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Integrering av tillämpningar för elförsörjning – Systemgränssnitt för distributionssystemstyrning – Del 3: Gränssnitt för nät drift

*Application integration at electric utilities –
System interfaces for distribution management –
Part 3: Interface for network operations*

Som svensk standard gäller europastandarden EN IEC 61968-3:2021. Den svenska standarden innehåller den officiella engelska språkversionen av EN IEC 61968-3:2021.

Nationellt förord

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**Application integration at electric utilities - System interfaces for
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(IEC 61968-3:2021)**

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Interfaces système pour la gestion de la distribution - Partie
3: Interface pour l'exploitation du réseau
(IEC 61968-3:2021)

Integration von Anwendungen in Anlagen der
Elektrizitätsversorgung - Systemschnittstellen für
Netzführung - Teil 3: Schnittstelle für Netzbetriebsarten
(IEC 61968-3:2021)

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SS-EN IEC 61968-3, utg 3:2021

European foreword

The text of document 57/2343/FDIS, future edition 3 of IEC 61968-3, 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 61968-3:2021.

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

IEC 61968-4	NOTE	Harmonized as EN IEC 61968-4
IEC 61968-5	NOTE	Harmonized as EN IEC 61968-5
IEC 61968-6	NOTE	Harmonized as EN 61968-6
IEC 61968-8	NOTE	Harmonized as EN 61968-8
IEC 61968-9	NOTE	Harmonized as EN 61968-9
IEC 61968-11	NOTE	Harmonized as EN 61968-11
IEC 61968-13	NOTE	Harmonized as EN IEC 61968-13
IEC 62361-100	NOTE	Harmonized as EN 62361-100

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	-	Application integration at electric utilities - System interfaces for distribution management - Part 1: Interface architecture and general recommendations	EN IEC 61968-1	-
IEC/TS 61968-2	-	Application integration at electric utilities - System interfaces for distribution management - Part 2: Glossary	-	-
IEC 61968-100	-	Application integration at electric utilities - System interfaces for distribution management - Part 100: Implementation profiles	EN 61968-100	-
IEC 61970-301	-	Energy management system application program interface (EMS-API) - Part 301: Common information model (CIM) base	EN IEC 61970-301	-

INTERNATIONAL STANDARD

NORME INTERNATIONALE



**Application integration at electric utilities – System interfaces for distribution management –
Part 3: Interface for network operations**

**Intégration d'applications pour les services électriques – Interfaces système pour la gestion de la distribution –
Partie 3: Interface pour l'exploitation du réseau**

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CONTENTS

FOREWORD.....	19
INTRODUCTION.....	22
1 Scope.....	23
2 Normative references	24
3 Terms, definitions and abbreviated terms	25
3.1 Terms and definitions.....	25
3.2 Abbreviated terms.....	25
4 Reference and information models	25
4.1 General approach to network operations.....	25
4.2 Reference model.....	26
4.3 Interface reference model	27
4.4 Network operations business functions and sub-business functions	27
4.5 Static information model	29
4.5.1 General	29
4.5.2 Classes for network operations.....	29
4.5.3 Classes related to network operations	32
5 Network operations message payloads.....	34
5.1 General.....	34
5.2 Summary of IEC 61968-3 message profiles.....	35
5.3 Config Profiles	36
5.3.1 General	36
5.3.2 Message payloads	38
5.3.3 AssetConfig payload	39
5.3.4 FaultCauseTypeConfig payload	44
5.3.5 LocationConfig payload	44
5.3.6 PowerSystemResourceConfig payload.....	45
5.3.7 OperationsDataLinkageConfig payload.....	46
5.3.8 Example – linking a Customer to a PowerSystemResource	48
5.4 PSRMeasurements payload.....	50
5.4.1 General	50
5.4.2 Message Payload	52
5.4.3 PSRMeasurements Payload – Accumulator.....	52
5.4.4 PSRMeasurements Payload – Analog	53
5.4.5 PSRMeasurements Payload – Discrete.....	55
5.4.6 PSRMeasurements Payload – StringMeasurement	57
5.4.7 GetPSRMeasurements payload.....	57
5.5 PSRControls payload.....	59
5.5.1 General	59
5.5.2 PSRControls Message Payload	60
5.5.3 PSRControls payload – AccumulatorReset	65
5.5.4 PSRControls payload – AnalogControl	65
5.5.5 PSRControls payload – Command.....	66
5.5.6 PSRControls payload – RaiseLowerCommand.....	68
5.5.7 PSRControls payload – SetPoint.....	69
5.6 SwitchingPlanRequests payload.....	70
5.6.1 General	70

5.6.2	Message Payload	71
5.6.3	Example XML	74
5.7	SwitchingPlan Definition and Execution	75
5.8	SwitchingPlans payload	76
5.8.1	General	76
5.8.2	Message payload	77
5.8.3	SwitchingPlans payload – SwitchingStepGroups fragment.....	81
5.8.4	SwitchingPlans payload – SwitchingStep fragment	82
5.8.5	Specifying Order of Step Execution	84
5.8.6	SwitchingPlans payload – ClampAction.....	86
5.8.7	SwitchingPlans payload – ClearanceAction.....	87
5.8.8	SwitchingPlans Payload – ControlAction.....	89
5.8.9	SwitchingPlans Payload – CutAction.....	91
5.8.10	SwitchingPlans payload – EnergyConsumerAction.....	92
5.8.11	SwitchingPlans payload – EnergySourceAction	94
5.8.12	SwitchingPlans payload – GenericAction	96
5.8.13	SwitchingPlans payload – GroundAction	98
5.8.14	SwitchingPlans payload – JumperAction.....	102
5.8.15	SwitchingPlans payload – MeasurementAction.....	104
5.8.16	SwitchingPlans payload – ShuntCompensatorAction	106
5.8.17	SwitchingPlans payload – SwitchAction.....	108
5.8.18	SwitchingPlans payload – TagAction.....	109
5.8.19	SwitchingPlans payload – VerificationAction	111
5.8.20	Example SwitchingPlan	112
5.8.21	Example XML for a complete SwitchingPlan	115
5.9	SwitchingOrders payload	117
5.9.1	General	117
5.9.2	Message payload.....	118
5.9.3	Example XML	121
5.10	SwitchingActions payload	122
5.10.1	General	122
5.10.2	Message Payload	123
5.10.3	SwitchingActions payload – SwitchingStep fragment	124
5.10.4	SwitchingActions payload – SwitchingStepGroups fragment	125
5.10.5	SwitchingActions payload – SwitchingPlan fragment	126
5.10.6	SwitchingActions payload – ClampAction	126
5.10.7	SwitchingActions payload – ClearanceAction.....	127
5.10.8	SwitchingActions payload – ControlAction.....	129
5.10.9	SwitchingActions Payload – CutAction	130
5.10.10	SwitchingActions payload – EnergyConsumerAction	131
5.10.11	SwitchingActions payload – EnergySourceAction	133
5.10.12	SwitchingActions payload – GenericAction	134
5.10.13	SwitchingActions payload – GroundAction.....	135
5.10.14	SwitchingActions payload – JumperAction.....	136
5.10.15	SwitchingActions payload – MeasurementAction	138
5.10.16	SwitchingActions payload – ShuntCompensatorAction	140
5.10.17	SwitchingActions payload – SwitchAction.....	141
5.10.18	SwitchingActions payload – TagAction	142

