



European Network of  
Transmission System Operators  
for Electricity

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# OUTAGE SCHEDULE DOCUMENT UML MODEL AND SCHEMA

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2021-02-17  
APPROVED DOCUMENT  
VERSION 1.2

2

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## Revision History

Version	Release	Date	Comments
1	0	2020-11-09	<p>First drafting of the document.</p> <p>Changes in version of Network element maintenance scheduling (OutageScheduling/mltopdocument) v1.1</p> <ul style="list-style-type: none"> <li>- mRIDs (ID_String) enlarged to 65 chars as compliant with last versions of the ESMP.</li> </ul>
1	1	2020-12-21	<p>Changes in version of Network element maintenance scheduling (OutageScheduling/mltopdocument) v1.2</p> <ul style="list-style-type: none"> <li>- A new PartnerCaseReference_Name is linked to Timeseries with cardinality 0..*</li> </ul>
1	2	2021-02-17	<p>The schema document was renamed to Outage Schedule document UML model and schema.</p> <p>XSD was renamed to Outage schedule document and version was upgraded to v1.3</p> <p>Changes in version of Outage schedule document v1.3</p> <ul style="list-style-type: none"> <li>• Namespace was changed to urn:iec62325.351:tc57wg16:451-n:outagescheduledocument:1:3</li> </ul> <p>Approved by SOC.</p>

65

## 66 **1 Objective**

67 The purpose of this document is to provide the contextual and assembly UML models and the  
68 schema of the Outage Schedule document.

69 The schema of the Outage Schedule document could be used in various business processes.

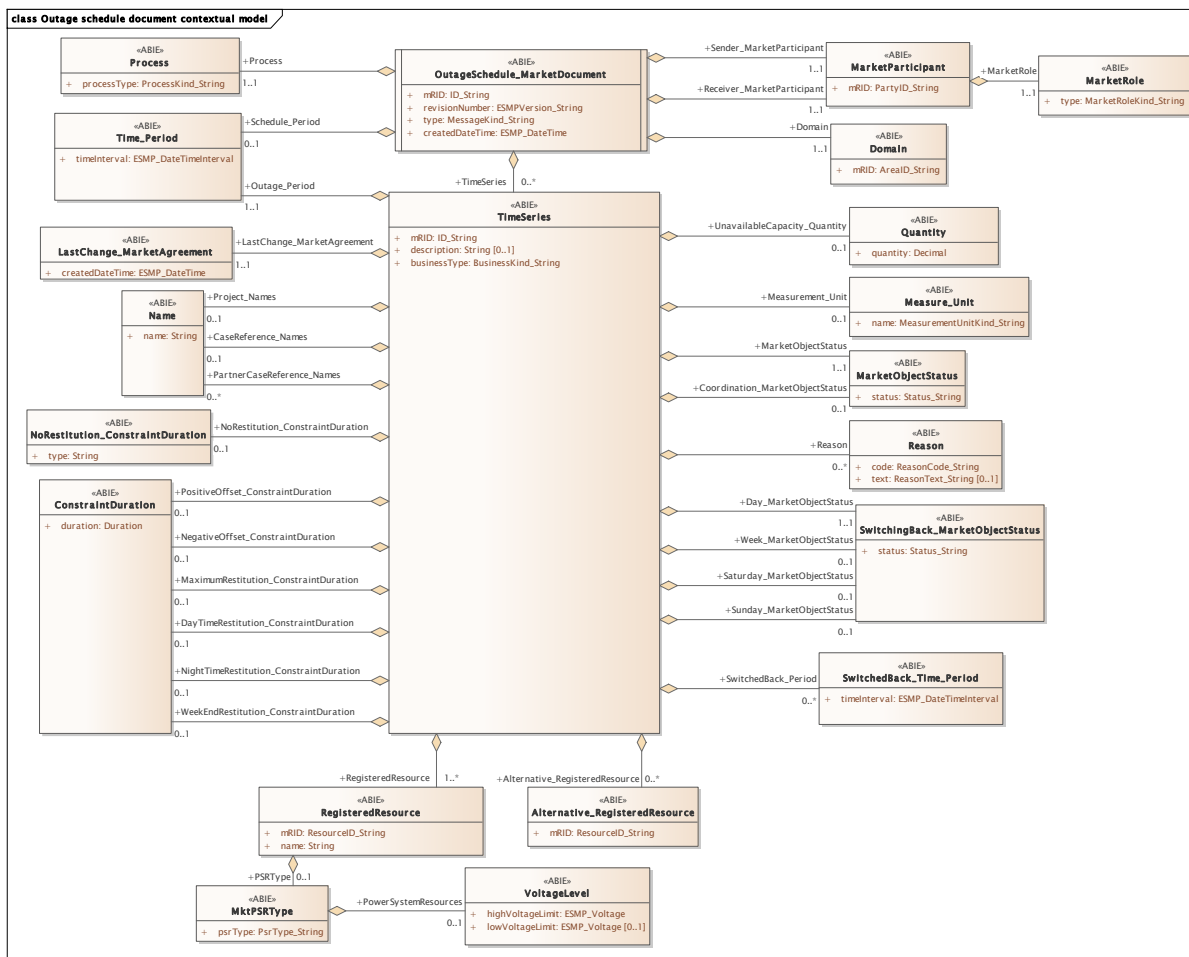
70 It is not the purpose of this document to describe all the use cases, sequence diagrams,  
71 business processes, etc. for which this schema is to be used.

72 This document shall only be referenced in an implementation guide of a specific business  
73 process. The content of the business process implementation guide shall be as follows:

- 74 • Description of the business process;
- 75 • Use case of the business process;
- 76 • Sequence diagrams of the business process;
- 77 • List of the schema (XSD) to be used in the business process and versions of the  
78 schema;
- 79 • For each schema, dependency tables providing the necessary information for the  
80 generation of the XML instances, i.e. when the optional attributes are to be used, which  
81 codes from which ENTSO-E codelist are to be used.

