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NOTE CONCERNING WORDING USED IN THIS DOCUMENT

The force of the following words is modified by the requirement level of the document in which they are used.

- SHALL: This word, or the terms “REQUIRED” or “MUST”, means that the definition is an absolute requirement of the specification.
- SHALL NOT: This phrase, or the phrase “MUST NOT”, means that the definition is an absolute prohibition of the specification.
- SHOULD: This word, or the adjective “RECOMMENDED”, means that there may exist valid reasons in particular circumstances to ignore a particular item, but the full implications must be understood and carefully weighed before choosing a different course.
- SHOULD NOT: This phrase, or the phrase “NOT RECOMMENDED”, means that there may exist valid reasons in particular circumstances when the particular behaviour is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behaviour described with this label.
- MAY: This word, or the adjective “OPTIONAL”, means that an item is truly optional.
## Revision History

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<td>Inclusion of inputs from STA project team to give more details</td>
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<td>• More detailed explanations regarding the different documents to be used and examples of use.</td>
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<td>• New use case and sequence diagrams for allowing NTC data submissions</td>
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<td>• Addition of the Capacity Market Document to exchange the NTCs.</td>
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<td>• New dependency tables for the different documents used in this IG.</td>
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<td>• Small typos were amended.</td>
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<td>1</td>
<td>2020-02-12</td>
<td>File naming convention chapter was updated to align it with the ECP Public interface document.</td>
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<td>2021-04-21</td>
<td>Must run businessType code (B94) and Production curtailment codes were included in the STA results dependency table.</td>
<td>New business type code for Available Energy and a new AssetType for Dispatchable Hydro Resource are introduced. This last code will allow to make reference to dispatchable hydro resources.</td>
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<td>New resolutions for businessType code Available Energy are also introduced. In case of weekly availabilities, resolution P7D should be used instead Gigawatt hour (GWH) unit of measure code is used together with the new Available Energy businessType code.</td>
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Scope

The objective of this implementation guide is to make possible for TSOs and RSCs to develop an IT application to exchange information relative to Short -Term Adequacy forecast process.

The implementation guide is one of the building blocks for using UML (Unified Modelling Language) based techniques in defining processes and messages for interchange between actors in the electrical industry in Europe.

The implementation guide is developed for the harmonisation of the underlying data exchange process

References

2.1 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

2.2 Other references

- Article 81 of the Guideline on electricity transmission system operation (SO GL).
- Coordinated Week Ahead Adequacy Assessment STA Methodology v1.5
- BP Coordinated Week Ahead Adequacy Assessment v2.4
- STA - Cross Regional Adequacy Tool - Functional Specification v2.0
- ECP public interface documentation
- Short Medium Term Adequacy Prognosis document UML model and schema.
- Short Medium Term Adequacy Results document UML model and schema.
Terms and definitions

Available Energy: A value concerning the available primary energy source of a generation type. For instance, “Available Energy” could correspond to the hydroelectric energy stored in reservoirs concerning Hydro Water Reservoir generation type. Another example is the available energy stored as raw fuel concerning Coal generation type.

Biomass: Biomass electrical power in [MW] at the reference point.

Coal-derived gas: Coal-derived gas electrical power in [MW] at the reference point.

Dispatchable hydro: A resource referring to dispatchable hydro generation. Hydro pump storage and Hydro Water Reservoir are considered as Dispatchable Hydro.

Force Outage Rate: A measure of the probability that a generating unit will not be available due to forced outages or forced deratings.


Fossil oil shale: Fossil oil shale electrical power in [MW] at the reference point.

Fossil peat: Fossil peat electrical power in [MW] at the reference point.

Gas: Gas electrical power in [MW] at the reference point.

Generation in Forced outages: Aggregates forced – i.e. not scheduled - unavailability of generating capacity.

Generation in planned Maintenance and Overhauls: Aggregates scheduled unavailability of generating capacity for regular inspection and maintenance.

Generation reserved for system services: This capacity is required to maintain the security of supply according to the operating rules of each TSO with a direct impact on adequacy. Ancillary services refer to a range of functions which TSOs contract so that they can guarantee system security. As system services reserve, TSOs have to consider:

- frequency containment reserves (FCR) (to maintain system frequency with automatic and very fast responses); fast reserve
- frequency restoration reserves (FRRm/a) (which can provide additional energy when needed),
- replacement reserves (RR) can be considered as an important tool for ensuring adequacy

Geothermal: Geothermal electrical power in [MW] at the reference point.

