



European Network of  
Transmission System Operators  
for Electricity

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# PROBLEM STATEMENT DOCUMENT UML MODEL AND SCHEMA

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2020-03-18  
APPROVED DOCUMENT  
VERSION 1.0

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## Revision History

Version	Release	Date	Comments
0	1	2019-12-23	First draft of the document.
1	0	2020-03-18	Approved by MC.

50

51 **1 Objective**

52 The purpose of this document is to provide the contextual and assembly UML models and the  
53 schema of the ProblemStatement\_MarketDocument.

54 The schema of the ProblemStatement\_MarketDocument could be used in various business  
55 processes.

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

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

- 60 • Description of the business process;
- 61 • Use case of the business process;
- 62 • Sequence diagrams of the business process;
- 63 • List of the schema (XSD) to be used in the business process and versions of the  
64 schema;
- 65 • For each schema, dependency tables providing the necessary information for the  
66 generation of the XML instances, i.e. when the optional attributes are to be used, which  
67 codes from which ENTSO-E codelist are to be used.

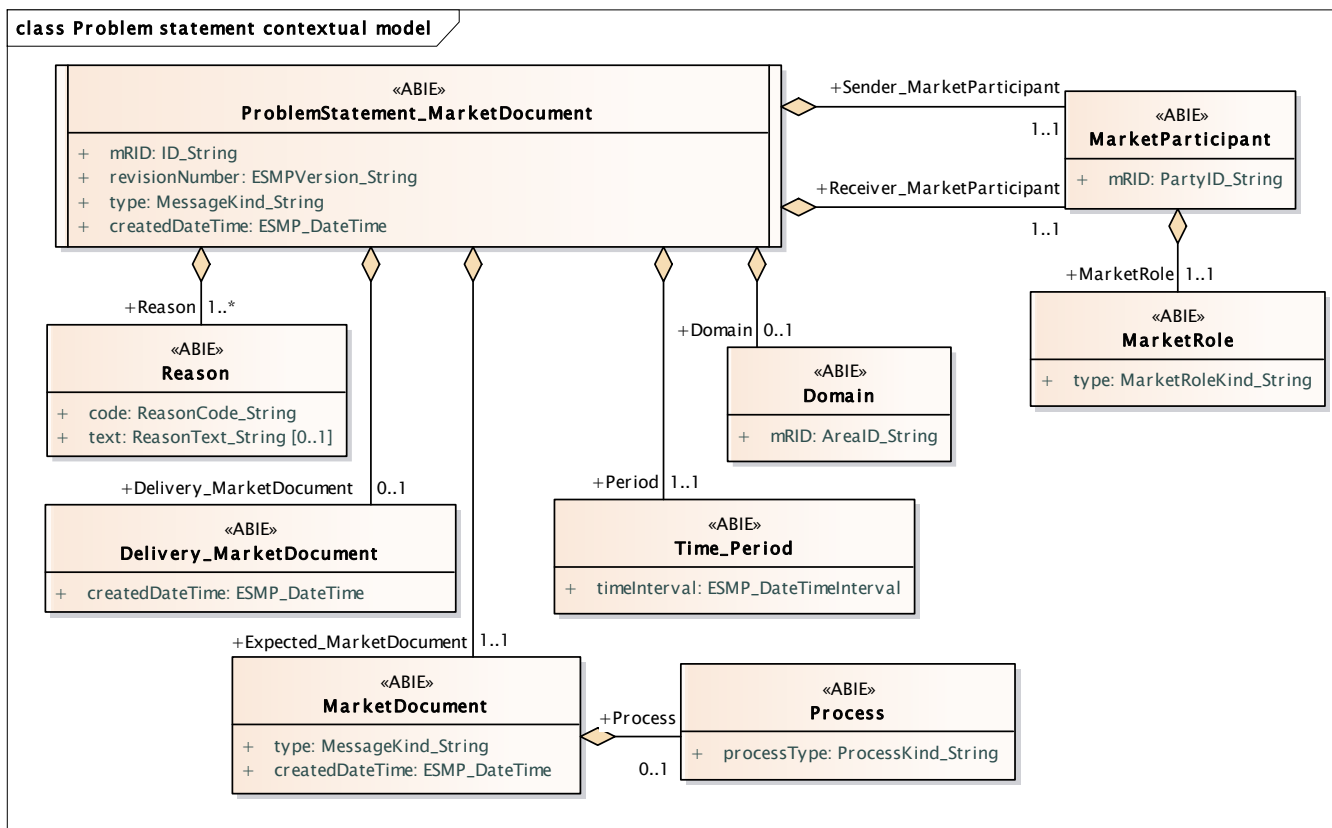
68

69 **2 ProblemStatement\_MarketDocument**

70 2.1 Problem statement contextual model

71 2.1.1 Overview of the model

72 Figure 1 shows the model.



73

74

**Figure 1 - Problem statement contextual model**

75 **2.1.2 IsBasedOn relationships from the European style market profile**

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

78

**Table 1 - IsBasedOn dependency**

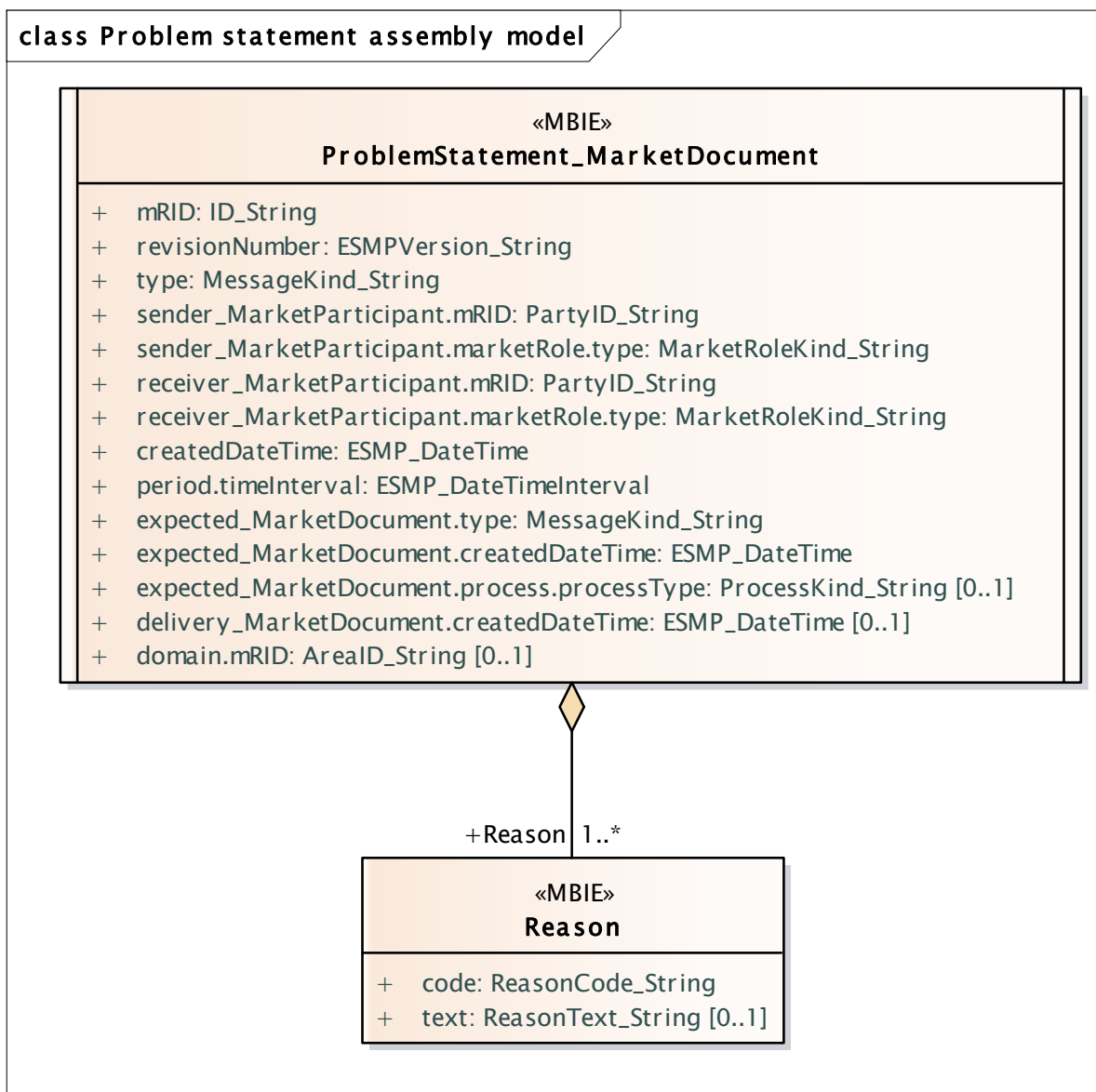
Name	Complete IsBasedOn Path
Delivery_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Domain	TC57CIM::IEC62325::MarketManagement::Domain
MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
MarketRole	TC57CIM::IEC62325::MarketCommon::MarketRole
ProblemStatement_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Process	TC57CIM::IEC62325::MarketManagement::Process
Reason	TC57CIM::IEC62325::MarketManagement::Reason
Time_Period	TC57CIM::IEC62325::MarketManagement::Period

