B.31 – Attributes of Standard::EarthFaultCompensator	299
Table B.32 – Association ends of Standard::EarthFaultCompensator with other classes	299
Table B.33 – Attributes of Standard::EnergyConsumer	299
Table B.34 – Association ends of Standard::EnergyConsumer with other classes	299
Table B.35 – Attributes of Standard::EnergySource	300
Table B.36 – Association ends of Standard::EnergySource with other classes	300
Table B.37 – Attributes of Standard::Equipment.....	300
Table B.38 – Association ends of Standard::Equipment with other classes.....	300
Table B.39 – Association ends of Standard::EquipmentContainer with other classes	300
Table B.40 – Attributes of Standard::EquivalentEquipment	301
Table B.41 – Association ends of Standard::EquivalentEquipment with other classes	301
Table B.42 – Attributes of Standard::EquivalentInjection	301
Table B.43 – Association ends of Standard::EquivalentInjection with other classes.....	301
Table B.44 – Attributes of Standard::ExternalNetworkInjection.....	301
Table B.45 – Association ends of Standard::ExternalNetworkInjection with other classes	302
Table B.46 – Attributes of Standard::FaultIndicator	302
Table B.47 – Association ends of Standard::FaultIndicator with other classes	302
Table B.48 – Attributes of Standard::Feeder	302
Table B.49 – Association ends of Standard::Feeder with other classes	302
Table B.50 – Attributes of Standard::Fuse.....	303
Table B.51 – Association ends of Standard::Fuse with other classes	303
Table B.52 – Attributes of Standard::GeneratingUnit.....	303

Table B.53 – Association ends of Standard::GeneratingUnit with other classes.....	303
Table B.54 – Attributes of Standard::Ground.....	304
Table B.55 – Association ends of Standard::Ground with other classes	304
Table B.56 – Attributes of Standard::GroundDisconnector.....	304
Table B.57 – Association ends of Standard::GroundDisconnector with other classes	304
Table B.58 – Attributes of Standard::GroundingImpedance	304
Table B.59 – Association ends of Standard::GroundingImpedance with other classes	304
Table B.60 – Attributes of Standard::HydroGeneratingUnit.....	305
Table B.61 – Association ends of Standard::HydroGeneratingUnit with other classes	305
Table B.62 – Attributes of Standard::HydroPump	305
Table B.63 – Association ends of Standard::HydroPump with other classes	305
Table B.64 – Attributes of Standard::Jumper.....	305
Table B.65 – Association ends of Standard::Jumper with other classes	306
Table B.66 – Attributes of Standard::Junction	306
Table B.67 – Association ends of Standard::Junction with other classes	306
Table B.68 – Attributes of Standard::Line.....	306
Table B.69 – Association ends of Standard::Line with other classes	306
Table B.70 – Attributes of Standard::LinearShuntCompensator	307
Table B.71 – Association ends of Standard::LinearShuntCompensator with other classes	307
Table B.72 – Attributes of Standard::LoadBreakSwitch	307
Table B.73 – Association ends of Standard::LoadBreakSwitch with other classes	307
Table B.74 – Attributes of Standard::NonConformLoad	307
Table B.75 – Association ends of Standard::NonConformLoad with other classes	308
Table B.76 – Attributes of Standard::NonlinearShuntCompensator.....	308
Table B.77 – Association ends of Standard::NonlinearShuntCompensator with other classes	308
Table B.78 – Association ends of Standard::OperationalLimitSet with other classes	308
Table B.79 – Attributes of Standard::OperationalLimitType	309
Table B.80 – Attributes of Standard::PetersenCoil	309
Table B.81 – Association ends of Standard::PetersenCoil with other classes	309
Table B.82 – Attributes of Standard::ProtectionEquipment	309
Table B.83 – Association ends of Standard::ProtectionEquipment with other classes	309
Table B.84 – Attributes of Standard::PostLineSensor	310
Table B.85 – Association ends of Standard::PostLineSensor with other classes.....	310
Table B.86 – Attributes of Standard::PotentialTransformer.....	310
Table B.87 – Association ends of Standard::PotentialTransformer with other classes	310
Table B.88 – Attributes of Standard::PowerTransformer.....	311
Table B.89 – Association ends of Standard::PowerTransformer with other classes	312
Table B.90 – Attributes of Standard::ProtectedSwitch	312
Table B.91 – Association ends of Standard::ProtectedSwitch with other classes	312
Table B.92 – Attributes of Standard::Recloser.....	312
Table B.93 – Association ends of Standard::Recloser with other classes	312
Table B.94 – Attributes of Standard::RegulatingCondEq	313