Hard coal: Hard coal electrical power in [MW] at the reference point.

Hydro Pump storage: Pump-Storage is a hydro unit in which water can be raised by means of pumps and stored to be used later for the generation of electrical energy in [MW] at the reference point.

Hydro Run of the river and poundage: Hydro Run of the river and poundage electrical power in [MW] at the reference point.

Hydro Water reservoir: Hydro Water reservoir electrical power in [MW] at the reference point.
Load reduction: Load Reduction is a voluntary reduction in demand performed by a consumer or a group of consumers in order to help the Balancing of the system. Load Reduction can be remunerated.

Load: Total Load, including losses without power used for energy storage, means a load equal to generation on transmission and distribution grids.

Marine: Marine (wave, tidal and sea current) electrical power in [MW] at the reference point.

Must Run: The amount of output of the generators which, for various reasons, must be connected to the transmission/distribution grid. Such reasons may include: network constraints (overload management, voltage control), specific policies, minimum number of units needed to provide system services, system inertia, subsidies, environmental causes etc

Net Generating Capacity (NGC): Net generating capacity is the maximum electrical net active power a power plant can feed-in continuously without exceeding the designed thermal limits.

Non-Usable Capacity: Aggregates reductions of the net generating capacities due to the following causes:
- Temporary limitation due to constraints, like power stations in mothball or test operation, heat extraction for CHP's
- Limitation due to fuel constraints management
- Limitation reflecting the average availability of the primary energy source (e.g. reservoir level for pump storage hydro units)
- Power stations with output power limitation due to environmental and ambient constraints
- Non-available part of the wind and solar total installed capacity due to variable weather conditions.

Nuclear: Nuclear electrical power in [MW] at the reference point.

Offshore Wind: Offshore wind electrical power in [MW] at the reference point.

Oil: Oil electrical power in [MW] at the reference point.

Onshore Wind: Onshore wind electrical power in [MW] at the reference point

Others Renewable: Others RES are energies from renewable non-fossil sources, namely athermical, geothermal, hydrothermal, tidal, ocean energy, hydropower, run of river, biomass, landfill gas, waste, sewage treatment plant gas and biogases in [MW] at the reference point.

Others: Others are energies from fossil sources not accounted for gas, nuclear and coal, such as oil, oil shades, and mixed fuels in [MW] at the reference point.

PEMMDB: Pan European Market Modelling Data Base.

PV Solar: PV Solar electrical power in [MW] at the reference point

PXX Load Forecast: The XXth percentile of load is the value in [MW] below which XX% of the observations may be found at the reference point.

PXX Solar Forecast: The XXth percentile of PV Solar is the value in [MW] below which XX% of the observations may be found at the reference point.
PXX Wind Offshore forecast: The XXth percentile of Wind Offshore is the value in [MW] below which XX% of the observations may be found at the reference point.

PXX Wind Onshore forecast: The XXth percentile of Wind Onshore is the value in [MW] below which XX% of the observations may be found at the reference point.

Reference point: The dates and times for which power data are collected. Reference points are characteristic enough of the entire period studied to limit the data to be collected to the data at the reference points. Reference point refers to hourly values. An hourly value is a forecast data foreseen at XX:30 (XX is the hour)

Reliable Available Capacity (RAC): The RAC on a power system is the difference between the Net Generating capacity (NGC) and the Unavailable Capacity. The RAC is the part of the NGC that is currently available to cover the load at a reference point.

**Reliable available capacity (RAC) formula:** RAC = Net Generating Capacity – Unavailable capacity

The Reliably Available Capacity definition can be applied to the hourly data needed for STA Remaining Capacity and to different generations types.

Remaining capacity: The remaining capacity (RC) for a TSO is the measurement of its own possibility to cover its load by its available generation. The Remaining Capacity on a power system is the difference between the Reliably Available Capacity and the Load.

