



European Network of
Transmission System Operators
for Electricity

UNAVAILABILITY DOCUMENT UML MODEL AND SCHEMA

2024-04-03
AGREED DOCUMENT
VERSION 1.2

2

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62

Revision History

Version	Release	Date	Comments
0	0	2017-01-27	First drafting of the document.
1	0	2017-01-30	Version to be submitted to Market Committee following WG EDI meeting in March 2017.
1	1	2022-02-01	XSD version 4.1: <ul style="list-style-type: none"> Quantity_Measure_Unit.name attribute was renamed to Quantity_Measurement_Unit.name to be compliant with the ESMP. mRID of Document, Series and Timeseries (ID_String type) was enlarged from 35 to 60 characters. Approved by MC.
1	2	2024-04-03	XSD version 4.2: <ol style="list-style-type: none"> Point.quantity becomes optional New optional attribute in Point class called installed_Quantity.quantity New class PTDFDomainSeries associated with Point class with cardinality 0..*. This new class has ptdf_Domain.mRID and unavailable import and export quantity attributes, all optional. Agreed by CIM WG.

63

64 1. Objective

65 The purpose of this document is to provide the contextual and assembly UML models and the
66 schema of the Unavailability_MarketDocument.

67 The schema of the Unavailability_MarketDocument could be used in various business
68 processes.

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

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

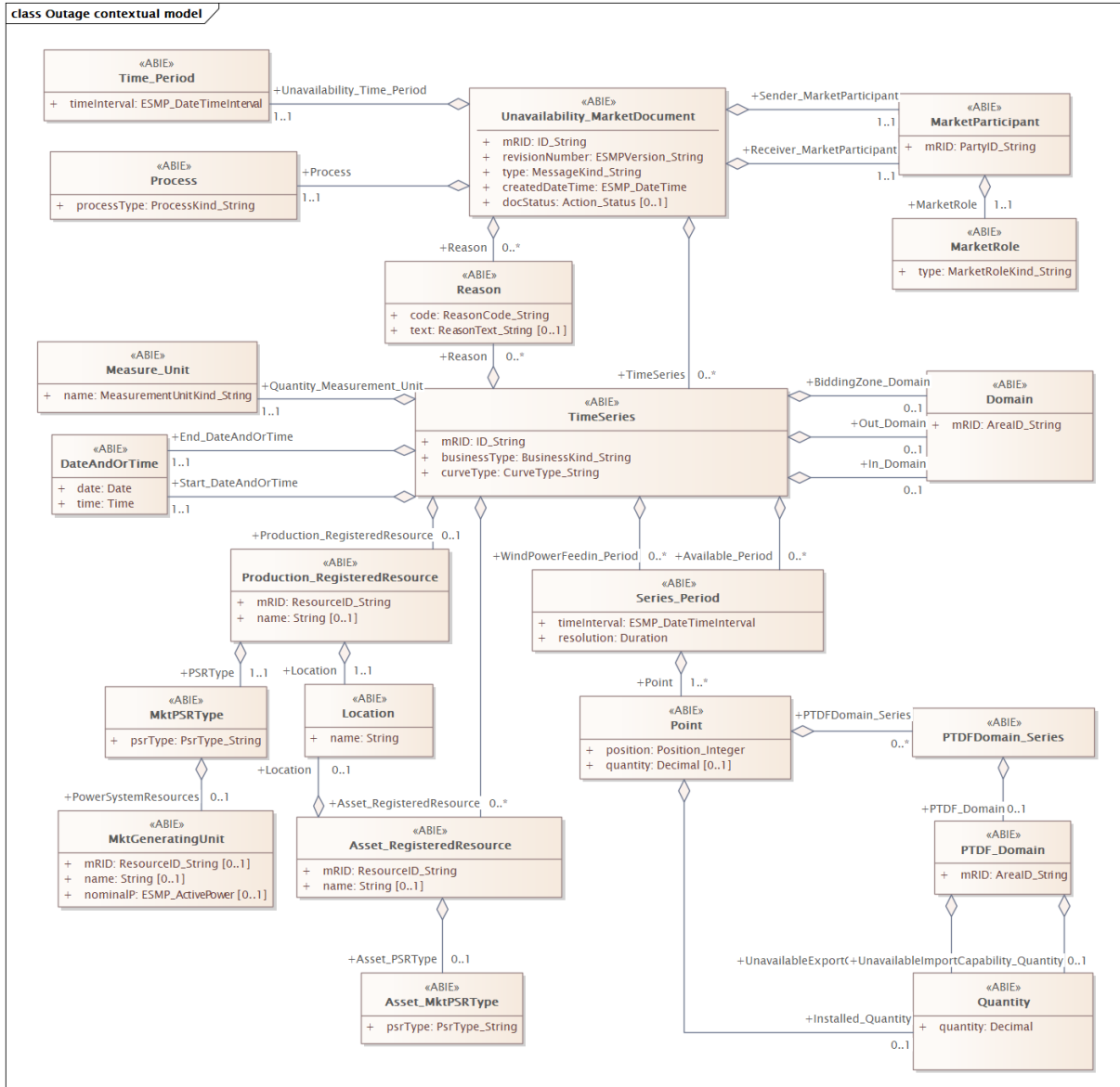
- 73 • Description of the business process;
- 74 • Use case of the business process;
- 75 • Sequence diagrams of the business process;
- 76 • List of the schema (XSD) to be used in the business process and versions of the
77 schema;
- 78 • For each schema, dependency tables providing the necessary information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