82

- 83 **2 Outage schedule configuration model**
- 84 **2.1 Outage schedule document contextual model**
- 85 **2.1.1 Overview of the model**
- 86 Figure 1 shows the model.



- 87
- 88
- 89

Figure 1 - Outage schedule document contextual model

90

91 **2.1.2 IsBasedOn relationships from the European style market profile**

92 Table 1 shows the traceability dependency of the classes used in this package towards the  
93 upper level.

94

**Table 1 - IsBasedOn dependency**

Name	Complete IsBasedOn Path
Alternative_RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
ConstraintDuration	TC57CIM::IEC62325::MarketManagement::ConstraintDuration
Domain	TC57CIM::IEC62325::MarketManagement::Domain
LastChange_MarketAgreement	TC57CIM::IEC62325::MarketManagement::MarketAgreement
MarketObjectStatus	TC57CIM::IEC62325::MarketManagement::MarketObjectStatus
MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
MarketRole	TC57CIM::IEC62325::MarketCommon::MarketRole
Measure_Unit	TC57CIM::IEC62325::MarketManagement::Unit
MktPSRType	TC57CIM::IEC62325::MarketManagement::MktPSRType
Name	TC57CIM::IEC61970::Base::Core::Name
NoRestitution_ConstraintDuration	TC57CIM::IEC62325::MarketManagement::ConstraintDuration
OutageSchedule_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Process	TC57CIM::IEC62325::MarketManagement::Process
Quantity	TC57CIM::IEC62325::MarketManagement::Quantity
Reason	TC57CIM::IEC62325::MarketManagement::Reason
RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
SwitchedBack_Time_Period	TC57CIM::IEC62325::MarketManagement::Period
SwitchingBack_MarketObjectStatus	TC57CIM::IEC62325::MarketManagement::MarketObjectStatus
Time_Period	TC57CIM::IEC62325::MarketManagement::Period
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries
VoltageLevel	TC57CIM::IEC61970::Base::Core::VoltageLevel

95

96

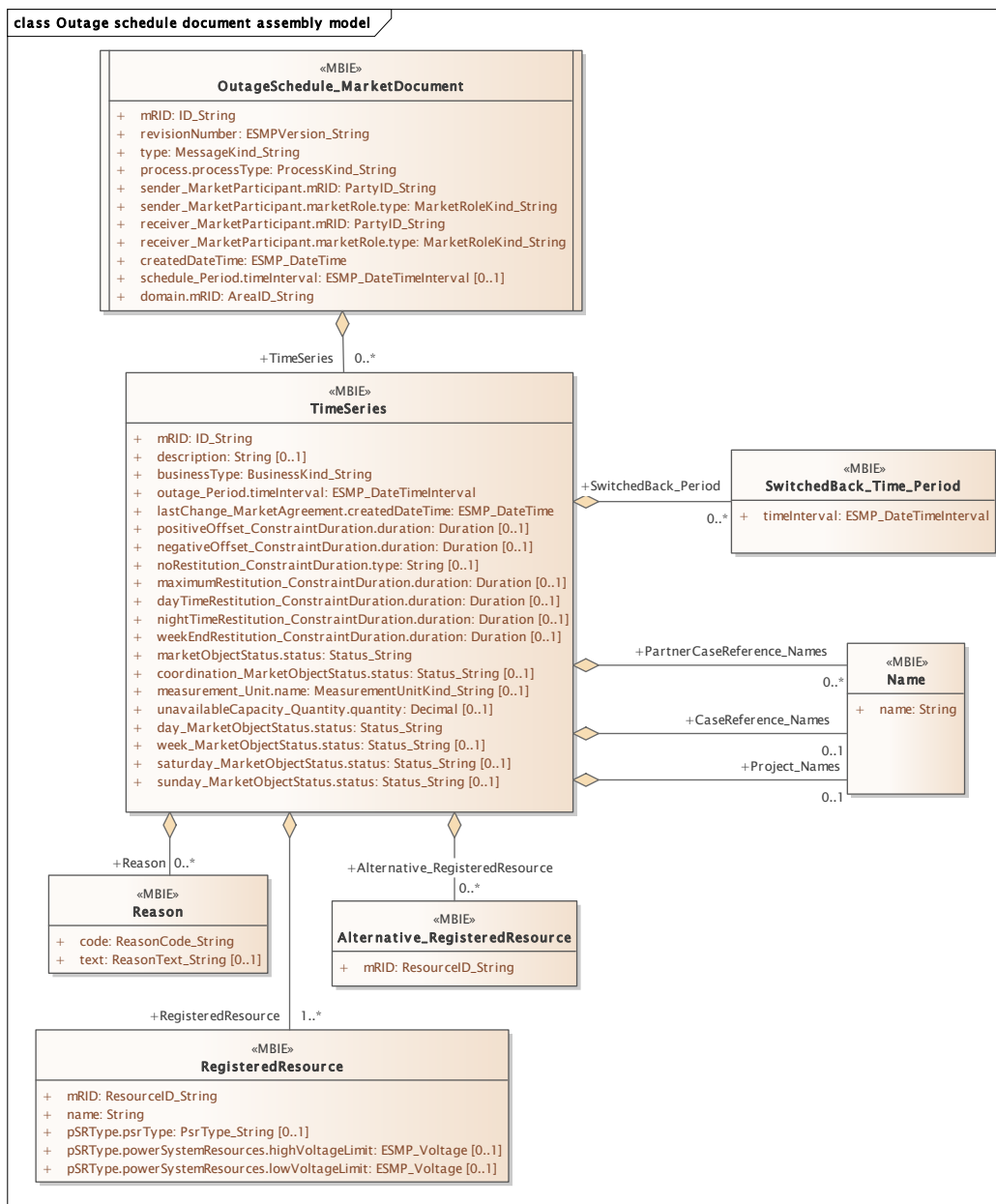


97

98 **2.2 Outage schedule document assembly model**

99 **2.2.1 Overview of the model**

100 Figure 2 shows the model.



101

102

**Figure 2 - Outage schedule document assembly model**

103

104

105 **2.2.2 IsBasedOn relationships from the European style market profile**

106 Table 2 shows the traceability dependency of the classes used in this package towards the  
107 upper level.

108

**Table 2 - IsBasedOn dependency**

Name	Complete IsBasedOn Path
Alternative_RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
Name	TC57CIM::IEC61970::Base::Core::Name
OutageSchedule_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Reason	TC57CIM::IEC62325::MarketManagement::Reason
RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
SwitchedBack_Time_Period	TC57CIM::IEC62325::MarketManagement::Period
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

109

110 **2.2.3 Detailed Outage schedule document assembly model**

111 **2.2.3.1 OutageSchedule\_MarketDocument root class**

112 An electronic document containing the information necessary to satisfy the requirements of a  
113 given business process.

