



European Network of  
Transmission System Operators  
for Electricity

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# PROBLEM STATEMENT DOCUMENT UML MODEL AND SCHEMA

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2022-03-15  
APPROVED DOCUMENT  
VERSION 1.1

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49

## Revision History

Version	Release	Date	Comments
0	1	2019-12-23	First draft of the document.
1	0	2020-03-18	Approved by MC.
1	1	2022-03-15	Updates in XSD v3.1: mRID of Document, Series and Timeseries (ID_String type) was enlarged from 35 to 60 characters. Approved by MC.

50

51 **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.

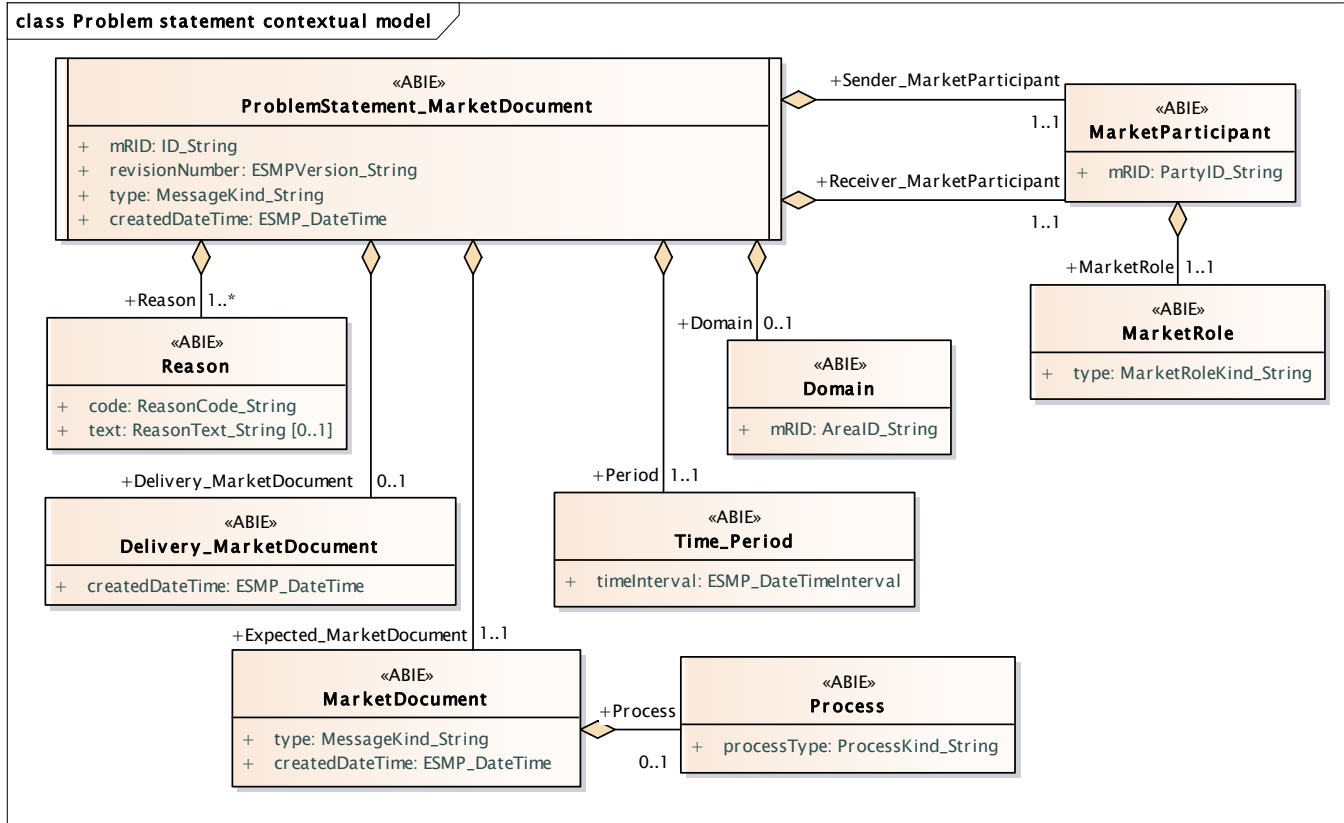
68

69 **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**

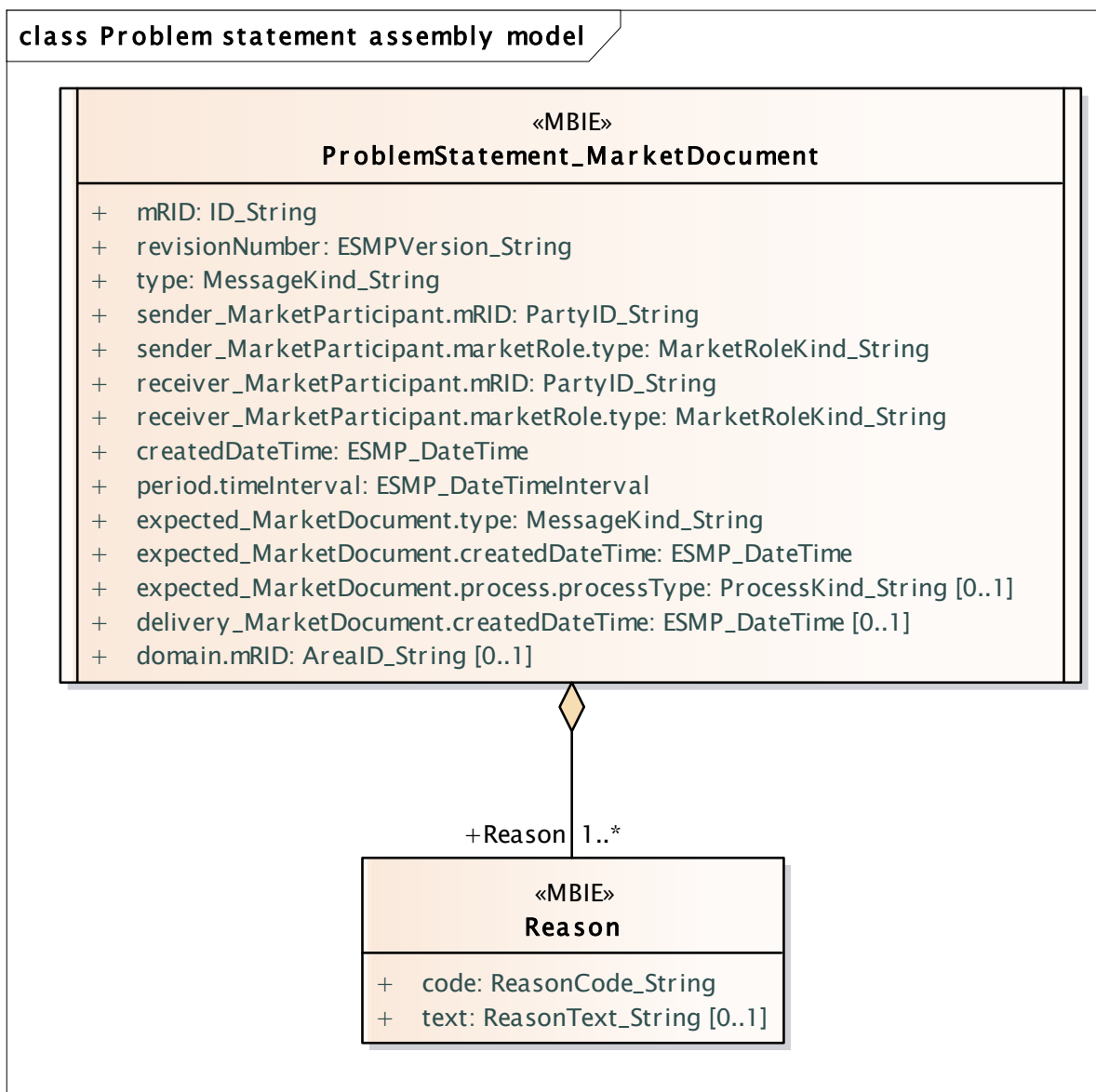
Name	Complete IsBasedOn Path
Delivery_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Domain	TC57CIM::IEC62325::MarketManagement::Domain
MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
MarketRole	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.