81 **2. Unavailability_MarketDocument**

82 **2.1 Outage contextual model**

83 **2.1.1 Overview of the model**

84 Figure 1 shows the model.



85

86

Figure 1 - Outage contextual model

87

88

89 **2.1.2 IsBasedOn relationships from the European style market profile**

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

92

Table 1 - IsBasedOn dependency

Name	Complete IsBasedOn Path
Asset_MktPSRType	TC57CIM::Market::MarketManagement::MktPSRType
Asset_RegisteredResource	TC57CIM::Market::MarketCommon::RegisteredResource
DateAndOrTime	TC57CIM::Market::MarketManagement::DateAndOrTime
Domain	TC57CIM::Market::MarketManagement::Domain
Location	TC57CIM::IEC61968::Common::Location
MarketParticipant	TC57CIM::Market::MarketCommon::MarketParticipant
MarketRole	TC57CIM::Market::MarketCommon::MarketRole
Measure_Unit	TC57CIM::Market::MarketManagement::Unit
MktGeneratingUnit	TC57CIM::Market::MarketCommon::MktGeneratingUnit
MktPSRType	TC57CIM::Market::MarketManagement::MktPSRType
Point	TC57CIM::Market::MarketManagement::Point
Process	TC57CIM::Market::MarketManagement::Process
Production_RegisteredResource	TC57CIM::Market::MarketCommon::RegisteredResource
PTDF_Domain	TC57CIM::Market::MarketManagement::Domain
PTDFDomain_Series	TC57CIM::Market::MarketManagement::Series
Quantity	TC57CIM::Market::MarketManagement::Quantity
Reason	TC57CIM::Market::MarketManagement::Reason
Series_Period	TC57CIM::Market::MarketManagement::Period
Time_Period	TC57CIM::Market::MarketManagement::Period
TimeSeries	TC57CIM::Market::MarketManagement::TimeSeries
Unavailability_MarketDocument	TC57CIM::Market::MarketManagement::MarketDocument

93

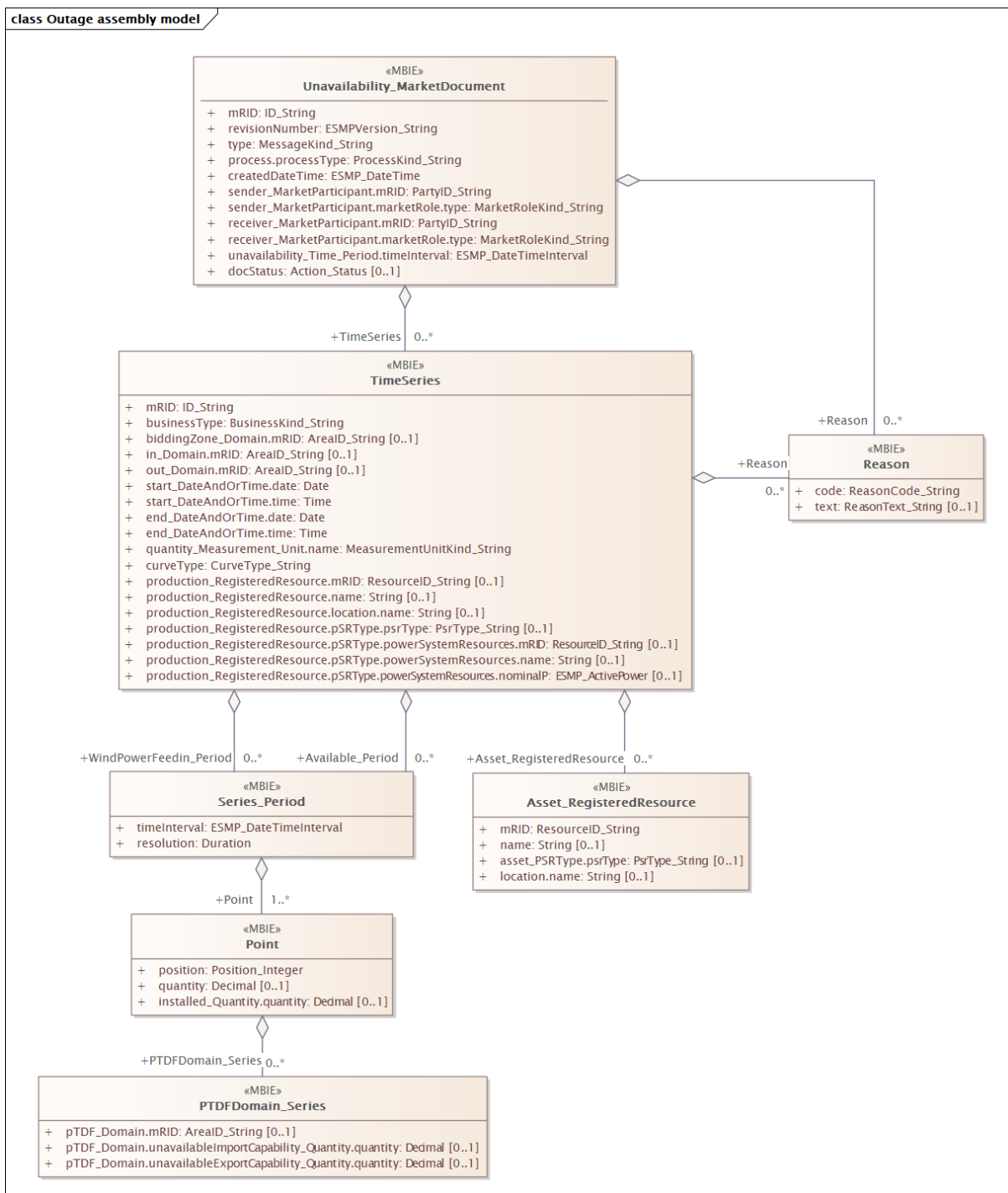
94

95

96 **2.2 Outage assembly model**

97 **2.2.1 Overview of the model**

98 Figure 2 shows the model.



99

100

Figure 2 - Outage assembly model

101

102

103 **2.2.2 IsBasedOn relationships from the European style market profile**

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

106

Table 2 - IsBasedOn dependency

Name	Complete IsBasedOn Path
Asset_RegisteredResource	TC57CIM::Market::MarketCommon::RegisteredResource
Point	TC57CIM::Market::MarketManagement::Point
PTDFDomain_Series	TC57CIM::Market::MarketManagement::Series
Reason	TC57CIM::Market::MarketManagement::Reason
Series_Period	TC57CIM::Market::MarketManagement::Period
TimeSeries	TC57CIM::Market::MarketManagement::TimeSeries
Unavailability_MarketDocument	TC57CIM::Market::MarketManagement::MarketDocument

107

108 **2.2.3 Detailed Outage assembly model**

109 **2.2.3.1 Unavailability_MarketDocument root class**

110 An electronic document containing the information necessary to satisfy the business process
111 concerning the previsual planned maintenance of assets and production and consumption
112 resource objects as well as the punctual change of availability of the same equipment.

