ANOMALY REPORT DOCUMENT
UML MODEL AND SCHEMA

2019-09-10
APPROVED DOCUMENT
VERSION 1.0
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## Revision History

<table>
<thead>
<tr>
<th>Version</th>
<th>Release</th>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2019-07-10</td>
<td>First draft of the document.</td>
</tr>
<tr>
<td>0</td>
<td>2</td>
<td>2019-07-18</td>
<td>Second draft of the document. This new version has into account the comments provided by ESMP subgroup members. Example reason codes and their descriptions have been removed from this document.</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
<td>2019-09-10</td>
<td>Updates in Anomaly document v5.2: Optional connectingLineRegisteredResource attribute added to the Anomaly_TimeSeries class. mRID of Document, Series and Timeseries (ID_String type) was enlarged from 35 to 60 characters. Approved by MC.</td>
</tr>
</tbody>
</table>
1 Objective

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

The schema of the AnomalyReport_MarketDocument could be used in various business processes.

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

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

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

2.1 Anomaly report contextual model

2.1.1 Overview of the model

Figure 1 shows the model.
2.1.2 IsBasedOn relationships from the European style market profile

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Complete IsBasedOn Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anomaly_TimeSeries</td>
<td>TC57CIM::IEC62325::MarketManagement::TimeSeries</td>
</tr>
<tr>
<td>AnomalyReport_MarketDocument</td>
<td>TC57CIM::IEC62325::MarketManagement::MarketDocument</td>
</tr>
<tr>
<td>Domain</td>
<td>TC57CIM::IEC62325::MarketManagement::Domain</td>
</tr>
<tr>
<td>MarketAgreement</td>
<td>TC57CIM::IEC62325::MarketManagement::MarketAgreement</td>
</tr>
<tr>
<td>MarketEvaluationPoint</td>
<td>TC57CIM::IEC62325::MarketManagement::MarketEvaluationPoint</td>
</tr>
<tr>
<td>MarketParticipant</td>
<td>TC57CIM::IEC62325::MarketCommon::MarketParticipant</td>
</tr>
<tr>
<td>MarketRole</td>
<td>TC57CIM::IEC62325::MarketCommon::MarketRole</td>
</tr>
<tr>
<td>Measure_Unit</td>
<td>TC57CIM::IEC62325::MarketManagement::Unit</td>
</tr>
<tr>
<td>Original_MarketDocument</td>
<td>TC57CIM::IEC62325::MarketManagement::MarketDocument</td>
</tr>
<tr>
<td>Party_MarketParticipant</td>
<td>TC57CIM::IEC62325::MarketCommon::MarketParticipant</td>
</tr>
<tr>
<td>Point</td>
<td>TC57CIM::IEC62325::MarketManagement::Point</td>
</tr>
<tr>
<td>Reason</td>
<td>TC57CIM::IEC62325::MarketManagement::Reason</td>
</tr>
<tr>
<td>RegisteredResource</td>
<td>TC57CIM::IEC62325::MarketCommon::RegisteredResource</td>
</tr>
<tr>
<td>Series_Period</td>
<td>TC57CIM::IEC62325::MarketManagement::Period</td>
</tr>
<tr>
<td>Time_Period</td>
<td>TC57CIM::IEC62325::MarketManagement::Period</td>
</tr>
</tbody>
</table>
2.2 Anomaly report assembly model

2.2.1 Overview of the model

Figure 2 shows the model.
### 2.2.2 IsBasedOn relationships from the European style market profile

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

<table>
<thead>
<tr>
<th>Name</th>
<th>Complete IsBasedOn Path</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anomaly_TimeSeries</td>
<td>TC57CIM::IEC62325::MarketManagement::TimeSeries</td>
</tr>
<tr>
<td>AnomalyReport_MarketDocument</td>
<td>TC57CIM::IEC62325::MarketManagement::MarketDocument</td>
</tr>
<tr>
<td>Original_MarketDocument</td>
<td>TC57CIM::IEC62325::MarketManagement::MarketDocument</td>
</tr>
<tr>
<td>Point</td>
<td>TC57CIM::IEC62325::MarketManagement::Point</td>
</tr>
<tr>
<td>Reason</td>
<td>TC57CIM::IEC62325::MarketManagement::Reason</td>
</tr>
<tr>
<td>Series_Period</td>
<td>TC57CIM::IEC62325::MarketManagement::Period</td>
</tr>
</tbody>
</table>

### 2.2.3 Detailed Anomaly report assembly model

#### 2.2.3.1 AnomalyReport_MarketDocument root class

An anomaly report is generated as soon as all the information necessary to balance a time series of a party becomes available.