**116 Table 5 - Attributes of Problem statement 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.

117

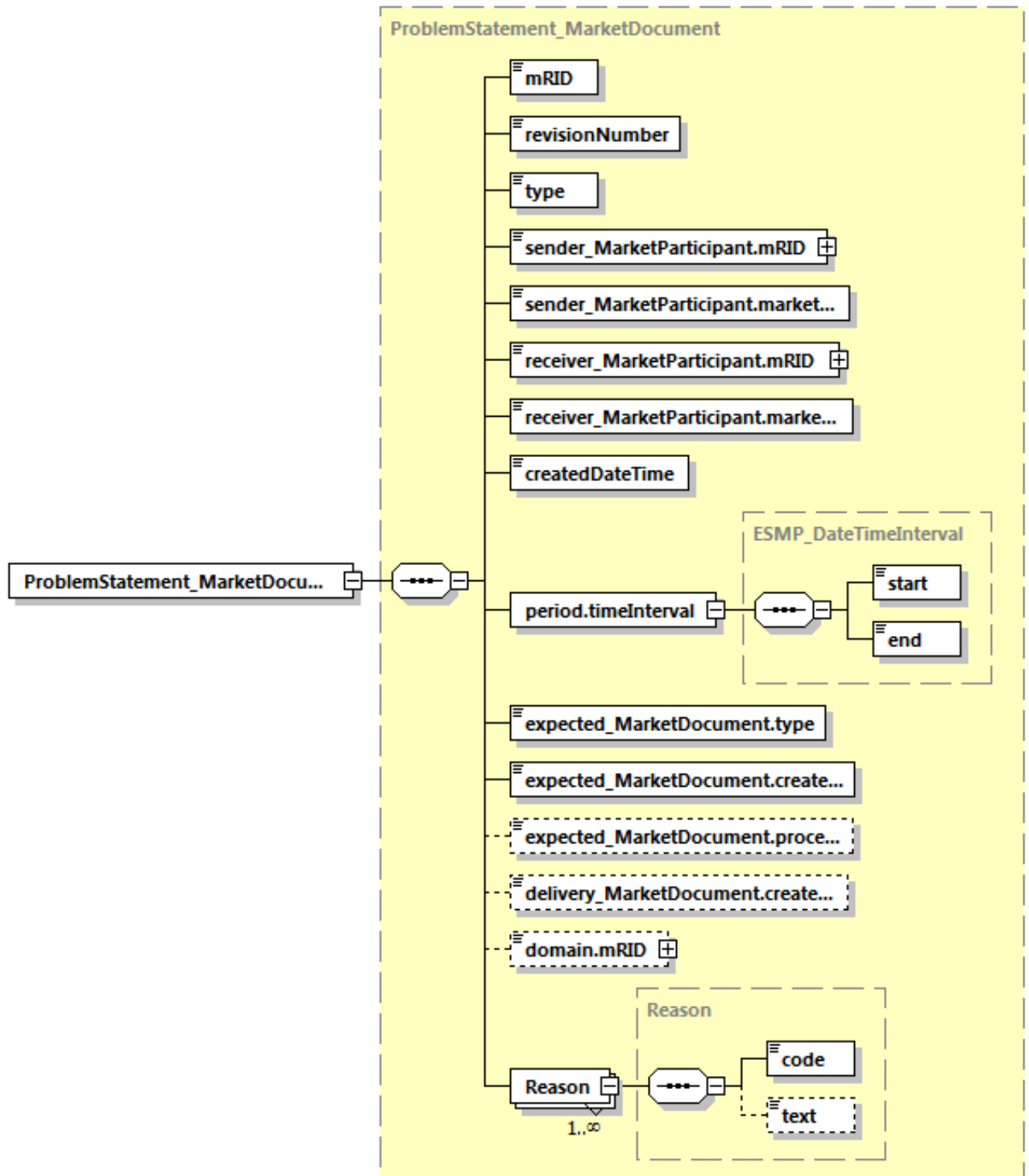
### 118 2.2.4 Datatypes

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:3:1

```

140 <?xml version="1.0" encoding="utf-8"?>
141 <xs:schema xmlns:ecl="urn:entsoe.eu:wgedi:codelists"
142 xmlns="urn:iec62325.351:tc57wg16:451-5:problemdocument:3:1"
143 xmlns:sawsdl="http://www.w3.org/ns/sawsdl"
144 xmlns:cimp="http://www.iec.ch/cimprofile"
145 xmlns:xs="http://www.w3.org/2001/XMLSchema"
146 targetNamespace="urn:iec62325.351:tc57wg16:451-5:problemdocument:3:1"
147 elementFormDefault="qualified" attributeFormDefault="unqualified">
148   <xs:import namespace="urn:entsoe.eu:wgedi:codelists" schemaLocation="urn-
149 entsoe-eu-wgedi-codelists.xsd"/>
150   <xs:element name="ProblemStatement_MarketDocument"
151 type="ProblemStatement_MarketDocument"/>
152   <xs:simpleType name="ID_String"
153 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
154     <xs:restriction base="xs:string">
155       <xs:maxLength value="60"/>
156     </xs:restriction>
157   </xs:simpleType>
158   <xs:simpleType name="ESMPVersion_String"
159 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
160     <xs:restriction base="xs:string">
161       <xs:pattern value="[1-9]([0-9]){0,2}"/>
162     </xs:restriction>
163   </xs:simpleType>
164   <xs:simpleType name="MessageKind_String"
165 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
166     <xs:restriction base="ecl:MessageTypeList"/>
167   </xs:simpleType>
168   <xs:simpleType name="PartyID_String-base"
169 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
170     <xs:restriction base="xs:string">