114 This document is to be used to exchange the information to coordinate the maintenance  
115 scheduling for network elements that may affect more than one system operators (e.g. such as  
116 crossborder lines).

117 Table 3 shows all attributes of OutageSchedule\_MarketDocument.

118

**Table 3 - Attributes of Outage schedule document assembly model::OutageSchedule\_MarketDocument**

119

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	The unique identification of the document being exchanged within a business process flow.
1	[1..1]	revisionNumber ESMPVersion_String	The identification of the version that distinguishes one evolution of a document from another.
2	[1..1]	type MessageKind_String	The coded type of a document. The document type describes the principal characteristic of the document.
3	[1..1]	process.processType ProcessKind_String	The identification of the nature of process that the document addresses. --- The process dealt with in the document depending upon the document type.
4	[1..1]	sender_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- The document owner.
5	[1..1]	sender_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- The document owner. --- The role associated with a MarketParticipant.

Order	mult.	Attribute name / Attribute type	Description
6	[1..1]	receiver_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- The document recipient.
7	[1..1]	receiver_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- The document recipient. --- The role associated with a MarketParticipant.
8	[1..1]	createdDateTime ESMP_DateTime	The date and time of the creation of the document.
9	[0..1]	schedule_Period.timeInterval ESMP_DateTimeInterval	The start and end date and time for a given interval. --- This information provides the start and end date and time of the schedule time interval.
10	[1..1]	domain.mRID AreaID_String	The unique identification of the domain. --- The Domain associated with an electronic document header; it is used for report filtering.

120

121 Table 4 shows all association ends of OutageSchedule\_MarketDocument with other classes.

122 **Table 4 - Association ends of Outage schedule document assembly**  
123 **model::OutageSchedule\_MarketDocument with other classes**

Order	mult.	Class name / Role	Description
11	[0..*]	TimeSeries TimeSeries	The timeseries related to a maintenance of a network element. Association Based On: Outage schedule document contextual model::OutageSchedule_MarketDocument.[] ----- Outage schedule document contextual model::TimeSeries.TimeSeries[0..*]

124

### 125 2.2.3.2 Alternative\_RegisteredResource

126 A resource that is registered through the market participant registration system. Examples  
127 include generating unit, load, and non-physical generator or load.

128 Table 5 shows all attributes of Alternative\_RegisteredResource.

129 **Table 5 - Attributes of Outage schedule document assembly**  
130 **model::Alternative\_RegisteredResource**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ResourceID_String	The unique identification of a resource.

131

### 132 2.2.3.3 Name

133 The Name class provides the means to define any number of human readable names for an  
134 object. A name is **not** to be used for defining inter-object relationships. For inter-object  
135 relationships instead use the object identification 'mRID'.

136 Table 6 shows all attributes of Name.

137 **Table 6 - Attributes of Outage schedule document assembly model::Name**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	name String	Any free text that name the object.

138

139 **2.2.3.4 Reason**

140 The motivation of an act.

141 Table 7 shows all attributes of Reason.

142 **Table 7 - Attributes of Outage schedule document assembly model::Reason**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	code ReasonCode_String	The motivation of an act in coded form.
1	[0..1]	text ReasonText_String	The textual explanation corresponding to the reason code.

143

144 **2.2.3.5 RegisteredResource**

145 A resource that is registered through the market participant registration system. Examples  
146 include generating unit, load, and non-physical generator or load.

147 Table 8 shows all attributes of RegisteredResource.

148 **Table 8 - Attributes of Outage schedule document assembly  
149 model::RegisteredResource**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ResourceID_String	The unique identification of a resource.
1	[1..1]	name String	The name is any free human readable and possibly non unique text naming the object.
2	[0..1]	pSRType.psrType PsrType_String	The coded type of a power system resource. --- The identification of the type of resource associated with this RegisteredResource.
3	[0..1]	pSRType.powerSystemResources.highVoltageLimit ESMP_Voltage	The bus bar's high voltage limit, or the high level limit for a transformer. --- The identification of the type of resource associated with this RegisteredResource. --- The voltage level of the RegisteredResource having the MktPSRType.
4	[0..1]	pSRType.powerSystemResources.lowVoltageLimit ESMP_Voltage	The bus bar's low voltage limit. The lower voltage value for a transformer. --- The identification of the type of resource associated with this RegisteredResource. --- The voltage level of the RegisteredResource having the MktPSRType.

150

151 **2.2.3.6 SwitchedBack\_Time\_Period**

152 The identification of a time interval or a duration.

153 These time intervals are the one when although in the maintenance period the network element  
154 is available for operation.

155 Table 9 shows all attributes of SwitchedBack\_Time\_Period.

156 **Table 9 - Attributes of Outage schedule document assembly**  
157 **model::SwitchedBack\_Time\_Period**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	timeInterval ESMP_DateTimeInterval	The start and end date and time for a given interval.