**Remaining capacity (RC) formula:** RC = Reliably Available Capacity – Load

A positive RC means that a TSO has more available generation than its load. In the opposite, a negative RC means its load isn’t covered by its reliably available generation. If RC is null, then load and available generation are equal. This item is a pragmatic indicator to define TSOs which need energy to cover their load or are able to export surplus of energy to help others TSOs to feed their load.

TP: Transparency Platform. This platform provides free, continuous access to pan-European electricity market data for all users.

Unavailable Capacity: This is the part of the NGC which is not reliably available to power plant operators due to limitations on the output power of power plants. It consists of the Non-Usable Capacity, power plants in scheduled Maintenance and Overhauls or in forced Outages or reserved for System Services.

Waste: Waste electrical power in [MW] at the reference point

Week Ahead Load forecast: This represents the load forecast value as predicted by a Transmission System Operator for its control area at W-1. The W-1 load forecast represents hourly average values of the load figures for the entire week.

Week Ahead Load reduction forecast: This represents the load reduction forecast value as predicted by a Transmission System Operator for its control area at W-1. The W-1 load forecast represents hourly average values of the load figures for the entire week.

Week Ahead PXX Load Forecast: This represents the PXX load forecast value as predicted by a system Operator for its control area at W-1. The W-1 system PXX load forecast represents hourly average values of the XXth percentile of load figures for the entire week.

Week Ahead PXX PV Solar Forecast: This represents the PXX PV Solar forecast value as predicted by a system Operator for its control area at W-1. The W-1 system PXX PV Solar forecast represents hourly average values of the 5th percentile of PV Solar figures for the entire week.
Week Ahead PXX Wind Offshore Forecast: This represents the PXX wind offshore forecast value as predicted by a system Operator for its control area at W-1. The W-1 system PXX wind offshore forecast represents hourly average values of the XXth percentile of wind offshore figures for the entire week.

Week Ahead PXX Wind Onshore Forecast: This represents the PXX wind onshore forecast value as predicted by a system Operator for its control area at W-1. The W-1 system PXX wind onshore forecast represents hourly average values of the XXth percentile of wind onshore figures for the entire week W.

Week Ahead Remaining capacity: This represents Remaining Capacity applied to week-ahead operational period.

Week-ahead (W-1) operational period: Starts on D-1 to D-7 CET/CEST time

Week-ahead operational granularity: Week Ahead values are hourly values from the Week Ahead operational period.
The STA Business Process

4.1 Overview

Each Transmission System Operator (TSO) shall provide to the Regional Security Coordinator (RSC) the information necessary to perform the adequacy assessments in its control area: expected total load and available resources of demand response, availability of power generation modules and operational security limits.

Based on these hourly forecasts for next week (from D-1 until D-7), Regional Security Coordinator shall perform adequacy assessments for at least the week-ahead timeframe with the aim of detecting situations where a lack of adequacy is expected in any of the control areas or at regional level, considering possible cross-border exchanges and operational security limits.

Following this,
- RSC (on a rotating basis) performs a cross-regional adequacy assessment to highlight at ENTSO-E level the situations where a lack of adequacy is expected.
- On TSO requests, e.g. due to lack of adequacy assessed or estimation of TSOs, RSC shall perform a regional adequacy assessment in the relevant adequacy coordination region and shall deliver the results of the regional adequacy assessment together with the actions it proposes to reduce risk to the associated TSOs.

The current Implementation Guide focuses only on the cross regional process.
4.2 Use Case

Figure 1 - Use Cases

Table 1 gives a list of actors involved in STA data exchange.

<table>
<thead>
<tr>
<th>Actor Label</th>
<th>Actor Description</th>
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<tbody>
<tr>
<td>Data provider</td>
<td>Data provider is responsible for providing transmission capacity, generation and load data information</td>
</tr>
<tr>
<td>System operator</td>
<td>A system operator, or any other actor on behalf a SO, who is responsible for providing load and generation forecasts. It is possible for SO to deliver the NTCs in case they consider it necessary.</td>
</tr>
</tbody>
</table>
The Regional Security Coordinator calculates STA results (Net positions, adequacy flags, interchange zones...) and send the acknowledgements and STA results.

An Information receiver only receives STA results. Information receivers can be SO or RSC as well.

Table 2 gives a list of use cases for STA data exchange.