Table B.95 – Association ends of Standard::RegulatingCondEq with other classes	313
Table B.96 – Attributes of Standard::RotatingMachine	313
Table B.97 – Association ends of Standard::RotatingMachine with other classes	313
Table B.98 – Attributes of Standard::Sectionaliser	313
Table B.99 – Association ends of Standard::Sectionaliser with other classes	314
Table B.100 – Attributes of Standard::Sensor	314
Table B.101 – Association ends of Standard::Sensor with other classes	314
Table B.102 – Attributes of Standard::ShuntCompensator.....	314
Table B.103 – Association ends of Standard::ShuntCompensator with other classes	314
Table B.104 – Attributes of Standard::SolarGeneratingUnit.....	315
Table B.105 – Association ends of Standard::SolarGeneratingUnit with other classes.....	315
Table B.106 – Attributes of Standard::StaticVarCompensator	315
Table B.107 – Association ends of Standard::StaticVarCompensator with other classes	315
Table B.108 – Attributes of Standard::StationSupply	316
Table B.109 – Association ends of Standard::StationSupply with other classes.....	316
Table B.110 – Attributes of Standard::Substation	316
Table B.111 – Association ends of Standard::Substation with other classes.....	316
Table B.112 – Attributes of Standard::SurgeArrester.....	317
Table B.113 – Association ends of Standard::SurgeArrester with other classes	317
Table B.114 – Attributes of Standard::Switch	317
Table B.115 – Association ends of Standard::Switch with other classes.....	317
Table B.116 – Attributes of Standard::SynchronousMachine	317
Table B.117 – Association ends of Standard::SynchronousMachine with other classes	318
Table B.118 – Attributes of Standard::ThermalGeneratingUnit	318
Table B.119 – Association ends of Standard::ThermalGeneratingUnit with other classes	318
Table B.120 – Attributes of Standard::VoltageLevel	318
Table B.121 – Association ends of Standard::VoltageLevel with other classes	318
Table B.122 – Attributes of Standard::VsConverter	319
Table B.123 – Association ends of Standard::VsConverter with other classes.....	319
Table B.124 – Attributes of Standard::WaveTrap	319
Table B.125 – Association ends of Standard::WaveTrap with other classes	319
Table B.126 – Attributes of Standard::WindGeneratingUnit	319
Table B.127 – Association ends of Standard::WindGeneratingUnit with other classes.....	320
Table B.128 – Attributes of (Informative) InfIEC61970::WeatherStation.....	320
Table B.129 – Association ends of (Informative) InfIEC61970:: WeatherStation with other classes	321
Table B.130 – Attributes of (Informative) InfNEKExtensions::ACLLineSegmentSpan.....	323
Table B.131 – Association ends of (Informative) InfNEKExtensions::ACLLineSegmentSpan with other classes	323
Table B.132 – Attributes of (Informative) InfNEKExtensions::CurrentTransformerPhase.....	323
Table B.133 – Association ends of (Informative) InfNEKExtensions::CurrentTransformerPhase with other classes	324
Table B.134 – Attributes of (Informative) InfNEKExtensions::Station	324

Table B.135 – Attributes of (Informative) InfEntsoeExtensions::RateTemperature	325
Table B.136 – Attributes of Standard::ACLLineSegmentPhase.....	326
Table B.137 – Attributes of Standard::Organisation.....	327
Table B.138 – Attributes of (Informative) InfAssets::UndergroundStructure	327
Table B.139 – Association ends of (Informative) InfAssets:: UndergroundStructure with other classes	328
Table B.140 – Attributes of (Informative) InfCDPSMExtensions::OperationOrganisationRole.....	330
Table B.141 – Association ends of (Informative) InfCDPSMExtensions::OperationOrganisationRole with other classes.....	330
Table B.142 – Attributes of (Informative) InfNEKExtensions::Concessionaire	332
Table B.143 – Association ends of (Informative) InfNEKExtensions:: Concessionaire with other classes	332
Table B.144 – Attributes of Standard::CableInfo	332
Table B.145 – Association ends of Standard::CableInfo with other classes	332
Table B.146 – Association ends of Standard::CatalogAssetType with other classes.....	333
Table B.147 – Attributes of Standard::CurrentTransformerInfo	333
Table B.148 – Attributes of Standard::Organisation.....	333
Table B.149 – Attributes of Standard::OverheadWireInfo	334
Table B.150 – Association ends of Standard::OverheadWireInfo with other classes	334
Table B.151 – Attributes of Standard::ParentOrganization	334
Table B.152 – Attributes of Standard::PowerTransformerInfo	334
Table B.153 – Association ends of Standard::ShuntCompensatorInfo with other classes.....	335
Table B.154 – Attributes of Standard::SwitchInfo	335
Table B.155 – Association ends of Standard::TransformerEndInfo with other classes	335
Table B.156 – Attributes of Standard::WireAssemblyInfo	335
Table B.157 – Attributes of Standard::WireInfo	336
Table B.158 – Association ends of Standard::WireInfo with other classes	336
Table B.159 – Attributes of (Informative) InfIEC61968::ShuntCompensatorControl.....	338
Table B.160 – Attributes of (Informative) InfIEC61968::TypeAssetCatalogue	339
Table B.161 – Attributes of (Informative) InfCDPSMExtensions::OperationOrganisationRole.....	341
Table B.162 – Association ends of (Informative) InfCDPSMExtensions::OperationOrganisationRole with other classes.....	341
Table B.163 – Association ends of (Informative) InfCDPSMExtensions::PowerSystemResource with other classes	341
Table B.164 – Attributes of (Informative) InfNEKExtensions::OverheadEarthWireCollection	343
Table B.165 – Association ends of (Informative) InfNEKExtensions::OverheadEarthWireCollection with other classes	343
Table B.166 – Attributes of (Informative) InfNEKExtensions::OverheadEarthWireType.....	344
Table B.167 – Attributes of (Informative) InfNEKExtensions::UndergroundEarthWireType.....	344
Table B.168 – Attributes of (Informative) InfNEKExtensions::WireEarthInfo.....	344
Table B.169 – Association ends of (Informative) InfNEKExtensions:: WireEarthInfo with other classes	344