158

159 **2.2.3.7 TimeSeries**

160 A set of time-ordered quantities being exchanged in relation to a product.

161 Table 10 shows all attributes of TimeSeries.

162 **Table 10 - Attributes of Outage schedule document assembly model::TimeSeries**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	A unique identification of the time series. This mRID provides the case identification.
1	[0..1]	description String	The description is a free human readable text describing or naming the object. It may be non unique and may not correlate to a naming hierarchy. This provides the description of the cause of the maintenance.
2	[1..1]	businessType BusinessKind_String	The identification of the nature of the time series.
6	[1..1]	outage_Period.timeInterval ESMP_DateTimeInterval	The start and end date and time for a given interval. --- The total period of the outage for the RegisteredResource.
7	[1..1]	lastChange_MarketAgreement.createdDateTime ESMP_DateTime	The date and time of the creation of the agreement. --- Information about the last change on the outage agreement. This is given by local tool as soon as a dataset is created or updated.
8	[0..1]	positiveOffset_ConstraintDuration.duration Duration	The duration of the constraint. --- The constraint duration for the process described in the TimeSeries. The number of days to delay the maintenance scheduling period.
9	[0..1]	negativeOffset_ConstraintDuration.duration Duration	The duration of the constraint. --- The constraint duration for the process described in the TimeSeries. The number of days to anticipate the maintenance scheduling period.

Order	mult.	Attribute name / Attribute type	Description
10	[0..1]	noRestitution_ConstraintDuration.type String	The type of the constraint. --- The constraint duration for the process described in the TimeSeries. If the type attribute has a value equal to No then there shall be no restitution time duration. Otherwise, the type attribute shall not be used.
11	[0..1]	maximumRestitution_ConstraintDuration.duration Duration	The duration of the constraint. --- The constraint duration for the process described in the TimeSeries. The maximum delay to give back the network element under maintenance if required.
12	[0..1]	dayTimeRestitution_ConstraintDuration.duration Duration	The duration of the constraint. --- The constraint duration for the process described in the TimeSeries. The time delay to give back during day time period the network element under maintenance if required.
13	[0..1]	nightTimeRestitution_ConstraintDuration.duration Duration	The duration of the constraint. --- The constraint duration for the process described in the TimeSeries. The time delay to give back during night time period the network element under maintenance if required.
14	[0..1]	weekEndRestitution_ConstraintDuration.duration Duration	The duration of the constraint. --- The constraint duration for the process described in the TimeSeries. The time delay to give back during week end period the network element under maintenance if required.
15	[1..1]	marketObjectStatus.status Status_String	The coded condition or position of an object with regard to its standing. --- The status of the maintenance scheduling identified by the mRID (case-study). The status may be roughly planned, planned in details or cancelled. IT is always filled even if coordination is not necessary for this element.
16	[0..1]	coordination_MarketObjectStatus.status Status_String	The coded condition or position of an object with regard to its standing. --- The coordination status; it could be merged, modified, or confirmed. This attribute is used for coordination by both the requester TSO and the requested TSO.
17	[0..1]	measurement_Unit.name MeasurementUnitKind_String	The identification of the formal code for a measurement unit (UN/ECE Recommendation 20). --- The unit of measure for the unavailable capacity. The unit may be MW for generation units or load and MVar for compensation means.
18	[0..1]	unavailableCapacity_Quantity.quantity Decimal	The quantity value. The association role provides the information about what is expressed. --- The quantity information associated to a TimeSeries. The unavailable capacity induced by the maintenance of the network element. This may be a generation unit, a load or a compensation mean.
19	[1..1]	day_MarketObjectStatus.status Status_String	The coded condition or position of an object with regard to its standing. --- When attribute has the "Active" value, the maintenance is only done during day ligh time.

Order	mult.	Attribute name / Attribute type	Description
20	[0..1]	week_MarketObjectStatus.status Status_String	The coded condition or position of an object with regard to its standing. --- When attribute has the "Active" value, the maintenance is only done from Monday to Friday included.
21	[0..1]	saturday_MarketObjectStatus.status Status_String	The coded condition or position of an object with regard to its standing. --- When attribute has the "Active" value, the maintenance s done on Saturday.
22	[0..1]	sunday_MarketObjectStatus.status Status_String	The coded condition or position of an object with regard to its standing. --- When attribute has the "Active" value, the maintenance s done on Sunday.

163

164 Table 11 shows all association ends of TimeSeries with other classes.

165 **Table 11 - Association ends of Outage schedule document assembly model::TimeSeries**  
166 **with other classes**

Order	mult.	Class name / Role	Description
3	[0..1]	Name Project_Names	The project identification for the outage, if it exists. If multiple cases belong to the same project, one common project ID for these cases shall be determined by the requesting TSO. This information is additional to case ID. Association Based On: Outage schedule document contextual model::Name.Project_Names[0..1] ----- Outage schedule document contextual model::TimeSeries.[]
4	[0..1]	Name CaseReference_Names	All names of this identified object. If two cases affect each other and the status of one turns to "approved", then the status of the other shall be changed to "cancelled" and the caseID of the other case shall be entered here for tracking purposes. Association Based On: Outage schedule document contextual model::Name.CaseReference_Names[0..1] ----- Outage schedule document contextual model::TimeSeries.[]
5	[0..*]	Name PartnerCaseReference_Names	All names of this identified object. Association Based On: Outage schedule document contextual model::Name.PartnerCaseReference_Names[0..*] ----- Outage schedule document contextual model::TimeSeries.[]
23	[0..*]	Reason Reason	The coordination status of the case-study. The status may be requested, rejected or confirmed. Association Based On: Outage schedule document contextual model::Reason.Reason[0..*] ----- Outage schedule document contextual model::TimeSeries.[]
24	[1..*]	RegisteredResource RegisteredResource	The identification of the network element object of the maintenance scheduling. Association Based On: Outage schedule document contextual model::TimeSeries.[] ----- Outage schedule document contextual model::RegisteredResource.RegisteredResource[1..*]