5.10.19	SwitchingActions payload – VerificationAction	143
5.10.20	Example XML	145
5.11	SwitchingEvents payload	145
5.11.1	General	145
5.11.2	Message payload	146
5.11.3	SwitchingEvents payload – ClampAction	148
5.11.4	SwitchingEvents payload – ClearanceAction	148
5.11.5	SwitchingEvents payload – ControlAction	149
5.11.6	SwitchingEvents Payload – CutAction	149
5.11.7	SwitchingEvents payload – EnergyConsumerAction	149
5.11.8	SwitchingEvents payload – EnergySourceAction	149
5.11.9	SwitchingEvents payload – GenericAction	149
5.11.10	SwitchingEvents payload – GroundAction	149
5.11.11	SwitchingEvents payload – JumperAction	149
5.11.12	SwitchingEvents payload – MeasurementAction	149
5.11.13	SwitchingEvents payload – ShuntCompensatorAction	149
5.11.14	SwitchingEvents payload – SwitchAction	149
5.11.15	SwitchingEvents payload – TagAction	149
5.11.16	SwitchingEvents payload – VerificationAction	150
5.11.17	Example XML	150
5.12	PlannedOutageNotification payload	150
5.12.1	General	150
5.12.2	Message payload	152
5.12.3	Example XML	153
5.13	PlannedOutages payload	154
5.13.1	General	154
5.13.2	Message payload	155
5.13.3	Example XML	159
5.14	TroubleTickets payload	159
5.15	Incidents payload	160
5.15.1	General	160
5.15.2	Message payload	162
5.15.3	Example XML	164
5.16	EquipmentFaults payload	165
5.16.1	General	165
5.16.2	Message payload	167
5.16.3	Example XML	169
5.17	LineFaults payload	170
5.17.1	General	170
5.17.2	Message payload	170
5.17.3	Example XML	172
5.18	UnplannedOutages payload	173
5.18.1	General	173
5.18.2	Message payload	174
5.18.3	Example XML	180
5.19	Metering message payloads	182
5.19.1	EndDeviceEvents	182
5.19.2	MeterReadings	183

5.20	Work message payloads	184
5.20.1	WorkRequests payload.....	184
5.21	TroubleOrders	185
5.21.1	General	185
5.21.2	Message payload.....	186
5.21.3	Example XML for an Incident TroubleOrder.....	200
6	Document Conventions.....	201
6.1	Message payload definitions	201
6.1.1	General	201
6.1.2	Mandatory versus Optional	202
6.2	Synchronous versus Asynchronous Messages	202
6.3	Message exchanges	202
6.3.1	General	202
Annex A (informative)	Use cases	203
A.1	General.....	203
A.2	FLISR for SCADA-detected outage, SCADA switching	203
A.2.1	Description of the use case	203
A.2.2	Use case diagrams	205
A.2.3	Technical details.....	206
A.2.4	Step by step analysis of use case	207
A.2.5	Information exchanged	209
A.2.6	Common terms and definitions.....	209
A.3	FLISR for trouble call and AMI outage, crew switching	209
A.3.1	Description of the use case	209
A.3.2	Use case diagrams	211
A.3.3	Technical details.....	212
A.3.4	Step by step analysis of use case	213
A.3.5	Information exchanged	217
A.3.6	Common terms and definitions.....	217
A.4	Planned outage for maintenance – Manual process	217
A.5	Planned outage for maintenance.....	219
A.5.1	General	219
A.5.2	Description of the use case	220
A.5.3	Use case diagrams	221
A.5.4	Technical details.....	222
A.5.5	Step by step analysis of use case	223
A.5.6	Information exchanged	230
A.5.7	Common terms and definitions.....	230
A.6	TroubleTicket creation	231
A.6.1	Description of the use case	231
A.6.2	Use case diagrams	231
A.6.3	Technical details.....	232
A.6.4	Step by step analysis of use case	233
A.6.5	Information exchanged	236
A.6.6	Common terms and definitions.....	236
A.7	CIS and OMS interactions during an unplanned outage	236
A.7.1	General	236
A.7.2	Description of the use case	236
A.7.3	Use case diagrams	237