If there are any anomalies discovered during this phase, an anomaly report is sent to all involved parties.

The anomaly contains only the time series that have been identified as being in error for the party in question.

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

Table 3 shows all attributes of AnomalyReport_MarketDocument.

#### Table 3 - Attributes of Anomaly report assembly model::AnomalyReport_MarketDocument

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Attribute name / Attribute type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>[1..1]</td>
<td>mRID ID_String</td>
<td>The unique identification of the document being exchanged within a business process flow.</td>
</tr>
<tr>
<td>1</td>
<td>[1..1]</td>
<td>createdDateTime ESMP_DateTime</td>
<td>The date and time of the creation of the document.</td>
</tr>
<tr>
<td>2</td>
<td>[1..1]</td>
<td>sender_MarketParticipant.mRID PartyID_String</td>
<td>The identification of a party in the energy market. Document owner.</td>
</tr>
<tr>
<td>3</td>
<td>[1..1]</td>
<td>sender_MarketParticipant.marketRole.type MarketRoleKind_String</td>
<td>The identification of the role played by a market player. Document owner. Role associated with a MarketParticipant.</td>
</tr>
<tr>
<td>4</td>
<td>[1..1]</td>
<td>receiver_MarketParticipant.mRID PartyID_String</td>
<td>The identification of a party in the energy market. Document recipient.</td>
</tr>
<tr>
<td>5</td>
<td>[1..1]</td>
<td>receiver_MarketParticipant.marketRole.type MarketRoleKind_String</td>
<td>The identification of the role played by a market player. Document recipient. Role associated with a MarketParticipant.</td>
</tr>
<tr>
<td>6</td>
<td>[1..1]</td>
<td>schedule_Time_Period.timeInterval ESMP_DateTimeInterval</td>
<td>The start and end date and time for a given interval. This information provides the start and end date and time of the schedule period for which the anomaly report is being generated.</td>
</tr>
</tbody>
</table>
Table 4 shows all association ends of AnomalyReport_MarketDocument with other classes.

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Class name / Role</th>
<th>Description</th>
</tr>
</thead>
</table>

2.2.3.2 Anomaly_TimeSeries

The time series from the original document containing where an error was detected.

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

Table 5 shows all attributes of Anomaly_TimeSeries.