79

80 2.2 Problem statement assembly model

81 **2.2.1 Overview of the model**

82 Figure 2 shows the model.



83

84 **Figure 2 - Problem statement assembly model**

85 **2.2.2 IsBasedOn relationships from the European style market profile**

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

88 **Table 2 - IsBasedOn dependency**

Name	Complete IsBasedOn Path
ProblemStatement_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Reason	TC57CIM::IEC62325::MarketManagement::Reason

89

90 **2.2.3 Detailed Problem statement assembly model**

91 **2.2.3.1 ProblemStatement\_MarketDocument root class**

92 The objective of this document is to provide either a means of informing a party that a document  
93 could not be issued by the expected time and thus will be delayed (the approval of this delay  
94 depends upon the rules that have been established between the parties) or an automated  
95 support in the case where an escalation procedure has to be put into place when an expected  
96 event does not occur or a critical situation has to be resolved.

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

99 Table 3 shows all attributes of ProblemStatement\_MarketDocument.

100 **Table 3 - Attributes of Problem statement assembly**  
101 **model::ProblemStatement\_MarketDocument**

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 document version is used to identify a given version of a Problem Statement document and is used in the case of possible erroneous transmissions. The first version number for a given document identification shall normally be 1. The identification of the version that distinguishes one evolution of a document from another.
2	[1..1]	type MessageKind_String	The following codes could be used - A34: Escalation document; - A35: Trouble shooting document. The coded type of a document. The document type describes the principal characteristic of the document.
3	[1..1]	sender_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- Document owner.
4	[1..1]	sender_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- Document owner.
5	[1..1]	receiver_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- Document recipient.
6	[1..1]	receiver_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- Document recipient.
7	[1..1]	createdDateTime ESMP_DateTime	The date and time of the creation of the document.
8	[1..1]	period.timeInterval ESMP_DateTimeInterval	The start and end date and time for a given interval.
9	[1..1]	expected_MarketDocument.type MessageKind_String	The coded type of a document. The document type describes the principal characteristic of the document. --- The information enabling to identify the expected (not received) or not received (escalation) document.
10	[1..1]	expected_MarketDocument.createdDateTime ESMP_DateTime	The date and time that the document is expected by the receiver. The date and time of the creation of the document. --- The information enabling to identify the expected (not received) or not received (escalation) document.