Order	mult.	Class name / Role	Description
25	[0..*]	Alternative_RegisteredResource Alternative_RegisteredResource	The identification of a resource associated with a TimeSeries. When used, this list contains alternative network element for the maintenance schedule. Association Based On: Outage schedule document contextual model::Alternative_RegisteredResource[0..*] ----- Outage schedule document contextual model::TimeSeries.[]
26	[0..*]	SwitchedBack_Time_Period SwitchedBack_Period	The time interval associated with a TimeSeries within an electronic document. When such time intervals are provided, they states that during the maintenance period, the network elements will be back for operation during these time intervals. Association Based On: Outage schedule document contextual model::SwitchedBack_Time_Period.SwitchedBack_Period[0..*] ----- Outage schedule document contextual model::TimeSeries.[]

167

## 168 2.2.4 Datatypes

169 The list of datatypes used for the Outage schedule document assembly model is as follows:

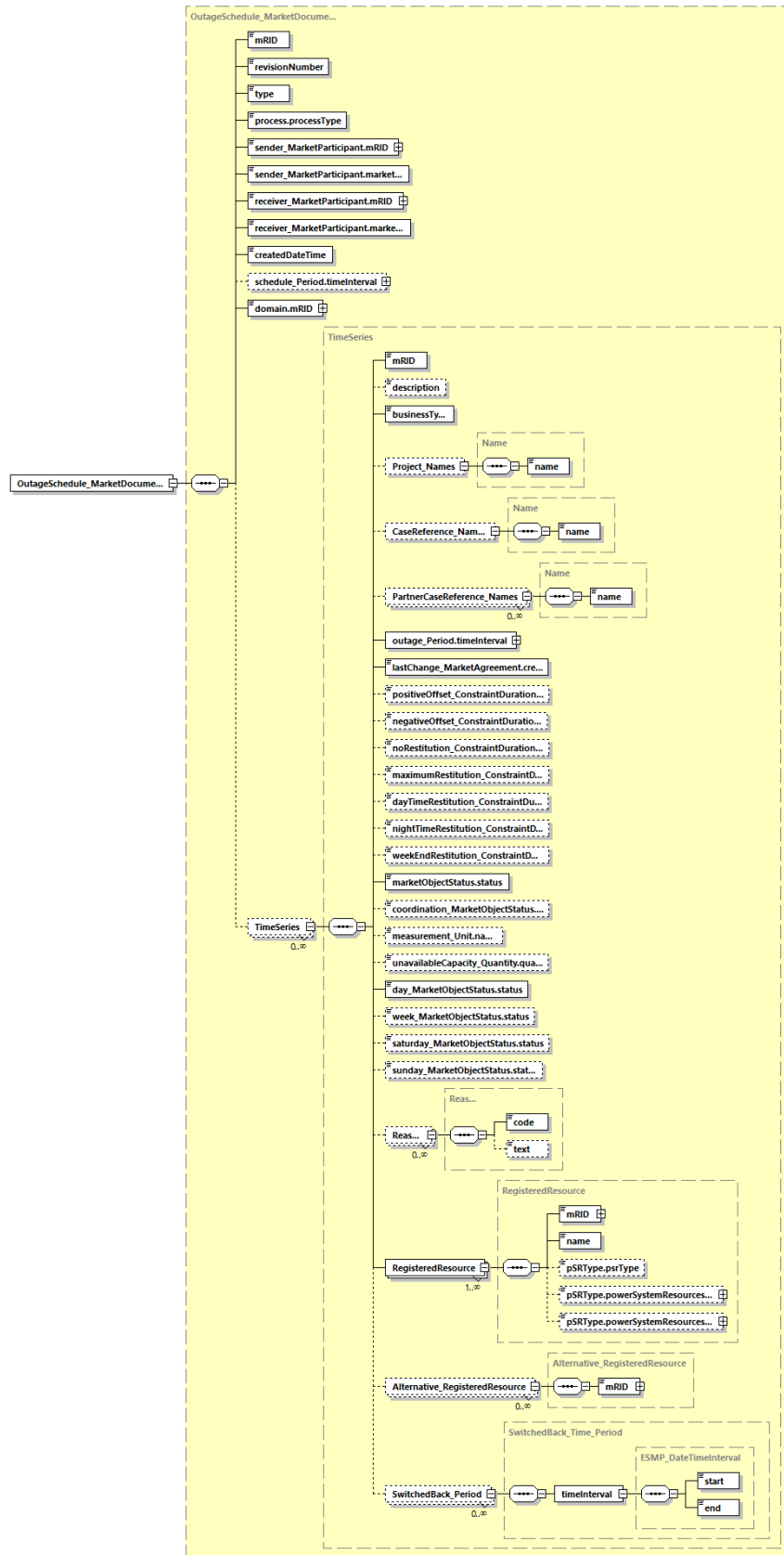
- 170 • ESMP\_DateTimeInterval compound
- 171 • AreaID\_String datatype, codelist CodingSchemeTypeList
- 172 • BusinessKind\_String datatype, codelist BusinessTypeList
- 173 • ESMP\_DateTime datatype
- 174 • ESMP\_Voltage datatype
- 175 • ESMPVersion\_String datatype
- 176 • ID\_String datatype
- 177 • MarketRoleKind\_String datatype, codelist RoleTypeList
- 178 • MeasurementUnitKind\_String datatype, codelist UnitOfMeasureTypeList
- 179 • MessageKind\_String datatype, codelist MessageTypeList
- 180 • PartyID\_String datatype, codelist CodingSchemeTypeList
- 181 • ProcessKind\_String datatype, codelist ProcessTypeList
- 182 • PsrType\_String datatype, codelist AssetTypeList
- 183 • ReasonCode\_String datatype, codelist ReasonCodeTypeList
- 184 • ReasonText\_String datatype
- 185 • ResourceID\_String datatype, codelist CodingSchemeTypeList
- 186 • Status\_String datatype, codelist StatusTypeList
- 187 • UnitSymbol datatype, codelist UnitSymbol
- 188 • YMDHM\_DateTime datatype