113 Table 3 shows all attributes of Unavailability_MarketDocument.

114

Table 3 - Attributes of Outage assembly model::Unavailability_MarketDocument

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	Unique identification of the document being exchanged within a business process flow. This identifies a given unavailability document.
1	[1..1]	revisionNumber ESMPVersion_String	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.
4	[1..1]	createdDateTime ESMP_DateTime	Identification of the date and time of the creation of the document.
5	[1..1]	sender_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- The document owner.
6	[1..1]	sender_MarketParticipant.marketRole.type MarketRoleKind_String	Identification of the role played by a market player. --- The document owner. --- The role associated with a MarketParticipant.
7	[1..1]	receiver_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- The document recipient.
8	[1..1]	receiver_MarketParticipant.marketRole.type MarketRoleKind_String	Identification of the role played by a market player. --- The document recipient. --- The role associated with a MarketParticipant.

Order	mult.	Attribute name / Attribute type	Description
9	[1..1]	unavailability_Time_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 time interval covering the whole unavailability document.
10	[0..1]	docStatus Action_Status	Identification of the condition or position of the document with regard to its standing. It is used to identify an unavailability document that has been withdrawn or cancelled.

115

116 Table 4 shows all association ends of Unavailability_MarketDocument with other classes.

117 **Table 4 - Association ends of Outage assembly model::Unavailability_MarketDocument**
118 **with other classes**

Order	mult.	Class name / Role	Description
11	[0..*]	TimeSeries TimeSeries	The time series that is associated with an electronic document. Association Based On: Outage contextual model::Unavailability_MarketDocument.[] ----- Outage contextual model::TimeSeries.TimeSeries[0..*]
12	[0..*]	Reason Reason	The Reason associated with the electronic document header providing the reason for the unavailability. Association Based On: Outage contextual model::Unavailability_MarketDocument.[] ----- Outage contextual model::Reason.Reason[0..*]

119

120 2.2.3.2 Asset_RegisteredResource

121 An asset that is registered through the market participant registration system.

122 Table 5 shows all attributes of Asset_RegisteredResource.

123 **Table 5 - Attributes of Outage assembly model::Asset_RegisteredResource**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ResourceID_String	The unique identification of an asset.
1	[0..1]	name String	The name of an asset.
2	[0..1]	asset_PSRType.psrType PsrType_String	The coded type of an asset. --- The classification for the asset..
3	[0..1]	location.name String	The name is any free human readable and possibly non unique text naming the object. --- The name of the location of the asset.

124

125 2.2.3.3 Point

126 The identification of the values being addressed within a specific interval of time.

127 Table 6 shows all attributes of Point.

128

Table 6 - Attributes of Outage assembly model::Point

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	position Position_Integer	A sequential value representing the relative position within a given time interval.
1	[0..1]	quantity Decimal	Principal quantity identified for a point. This information defines the available, installed, wind power feed in or specific point quantities of an unavailability that is taken from or put into the area for the position within the interval period.
2	[0..1]	installed_Quantity.quantity Decimal	The quantity value. The association role provides the information about what is expressed. --- The Quantity information associated with a given Point.

129

130 Table 7 shows all association ends of Point with other classes.

131 **Table 7 - Association ends of Outage assembly model::Point with other classes**

Order	mult.	Class name / Role	Description
3	[0..*]	PTDFDomain_Series PTDFDomain_Series	TheTimeSeries provides additional information related to a Position within a given time interval. Association Based On: Outage contextual model::PTDFDomain_Series.PTDFDomain_Series[0..*] ----- Outage contextual model::Point.[]

132

133 **2.2.3.4 PTDFDomain_Series**

134 A set of similar physical or conceptual objects defined for the same period or point of time.

135 Table 8 shows all attributes of PTDFDomain_Series.

136 **Table 8 - Attributes of Outage assembly model::PTDFDomain_Series**

Order	mult.	Attribute name / Attribute type	Description
0	[0..1]	pTDF_Domain.mRID AreaID_String	The unique identification of the domain. In the ESMP context, the "model authority" is defined as an authorized issuing office that provides an agreed identification coding scheme for market participant, domain, measurement point, resources (generator, lines, substations, etc.) identification. Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.
1	[0..1]	pTDF_Domain.unavailableImportCapability_Quantity.quantity Decimal	The quantity value. The association role provides the information about what is expressed. --- Associated quantity for a domain.
2	[0..1]	pTDF_Domain.unavailableExportCapability_Quantity.quantity Decimal	The quantity value. The association role provides the information about what is expressed. --- Associated quantity for a domain.

137

138 **2.2.3.5 Reason**

139 The motivation of an act.

140 Table 9 shows all attributes of Reason.

141 **Table 9 - Attributes of Outage 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.

142

143 **2.2.3.6 Series_Period**

144 The identification of the period of time corresponding to a given time interval and resolution.

145 The Series_Period class provides for a given unavailability the market time unit information for:

- 146 • available capacity in the Available_Period class, the available consumption capacity, generation capacity or production unit capacity, or the impact on cross border capacity.
- 147 • or wind power feeding capacity in the WindPowerFeedin_Period class, the off shore wind power feed in capacity to the transmission infrastructure

150 Table 10 shows all attributes of Series_Period.

151 **Table 10 - Attributes of Outage assembly model::Series_Period**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	timeInterval ESMP_DateTimeInterval	The start and end time of the period.
1	[1..1]	resolution Duration	The definition of the number of units of time that compose an individual step within a period.