A.7.4	Technical details.....	238
A.7.5	Step by step analysis of use case.....	240
A.7.6	Information exchanged	247
A.7.7	Common terms and definitions.....	247
A.8	Car hits pole but there is no outage	247
A.8.1	Description of the use case	247
A.8.2	Use case diagrams	249
A.8.3	Technical details.....	250
A.8.4	Step by step analysis of use case.....	251
A.8.5	Information exchanged	254
A.8.6	Common terms and definitions.....	254
A.9	Car hits pole and there is an outage.....	254
A.9.1	Description of the use case	254
A.9.2	Use case diagrams	256
A.9.3	Technical details.....	257
A.9.4	Further Information to the use case for classification / mapping	258
A.9.5	Step by step analysis of use case.....	258
A.9.6	Information exchanged	262
A.9.7	Common terms and definitions.....	262
Annex B (normative)	Payload fragments	263
B.1	General.....	263
B.2	Accumulator fragment.....	263
B.3	AccumulatorValue Fragment	265
B.4	ACLineSegment fragment	265
B.5	ActivityRecord fragment.....	267
B.6	Analog fragment.....	267
B.7	AnalogValue fragment	269
B.8	Approver fragment.....	269
B.9	Asset fragment.....	270
B.10	AssetContainer fragment.....	272
B.11	AssetInfo fragment.....	272
B.12	AssetOwner fragment.....	272
B.13	Author fragment	273
B.14	Cabinet fragment	273
B.15	Clamp fragment.....	274
B.16	Clearance fragment.....	275
B.17	ConductingEquipment fragment.....	276
B.18	Cut fragment	276
B.19	ConfigurationEvent fragment	277
B.20	ConnectivityNode fragment	278
B.21	CoordinateSystem fragment	279
B.22	Crew fragment	279
B.23	CrewMember fragment	281
B.24	CrewType fragment.....	281
B.25	Customer fragment.....	281
B.26	CustomerAgreement fragment	282
B.27	DeEnergizedUsagePoint fragment.....	283
B.28	Discrete fragment	284

B.29	DiscreteValue fragment.....	286
B.30	DuctBank fragment.....	286
B.31	Editor fragment.....	287
B.32	ElectronicAddress fragment.....	288
B.33	EndDevice fragment.....	289
B.34	EnergyConsumer fragment.....	289
B.35	EnergySource fragment.....	290
B.36	EnergizedUsagePoint fragment.....	292
B.37	Equipment fragment.....	292
B.38	EstimatedRestorationTime fragment.....	293
B.39	FaultImpedance fragment.....	293
B.40	FaultCauseTypes fragment.....	294
B.41	Feeder fragment.....	294
B.42	FieldSafetySupervisor fragment.....	294
B.43	FieldDispatchHistory fragment.....	295
B.44	Ground fragment.....	296
B.45	FieldDispatchStep fragment.....	296
B.46	Hazard fragment.....	297
B.47	Issuer fragment.....	297
B.48	IssuedBySupervisor fragment.....	298
B.49	IssuedToSupervisor fragment.....	299
B.50	lifecycleDate fragment.....	299
B.51	Jumper fragment.....	300
B.52	Location fragment.....	301
B.53	Manufacturer fragment.....	304
B.54	MeasurementValueQuality fragment.....	304
B.55	MeasurementValueSource fragment.....	307
B.56	Name fragment.....	307
B.57	NameType fragment.....	308
B.58	NameTypeAuthority fragment.....	308
B.59	OperationalTag fragment.....	308
B.60	Operator fragment.....	309
B.61	OperationsSafetySupervisor fragment.....	310
B.62	Organisation fragment.....	311
B.63	OutageIsolationEquipment fragment.....	312
B.64	OwnerShip fragment.....	313
B.65	Person fragment.....	313
B.66	Pole fragment.....	315
B.67	PositionPoint fragment.....	316
B.68	PowerSystemResource fragment.....	317
B.69	Priority fragment.....	319
B.70	ProductAssetModel fragment.....	319
B.71	PSRType fragment.....	321
B.72	ReleasedBySupervisor fragment.....	321
B.73	ReleasedToSupervisor fragment.....	321
B.74	RevisionHistory fragment.....	322
B.75	SafetyDocument fragment.....	323
B.76	ServiceLocation fragment.....	325

B.77	ServicePointOutageSummary fragment	326
B.78	ShuntCompensator fragment	327
B.79	Status fragment	327
B.80	StreetAddress fragment	328
B.81	StreetDetail fragment	328
B.82	StringMeasurement fragment	329
B.83	StringMeasurementValue fragment	331
B.84	Structure fragment	331
B.85	Substation fragment	332
B.86	Switch fragment	332
B.87	SwitchPhase fragment	333
B.88	TaggedPSRs fragment	334
B.89	TelephoneNumber fragment	335
B.90	Terminal fragment	335
B.91	TimeSchedule fragment	337
B.92	Tower fragment	337
B.93	TownDetail fragment	338
B.94	TroubleReporter fragment	339
B.95	TroubleSymptoms fragment	340
B.96	UndergroundStructure fragment	342
B.97	UsagePoint fragment	342
B.98	UsagePointLocation fragment	343
B.99	WirePhaseInfo fragment	345
B.100	WirePosition fragment	345
B.101	WireSpacing fragment	346
B.102	WorkActivityRecord fragment	346
Annex C (normative) Enumerated classes		348
C.1	AssetKind enumeration class	348
C.2	AssetLifeCycleStateKind enumeration class	348
C.3	AssetModelUsageKind enumeration class	349
C.4	ClearanceActionKind enumeration class	349
C.5	CorporateStandardKind enumeration class	349
C.6	CrewStatusKind enumeration class	350
C.7	CustomerKind enumeration class	350
C.8	ERTConfidenceKind enumeration class	350
C.9	InUseStateKind enumeration class	351
C.10	OutageCauseKind enumeration class	351
C.11	OutageStatusKind enumeration class	352
C.12	PhaseCode enumeration class	352
C.13	PhaseConnectedFaultKind enumeration class	353
C.14	PoleBaseKind enumeration class	354
C.15	RevisionKind enumeration class	354
C.16	RetiredReasonKind enumeration class	354
C.17	SinglePhaseKind enumeration class	355
C.18	Source enumeration class	355
C.19	StructureMaterialKind enumeration class	355
C.20	SwitchActionKind enumeration class	356
C.21	TagActionKind enumeration class	356