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Attribute name / Attribute type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>[1..1]</td>
<td>mRID_ID_String</td>
<td>A unique identification of the time series.</td>
</tr>
<tr>
<td>1</td>
<td>[1..1]</td>
<td>version_ESMPVersion_String</td>
<td>The identification of the version of the time series.</td>
</tr>
<tr>
<td>2</td>
<td>[1..1]</td>
<td>businessType_BusinessKind_String</td>
<td>The identification of the nature of the time series.</td>
</tr>
<tr>
<td>3</td>
<td>[1..1]</td>
<td>product_EnergyProductKind_String</td>
<td>The identification of the nature of an energy product such as power, energy, reactive power, etc.</td>
</tr>
<tr>
<td>4</td>
<td>[1..1]</td>
<td>objectAggregation_ObjectAggregationKind_String</td>
<td>The identification of the domain that is the common denominator used to aggregate a time series.</td>
</tr>
<tr>
<td>5</td>
<td>[0..1]</td>
<td>in_Domain.mRID_AreaID_String</td>
<td>The unique identification of the domain. --- The area where the product is being delivered. The domain associated with a TimeSeries.</td>
</tr>
<tr>
<td>6</td>
<td>[0..1]</td>
<td>out_Domain.mRID_AreaID_String</td>
<td>The unique identification of the domain. --- The area where the product is being extracted. The domain associated with a TimeSeries.</td>
</tr>
<tr>
<td>7</td>
<td>[0..1]</td>
<td>marketEvaluationPoint.mRID_MeasurementPointID_String</td>
<td>A unique identification of the measurement point. --- The identification of the location where one or more products are metered. The identification of a measurement point associated with a TimeSeries.</td>
</tr>
<tr>
<td>Order</td>
<td>mult.</td>
<td>Attribute name / Attribute type</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------</td>
<td>---------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>8</td>
<td>[0..1]</td>
<td>in_MarketParticipant.mRID</td>
<td>The identification of a party in the energy market. --- The identification of the party putting the product into the in area. The identification of a market participant associated with a TimeSeries.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PartyID_String</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>[0..1]</td>
<td>out_MarketParticipant.mRID</td>
<td>The identification of a party in the energy market. --- The identification of the party taking the product out of the out area. The identification of a market participant associated with a TimeSeries.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>PartyID_String</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>[0..1]</td>
<td>marketAgreement.type</td>
<td>The specification of the kind of the agreement, e.g. long term, daily contract. --- The identification of an agreement for the allocation of capacity to a party.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CapacityContractKind_String</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>[0..1]</td>
<td>marketAgreement.mRID</td>
<td>The unique identification of the agreement. --- The identification of an agreement for the allocation of capacity to a party.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID_String</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>[0..1]</td>
<td>connectingLine_RegisteredResource.mRID</td>
<td>The unique identification of a resource. In the ESMP context, the &quot;model authority&quot; 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. --- The identification of a resource associated with a TimeSeries.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ResourceID_String</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>[1..1]</td>
<td>measurement_Unit.name</td>
<td>The identification of the formal code for a measurement unit (UN/ECE Recommendation 20). --- The unit of measurement used for the quantities expressed within the time series.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MeasurementUnitKind_String</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>[0..1]</td>
<td>curveType</td>
<td>The identification of the coded representation of the type of curve being described.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CurveType_String</td>
<td></td>
</tr>
</tbody>
</table>

Table 6 shows all association ends of Anomaly_TimeSeries with other classes.

Table 6 - Association ends of Anomaly report assembly model::Anomaly_TimeSeries with other classes

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Class name / Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>[1..*]</td>
<td>Series_Period</td>
<td>The time interval and resolution for a period associated with a TimeSeries. Association Based On: Anomaly report contextual model::Series_Period.Period[1..*] ----- Anomaly report contextual model::Anomaly_TimeSeries.[]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Period</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>[1..*]</td>
<td>Reason</td>
<td>In an anomaly report, errors are detailed at the time series level to identify the anomalies that have occurred. Association Based On: Anomaly report contextual model::Reason.Reason[1..*] ----- Anomaly report contextual model::Anomaly_TimeSeries.[]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reason</td>
<td></td>
</tr>
</tbody>
</table>
2.2.3.3 Original_MarketDocument

The document issued by one of the parties where errors have been detected. All the attributes are the ones of this party's original time series.

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

Table 7 shows all attributes of Original_MarketDocument.

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Attribute name / Attribute type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>[1..1]</td>
<td>marketParticipant.mRID</td>
<td>PartyID_String</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[1..1]</td>
<td>mRID</td>
</tr>
<tr>
<td></td>
<td></td>
<td>[1..1]</td>
<td>revisionNumber</td>
</tr>
</tbody>
</table>

Table 8 shows all association ends of Original_MarketDocument with other classes.

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Class name / Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>[1..1]</td>
<td>Anomaly_TimeSeries</td>
<td>TimeSeries</td>
</tr>
</tbody>
</table>

2.2.3.4 Point

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

Table 9 shows all attributes of Point.