Table B.170 – Attributes of (Informative) InfNEKExtensions::WireInfoType	345
Table B.171 – Attributes of Standard::PricingStructure	345
Table B.172 – Literals of EntsoeExtensionsTypes::LimitTypeKind	346
Table B.173 – Literals of NEKnoExtensionsTypes::BusbarConfigurationKind	347
Table B.174 – Literals of NEKnoExtensionsTypes::CableConfigurationKind	348
Table B.175 – Literals of NEKnoExtensionsTypes::CableShieldGroundingKind	348
Table B.176 – Literals of NEKnoExtensionsTypes::SubstationKind	348
Table B.177 – Literals of NEKnoExtensionsTypes::GridKind	349
Table B.178 – Literals of NEKnoExtensionsTypes::EmergencyClassKind	349
Table B.179 – Literals of NEKnoExtensionsTypes::SourceForLineValues	349

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**APPLICATION INTEGRATION AT ELECTRIC UTILITIES –
SYSTEM INTERFACES FOR DISTRIBUTION MANAGEMENT –****Part 13: Common distribution power system model profiles**

FOREWORD

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International Standard IEC 61968-13 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

This second edition cancels and replaces the first edition published in 2008. This edition constitutes a technical revision. This edition was pre-tested during 2016 ENTSO-E interoperability tests [1]¹. The interoperability test report mentions: "Some vendors demonstrated that the transformation between distribution network and CGMES is possible. This is a first step towards the efforts to have closer integration between CGMES and profiles for exchanging distribution data (CDPSM)."

¹ Numbers in square brackets refer to the bibliography.

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

- a) Alignment with "CIM100" UML version fixed in July 2018:
iec61970cim17v24_iec61968cim13v05_iec62325cim03v14.eap
Namespace associated to this version was: <http://iec.ch/TC57/2017/CIM-schema-cim100#>
- b) Test of Data Sets against "CIM100" version given in a).
- c) Test of Data Sets against a newer "CIM100" version of May 2019:
iec61970cim17v34_iec61968cim13v12_iec62325cim03v17a.eap
Namespace associated to this version was: <http://iec.ch/TC57/CIM100#>
- d) Alignment with "CIM100" after CDV stage in order to align 61968-13 with the latest CIM version iec61970cim17v38_iec61968cim13v12_iec62325cim03v17a. A new alignment was done in March/April 2020 on a new CIM100:
iec61970cim17v38_iec62968cim13v13_iec62325cim03v17a.eap. This document has been properly updated with latest developments to minimize the need for any convergence.
- e) Test of Data Sets were validated against the profiles derived from these two newer versions of CIM100 in order to guarantee consistency. Validation include syntax validation, and load flow calculation.
- f) Informative extensions included (NEK, EDF) which are based on some utility needs, which shall be discussed and which could be integrated in the IEC CIM model. These extensions have been put in a dedicated annex. These extensions will be discussed in IEC TC 57, and eventually be put in the official CIM Model. These extensions are managed through specific namespaces and do not block any interoperability test. Amendments to IEC 61968-13 or new parts to IEC 61968-13 will potentially address these "extensions" in the near future (when integrated into the IEC CIM Model).
- g) Namespaces and associated URI modified.
- h) Use of last CIM Feeder modelling and unbalanced networks modelling artefacts.
- i) New annex illustrating CDPSM usage by EDF in H2020 TDX-ASSIST European project.
- j) New annex illustrating CDPSM usage by the Norwegian AutoFOS project. The extension is governed by the Norwegian National Committee (NEK).
- k) New paragraph and annex illustrating Observability Area concept.
- l) Tools that were used are MODSARUS² (Copyright © 2019, EDF R&D contact: modsarus@edf.fr) for Use Case definition (according to IEC 62559-2, IEC SRD 62913-1 methodology) and CDPSM UML profiling. Riseclipse tool was used for Data Set Validation (RiseClipse Web <https://rise-clipse.pam-retd.fr/> Rise Clipse Code: <https://wdi.supelec.fr/software/RiseClipse/>). CIMTool (<https://wiki.cimtool.org/>) was also used to verify tools compatibility (profiling and data set validation). A modified version of jCleanCim (<http://www.tanjakostic.org/jCleanCim/>) was used to generate this documentation. Other tools like CimConteXtor and CimSyntaxGen could be used to produce the profiles and documentation. (<https://www.cimcontextor.net/>).
- m) Replacement of Figure 6 on Network Model Management. Introduction of a new informative annex on CDPSM to CGMES conversion, replacing Figure 7 of the CDV document.