C.22	TempEquipActionKind enumeration class	356
C.23	TowerConstructionKind enumeration class.....	357
C.24	TroubleReportingKind enumeration class	357
C.25	TroubleSymptomsExtentKind enumeration class	357
C.26	TroubleSymptomsLightKind enumeration class.....	357
C.27	TroubleSymptomsPoleKind enumeration class.....	358
C.28	TroubleSymptomsTransformerKind enumeration class.....	358
C.29	TroubleSymptomsTreeKind enumeration class.....	358
C.30	TroubleSymptomsWireKind enumeration class.....	359
C.31	UndergroundStructureKind enumeration class.....	359
C.32	Validity enumeration class	360
C.33	WireUsageKind enumeration class.....	360
C.34	WorkKind enumeration class	360
C.35	WorkStatusKind enumeration class	361
C.36	WorkTaskKind enumeration class.....	361
Annex D (informative) Profiles defined in other parts of IEC 61968		362
D.1	CustomerAgreementConfig payload.....	362
D.2	CustomerConfig payload	363
D.3	MeterConfig payload	365
D.4	UsagePointConfig payload.....	367
D.5	UsagePointLocationConfig payload	369
Bibliography.....		371
Figure 1	– IEC 61968-3 Scope	24
Figure 2	– IEC 61968-3 Reference model	26
Figure 3	– Example of a Push Message Exchange.....	37
Figure 4	– Example of a Pull Message Exchange.....	38
Figure 5	– AssetConfig payload (1)	43
Figure 6	– AssetConfig payload (2)	44
Figure 7	– FaultCauseTypeConfig payload.....	44
Figure 8	– LocationConfig payload	45
Figure 9	– PowerSystemResourceConfig payload	45
Figure 10	– OperationsDataLinkageConfig payload (1)	47
Figure 11	– OperationsDataLinkageConfig payload (2)	48
Figure 12	– PSRMeasurements sequence diagram.....	51
Figure 13	– Get/Reply Message Pattern for PSRMeasurements	51
Figure 14	– PSRMeasurements payload – Accumulator	53
Figure 15	– PSRMeasurements payload – Analog	54
Figure 16	– PSRMeasurements payload – Discrete	56
Figure 17	– PSRMeasurements payload – StringMeasurement	57
Figure 18	– GetPSRMeasurements payload	58
Figure 19	– PSRControls sequence diagram.....	59
Figure 20	– PSRControls payload – AccumulatorReset	65
Figure 21	– PSRControls payload – AnalogControl.....	66
Figure 22	– PSRControls payload – Command	67

Figure 23 – PSRControls payload RaiseLowerCommand	68
Figure 24 – PSRControls payload SetPoint	69
Figure 25 – SwitchingPlanRequests Sequence Diagram	71
Figure 26 – SwitchingPlanRequests payload (Part 1)	73
Figure 27 – SwitchingPlanRequests payload (Part 2)	74
Figure 28 – SwitchingPlans sequence diagram	77
Figure 29 – SwitchingPlans message payload top level.....	80
Figure 30 – SwitchingPlans message – SafetyDocuments payload fragment	81
Figure 31 – SwitchingPlans message payload – SwitchingStepGroups	82
Figure 32 – SwitchingStep actions	84
Figure 33 – SwitchingStepGroup and SwitchingStep Execution Order	86
Figure 34 – SwitchingPlans – ClampAction	87
Figure 35 – SwitchingPlans – ClearanceAction.....	89
Figure 36 – SwitchingPlans – ControlAction.....	91
Figure 37 – SwitchingPlans – CutAction.....	92
Figure 38 – SwitchingPlans – EnergyConsumerAction	94
Figure 39 – SwitchingPlans – EnergySourceAction	96
Figure 40 – SwitchingPlans – GenericAction	98
Figure 41 – SwitchingPlans – GroundAction	100
Figure 42 – SwitchingPlans – GroundAction – Ground	100
Figure 43 – ACLineSegment choice for connecting ground.....	101
Figure 44 – Clamp choice for connecting ground	101
Figure 45 – ConductingEquipment choice for connecting ground	101
Figure 46 – SwitchingPlans – JumperAction.....	103
Figure 47 – SwitchingPlans – Jumper payload fragment.....	104
Figure 48 – SwitchingPlans – MeasurementAction	105
Figure 49 – Execution of a SwitchingStep with a MeasurementAction and the quantity is telemetered.....	106
Figure 50 – SwitchingPlans – ShuntCompensatorAction.....	107
Figure 51 – SwitchingPlans – SwitchAction	109
Figure 52 – SwitchingPlans – TagAction payload	110
Figure 53 – SwitchingPlans – OperationalTag payload fragment.....	111
Figure 54 – SwitchingPlans – VerificationAction payload.....	112
Figure 55 – Sample XML for SwitchingPlans	115
Figure 56 – SwitchingOrders sequence diagram.....	118
Figure 57 – SwitchingOrders message payload	120
Figure 58 – SwitchingOrders – Location fragment	121
Figure 59 – Sequence Diagram of Switching Step Execution	123
Figure 60 – SwitchingActions top level payload	124
Figure 61 – SwitchingActions – SwitchingPlan fragment	125
Figure 62 – SwitchingAction – ClampAction fragment	127
Figure 63 – SwitchingActions – ClearanceAction fragment.....	129
Figure 64 – SwitchingActions – ControlAction fragment.....	130