Order	mult.	Attribute name / Attribute type	Description
11	[0..1]	expected_MarketDocument.process.processType ProcessKind_String	The identification of the nature of process that the document addresses. --- The information enabling to identify the expected (not received) or not received (escalation) document. --- The process that the expected document is directed at. This process is only to be defined if the expected document addresses a specific process otherwise it is optional.
12	[0..1]	delivery_MarketDocument.createdDateTime ESMP_DateTime	The date and time of the creation of the document. --- The date and time when the document is expected to be prepared for transmission by the application of the sender.
13	[0..1]	domain.mRID AreaID_String	The unique identification of the domain.

102

103 Table 4 shows all association ends of ProblemStatement\_MarketDocument with other classes.

104

**Table 4 - Association ends of Problem statement assembly model::ProblemStatement\_MarketDocument with other classes**

105

Order	mult.	Class name / Role	Description
14	[1..*]	Reason Reason	Association Based On: Problem statement contextual model::Reason.Reason[1..*] ----- Problem statement contextual model::ProblemStatement_MarketDocument.[]

106

### 107 2.2.3.2 Reason

108 The reason code is used to identify the reason for the transmission of the document. If  
109 necessary additional information may be provided in the reason text.

110 The following codes have currently been identified: - A91: Expected document not received; -  
111 A92: Not possible to send document on time, but estimated delivery time is provided; - A93: Not  
112 possible to send document on time, and further more no expected time of return to normal  
113 situation.

114 The motivation of an act.

115 Table 5 shows all attributes of Reason.

**Table 5 - Attributes of Problem statement assembly model::Reason**

116

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.