152

153 Table 11 shows all association ends of Series_Period with other classes.

154 **Table 11 - Association ends of Outage assembly model::Series_Period with other classes**

155

Order	mult.	Class name / Role	Description
2	[1..*]	Point Point	The Point information associated with a given Series_Period.within a TimeSeries. Association Based On: Outage contextual model::Series_Period.[] ----- Outage contextual model::Point.Point[1..*]

156

157 **2.2.3.7 TimeSeries**

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

159 A time series should exist to describe a specific piece of an unavailability situation. It conveys
160 the data related to the unavailability. For consumption or production / generating unit

161 unavailability it identifies the unavailable capacity during the event. For transmission asset
162 unavailability it identifies the impact on cross zonal capacity per direction.

163 Table 12 shows all attributes of TimeSeries.

164 **Table 12 - Attributes of Outage assembly model::TimeSeries**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	A unique identification of the time series.
1	[1..1]	businessType BusinessKind_String	The identification of the nature of the time series.
2	[0..1]	biddingZone_Domain.mRID AreaID_String	The unique identification of the domain. --- The bidding domain associated with a TimeSeries. The identification of the bidding zone for which the unavailability information is being provided.
3	[0..1]	in_Domain.mRID AreaID_String	The unique identification of the domain. --- The domain where energy is going associated with a TimeSeries.
4	[0..1]	out_Domain.mRID AreaID_String	The unique identification of the domain. --- The domain where energy is coming from associated with a TimeSeries.
5	[1..1]	start_DateAndOrTime.date Date	Date as "yyyy-mm-dd", which conforms with ISO 8601. --- A start date and/or time associated with a TimeSeries. This identifies the date and/or time of the start of the unavailability being described in the time series.
6	[1..1]	start_DateAndOrTime.time Time	Time as "hh:mm:ss.sssZ", which conforms with ISO 8601. --- A start date and/or time associated with a TimeSeries. This identifies the date and/or time of the start of the unavailability being described in the time series.

Order	mult.	Attribute name / Attribute type	Description
7	[1..1]	end_DateAndOrTime.date Date	Date as "yyyy-mm-dd", which conforms with ISO 8601. --- An end date and/or time associated with a TimeSeries. This identifies the date and/or time of the end of the unavailability being described in the time series.
8	[1..1]	end_DateAndOrTime.time Time	Time as "hh:mm:ss.sssZ", which conforms with ISO 8601. --- An end date and/or time associated with a TimeSeries. This identifies the date and/or time of the end of the unavailability being described in the time series.
9	[1..1]	quantity_Measurement_Unit.name MeasurementUnitKind_String	Identification of the formal code for a measurement unit (UN/ECE Recommendation 20). --- The unit of measure associated with the quantities in a TimeSeries.
10	[1..1]	curveType CurveType_String	The identification of the coded representation of the type of curve being described.
11	[0..1]	production_RegisteredResource.mRID ResourceID_String	The unique identification of a production unit resource. --- Characteristics of a production unit affected by the unavailability.
12	[0..1]	production_RegisteredResource.name String	The name is any free human readable and possibly non unique text naming the production unit. --- Characteristics of a production unit affected by the unavailability.
13	[0..1]	production_RegisteredResource.location.name String	The name is any free human readable and possibly non unique text naming the object. --- Characteristics of a production unit affected by the unavailability. --- The identification of the location of the production unit.
14	[0..1]	production_RegisteredResource.pSRType.psrType PsrType_String	The coded type of a power system resource. --- Characteristics of a production unit affected by the unavailability. --- The classification for this production unit.

Order	mult.	Attribute name / Attribute type	Description
15	[0..1]	production_RegisteredResource.pSRtype.powerSystemResources.mRID ResourceID_String	The unique identification of a generation unit. --- Characteristics of a production unit affected by the unavailability. --- The classification for this production unit. --- The generation unit dependent on a given type.
16	[0..1]	production_RegisteredResource.pSRtype.powerSystemResources.name String	The name of the generation unit. --- Characteristics of a production unit affected by the unavailability. --- The classification for this production unit. --- The generation unit dependent on a given type.
17	[0..1]	production_RegisteredResource.pSRtype.powerSystemResources.nominalP ESMP_ActivePower	The nominal power of the object in question. --- Characteristics of a production unit affected by the unavailability. --- The classification for this production unit. --- The generation unit dependent on a given type.

165

166 Table 13 shows all association ends of TimeSeries with other classes.

167 **Table 13 - Association ends of Outage assembly model::TimeSeries with other classes**

Order	mult.	Class name / Role	Description
18	[0..*]	Asset_RegisteredResource Asset_RegisteredResource	The identification of an asset. Association Based On: Outage contextual model::TimeSeries.[] ----- Outage contextual model::Asset_RegisteredResource.Asset_RegisteredResource[0..*]
19	[0..*]	Series_Period Available_Period	The time interval and resolution of available capacity for a period associated with a TimeSeries. Association Based On: Outage contextual model::TimeSeries.[] ----- Outage contextual model::Series_Period.Available_Period[0..*]
20	[0..*]	Series_Period WindPowerFeedin_Period	The time interval and resolution for a period associated with windpower feedin. Association Based On: Outage contextual model::TimeSeries.[] ----- Outage contextual model::Series_Period.WindPowerFeedin_Period[0..*]
21	[0..*]	Reason Reason	The reason information associated with a TimeSeries providing motivation information. Association Based On: Outage contextual model::TimeSeries.[] ----- Outage contextual model::Reason.Reason[0..*]