Figure 65 – SwitchingActions – CutAction fragment.....	131
Figure 66 – SwitchingActions – EnergyConsumerAction fragment	132
Figure 67 – SwitchingActions – EnergySourceAction fragment.....	133
Figure 68 – SwitchingActions – GenericAction fragment	135
Figure 69 – SwitchingActions – GroundAction fragment	136
Figure 70 – SwitchingActions – JumperAction fragment.....	138
Figure 71 – SwitchingActions – MeasurementAction fragment	139
Figure 72 – SwitchingActions – ShuntCompensatorAction fragment	140
Figure 73 – SwitchingActions – SwitchAction fragment	141
Figure 74 – SwitchingActions – TagAction fragment	142
Figure 75 – SwitchingActions – VerificationAction fragment.....	144
Figure 76 – SwitchingEvents sequence diagram for a notification	146
Figure 77 – SwitchingEvents top level payload.....	148
Figure 78 – PlannedOutageNotifications sequence diagram	151
Figure 79 – change PlannedOutageNotifications sequence diagram.....	152
Figure 80 – PlannedOutageNotifications message payload	153
Figure 81 – PlannedOutages - sequence diagram.....	155
Figure 82 – PlannedOutages message payload	158
Figure 83 – TroubleTickets sequence diagram	160
Figure 84 – Sequence diagram showing lifecycle of Incident	161
Figure 85 – Sequence diagram showing association of Incident with UnplannedOutage	162
Figure 86 – Incident message payload.....	164
Figure 87 – Association of LineFaults/EquipmentFaults to UnplannedOutage	166
Figure 88 – EquipmentFaults sequence diagram	167
Figure 89 – EquipmentFaults message payload.....	169
Figure 90 – LineFaults sequence diagram.....	170
Figure 91 – LineFaults message payload	172
Figure 92 – UnplannedOutages sequence diagram	173
Figure 93 – UnplannedOutages message payload top level	178
Figure 94 – UnplannedOutages message payload, LineFault detail.....	179
Figure 95 – UnplannedOutages message payload, EquipmentFault detail	180
Figure 96 – EndDeviceEvents	183
Figure 97 – MeterReadings sequence diagram	184
Figure 98 – WorkRequests sequence diagram	185
Figure 99 – TroubleOrders	186
Figure 100 – TroubleOrders top level message payload	188
Figure 101 – TroubleOrders – Incident payload fragment	188
Figure 102 – TroubleOrders – UnplannedOutage payload fragment.....	189
Figure 103 – Distinction between outage location and fault location.....	190
Figure 104 – TroubleOrders, UnplannedOutage, EquipmentFault payload fragment.....	191
Figure 105 – TroubleOrders, UnplannedOutage, LineFault payload fragment	192
Figure 106 – TroubleOrders, UnplannedOutage – actualPeriod payload fragment	192

Figure 107 – TroubleOrders – TroubleTicket payload fragment	193
Figure 108 – TroubleOrders – WorkTask payload fragment (1)	197
Figure 109 – TroubleOrders – WorkTask payload fragment (2)	198
Figure 110 – TroubleOrders – WorkTask WorkActivityRecords payload fragment.....	199
Figure 111 – TroubleOrders – WorkTask, WorkActivityRecords, Assets payload	199
Figure A.1 – Planned outage for maintenance – Manual process	219
Figure A.2 – SwitchingPlan creation.....	225
Figure A.3 – SwitchingOrder changes	227
Figure A.4 – SwitchingPlan execution	230
Figure A.5 – UnplannedOutages overview	238
Figure A.6 – UnplannedOutage creation	242
Figure A.7 – UnplannedOutages update.....	244
Figure A.8 – Outages being combined	245
Figure A.9 – Outage being split.....	246
Figure A.10 – UnplannedOutage restore	247
Figure B.1 – ACLineSegment payload fragment.....	266
Figure B.2 – Approver payload fragment	270
Figure B.3 – Author payload fragment.....	273
Figure B.4 – ConfigurationEvent payload fragment.....	278
Figure B.5 – Crew payload fragment	280
Figure B.6 – Customer payload fragment	282
Figure B.7 – CustomerAgreement payload fragment.....	283
Figure B.8 – DeEnergizedUsagePoint payload fragment.....	284
Figure B.9 – Editor payload fragment.....	287
Figure B.10 – ElectronicAddress payload fragment	288
Figure B.11 – EnergyConsumer payload fragment	290
Figure B.12 – EnergySource payload fragment	291
Figure B.13 – EnergizedUsagePoint payload fragment.....	292
Figure B.14 – FieldSafetySupervisor payload fragment.....	295
Figure B.15 – FieldDispatchHistory payload fragment	295
Figure B.16 – Hazard payload fragment	297
Figure B.17 – Issuer payload fragment.....	298
Figure B.18 – IssuedBySupervisor payload fragment	298
Figure B.19 – IssuedToSupervisor payload fragment	299
Figure B.20 – lifecycleDate fragment	299
Figure B.21 – Location payload fragment.....	301
Figure B.22 – Manufacturer fragment	304
Figure B.23 – MeasurementValueQuality payload fragment	305
Figure B.24 – MeasurementValueSource payload fragment	307
Figure B.25 – Name payload fragment	307
Figure B.26 – Operator payload fragment.....	310
Figure B.27 – OperationsSafetySupervisor payload fragment	310

Figure B.28 – Organisation payload fragment.....	311
Figure B.29 – OutageIsolationEquipment payload fragment.....	312
Figure B.30 – Ownerships payload fragment	313
Figure B.31 – Person payload fragment.....	314
Figure B.32 – PowerSystemResource fragment	318
Figure B.33 – ProductAssetModel fragment.....	320
Figure B.34 – ReleasedBySupervisor payload fragment	321
Figure B.35 – ReleasedToSupervisor payload fragment	322
Figure B.36 – RevisionHistory payload fragment	322
Figure B.37 – SafetyDocument payload fragment	323
Figure B.38 – ServiceLocation payload fragment	325
Figure B.39 – ShuntCompensator payload fragment	327
Figure B.40 – Status payload fragment	328
Figure B.41 – StreetDetail payload fragment.....	329
Figure B.42 – SwitchPhase payload fragment	333
Figure B.43 – TaggedPSRs payload fragment	334
Figure B.44 – Terminal payload fragment.....	336
Figure B.45 – TimeSchedule payload fragment.....	337
Figure B.46 – TownDetail payload fragment.....	339
Figure B.47 – TroubleReporter payload fragment	339
Figure B.48 – TroubleSymptoms payload fragment.....	340
Figure B.49 – UsagePointLocation payload fragment	344
Figure D.1 – CustomerAgreementConfig payload.....	363
Figure D.2 – CustomerConfig payload	364
Figure D.3 – MeterConfig payload	366
Figure D.4 – UsagePointConfig payload	368
Figure D.5 – UsagePointLocationConfig payload	370
Table 1 – Business functions and sub-business functions	28
Table 2 – Classes for network operations	30
Table 3 – Classes related to network operations	32
Table 4 – Summary of IEC 61968-3 message profiles	35
Table 5 – AssetConfig Profile	40
Table 6 – PSRMeasurements Profile	52
Table 7 – Valid values for DiscreteValue.value.....	55
Table 8 – getPSRMeasurements Profile	58
Table 9 – PSRControls Profile	61
Table 10 – SwitchingPlanRequests Profile.....	72
Table 11 – Messages used to coordinate different types of SwitchingSteps	76
Table 12 – SwitchingPlans Profile	78
Table 13 – SwitchingPlans – SwitchingStepGroups payload fragment	82
Table 14 – SwitchingPlans – SwitchingStep payload fragment	83