117

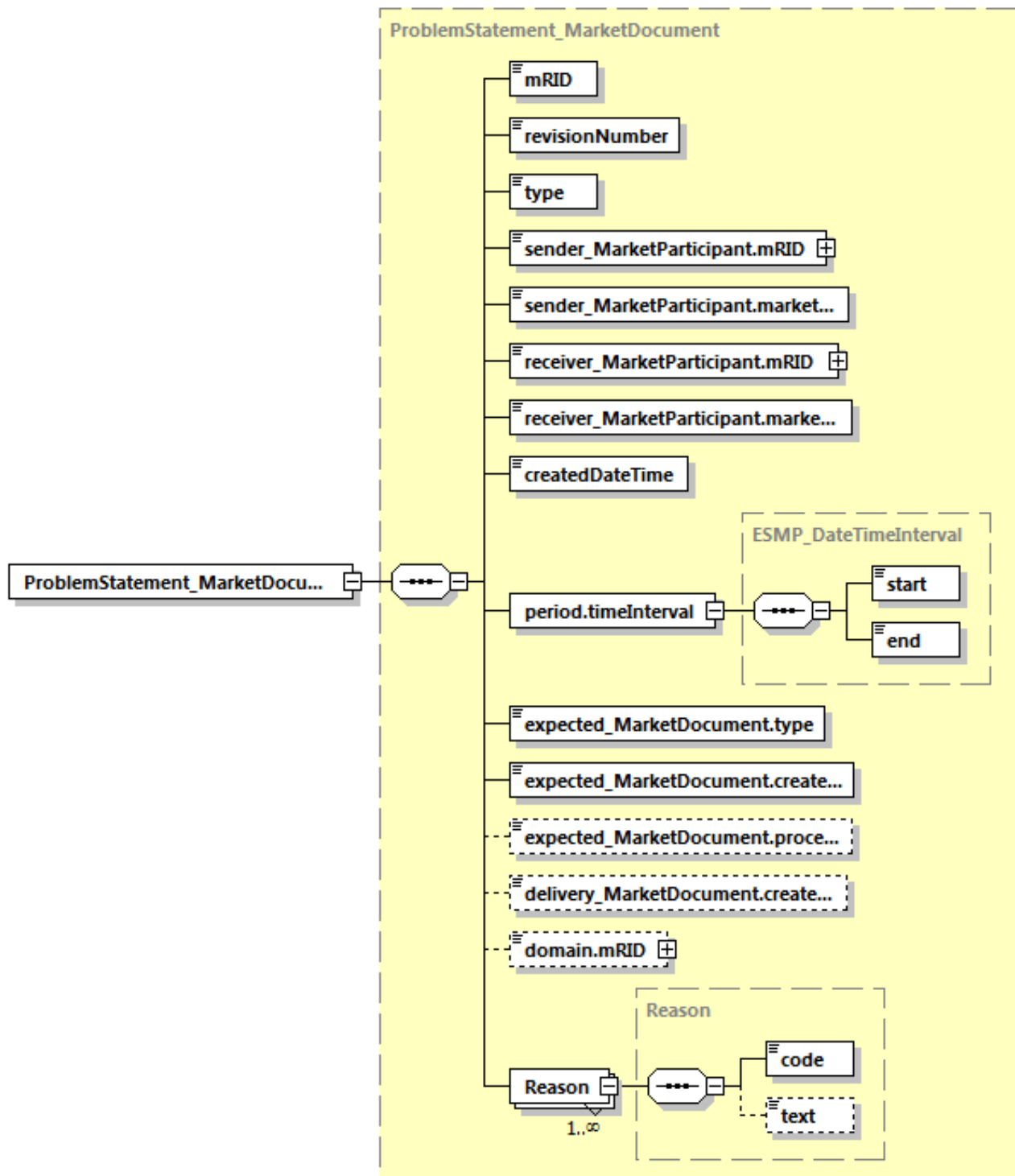
### 118 2.2.4 Datatypes

119 The list of datatypes used for the Problem statement assembly model is as follows:

- 120 • ESMP\_DateTimeInterval compound

- 121 • ArealID\_String datatype, codelist CodingSchemeTypeList
- 122 • ESMP\_DateTime datatype
- 123 • ESMPVersion\_String datatype
- 124 • ID\_String datatype
- 125 • MarketRoleKind\_String datatype, codelist RoleTypeList
- 126 • MessageKind\_String datatype, codelist MessageTypeList
- 127 • PartyID\_String datatype, codelist CodingSchemeTypeList
- 128 • ProcessKind\_String datatype, codelist ProcessTypeList
- 129 • ReasonCode\_String datatype, codelist ReasonCodeTypeList
- 130 • ReasonText\_String datatype
- 131 • YMDHM\_DateTime datatype
- 132

133 2.2.5 ProblemStatement\_MarketDocument XML schema structure



Generated by XMLSpy

www.altova.com

Figure 3 - ProblemStatement\_MarketDocument schema structure

134  
 135

136 **2.2.6 ProblemStatement\_MarketDocument XML schema**

137

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

139 urn:iec62325.351:tc57wg16:451-5:problemdocument:3:0

```

140 <?xml version="1.0" encoding="utf-8"?>
141 <xs:schema xmlns:cl="urn:entsoe.eu:wgedi:codelists"
142 xmlns:sawsdl="http://www.w3.org/ns/sawsdl" xmlns="urn:iec62325.351:tc57wg16:451-
143 5:problemdocument:3:0" xmlns:cimp="http://www.iec.ch/cimprofile"
144 xmlns:xs="http://www.w3.org/2001/XMLSchema"
145 targetNamespace="urn:iec62325.351:tc57wg16:451-5:problemdocument:3:0"
146 elementFormDefault="qualified" attributeFormDefault="unqualified">
147   <xs:import namespace="urn:entsoe.eu:wgedi:codelists" schemaLocation="urn-
148 entsoe-eu-wgedi-codelists.xsd"/>
149   <xs:element name="ProblemStatement_MarketDocument"
150 type="ProblemStatement_MarketDocument"/>
151   <xs:simpleType name="ID_String"
152 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
153     <xs:restriction base="xs:string">
154       <xs:maxLength value="35"/>
155     </xs:restriction>
156   </xs:simpleType>
157   <xs:simpleType name="ESMPVersion_String"
158 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
159     <xs:restriction base="xs:string">
160       <xs:pattern value="[1-9]([0-9]){0,2}"/>
161     </xs:restriction>
162   </xs:simpleType>
163   <xs:simpleType name="MessageKind_String"
164 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
165     <xs:restriction base="cl:MessageTypeList"/>
166   </xs:simpleType>
167   <xs:simpleType name="PartyID_String-base"
168 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
169     <xs:restriction base="xs:string">
170       <xs:maxLength value="16"/>
171     </xs:restriction>
172   </xs:simpleType>
173   <xs:complexType name="PartyID_String"
174 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
175     <xs:simpleContent>
176       <xs:extension base="PartyID_String-base">
177         <xs:attribute name="codingScheme"
178 type="cl:CodingSchemeTypeList" use="required"/>
179       </xs:extension>
180     </xs:simpleContent>
181   </xs:complexType>
182   <xs:simpleType name="MarketRoleKind_String"
183 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
184     <xs:restriction base="cl:RoleTypeList"/>
185   </xs:simpleType>
186   <xs:simpleType name="ESMP_DateTime"
187 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
188     <xs:restriction base="xs:dateTime">
189       <xs:pattern value="((([0-9]{4})[\-](0[13578]|1[02]))[\-](0[1-
190 9]|[12][0-9]|3[01]))|([0-9]{4})[\-]((0[469])|(11))[\-](0[1-9]|[12][0-
191 9]|30))T((([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-
192 9])Z)|(((13579)[26][02468][048])|(13579)[01345789](0)[48]|(13579)[01345789][2468])[0
  