168

169 2.2.4 Datatypes

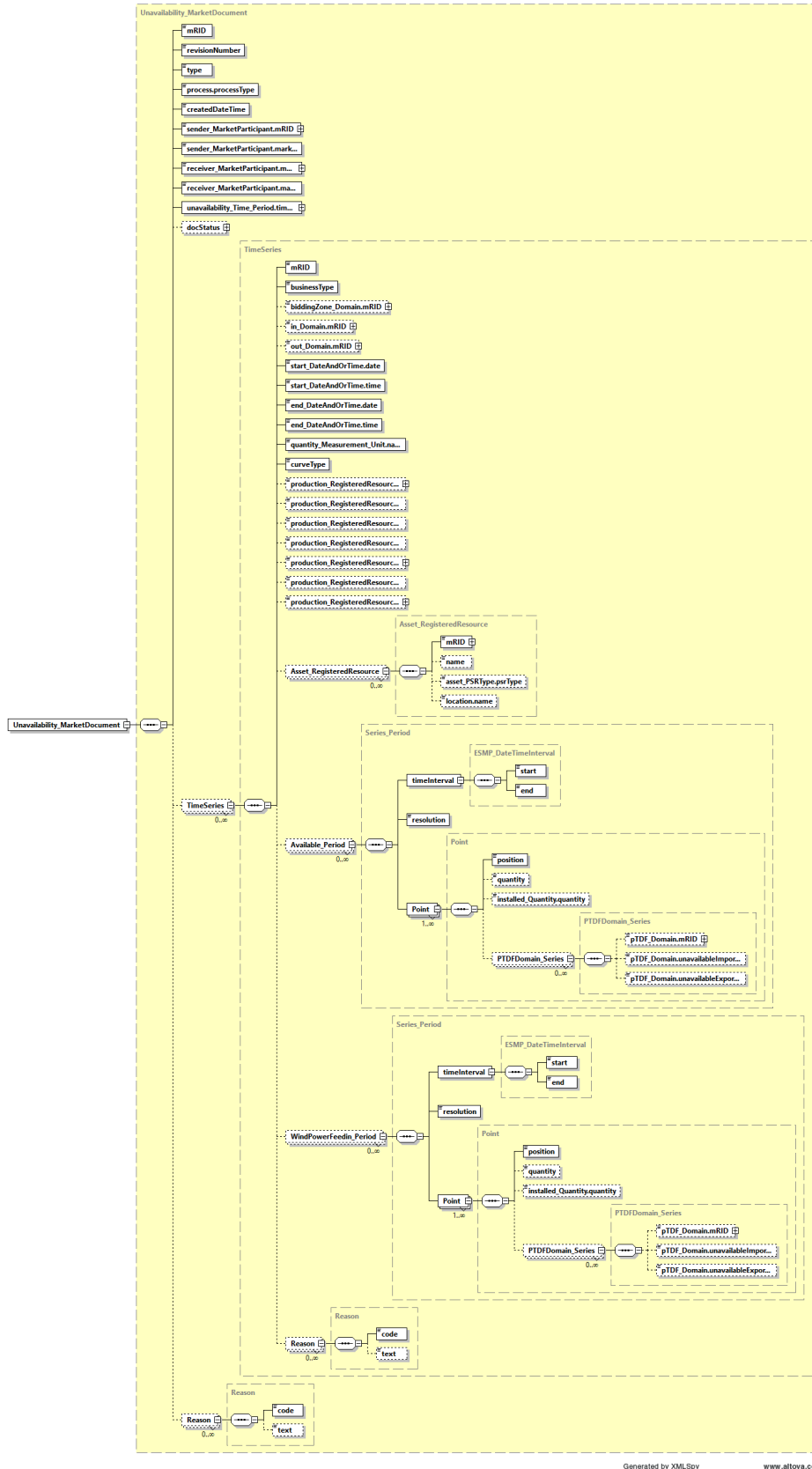
170 The list of datatypes used for the Outage assembly model is as follows:

- 171 • Action_Status compound
- 172 • ESMP_DateTimeInterval compound
- 173 • ArealID_String datatype, codelist CodingSchemeTypeList
- 174 • BusinessKind_String datatype, codelist BusinessTypeList
- 175 • CurveType_String datatype, codelist CurveTypeList
- 176 • ESMP_ActivePower datatype
- 177 • ESMP_DateTime datatype
- 178 • ESMPVersion_String datatype
- 179 • ID_String datatype
- 180 • MarketRoleKind_String datatype, codelist RoleTypeList
- 181 • MeasurementUnitKind_String datatype, codelist UnitOfMeasureTypeList
- 182 • MessageKind_String datatype, codelist MessageTypeList
- 183 • PartyID_String datatype, codelist CodingSchemeTypeList
- 184 • Position_Integer datatype
- 185 • ProcessKind_String datatype, codelist ProcessTypeList
- 186 • PsrType_String datatype, codelist AssetTypeList
- 187 • ReasonCode_String datatype, codelist ReasonCodeTypeList
- 188 • ReasonText_String datatype
- 189 • ResourceID_String datatype, codelist CodingSchemeTypeList
- 190 • Status_String datatype, codelist StatusTypeList
- 191 • UnitSymbol datatype, codelist UnitSymbol
- 192 • YMDHM_DateTime datatype
- 193

194

195 **2.2.5 Unavailability_MarketDocument XML schema structure**

196 Figure 3 provides the structure of the schema.



197

198

Figure 3 - Unavailability_MarketDocument schema structure

199

200 2.2.6 Unavailability_MarketDocument XML schema

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

202 urn:iec62325.351:tc57wg16:451-6:outagedocument:4:2

```

203 <?xml version="1.0" encoding="utf-8"?>
204 <xs:schema xmlns:ecl="urn:entsoe.eu:wgedi:codelists"
205 xmlns="urn:iec62325.351:tc57wg16:451-6:outagedocument:4:2"
206 xmlns:sawsdl="http://www.w3.org/ns/sawsdl"
207 xmlns:cimp="http://www.iec.ch/cimprofile" attributeFormDefault="unqualified"
208 elementFormDefault="qualified" targetNamespace="urn:iec62325.351:tc57wg16:451-
209 6:outagedocument:4:2" xmlns:xs="http://www.w3.org/2001/XMLSchema">
210   <xs:import schemaLocation="urn-entsoe-eu-wgedi-codelists.xsd"
211 namespace="urn:entsoe.eu:wgedi:codelists" />
212   <xs:element name="Unavailability_MarketDocument"
213 type="Unavailability_MarketDocument" />
214   <xs:simpleType name="ResourceID_String-base"
215 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
216     <xs:restriction base="xs:string">
217       <xs:maxLength value="60" />
218     </xs:restriction>
219   </xs:simpleType>
220   <xs:complexType name="ResourceID_String"
221 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
222     <xs:simpleContent>
223       <xs:extension base="ResourceID_String-base">
224         <xs:attribute name="codingScheme" type="ecl:CodingSchemeTypeList"
225 use="required" />
226       </xs:extension>
227     </xs:simpleContent>
228   </xs:complexType>
229   <xs:simpleType name="PsrType_String"
230 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
231     <xs:restriction base="ecl:AssetTypeList" />
232   </xs:simpleType>
233   <xs:complexType name="Asset_RegisteredResource"
234 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
235 cim16#RegisteredResource">
236     <xs:sequence>
237       <xs:element minOccurs="1" maxOccurs="1" name="mRID" type="ResourceID_String"
238 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
239 cim16#IdentifiedObject.mRID">
240       </xs:element>
241       <xs:element minOccurs="0" maxOccurs="1" name="name" type="xs:string"
242 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
243 cim16#IdentifiedObject.name">
244       </xs:element>
245       <xs:element minOccurs="0" maxOccurs="1" name="asset_PSRTYPE.psrType"
246 type="PsrType_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
247 cim16#MktPSRTYPE.psrType">
248       </xs:element>
249       <xs:element minOccurs="0" maxOccurs="1" name="location.name"
250 type="xs:string" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
251 cim16#IdentifiedObject.name">
252       </xs:element>
253     </xs:sequence>
254   </xs:complexType>