189

190



191 2.2.5 Outage Schedule XML schema structure



Generated by XMLSpy www.altova.com

Figure 3 – Outage Schedule XML schema structure

## 194 2.2.6 Outage Schedule XML schema

195 The schema to be used to validate XML instances is to be identified by:

196 urn:iec62325.351:tc57wg16:451-n:outagescheduledocument:1:3

197

```
198 <?xml version="1.0" encoding="utf-8"?>
```

```
199 <xs:schema xmlns:ecl="urn:entsoe.eu:wgedi:codelists"
```

```
200 xmlns="urn:iec62325.351:tc57wg16:451-n:outagescheduledocument:1:3"
```

```
201 xmlns:sawsdl="http://www.w3.org/ns/sawsdl"
```

```
202 xmlns:cimp="http://www.iec.ch/cimprofile"
```

```
203 xmlns:xs="http://www.w3.org/2001/XMLSchema"
```

```
204 targetNamespace="urn:iec62325.351:tc57wg16:451-n:outagescheduledocument:1:3"
```

```
205 elementFormDefault="qualified" attributeFormDefault="unqualified">
```

```
206 <xs:import namespace="urn:entsoe.eu:wgedi:codelists" schemaLocation="urn-  
207 entsoe-eu-wgedi-codelists.xsd"/>
```

```
208 <xs:element name="OutageSchedule_MarketDocument"
```

```
209 type="OutageSchedule_MarketDocument"/>
```

```
210 <xs:simpleType name="ResourceID_String-base"
```

```
211 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
```

```
212 <xs:restriction base="xs:string">
```

```
213 <xs:maxLength value="60"/>
```

```
214 </xs:restriction>
```

```
215 </xs:simpleType>
```

```
216 <xs:complexType name="ResourceID_String"
```

```
217 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
```

```
218 <xs:simpleContent>
```

```
219 <xs:extension base="ResourceID_String-base">
```

```
220 <xs:attribute name="codingScheme"
```

```
221 type="ecl:CodingSchemeTypeList" use="required"/>
```

```
222 </xs:extension>
```

```
223 </xs:simpleContent>
```

```
224 </xs:complexType>
```

```
225 <xs:complexType name="Alternative_RegisteredResource"
```

```
226 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
```

```
227 cim16#RegisteredResource">
```

```
228 <xs:sequence>
```

```
229 <xs:element name="mRID" type="ResourceID_String" minOccurs="1"
```

```
230 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
```

```
231 cim16#IdentifiedObject.mRID"/>
```

```
232 </xs:sequence>
```

```
233 </xs:complexType>
```

```
234 <xs:complexType name="Name"
```

```
235 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Name">
```

```
236 <xs:sequence>
```

```
237 <xs:element name="name" type="xs:string" minOccurs="1"
```

```
238 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
```

```
239 cim16#Name.name"/>
```

```
240 </xs:sequence>
```

```
241 </xs:complexType>
```

```
242 <xs:simpleType name="ID_String"
```

```
243 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
```

```
244 <xs:restriction base="xs:string">
```

```
245 <xs:maxLength value="60"/>
```

```
246 </xs:restriction>
```

```
247 </xs:simpleType>
```

```
248     <xs:simpleType name="ESMPVersion_String"
249 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
250     <xs:restriction base="xs:string">
251         <xs:pattern value="[1-9]([0-9]){0,2}"/>
252     </xs:restriction>
253 </xs:simpleType>
254 <xs:simpleType name="MessageKind_String"
255 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
256     <xs:restriction base="ecl:MessageTypeList"/>
257 </xs:simpleType>
258 <xs:simpleType name="ProcessKind_String"
259 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
260     <xs:restriction base="ecl:ProcessTypeList"/>
261 </xs:simpleType>
262 <xs:simpleType name="PartyID_String-base"
263 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
264     <xs:restriction base="xs:string">
265         <xs:maxLength value="16"/>
266     </xs:restriction>
267 </xs:simpleType>
268 <xs:complexType name="PartyID_String"
269 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
270     <xs:simpleContent>
271         <xs:extension base="PartyID_String-base">
272             <xs:attribute name="codingScheme"
273 type="ecl:CodingSchemeTypeList" use="required"/>
274         </xs:extension>
275     </xs:simpleContent>
276 </xs:complexType>
277 <xs:simpleType name="MarketRoleKind_String"
278 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
279     <xs:restriction base="ecl:RoleTypeList"/>
280 </xs:simpleType>
281 <xs:simpleType name="ESMP_DateTime"
282 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
283     <xs:restriction base="xs:dateTime">
284         <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02]))[\-](0[1-
285 9]|12)[0-9]|3[01])|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|12)[0-
286 9]|30))T((([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-
287 9])Z)|((([13579][26][02468][048]|13579][01345789](0)[48]|13579][01345789][2468][0
288 48]|02468][048][02468][048]|02468][1235679](0)[48]|02468][1235679][2468][048]|
289 0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T((([01][0-9]|2[0-3]):[0-
290 5][0-9]:[0-5][0-
291 9])Z)|((([13579][26][02468][1235679]|13579][01345789](0)[01235679]|13579][0134578
292 9][2468][1235679]|02468][048][02468][1235679]|02468][1235679](0)[01235679]|0246
293 8][1235679][2468][1235679]|0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
294 9]|2[0-8])T((([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-9])Z)"/>
295     </xs:restriction>
296 </xs:simpleType>
297 <xs:simpleType name="AreaID_String-base"
298 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
299     <xs:restriction base="xs:string">
300         <xs:maxLength value="18"/>
301     </xs:restriction>
302 </xs:simpleType>
```