```

```

193 48]|[02468][048][02468][048]|[02468][1235679](0)[48]|[02468][1235679][2468][048][[
194 0-9][0-9][13579][26]][\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T((01)[0-9]|2[0-3]):[0-
195 5][0-9]:[0-5][0-
196 9])Z)|((13579)[26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578
197 9][2468][1235679]|[02468][048][02468][1235679]|[02468][1235679](0)[01235679]|[0246
198 8][1235679][2468][1235679]|[0-9][0-9][13579][01345789]][\-](02)[\-](0[1-9]|1[0-
199 9]|2[0-8])T((01)[0-9]|2[0-3]):[0-5][0-9]:[0-5][0-9])Z)"/>
200     </xs:restriction>
201   </xs:simpleType>
202   <xs:simpleType name="ProcessKind_String"
203 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
204     <xs:restriction base="cl:ProcessTypeList"/>
205   </xs:simpleType>
206   <xs:simpleType name="AreaID_String-base"
207 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
208     <xs:restriction base="xs:string">
209       <xs:maxLength value="18"/>
210     </xs:restriction>
211   </xs:simpleType>
212   <xs:complexType name="AreaID_String"
213 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
214     <xs:simpleContent>
215       <xs:extension base="AreaID_String-base">
216         <xs:attribute name="codingScheme"
217 type="cl:CodingSchemeTypeList" use="required"/>
218       </xs:extension>
219     </xs:simpleContent>
220   </xs:complexType>
221   <xs:simpleType name="YMDHM_DateTime"
222 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
223     <xs:restriction base="xs:string">
224       <xs:pattern value="(((0-9){4})[\-](0[13578]|1[02])[\-](0[1-
225 9]|12)[0-9]|3[01])|((0-9){4})[\-]((0[469])|(11))[\-](0[1-9]|12)[0-
226 9]|30))T((01)[0-9]|2[0-3]):[0-5][0-
227 9])Z)|((13579)[26][02468][048]|[13579][01345789](0)[48]|[13579][01345789][2468][0
228 48]|[02468][048][02468][048]|[02468][1235679](0)[48]|[02468][1235679][2468][048][[
229 0-9][0-9][13579][26]][\-](02)[\-](0[1-9]|1[0-9]|2[0-9])T((01)[0-9]|2[0-3]):[0-
230 5][0-
231 9])Z)|((13579)[26][02468][1235679]|[13579][01345789](0)[01235679]|[13579][0134578
232 9][2468][1235679]|[02468][048][02468][1235679]|[02468][1235679](0)[01235679]|[0246
233 8][1235679][2468][1235679]|[0-9][0-9][13579][01345789]][\-](02)[\-](0[1-9]|1[0-
234 9]|2[0-8])T((01)[0-9]|2[0-3]):[0-5][0-9])Z)"/>
235     </xs:restriction>
236   </xs:simpleType>
237   <xs:complexType name="ESMP_DateTimeInterval"
238 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTimeInterval">
239     <xs:sequence>
240       <xs:element name="start" type="YMDHM_DateTime" minOccurs="1"
241 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
242 cim16#DateTimeInterval.start"/>
243       <xs:element name="end" type="YMDHM_DateTime" minOccurs="1"
244 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
245 cim16#DateTimeInterval.end"/>
246     </xs:sequence>
247   </xs:complexType>
248   <xs:complexType name="ProblemStatement_MarketDocument"
249 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketDocument">
250     <xs:sequence>