```

```

255     <xs:simpleType name="Position_Integer"
256 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Integer">
257     <xs:restriction base="xs:integer">
258         <xs:maxInclusive value="999999" />
259         <xs:minInclusive value="1" />
260     </xs:restriction>
261 </xs:simpleType>
262 <xs:complexType name="Point" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
263 schema-cim16#Point">
264     <xs:sequence>
265         <xs:element minOccurs="1" maxOccurs="1" name="position"
266 type="Position_Integer" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
267 cim16#Point.position">
268         </xs:element>
269         <xs:element minOccurs="0" maxOccurs="1" name="quantity" type="xs:decimal"
270 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Point.quantity">
271         </xs:element>
272         <xs:element minOccurs="0" maxOccurs="1" name="installed_Quantity.quantity"
273 type="xs:decimal" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
274 cim16#Quantity.quantity">
275         </xs:element>
276         <xs:element minOccurs="0" maxOccurs="unbounded" name="PTDFDomain_Series"
277 type="PTDFDomain_Series" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
278 schema-cim16#Point.PTDFDomain_Series">
279         </xs:element>
280     </xs:sequence>
281 </xs:complexType>
282 <xs:simpleType name="AreaID_String-base"
283 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
284     <xs:restriction base="xs:string">
285         <xs:maxLength value="18" />
286     </xs:restriction>
287 </xs:simpleType>
288 <xs:complexType name="AreaID_String"
289 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
290     <xs:simpleContent>
291         <xs:extension base="AreaID_String-base">
292             <xs:attribute name="codingScheme" type="ecl:CodingSchemeTypeList"
293 use="required" />
294         </xs:extension>
295     </xs:simpleContent>
296 </xs:complexType>
297 <xs:complexType name="PTDFDomain_Series"
298 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Series">
299     <xs:sequence>
300         <xs:element minOccurs="0" maxOccurs="1" name="pTDF_Domain.mRID"
301 type="AreaID_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
302 cim16#IdentifiedObject.mRID">
303         </xs:element>
304         <xs:element minOccurs="0" maxOccurs="1"
305 name="pTDF_Domain.unavailableImportCapability_Quantity.quantity" type="xs:decimal"
306 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
307 cim16#Quantity.quantity">
308         </xs:element>
309         <xs:element minOccurs="0" maxOccurs="1"
310 name="pTDF_Domain.unavailableExportCapability_Quantity.quantity" type="xs:decimal"
311 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
312 cim16#Quantity.quantity">
313         </xs:element>
314     </xs:sequence>

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315     </xs:complexType>
316     <xs:simpleType name="ReasonCode_String"
317 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
318     <xs:restriction base="ecl:ReasonCodeTypeList" />
319     </xs:simpleType>
320     <xs:simpleType name="ReasonText_String"
321 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
322     <xs:restriction base="xs:string">
323     <xs:maxLength value="512" />
324     </xs:restriction>
325     </xs:simpleType>
326     <xs:complexType name="Reason"
327 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Reason">
328     <xs:sequence>
329     <xs:element minOccurs="1" maxOccurs="1" name="code" type="ReasonCode_String"
330 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Reason.code">
331     </xs:element>
332     <xs:element minOccurs="0" maxOccurs="1" name="text" type="ReasonText_String"
333 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Reason.text">
334     </xs:element>
335     </xs:sequence>
336     </xs:complexType>
337     <xs:simpleType name="YMDHM_DateTime"
338 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
339     <xs:restriction base="xs:string">
340     <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02])[\-](0[1-9]|[12][0-
341 9]|3[01])|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-9]|30))T(([01][0-9]|2[0-
342 3]):[0-5][0-
343 9])Z)|((([13579][26][02468][048]|13579][01345789])(0)[48]|13579][01345789][2468][0
344 48]|02468][048][02468][048]|02468][1235679](0)[48]|02468][1235679][2468][048]|
345 0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T((([01][0-9]|2[0-3]):[0-
346 5][0-
347 9])Z)|((([13579][26][02468][1235679]|13579][01345789])(0)[01235679]|13579][0134578
348 9][2468][1235679]|02468][048][02468][1235679]|02468][1235679](0)[01235679]|0246
349 8][1235679][2468][1235679]|0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
350 9]|2[0-8])T((([01][0-9]|2[0-3]):[0-5][0-9])Z)" />
351     </xs:restriction>
352     </xs:simpleType>
353     <xs:complexType name="ESMP_DateTimeInterval"
354 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTimeInterval">
355     <xs:sequence>
356     <xs:element minOccurs="1" maxOccurs="1" name="start" type="YMDHM_DateTime"
357 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
358 cim16#DateTimeInterval.start">
359     </xs:element>
360     <xs:element minOccurs="1" maxOccurs="1" name="end" type="YMDHM_DateTime"
361 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
362 cim16#DateTimeInterval.end">
363     </xs:element>
364     </xs:sequence>
365     </xs:complexType>
366     <xs:complexType name="Series_Period"
367 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period">
368     <xs:sequence>
369     <xs:element minOccurs="1" maxOccurs="1" name="timeInterval"
370 type="ESMP_DateTimeInterval" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
371 schema-cim16#Period.timeInterval">
372     </xs:element>

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373         <xs:element minOccurs="1" maxOccurs="1" name="resolution" type="xs:duration"
374 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
375 cim16#Period.resolution">
376         </xs:element>
377         <xs:element minOccurs="1" maxOccurs="unbounded" name="Point" type="Point"
378 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period.Point">
379         </xs:element>
380     </xs:sequence>
381 </xs:complexType>
382 <xs:simpleType name="ID_String"
383 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
384     <xs:restriction base="xs:string">
385         <xs:maxLength value="60" />
386     </xs:restriction>
387 </xs:simpleType>