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303     <xs:complexType name="AreaID_String"
304 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
305     <xs:simpleContent>
306         <xs:extension base="AreaID_String-base">
307             <xs:attribute name="codingScheme"
308 type="ecl:CodingSchemeTypeList" use="required"/>
309         </xs:extension>
310     </xs:simpleContent>
311 </xs:complexType>
312 <xs:simpleType name="YMDHM_DateTime"
313 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
314     <xs:restriction base="xs:string">
315         <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02]))[\-](0[1-
316 9]|[12][0-9]|3[01]))|((0[0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
317 9]|30))T((0[1][0-9]|2[0-3]):[0-5][0-
318 9])Z)|((0[13579][26][02468][048]|0[13579][01345789](0)[48]|0[13579][01345789][2468][0
319 48]|0[2468][048][02468][048]|0[2468][1235679](0)[48]|0[2468][1235679][2468][048]|0
320 0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T((0[1][0-9]|2[0-3]):[0-
321 5][0-
322 9])Z)|((0[13579][26][02468][1235679]|0[13579][01345789](0)[01235679]|0[13579][0134578
323 9][2468][1235679]|0[2468][048][02468][1235679]|0[2468][1235679](0)[01235679]|0[246
324 8][1235679][2468][1235679]|0[0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
325 9]|2[0-8])T((0[1][0-9]|2[0-3]):[0-5][0-9])Z)"/>
326     </xs:restriction>
327 </xs:simpleType>
328 <xs:complexType name="ESMP_DateTimeInterval"
329 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTimeInterval">
330     <xs:sequence>
331         <xs:element name="start" type="YMDHM_DateTime" minOccurs="1"
332 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
333 cim16#DateTimeInterval.start"/>
334         <xs:element name="end" type="YMDHM_DateTime" minOccurs="1"
335 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
336 cim16#DateTimeInterval.end"/>
337     </xs:sequence>
338 </xs:complexType>
339 <xs:complexType name="OutageSchedule_MarketDocument"
340 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketDocument">
341     <xs:sequence>
342         <xs:element name="mRID" type="ID_String" minOccurs="1"
343 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
344 cim16#IdentifiedObject.mRID"/>
345         <xs:element name="revisionNumber" type="ESMPVersion_String"
346 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
347 schema-cim16#Document.revisionNumber"/>
348         <xs:element name="type" type="MessageKind_String" minOccurs="1"
349 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
350 cim16#Document.type"/>
351         <xs:element name="process.processType"
352 type="ProcessKind_String" minOccurs="1" maxOccurs="1"
353 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
354 cim16#Process.processType"/>
355         <xs:element name="sender_MarketParticipant.mRID"
356 type="PartyID_String" minOccurs="1" maxOccurs="1"
357 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
358 cim16#IdentifiedObject.mRID"/>
```

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359         <xs:element name="sender_MarketParticipant.marketRole.type"  
360 type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"  
361 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>  
362         <xs:element name="receiver_MarketParticipant.mRID"  
363 type="PartyID_String" minOccurs="1" maxOccurs="1"  
364 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
365 cim16#IdentifiedObject.mRID"/>  
366         <xs:element name="receiver_MarketParticipant.marketRole.type"  
367 type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"  
368 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>  
369         <xs:element name="createdDateTime" type="ESMP_DateTime"  
370 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-  
371 schema-cim16#Document.createdDateTime"/>  
372         <xs:element name="schedule_Period.timeInterval"  
373 type="ESMP_DateTimeInterval" minOccurs="0" maxOccurs="1"  
374 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
375 cim16#Period.timeInterval"/>  
376         <xs:element name="domain.mRID" type="AreaID_String"  
377 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-  
378 schema-cim16#IdentifiedObject.mRID"/>  
379         <xs:element name="TimeSeries" type="TimeSeries" minOccurs="0"  
380 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
381 cim16#MarketDocument.TimeSeries"/>  
382     </xs:sequence>  
383 </xs:complexType>  
384 <xs:simpleType name="ReasonCode_String"  
385 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">  
386     <xs:restriction base="ecl:ReasonCodeTypeList"/>  
387 </xs:simpleType>  
388 <xs:simpleType name="ReasonText_String"  
389 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">  
390     <xs:restriction base="xs:string">  
391         <xs:maxLength value="512"/>  
392     </xs:restriction>  
393 </xs:simpleType>  
394 <xs:complexType name="Reason"  
395 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Reason">  
396     <xs:sequence>  
397         <xs:element name="code" type="ReasonCode_String" minOccurs="1"  
398 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
399 cim16#Reason.code"/>  
400         <xs:element name="text" type="ReasonText_String" minOccurs="0"  
401 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
402 cim16#Reason.text"/>  
403     </xs:sequence>  
404 </xs:complexType>  
405 <xs:simpleType name="PsrType_String"  
406 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">  
407     <xs:restriction base="ecl:AssetTypeList"/>  
408 </xs:simpleType>  
409 <xs:simpleType name="ESMP_Voltage-base"  
410 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Voltage">  
411     <xs:restriction base="xs:float">  
412         <xs:pattern value="([0-9]*\.[0-9]*)"/>  
413     </xs:restriction>  
414 </xs:simpleType>
```

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415     <xs:complexType name="ESMP_Voltage"
416 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Voltage">
417       <xs:simpleContent>
418         <xs:extension base="ESMP_Voltage-base">
419           <xs:attribute name="unit" type="ecl:UnitSymbol"
420 use="required" fixed="KVT"/>
421         </xs:extension>
422       </xs:simpleContent>
423     </xs:complexType>
424     <xs:complexType name="RegisteredResource"
425 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
426 cim16#RegisteredResource">
427       <xs:sequence>
428         <xs:element name="mRID" type="ResourceID_String" minOccurs="1"
429 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
430 cim16#IdentifiedObject.mRID"/>
431         <xs:element name="name" type="xs:string" minOccurs="1"
432 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
433 cim16#IdentifiedObject.name"/>
434         <xs:element name="pSRType.psrType" type="PsrType_String"
435 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
436 schema-cim16#MktPSRType.psrType"/>
437         <xs:element
438 name="pSRType.powerSystemResources.highVoltageLimit" type="ESMP_Voltage"
439 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
440 schema-cim16#VoltageLevel.highVoltageLimit"/>
441         <xs:element name="pSRType.powerSystemResources.lowVoltageLimit"
442 type="ESMP_Voltage" minOccurs="0" maxOccurs="1"
443 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
444 cim16#VoltageLevel.lowVoltageLimit"/>
445       </xs:sequence>
446     </xs:complexType>
447     <xs:complexType name="SwitchedBack_Time_Period"
448 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period">
449       <xs:sequence>
450         <xs:element name="timeInterval" type="ESMP_DateTimeInterval"
451 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
452 schema-cim16#Period.timeInterval"/>
453       </xs:sequence>
454     </xs:complexType>
455     <xs:simpleType name="BusinessKind_String"
456 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
457       <xs:restriction base="ecl:BusinessTypeList"/>
458     </xs:simpleType>
459     <xs:simpleType name="Status_String"
460 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
461       <xs:restriction base="ecl:StatusTypeList"/>
462     </xs:simpleType>
463     <xs:simpleType name="MeasurementUnitKind_String"
464 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
465       <xs:restriction base="ecl:UnitOfMeasureTypeList"/>
466     </xs:simpleType>
467     <xs:complexType name="TimeSeries"
468 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#TimeSeries">
469       <xs:sequence>