² MODSARUS is the trademark of a product supplied by EDF. This information is given for the convenience of users of this document and does not constitute an endorsement by IEC of the product named.

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

FDIS	Report on voting
57/2311/FDIS	57/2336/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

The organization of IEC 61968-13 is described in Table 1.

Table 1 – Document overview for IEC 61968-13

Clause	Title	Purpose
1	Scope	Scope of IEC 61968-13.
2	Normative references	Define the normative references that the document depends on.
3	Terms and definitions	Define the terms and definitions that are used in the document.
4	Use Case list	Use cases related to CDPSM.
5	Distribution network modelling and CIM related issues resolved	Feeder modelling Partial-phase devices modelling Manage LV cable in Catalog
6	CIM Distribution Network Static Model Profiles	
Informative Annex A	Use Cases	
Informative Annex C	Example of a European CDPSM MV/LV urban and rural network	CDPSM usage and associated satellite image.
Informative Annex D	Example of a European CDPSM MV/LV urban network	CDPSM usage and associated satellite image.
Informative Annex E	Example of a European CDPSM MV Urban and Rural Network	CDPSM usage and associated satellite image.
Informative Annex F	Example of CDPSM usage in H2020 TDX-ASSIST project	CDPSM usage in European project H2020 TDX-ASSIST project.
Informative Annex G	Example of a nuclear distribution network	CDPSM was leveraged to model internal distribution network of Nuclear Power Plant.
Informative Annex H	Observability area concept	The CIM modelling should be able to represent the concept of observability area.
Informative Annex I	CDPSM to CGMES conversion	Illustrates how CDSPM data sets could be transformed in CGMES data sets.
Informative Annex J	Norwegian Electrotechnical Committee (NEK) CDPSM related Use Cases	Describe the use of CDPSM in the context of Autofos project.

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

Part 13: Common distribution power system model profiles

1 Scope

This part of IEC 61968 specifies profiles that can be used to exchange Network Models in a Utility or between a Utility and external applications to the utility. This document provides a list of profiles which allow to model balanced and unbalanced distribution networks in order to conduct network analysis (Power flow calculation). Therefore, it leverages already existing profiles (IEC 61970-45x based on IEC 61970-301 (CIM base) or profiles based on IEC 61968-11 CIM extension for Distribution). This document reuses some profiles without any change, or eventually extends them or restricts them. Moreover, it proposes other profiles to reflect Distribution needs.

Use of CIM in Distribution is not a new topic. Several documents can be of interest [13][17][18][19][20]. This document includes informative parts, as CIM model extensions, which could be integrated in future versions of the IEC CIM Model. These extensions have been used by some utilities for utility internal information exchange use cases and to support information exchanges between different market participants like Transmission System Operators (TSO), Distributed System Operators (DSO), Distributed Network Operators (DNO) and Significant Grid Users (SGU) including generators and industry (see Annex J for example).

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 TS 61968-2, *Application integration at electric utilities – System interfaces for distribution management – Part 2: Glossary*

IEC 61968-11:2013, *Application integration at electric utilities – System interfaces for distribution management – Part 11: Common information model (CIM) extensions for distribution*

IEC 61970-301:2020, *Energy management system application program interface (EMS-API) – Common information model (CIM) base*

IEC 61970-452, *Energy management system application program interface (EMS-API) – Part 452: CIM static transmission network model profiles*

IEC 61970-501:2006, *Energy management system application program interface (EMS-API) – Part 501: Common Information Model Resource Description Framework (CIM RDF) schema*

IEC 61970-552:2016, *Energy management system application program interface (EMS-API) – Part 552: CIMXML Model exchange format*

IEC 62325-301, *Framework for energy market communications – Part 301: Common information model (CIM) extensions for markets*