```

```
251         <xs:element name="mRID" type="ID_String" minOccurs="1"
252 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
253 cim16#IdentifiedObject.mRID"/>
254         <xs:element name="revisionNumber" type="ESMPVersion_String"
255 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
256 schema-cim16#Document.revisionNumber"/>
257         <xs:element name="type" type="MessageKind_String"
258 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
259 schema-cim16#Document.type"/>
260         <xs:element name="sender_MarketParticipant.mRID"
261 type="PartyID_String" minOccurs="1" maxOccurs="1"
262 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
263 cim16#IdentifiedObject.mRID"/>
264         <xs:element name="sender_MarketParticipant.marketRole.type"
265 type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"
266 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
267         <xs:element name="receiver_MarketParticipant.mRID"
268 type="PartyID_String" minOccurs="1" maxOccurs="1"
269 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
270 cim16#IdentifiedObject.mRID"/>
271         <xs:element name="receiver_MarketParticipant.marketRole.type"
272 type="MarketRoleKind_String" minOccurs="1" maxOccurs="1"
273 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#MarketRole.type"/>
274         <xs:element name="createdDateTime" type="ESMP_DateTime"
275 minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
276 schema-cim16#Document.createdDateTime"/>
277         <xs:element name="period.timeInterval"
278 type="ESMP_DateTimeInterval" minOccurs="1" maxOccurs="1"
279 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
280 cim16#Period.timeInterval"/>
281         <xs:element name="expected_MarketDocument.type"
282 type="MessageKind_String" minOccurs="1" maxOccurs="1"
283 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Document.type"/>
284         <xs:element name="expected_MarketDocument.createdDateTime"
285 type="ESMP_DateTime" minOccurs="1" maxOccurs="1"
286 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
287 cim16#Document.createdDateTime"/>
288         <xs:element name="expected_MarketDocument.process.processType"
289 type="ProcessKind_String" minOccurs="0" maxOccurs="1"
290 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
291 cim16#Process.processType"/>
292         <xs:element name="delivery_MarketDocument.createdDateTime"
293 type="ESMP_DateTime" minOccurs="0" maxOccurs="1"
294 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
295 cim16#Document.createdDateTime"/>
296         <xs:element name="domain.mRID" type="AreaID_String"
297 minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-
298 schema-cim16#IdentifiedObject.mRID"/>
299         <xs:element name="Reason" type="Reason" minOccurs="1"
300 maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
301 cim16#MarketDocument.Reason"/>
302     </xs:sequence>
303 </xs:complexType>
304 <xs:simpleType name="ReasonCode_String"
305 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
306     <xs:restriction base="cl:ReasonCodeTypeList"/>
307 </xs:simpleType>
308 <xs:simpleType name="ReasonText_String"
309 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
310     <xs:restriction base="xs:string">
```

```
311         <xs:maxLength value="512"/>
312     </xs:restriction>
313 </xs:simpleType>
314 <xs:complexType name="Reason"
315 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Reason">
316     <xs:sequence>
317         <xs:element name="code" type="ReasonCode_String" minOccurs="1"
318 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
319 cim16#Reason.code"/>
320         <xs:element name="text" type="ReasonText_String" minOccurs="0"
321 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
322 cim16#Reason.text"/>
323     </xs:sequence>
324 </xs:complexType>
325 </xs:schema>
326
```