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Attribute name / Attribute type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>[1..1]</td>
<td>position</td>
<td>Position_Integer</td>
</tr>
<tr>
<td>1</td>
<td>[1..1]</td>
<td>quantity</td>
<td>Decimal</td>
</tr>
</tbody>
</table>

Table 10 shows all association ends of Point with other classes.
Table 10 - Association ends of Anomaly report assembly model::Point with other classes

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Class name / Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>0..*</td>
<td>Reason</td>
<td>The Reason information associated with a Point providing motivation information. Association Based On: Anomaly report contextual model::Reason.Reason[0..*] ----- Anomaly report contextual model::Point[]</td>
</tr>
</tbody>
</table>

2.2.3.5 Reason

The motivation of an act.

Table 11 shows all attributes of Reason.

Table 11 - Attributes of Anomaly report assembly model::Reason

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Attribute name / Attribute type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1..1</td>
<td>code ReasonCode_String</td>
<td>The motivation of an act in coded form.</td>
</tr>
<tr>
<td>1</td>
<td>0..1</td>
<td>text ReasonText_String</td>
<td>The textual explanation corresponding to the reason code.</td>
</tr>
</tbody>
</table>

2.2.3.6 Series_Period

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

Table 12 shows all attributes of Series_Period.

Table 12 - Attributes of Anomaly report assembly model::Series_Period

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Attribute name / Attribute type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1..1</td>
<td>timeInterval ESMP_DateTimeInterval</td>
<td>The start and end time of the period.</td>
</tr>
<tr>
<td>1</td>
<td>1..1</td>
<td>resolution Duration</td>
<td>The definition of the number of units of time that compose an individual step within a period.</td>
</tr>
</tbody>
</table>

Table 13 shows all association ends of Series_Period with other classes.

Table 13 - Association ends of Anomaly report assembly model::Series_Period with other classes

<table>
<thead>
<tr>
<th>Order</th>
<th>mult.</th>
<th>Class name / Role</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1..*</td>
<td>Point Point</td>
<td>The Point information associated with a given Series_Period.within a TimeSeries. Association Based On: Anomaly report contextual model::Series_Period[] ----- Anomaly report contextual model::Point.Point[1..*]</td>
</tr>
</tbody>
</table>

2.2.4 Datatypes

The list of datatypes used for the Anomaly report assembly model is as follows:
172  •  ESMP_DateTimeInterval compound
173  •  AreaID_String datatype, codelist CodingSchemeTypeList
174  •  BusinessKind_String datatype, codelist BusinessTypeList
175  •  CapacityContractKind_String datatype, codelist ContractTypeList
176  •  CurveType_String datatype, codelist CurveTypeList
177  •  EnergyProductKind_String datatype, codelist EnergyProductTypeList
178  •  ESMP_DateTime datatype
179  •  ESMPVersion_String datatype
180  •  ID_String datatype
181  •  MarketRoleKind_String datatype, codelist RoleTypeList
182  •  MeasurementPointID_String datatype, codelist CodingSchemeTypeList
183  •  MeasurementUnitKind_String datatype, codelist UnitOfMeasureTypeList
184  •  ObjectAggregationKind_String datatype, codelist ObjectAggregationTypeList
185  •  PartyID_String datatype, codelist CodingSchemeTypeList
186  •  Position_Integer datatype
187  •  ReasonCode_String datatype, codelist ReasonCodeTypeList
188  •  ReasonText_String datatype
189  •  ResourceID_String datatype, codelist CodingSchemeTypeList
190  •  YMDHM_DateTime datatype
2.2.5 AnomalyReport_MarketDocument XML schema structure

Figure 3 - AnomalyReport_MarketDocument schema structure
2.2.6 AnomalyReport_MarketDocument XML schema