Table 15 – Example of Switching Step Execution Order	85
Table 16 – ClampAction payload fragment for SwitchingPlans.....	87
Table 17 – ClearanceAction payload fragment for SwitchingPlans.....	88
Table 18 – ControlAction payload fragment for SwitchingPlans	90
Table 19 – CutAction payload fragment for SwitchingPlans	92
Table 20 – EnergyConsumerAction payload fragment for SwitchingPlans	93
Table 21 – EnergySourceAction payload fragment for SwitchingPlans	95
Table 22 – GenericAction payload fragment for SwitchingPlans	97
Table 23 – GroundAction payload fragment for SwitchingPlans	99
Table 24 – JumperAction payload fragment for SwitchingPlans.....	102
Table 25 – MeasurementAction payload fragment for SwitchingPlans.....	105
Table 26 – ShuntCompensatorAction payload fragment for SwitchingPlans	107
Table 27 – SwitchAction payload fragment for SwitchingPlans.....	108
Table 28 – TagAction payload fragment for SwitchingPlans	110
Table 29 – VerificationAction payload fragment for SwitchingPlans	111
Table 30 – Example of a switching plan	113
Table 31 – SwitchingOrders Profile	119
Table 32 – SwitchingActions Profile.....	124
Table 33 – SwitchingStep payload fragment for SwitchingActions.....	125
Table 34 – SwitchingStepGroup payload fragment for SwitchingActions.....	126
Table 35 – SwitchingPlan payload fragment for SwitchingActions	126
Table 36 – ClampAction payload fragment for SwitchingActions	127
Table 37 – ClearanceAction payload fragment for SwitchingActions	128
Table 38 – ControlAction payload fragment	129
Table 39 – CutAction payload fragment for SwitchingActions.....	131
Table 40 – EnergyConsumerAction payload fragment for SwitchingActions	132
Table 41 – EnergySourceAction payload fragment for SwitchingActions.....	133
Table 42 – GenericAction payload fragment for SwitchingActions	134
Table 43 – GroundAction payload fragment for SwitchingActions	135
Table 44 – JumperAction payload fragment for SwitchingActions	137
Table 45 – MeasurementAction payload fragment for SwitchingActions	139
Table 46 – ShuntCompensatorAction payload fragment for SwitchingActions	140
Table 47 – SwitchAction payload fragment for SwitchingActions	141
Table 48 – TagAction payload fragment for SwitchingActions	142
Table 49 – VerificationAction payload fragment for SwitchingActions.....	143
Table 50 – SwitchingEvents Profile	147
Table 51 – PlannedOutageNotifications Profile.....	152
Table 52 – PlannedOutages Profile.....	156
Table 53 – Incidents Profile	163
Table 54 – EquipmentFaults payload.....	168
Table 55 – LineFaults payload	171
Table 56 – UnplannedOutages Profile.....	175

Table 57 – Priority of statusKind when multiple crews assigned.....	180
Table 58 – TroubleOrders Profile.....	187
Table 59 – Additional outage location information	190
Table 60 – TroubleTicket attributes.....	194
Table 61 – WorkTask attributes.....	195
Table B.1 – IdentifiedObject	263
Table B.2 – Accumulator payload fragment.....	264
Table B.3 – AccumulatorValue payload fragment	265
Table B.4 – ACLineSegment payload fragment	266
Table B.5 – ActivityRecord payload fragment.....	267
Table B.6 – Analog payload fragment.....	268
Table B.7 – AnalogValue payload fragment	269
Table B.8 – Approver payload fragment	270
Table B.9 – Asset payload fragment.....	271
Table B.10 – AssetContainer payload fragment.....	272
Table B.11 – AssetInfo payload fragment.....	272
Table B.12 – AssetOwner payload fragment.....	273
Table B.13 – Author payload fragment	273
Table B.14 – Cabinet payload fragment.....	274
Table B.15 – Clamp payload fragment.....	274
Table B.16 – Clearance payload fragment.....	275
Table B.17 – ConductingEquipment payload fragment attributes	276
Table B.18 – Cut payload fragment	277
Table B.19 – ConfigurationEvent payload fragment	278
Table B.20 – ConnectivityNode payload fragment	279
Table B.21 – CoordinateSystem payload fragment	279
Table B.22 – Crew payload fragment	280
Table B.23 – CrewMember payload fragment	281
Table B.24 – CrewType payload fragment	281
Table B.25 – Customer payload fragment.....	282
Table B.26 – CustomerAgreement payload fragment	283
Table B.27 – Discrete payload fragment	285
Table B.28 – DiscreteValue payload fragment.....	286
Table B.29 – DuctBank payload fragment.....	287
Table B.30 – Editor payload fragment	288
Table B.31 – ElectronicAddress payload fragment	288
Table B.32 – EndDevice payload fragment	289
Table B.33 – EnergyConsumer payload fragment.....	289
Table B.34 – EnergySource payload fragment	290
Table B.35 – Equipment payload fragment	293
Table B.36 – EstimatedRestorationTime payload fragment.....	293
Table B.37 – FaultImpedance payload fragment.....	293