388 <xs:simpleType name="BusinessKind_String"
389 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
390     <xs:restriction base="ecl:BusinessTypeList" />
391 </xs:simpleType>
392 <xs:simpleType name="MeasurementUnitKind_String"
393 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
394     <xs:restriction base="ecl:UnitOfMeasureTypeList" />
395 </xs:simpleType>
396 <xs:simpleType name="CurveType_String"
397 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
398     <xs:restriction base="ecl:CurveTypeList" />
399 </xs:simpleType>
400 <xs:simpleType name="ESMP_ActivePower-base"
401 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#ActivePower">
402     <xs:restriction base="xs:float">
403         <xs:pattern value="([0-9]*\.[0-9]*)" />
404     </xs:restriction>
405 </xs:simpleType>
406 <xs:complexType name="ESMP_ActivePower"
407 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#ActivePower">
408     <xs:simpleContent>
409         <xs:extension base="ESMP_ActivePower-base">
410             <xs:attribute fixed="MAW" name="unit" type="ecl:UnitSymbol" use="required"
411 />
412         </xs:extension>
413     </xs:simpleContent>
414 </xs:complexType>
415 <xs:complexType name="TimeSeries"
416 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#TimeSeries">
417     <xs:sequence>
418         <xs:element minOccurs="1" maxOccurs="1" name="mRID" type="ID_String"
419 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
420 cim16#IdentifiedObject.mRID">
421         </xs:element>
422         <xs:element minOccurs="1" maxOccurs="1" name="businessType"
423 type="BusinessKind_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
424 schema-cim16#TimeSeries.businessType">
425         </xs:element>
426         <xs:element minOccurs="0" maxOccurs="1" name="biddingZone_Domain.mRID"
427 type="AreaID_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
428 cim16#IdentifiedObject.mRID">
429         </xs:element>
430         <xs:element minOccurs="0" maxOccurs="1" name="in_Domain.mRID"
431 type="AreaID_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
432 cim16#IdentifiedObject.mRID">

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433         </xs:element>
434         <xs:element minOccurs="0" maxOccurs="1" name="out_Domain.mRID"
435 type="AreaID_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
436 cim16#IdentifiedObject.mRID">
437         </xs:element>
438         <xs:element minOccurs="1" maxOccurs="1" name="start_DateAndOrTime.date"
439 type="xs:date" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
440 cim16#DateAndOrTime.date">
441         </xs:element>
442         <xs:element minOccurs="1" maxOccurs="1" name="start_DateAndOrTime.time"
443 type="xs:time" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
444 cim16#DateAndOrTime.time">
445         </xs:element>
446         <xs:element minOccurs="1" maxOccurs="1" name="end_DateAndOrTime.date"
447 type="xs:date" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
448 cim16#DateAndOrTime.date">
449         </xs:element>
450         <xs:element minOccurs="1" maxOccurs="1" name="end_DateAndOrTime.time"
451 type="xs:time" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
452 cim16#DateAndOrTime.time">
453         </xs:element>
454         <xs:element minOccurs="1" maxOccurs="1"
455 name="quantity_Measurement_Unit.name" type="MeasurementUnitKind_String"
456 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Unit.name">
457         </xs:element>
458         <xs:element minOccurs="1" maxOccurs="1" name="curveType"
459 type="CurveType_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
460 cim16#TimeSeries.curveType">
461         </xs:element>
462         <xs:element minOccurs="0" maxOccurs="1"
463 name="production_RegisteredResource.mRID" type="ResourceID_String"
464 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
465 cim16#IdentifiedObject.mRID">
466         </xs:element>
467         <xs:element minOccurs="0" maxOccurs="1"
468 name="production_RegisteredResource.name" type="xs:string"
469 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
470 cim16#IdentifiedObject.name">
471         </xs:element>
472         <xs:element minOccurs="0" maxOccurs="1"
473 name="production_RegisteredResource.location.name" type="xs:string"
474 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
475 cim16#IdentifiedObject.name">
476         </xs:element>
477         <xs:element minOccurs="0" maxOccurs="1"
478 name="production_RegisteredResource.pSRType.psrType" type="PsrType_String"
479 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
480 cim16#MktPSRType.psrType">
481         </xs:element>
482         <xs:element minOccurs="0" maxOccurs="1"
483 name="production_RegisteredResource.pSRType.powerSystemResources.mRID"
484 type="ResourceID_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
485 schema-cim16#IdentifiedObject.mRID">
486         </xs:element>
487         <xs:element minOccurs="0" maxOccurs="1"
488 name="production_RegisteredResource.pSRType.powerSystemResources.name"
489 type="xs:string" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
490 cim16#IdentifiedObject.name">
491         </xs:element>

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492     <xs:element minOccurs="0" maxOccurs="1"
493     name="production_RegisteredResource.pSRType.powerSystemResources.nominalP"
494     type="ESMP_ActivePower" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
495     cim16#GeneratingUnit.nominalP">
496     </xs:element>
497     <xs:element minOccurs="0" maxOccurs="unbounded"
498     name="Asset_RegisteredResource" type="Asset_RegisteredResource"
499     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
500     cim16#TimeSeries.Asset_RegisteredResource">
501     </xs:element>
502     <xs:element minOccurs="0" maxOccurs="unbounded" name="Available_Period"
503     type="Series_Period" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
504     cim16#TimeSeries.Available_Period">
505     </xs:element>
506     <xs:element minOccurs="0" maxOccurs="unbounded"
507     name="WindPowerFeedin_Period" type="Series_Period"
508     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
509     cim16#TimeSeries.WindPowerFeedin_Period">
510     </xs:element>
511     <xs:element minOccurs="0" maxOccurs="unbounded" name="Reason" type="Reason"
512     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
513     cim16#TimeSeries.Reason">