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


<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:cim="http://iec.ch/TC57/2013/CIM"
  xmlns:sawsdl=http://www.entsoe.eu/wgedi/codelists"
  targetNamespace="urn:iec62325.351:tc57wg16:451-2:anomalydocument:5:2"
  elementFormDefault="qualified" attributeFormDefault="unqualified">
  <xs:element name="AnomalyReport_MarketDocument" schemaLocation="urn-entsoe-eu-wgedi-codelists.xsd"/>
  <xs:complexType name="AnomalyReport_MarketDocument">
    <xs:attribute name="AnomalyReport_ID" type="ID_String" use="required"/>
    <xs:attribute name="AreaID" type="AreaID_String" use="required"/>
    <xs:attribute name="ESMPVersion" type="ESMPVersion_String" use="required"/>
    <xs:attribute name="BusinessKind" type="BusinessKind_String" use="required"/>
    <xs:attribute name="EnergyProductKind" type="EnergyProductKind_String" use="required"/>
    <xs:attribute name="ObjectAggregationKind" type="ObjectAggregationKind_String" use="required"/>
    <xs:attribute name="ChangeReasonKind" type="ChangeReasonKind_String" use="required"/>
    <xs:attribute name="AreaChangeReasonKind" type="AreaChangeReasonKind_String" use="required"/>
  </xs:complexType>
</xs:schema>
<xs:restriction base="xs:string">
  <xs:maxLength value="35"/>
</xs:restriction>
</xs:simpleType>

<xsd:complexType name="MeasurementPointID_String">
  <xsd:restriction base="xs:string">
    <xsd:maxLength value="16"/>
  </xsd:restriction>
</xsd:complexType>

<xsd:complexType name="PartyID_String">
  <xsd:restriction base="xs:string">
    <xsd:maxLength value="60"/>
  </xsd:restriction>
</xsd:complexType>

<xsd:complexType name="CapacityContractKind_String">
  <xsd:restriction base="ecl:ContractTypeList"/>
</xsd:complexType>

<xsd:complexType name="ResourceID_String">
  <xsd:restriction base="xs:string">
    <xsd:maxLength value="16"/>
  </xsd:restriction>
</xsd:complexType>

<xsd:complexType name="ResourceID_String">
  <xsd:restriction base="xs:string">
    <xsd:maxLength value="60"/>
  </xsd:restriction>
</xsd:complexType>

<xsd:complexType name="MeasurementUnitKind_String">
  <xsd:restriction base="ecl:UnitOfMeasureTypeList"/>
</xsd:complexType>

<xsd:complexType name="CurveType_String">
  <xsd:restriction base="ecl:CurveTypeList"/>
</xsd:complexType>

<xsd:complexType name="Anomaly_TimeSeries">
  <xsd:restriction base="cim16#TimeSeries"/>
</xsd:complexType>

<xsd:complexType name="Anomaly_TimeSeries">
  <xsd:restriction base="cim16#TimeSeries"/>
</xsd:complexType>

<xsd:complexType name="Anomaly_TimeSeries">
  <xsd:restriction base="cim16#TimeSeries"/>
</xsd:complexType>

<xsd:complexType name="Anomaly_TimeSeries">
  <xsd:restriction base="cim16#TimeSeries"/>
</xsd:complexType>
```xml
<xs:element name="mRID" type="ID/String" minOccurs="1" cim16#IdentifiedObject.mRID/>
<xs:element name="version" type="ESMPVersion_String" cim16#TimeSeries.version/>
<xs:element name="businessType" type="BusinessKind_String" cim16#TimeSeries.businessType/>
<xs:element name="product" type="EnergyProductKind_String" cim16#TimeSeries.product"/>
<xs:element name="objectAggregation" type="ObjectAggregationKind_String" minOccurs="1" maxOccurs="1" sawsd1:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#TimeSeries.objectAggregation"/>
<xs:element name="in_Domain.mRID" type="AreaID_String" cim16#IdentificationObject.mRID"/>
<xs:element name="out_Domain.mRID" type="AreaID_String" cim16#IdentificationObject.mRID"/>
<xs:element name="marketEvaluationPoint.mRID" type="MeasurementPointID_String" minOccurs="0" maxOccurs="1" sawsd1:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#IdentificationObject.mRID"/>
<xs:element name="in_MarketParticipant.mRID" type="PartyID_String" minOccurs="0" maxOccurs="1" sawsd1:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#IdentificationObject.mRID"/>
<xs:element name="out_MarketParticipant.mRID" type="PartyID_String" minOccurs="0" maxOccurs="1" sawsd1:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#IdentificationObject.mRID"/>
<xs:element name="marketAgreement.type" type="CapacityContractKind_String" minOccurs="0" maxOccurs="1" sawsd1:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Document.type"/>
<xs:element name="marketAgreement.mRID" type="ID/String" cim16#IdentificationObject.mRID"/>
<xs:element name="connectingLine_RegisteredResource.mRID" type="ID/String" cim16#IdentificationObject.mRID"/>
<xs:element name="ResourceID_String" minOccurs="0" maxOccurs="1" sawsd1:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#IdentificationObject.mRID"/>
<xs:element name="measurement_Unit.name" type="CurveType_String" cim16#TimeSeries.curveType"/>
</xs:complexType>
```