Table B.38 – FaultCodeTypes payload fragment.....	294
Table B.39 – Feeder payload fragment.....	294
Table B.40 – FieldSafetySupervisor payload fragment.....	295
Table B.41 – FieldDispatchHistory payload fragment	296
Table B.42 – Ground payload fragment	296
Table B.43 – FieldDispatchStep payload fragment	296
Table B.44 – Hazard payload fragment.....	297
Table B.45 – Issuer payload fragment.....	298
Table B.46 – lifecycleDate payload fragment	300
Table B.47 – Jumper payload fragment	300
Table B.48 – Location payload fragment	303
Table B.49 – Manufacturer payload fragment.....	304
Table B.50 – MeasurementValueQuality payload fragment	306
Table B.51 – MeasurementValueSource payload fragment.....	307
Table B.52 – Name payload fragment.....	308
Table B.53 – NameType payload fragment	308
Table B.54 – NameTypeAuthority payload fragment	308
Table B.55 – OperationalTag payload fragment.....	309
Table B.56 – Operator payload fragment.....	310
Table B.57 – OperationsSafetySupervisor payload fragment.....	311
Table B.58 – Organisation payload fragment.....	312
Table B.59 – OwnerShip payload fragment.....	313
Table B.60 – Person payload fragment.....	315
Table B.61 – Pole payload fragment.....	316
Table B.62 – PositionPoint payload fragment.....	317
Table B.63 – PowerSystemResource payload fragment	318
Table B.64 – Priority payload fragment	319
Table B.65 – ProductAssetModel payload fragment.....	320
Table B.66 – PSRType payload fragment.....	321
Table B.67 – RevisionHistory payload fragment	323
Table B.68 – SafetyDocument payload fragment	324
Table B.69 – ServiceLocation payload fragment.....	326
Table B.70 – ServicePointOutageSummary payload fragment	327
Table B.71 – ShuntCompensator payload fragment	327
Table B.72 – Status payload fragment	328
Table B.73 – StreetAddress payload fragment.....	328
Table B.74 – StreetDetail payload fragment.....	329
Table B.75 – StringMeasurement payload fragment.....	330
Table B.76 – StringMeasurementValue payload fragment	331
Table B.77 – Structure payload fragment.....	332
Table B.78 – Substation payload fragment.....	332
Table B.79 – Switch payload fragment.....	333

Table B.80 – SwitchPhase payload fragment.....	334
Table B.81 – TelephoneNumber payload fragment.....	335
Table B.82 – Terminal payload fragment.....	336
Table B.83 – TimeSchedule payload fragment.....	337
Table B.84 – Tower payload fragment.....	338
Table B.85 – TownDetail payload fragment.....	339
Table B.86 – TroubleReporter payload fragment.....	340
Table B.87 – TroubleSymptoms payload fragment.....	341
Table B.88 – UndergroundStructure payload fragment.....	342
Table B.89 – UsagePoint payload fragment.....	343
Table B.90 – UsagePointLocation payload fragment.....	345
Table B.91 – WirePhaseInfo payload fragment.....	345
Table B.92 – WirePosition payload fragment.....	346
Table B.93 – WireSpacing payload fragment.....	346
Table B.94 – WorkActivityRecord payload fragment.....	347
Table C.1 – AssetKind.....	348
Table C.2 – AssetLifeCycleStateKind.....	348
Table C.3 – AssetModelUsageKind.....	349
Table C.4 – ClearanceActionKind.....	349
Table C.5 – CorporateStandardKind.....	349
Table C.6 – CrewStatusKind.....	350
Table C.7 – CustomerKind.....	350
Table C.8 – ERTConfidenceKind.....	351
Table C.9 – InUseStateKind.....	351
Table C.10 – OutageCauseKind.....	351
Table C.11 – OutageStatusKind.....	352
Table C.12 – PhaseCode.....	352
Table C.13 – PhaseConnectedFaultKind.....	353
Table C.14 – PoleBaseKind.....	354
Table C.15 – RevisionKind.....	354
Table C.16 – RetiredReasonKind.....	354
Table C.17 – SinglePhaseKind.....	355
Table C.18 – Source.....	355
Table C.19 – StructureMaterialKind.....	355
Table C.20 – SwitchActionKind.....	356
Table C.21 – TagActionKind.....	356
Table C.22 – TempEquipActionKind.....	356
Table C.23 – TowerConstructionKind.....	357
Table C.24 – TroubleReportingKind.....	357
Table C.25 – TroubleSymptomsExtentKind.....	357
Table C.26 – TroubleSymptomsLightKind.....	358
Table C.27 – TroubleSymptomsPoleKind.....	358

Table C.28 – TroubleSymptomsTransformerKind	358
Table C.29 – TroubleSymptomsTreeKind	359
Table C.30 – TroubleSymptomsWireKind	359
Table C.31 – UndergroundStructureKind	359
Table C.32 – Validity	360
Table C.33 – WireUsageKind	360
Table C.34 – WorkKind	360
Table C.35 – WorkStatusKind	361
Table C.36 – WorkTaskKind	361

INTERNATIONAL ELECTROTECHNICAL COMMISSION

**APPLICATION INTEGRATION AT ELECTRIC UTILITIES –
SYSTEM INTERFACES FOR DISTRIBUTION MANAGEMENT –****Part 3: Interface for network operations**

FOREWORD

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International standard IEC 61968-3 has been prepared by IEC technical committee 57: Power systems management and associated information exchange.

This third edition cancels and replaces the second edition published in 2017. This edition constitutes a technical revision.

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

- a) major rework of Switch Order related profiles and Outage related profiles;
- b) documented profiles in more detail as a result of the analysis of end-to-end use cases;
- c) separated Measurement and Control profile into two profiles: PSRMeasurements and PSRControls;
- d) replaced Temporary Network Change profile with SwitchingEvents profile;

- e) added MeasurementAction, ControlAction, GenericAction and VerificationAction to SwitchingPlans profile. Added examples;
- f) added SwitchingActions profile to support the coordination of SwitchingPlan execution between control room and the field crew;
- g) added ClampAction to SwitchingPlan, SwitchingAction and SwitchingEvent profiles, to allow clamps to be placed and removed independently of jumpers;
- h) separated OutagesAndFaults profile into UnplannedOutages, PlannedOutages, EquipmentFaults, LineFaults;
- i) added list of energized and de-energized UsagePoints to the UnplannedOutages profile;
- j) added PlannedOutages profile;
- k) added PlannedOutageNotifications profile;
- l) added SwitchingPlanRequest profile to replace OutageSchedules profile;
- m) expanded TroubleOrders profile to include UnplannedOutages and TroubleTickets and to allow crews to be scheduled to individual tasks within the TroubleOrder;
- n) expanded use cases and sequence diagrams;
- o) sequence diagrams updated to use IEC 61968-100 message patterns;
- p) use cases in IEC 62559-2 use case template;
- q) added example XML for profiles;
- r) replaced xsd in Annex with tables to document the profiles in a serialisation-independent form;
- s) clarified FLISR use case to include interactions between DSO and TSO per review comments from Edition 2.
- t) removed OperationalTags since it is now part of the TagAction in the SwitchingEvents payload

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

Draft	Report on voting
57/2343/FDIS	57/2364/RVD

Full information on the voting for its approval 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 language used for the development of this International Standard is English.