514     </xs:element>
515     </xs:sequence>
516     </xs:complexType>
517     <xs:simpleType name="ESMPVersion_String"
518     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
519     <xs:restriction base="xs:string">
520     <xs:pattern value="[1-9]([0-9]){0,2}" />
521     </xs:restriction>
522     </xs:simpleType>
523     <xs:simpleType name="MessageKind_String"
524     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
525     <xs:restriction base="ecl:MessageTypeList" />
526     </xs:simpleType>
527     <xs:simpleType name="ProcessKind_String"
528     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
529     <xs:restriction base="ecl:ProcessTypeList" />
530     </xs:simpleType>
531     <xs:simpleType name="ESMP_DateTime"
532     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
533     <xs:restriction base="xs:dateTime">
534     <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02])[\-](0[1-9]|12)[0-
535     9]|3[01])|(([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|12)[0-9]|30))T((([01][0-9]|2[0-
536     3]):[0-5][0-9]:[0-5][0-
537     9])Z)|(((13579)[26][02468][048]|13579)[01345789](0)[48]|13579)[01345789][2468][0
538     48]|02468)[048][02468][048]|02468)[1235679](0)[48]|02468)[1235679][2468][048]|
539     0-9][0-9][13579][26])[\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T((([01][0-9]|2[0-3]):[0-
540     5][0-9]:[0-5][0-
541     9])Z)|(((13579)[26][02468][1235679]|13579)[01345789](0)[01235679]|13579)[0134578
542     9][2468][1235679]|02468)[048][02468][1235679]|02468)[1235679](0)[01235679]|0246
543     8][1235679][2468][1235679]|0-9][0-9][13579][01345789])[\-](02)[\-](0[1-9]|1[0-
544     9]|2[0-8])T((([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-9])Z)" />
545     </xs:restriction>
546     </xs:simpleType>
547     <xs:simpleType name="PartyID_String-base"
548     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
549     <xs:restriction base="xs:string">
550     <xs:maxLength value="16" />
551     </xs:restriction>

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552     </xs:simpleType>
553     <xs:complexType name="PartyID_String"
554     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
555         <xs:simpleContent>
556             <xs:extension base="PartyID_String-base">
557                 <xs:attribute name="codingScheme" type="ecl:CodingSchemeTypeList"
558                 use="required" />
559             </xs:extension>
560         </xs:simpleContent>
561     </xs:complexType>
562     <xs:simpleType name="MarketRoleKind_String"
563     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
564         <xs:restriction base="ecl:RoleTypeList" />
565     </xs:simpleType>
566     <xs:simpleType name="Status_String"
567     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
568         <xs:restriction base="ecl:StatusTypeList" />
569     </xs:simpleType>
570     <xs:complexType name="Action_Status"
571     sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Status">
572         <xs:sequence>
573             <xs:element minOccurs="1" maxOccurs="1" name="value" type="Status_String"
574             sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Status.value">
575         </xs:element>
576     </xs:sequence>
577 </xs:complexType>
578 <xs:complexType name="Unavailability_MarketDocument"
579 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketDocument">
580     <xs:sequence>
581         <xs:element minOccurs="1" maxOccurs="1" name="mRID" type="ID_String"
582         sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
583         cim16#IdentifiedObject.mRID">
584     </xs:element>
585         <xs:element minOccurs="1" maxOccurs="1" name="revisionNumber"
586         type="ESMPVersion_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
587         schema-cim16#Document.revisionNumber">
588     </xs:element>
589         <xs:element minOccurs="1" maxOccurs="1" name="type"
590         type="MessageKind_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
591         schema-cim16#Document.type">
592     </xs:element>
593         <xs:element minOccurs="1" maxOccurs="1" name="process.processType"
594         type="ProcessKind_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
595         schema-cim16#Process.processType">
596     </xs:element>
597         <xs:element minOccurs="1" maxOccurs="1" name="createdDateTime"
598         type="ESMP_DateTime" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
599         cim16#Document.createdDateTime">
600     </xs:element>
601         <xs:element minOccurs="1" maxOccurs="1" name="sender_MarketParticipant.mRID"
602         type="PartyID_String" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
603         cim16#IdentifiedObject.mRID">
604     </xs:element>
605         <xs:element minOccurs="1" maxOccurs="1"
606         name="sender_MarketParticipant.marketRole.type" type="MarketRoleKind_String"
607         sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type">
608     </xs:element>
609         <xs:element minOccurs="1" maxOccurs="1"
610         name="receiver_MarketParticipant.mRID" type="PartyID_String"

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611 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
612 cim16#IdentifiedObject.mRID">
613     </xs:element>
614     <xs:element minOccurs="1" maxOccurs="1"
615 name="receiver_MarketParticipant.marketRole.type" type="MarketRoleKind_String"
616 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type">
617     </xs:element>
618     <xs:element minOccurs="1" maxOccurs="1"
619 name="unavailability_Time_Period.timeInterval" type="ESMP_DateTimeInterval"
620 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
621 cim16#Period.timeInterval">
622     </xs:element>
623     <xs:element minOccurs="0" maxOccurs="1" name="docStatus"
624 type="Action_Status" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
625 cim16#Document.docStatus">
626     </xs:element>
627     <xs:element minOccurs="0" maxOccurs="unbounded" name="TimeSeries"
628 type="TimeSeries" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
629 cim16#MarketDocument.TimeSeries">
630     </xs:element>
631     <xs:element minOccurs="0" maxOccurs="unbounded" name="Reason" type="Reason"
632 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
633 cim16#MarketDocument.Reason">
634     </xs:element>
635 </xs:sequence>
636 </xs:complexType>
637 </xs:schema>
```