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<xs:element name="sender_MarketParticipant.marketRole.type">
  <xs:simpleType name="sender_MarketParticipant.marketRole.type">
    <xs:restriction base="xs:string">
      <xs:enumeration value="Transmission System Operators"/>
      <xs:enumeration value="Receiving System Operators"/>
      <xs:enumeration value="Transmission System Service Provider"/>
    </xs:restriction>
  </xs:simpleType>
</xs:element>

<xs:element name="receiver_MarketParticipant.mRID">
  <xs:simpleType name="receiver_MarketParticipant.mRID">
    <xs:restriction base="xs:string">
      <xs:maxLength value="21"/>  
    </xs:restriction>
  </xs:simpleType>
</xs:element>

<xs:element name="marketParticipant.mRID">
  <xs:simpleType name="marketParticipant.mRID">
    <xs:restriction base="xs:string">
      <xs:maxLength value="21"/>  
    </xs:restriction>
  </xs:simpleType>
</xs:element>

<xs:element name="ID_String">
  <xs:simpleType name="ID_String">
    <xs:restriction base="xs:string">
      <xs:maxLength value="999999"/>  
    </xs:restriction>
  </xs:simpleType>
</xs:element>

<xs:element name="Position_Integer">
  <xs:simpleType name="Position_Integer">
    <xs:restriction base="xs:int">
      <xs:minInclusive value="1"/>  
      <xs:maxInclusive value="999999"/>  
    </xs:restriction>
  </xs:simpleType>
</xs:element>

<xs:element name="Point">
  <xs:complexType name="Point">
    <xs:sequence>
      <xs:element name="position">
        <xs:simpleType name="Position_Integer">
          <xs:restriction base="xs:int">
            <xs:minInclusive value="1"/>  
            <xs:maxInclusive value="999999"/>  
          </xs:restriction>
        </xs:simpleType>
      </xs:element>
      <xs:element name="quantity" type="xs:decimal">
        <xs:restriction base="xs:float">
          <xs:minInclusive value="1"/>  
          <xs:maxInclusive value="999999"/>  
        </xs:restriction>
      </xs:element>
      
    </xs:sequence>
  </xs:complexType>
</xs:element>

<xs:element name="Reason">
  <xs:simpleType name="Reason">
    <xs:restriction base="xs:string">
      <xs:maxLength value="999999"/>  
    </xs:restriction>
  </xs:simpleType>
</xs:element>
<xs:complexType name="ReasonCode_String">
  <xs:simpleType>
    <xs:restriction base="ecl:ReasonCodeTypeList"/>
  </xs:simpleType>
</xs:complexType>


<xs:complexType name="ReasonText_String">
  <xs:restriction base="xs:string">
    <xs:maxLength value="512"/>
  </xs:restriction>
</xs:complexType>


<xs:complexType name="Reason">
  <xs:sequence>
    <xs:element name="code" type="ReasonCode_String" minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Reason.code"/>
    <xs:element name="text" type="ReasonText_String" minOccurs="0" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Reason.text"/>
  </xs:sequence>
</xs:complexType>


<xs:complexType name="Series_Period">
  <xs:sequence>
    <xs:element name="timeInterval" type="ESMP_DateTimeInterval" minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period.timeInterval"/>
    <xs:element name="resolution" type="xs:duration" minOccurs="1" maxOccurs="1" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period.resolution"/>
    <xs:element name="Point" type="Point" minOccurs="1" maxOccurs="unbounded" sawsdl:modelReference="http://iec.ch/TC57/2013/CIM-schema-cim16#Period.Point"/>
  </xs:sequence>
</xs:complexType>