In this standard, the following print types are used:

- tokens: in arial black type

A list of all parts of the IEC 61968 series, 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 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 purpose of this part of IEC 61968 is to define a standard for the integration of network operations systems with each other and other systems and business functions within the scope of IEC 61968. The specific details of the communication protocols those systems employ are outside the scope of this part of IEC 61968. Instead, this part of IEC 61968 will recognize and model the general capabilities that can be potentially provided by network operations systems. In this way, this part of IEC 61968 will not be impacted by the specification, development and/or deployment of next generation network operations 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. Therefore, these inter-application 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.

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

Part 3: Interface for network operations

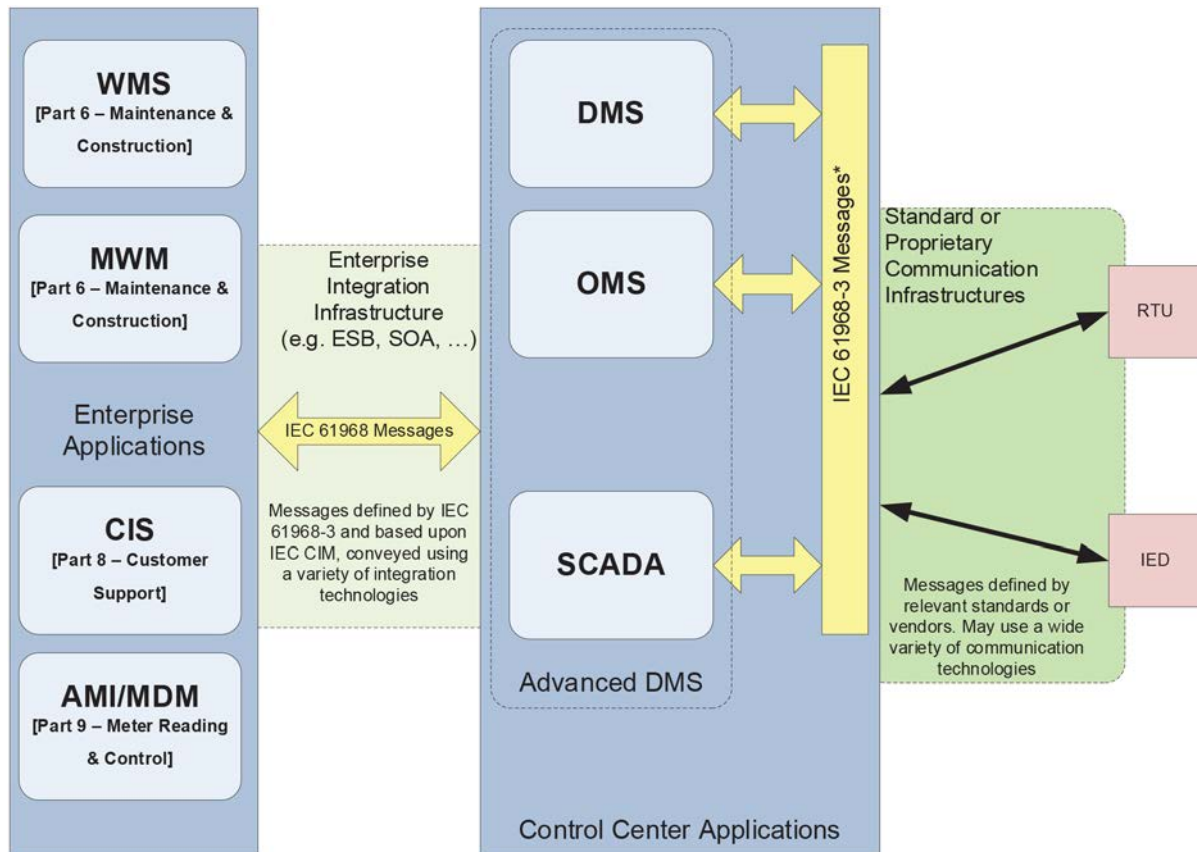
1 Scope

Per the IEC 61968 Interface Reference Model, the Network Operations function defined in this part of IEC 61968 provides utilities with the means to supervise main substation topology (breaker and switch state), feeder topology and control equipment status through SCADA, AMI and other data sources. It also provides the means for handling network connectivity and loading conditions. Finally, it makes it possible for utilities to locate customer telephone complaints and coordinate activities of field crews with respect to planned and unplanned outages.

IEC 61968-3 specifies the information content of a set of message payloads that can be used to support many of the business functions related to network operations. Typical uses of the message payloads defined in IEC 61968-3 include data acquisition by external systems, fault isolation, fault restoration, trouble management and coordination of the real-time state of the network.

The scope diagram shown in Figure 1 illustrates the possibility of implementing IEC 61968-3 functionality as either a single integrated advanced distribution management system or as a set of separate functions – OMS, DMS and SCADA. Utilities may choose to buy these systems from different vendors and integrate them using the IEC 61968-3 messages. Alternatively, a single vendor could provide two or all of these components as a single integrated system. In the case of more than one system being provided by the same vendor, the vendor may choose to use either extensions of the IEC 61968 messages or a proprietary integration mechanism to provide enhanced functionality over and above what is required/supported by the IEC 61968-3 specification. While this is a possible implementation, Subclause 4.3 defines the scope in terms of business functions that are implemented in common vendor offerings.

Annexes in this document detail integration scenarios or use cases, which are informative examples showing typical ways of using the message payloads defined in this document as well as message payloads to be defined in other parts of the IEC 61968 series.



* Note, that depending on the system configuration, these can also be proprietary interfaces (E.g. a system that covers DMS and SCADA in one product).

IEC

Figure 1 – IEC 61968-3 Scope

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

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

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

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