171       <xs:maxLength value="16"/>
172     </xs:restriction>
173   </xs:simpleType>
174   <xs:complexType name="PartyID_String"
175 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
176     <xs:simpleContent>
177       <xs:extension base="PartyID_String-base">
178         <xs:attribute name="codingScheme"
179 type="ecl:CodingSchemeTypeList" use="required"/>
180       </xs:extension>
181     </xs:simpleContent>
182   </xs:complexType>
183   <xs:simpleType name="MarketRoleKind_String"
184 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#String">
185     <xs:restriction base="ecl:RoleTypeList"/>
186   </xs:simpleType>
187   <xs:simpleType name="ESMP_DateTime"
188 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#DateTime">
189     <xs:restriction base="xs:dateTime">
190       <xs:pattern value="((([0-9]{4})[-](0[13578]|1[02]))[-](0[1-
191 9]|12|[0-9]|3[01]))|([0-9]{4})[-]((0[469])|(11))[-](0[1-9]|12|[0-
192 9]|30))T(([01][0-9]|2[0-3]):[0-5][0-9]:[0-5][0-
```

```

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

```

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

```
312         <xs:maxLength value="512"/>
313     </xs:restriction>
314 </xs:simpleType>
315 <xs:complexType name="Reason"
316 sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Reason">
317     <xs:sequence>
318         <xs:element name="code" type="ReasonCode_String" minOccurs="1"
319 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
320 cim16#Reason.code"/>
321         <xs:element name="text" type="ReasonText_String" minOccurs="0"
322 maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-
323 cim16#Reason.text"/>
324     </xs:sequence>
325 </xs:complexType>
326 </xs:schema>
327
```