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470         <xs:element name="mRID" type="ID_String" minOccurs="1"
471 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
472 cim16#IdentifiedObject.mRID"/>
473         <xs:element name="description" type="xs:string" minOccurs="0"
474 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
475 cim16#IdentifiedObject.description"/>
476         <xs:element name="businessType" type="BusinessKind_String"
477 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
478 schema-cim16#TimeSeries.businessType"/>
479         <xs:element name="Project_Names" type="Name" minOccurs="0"
480 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
481 cim16#TimeSeries.Project_Names"/>
482         <xs:element name="CaseReference_Names" type="Name"
483 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
484 schema-cim16#TimeSeries.CaseReference_Names"/>
485         <xs:element name="PartnerCaseReference_Names" type="Name"
486 minOccurs="0" maxOccurs="unbounded"
487 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
488 cim16#TimeSeries.PartnerCaseReference_Names"/>
489         <xs:element name="outage_Period.timeInterval"
490 type="ESMP_DateTimeInterval" minOccurs="1" maxOccurs="1"
491 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
492 cim16#Period.timeInterval"/>
493         <xs:element name="lastChange_MarketAgreement.createdDateTime"
494 type="ESMP_DateTime" minOccurs="1" maxOccurs="1"
495 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
496 cim16#Document.createdDateTime"/>
497         <xs:element name="positiveOffset_ConstraintDuration.duration"
498 type="xs:duration" minOccurs="0" maxOccurs="1"
499 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
500 cim16#ConstraintDuration.duration"/>
501         <xs:element name="negativeOffset_ConstraintDuration.duration"
502 type="xs:duration" minOccurs="0" maxOccurs="1"
503 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
504 cim16#ConstraintDuration.duration"/>
505         <xs:element name="noRestitution_ConstraintDuration.type"
506 type="xs:string" minOccurs="0" maxOccurs="1"
507 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
508 cim16#ConstraintDuration.type"/>
509         <xs:element
510 name="maximumRestitution_ConstraintDuration.duration" type="xs:duration"
511 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
512 schema-cim16#ConstraintDuration.duration"/>
513         <xs:element
514 name="dayTimeRestitution_ConstraintDuration.duration" type="xs:duration"
515 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
516 schema-cim16#ConstraintDuration.duration"/>
517         <xs:element
518 name="nightTimeRestitution_ConstraintDuration.duration" type="xs:duration"
519 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
520 schema-cim16#ConstraintDuration.duration"/>
521         <xs:element
522 name="weekEndRestitution_ConstraintDuration.duration" type="xs:duration"
523 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
524 schema-cim16#ConstraintDuration.duration"/>
```

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525         <xs:element name="marketObjectStatus.status"  
526 type="Status_String" minOccurs="1" maxOccurs="1"  
527 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
528 cim16#MarketObjectStatus.status"/>  
529         <xs:element name="coordination_MarketObjectStatus.status"  
530 type="Status_String" minOccurs="0" maxOccurs="1"  
531 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
532 cim16#MarketObjectStatus.status"/>  
533         <xs:element name="measurement_Unit.name"  
534 type="MeasurementUnitKind_String" minOccurs="0" maxOccurs="1"  
535 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name"/>  
536         <xs:element name="unavailableCapacity_Quantity.quantity"  
537 type="xs:decimal" minOccurs="0" maxOccurs="1"  
538 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
539 cim16#Quantity.quantity"/>  
540         <xs:element name="day_MarketObjectStatus.status"  
541 type="Status_String" minOccurs="1" maxOccurs="1"  
542 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
543 cim16#MarketObjectStatus.status"/>  
544         <xs:element name="week_MarketObjectStatus.status"  
545 type="Status_String" minOccurs="0" maxOccurs="1"  
546 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
547 cim16#MarketObjectStatus.status"/>  
548         <xs:element name="saturday_MarketObjectStatus.status"  
549 type="Status_String" minOccurs="0" maxOccurs="1"  
550 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
551 cim16#MarketObjectStatus.status"/>  
552         <xs:element name="sunday_MarketObjectStatus.status"  
553 type="Status_String" minOccurs="0" maxOccurs="1"  
554 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
555 cim16#MarketObjectStatus.status"/>  
556         <xs:element name="Reason" type="Reason" minOccurs="0"  
557 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
558 cim16#TimeSeries.Reason"/>  
559         <xs:element name="RegisteredResource" type="RegisteredResource"  
560 minOccurs="1" maxOccurs="unbounded"  
561 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
562 cim16#TimeSeries.RegisteredResource"/>  
563         <xs:element name="Alternative_RegisteredResource"  
564 type="Alternative_RegisteredResource" minOccurs="0" maxOccurs="unbounded"  
565 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
566 cim16#TimeSeries.Alternative_RegisteredResource"/>  
567         <xs:element name="SwitchedBack_Period"  
568 type="SwitchedBack_Time_Period" minOccurs="0" maxOccurs="unbounded"  
569 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-  
570 cim16#TimeSeries.SwitchedBack_Period"/>  
571     </xs:sequence>  
572 </xs:complexType>  
573 </xs:schema>  
574
```