<table>
<thead>
<tr>
<th>Use case label</th>
<th>Actors involved</th>
<th>Action descriptions and assertions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provide Transmission Capacity, Generation and Load data information</td>
<td>Data provider, System operator</td>
<td>Data provider sends to the system operator all the information necessary to calculate forecasts. This use case is out of the scope of the implementation guide.</td>
</tr>
<tr>
<td>Calculate week ahead total load and generation forecast, percentile 5 and 95</td>
<td>System operator</td>
<td>System operator calculates week ahead total load and generation forecast, percentile 5 and 95 with the information received from Data provider. This use case is out of the scope of the implementation guide.</td>
</tr>
<tr>
<td>Submit (forecasts, ack)</td>
<td>System operator, RSC</td>
<td>System operator submits forecasts to RSC. The RSC checks submitted document. It fully or partially accepts or rejects received data and send an acknowledgement to the System operator. Submitting must include generation and load forecast information documents. The submission of the NTCs is optional.</td>
</tr>
<tr>
<td>Calculate STA results</td>
<td>RSC</td>
<td>RSC calculates STA results (Net positions, adequacy flags, interchange zones...) with the information received from System operator. The calculation is performed according to the deadlines of the business process.</td>
</tr>
<tr>
<td>Send STA Results</td>
<td>RSC, Information Receiver</td>
<td>This use case is out of the scope of the implementation guide.</td>
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<td>Once RSC has calculated the results, he sends them to the information receivers.</td>
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</table>
4.3 Document exchange processes

4.3.1 Overview

The use cases are supported by the following document exchanges:

- Submit ShortMediumTermAdequacyPrognosis_MarketDocument
- Submit Capacity_MarketDocument
- Reply Acknowledgement_MarketDocument
- Send ShortMediumTermAdequacyResults_MarketDocument

Next figure shows a sequence diagram of the documents exchange processes.

![Sequence diagram for STA](image)

**Figure 2 - Sequence diagram for STA**

- The above sequence diagram describes how the system operator submits week ahead generation, load forecast and NTCs (Optional submission for TSOs) to enable the RSC to calculate the STA results (Net positions, adequacy flags, interchange zones...).
4.3.2 Submit ShortMediumTermAdequacyPrognosis_MarketDocument

- First, data providers send to the SO all the necessary data to perform the calculation of the percentiles. As an example, we can quote:
  - The Production unit existing and planned capacity
  - The Installed generation capacity aggregated
  - The Generation or load forecast information

- These data exchanges between the data provider and the SO are out of the scope of this implementation guide.

- Once the SO has received these data, the SO calculates total load and generation forecast percentile 5 and 95 and submits them (In a ShortMediumTermAdequacyPrognosis_MarketDocument CIM format) to the RSC.

4.3.3 Submit Capacity_MarketDocument

In case, SO wants to submit the NTCs, they should send them separately using the capacity market document.

4.3.4 Reply Acknowledgement

It is a syntax and business acknowledgment: When the RSC receives the forecasts, the RSC checks that the technical and functional validity of the information and send an acknowledgment to the SO. The acknowledgement can be positive (A01 fully accepted), partially accepted (A03 Message contains errors at the time series level) or negative (A02 fully rejected).

4.3.5 Send ShortMediumTermAdequacyResults_MarketDocument

Then RSC calculates Adequacy and send the results to the information receiver.
General rules for document exchange

5.1 Overview

The document exchange processes of STA described in the previous chapter require sending and receiving various CIM based documents. The CIM based documents to be used are:

- ShortMediumTermAdequacyPrognosis_MarketDocument (v1.0.xsd)
- Capacity_MarketDocument (iec62325-451-3-capacity_v8_0.xsd)
- Acknowledgement_MarketDocument (iec62325-451-1-acknowledgement_v8_0.xsd)
- ShortMediumTermAdequacyResults_MarketDocument (v1.0.xsd)

These CIM based documents shall be used to carry out the communication tasks:

- **submit** - The document contains data to be processed by the receiver.
- **reply** - It is the reaction to receiving a submit or get document.
- **send** - The document contains data which may be processed by the receiver.

Next table gives an overview, which document shall be used to carry out the communication tasks of document exchange processes (DEP). For reducing the size of the table, we are going to use the following abbreviations:

- SMTAPD: ShortMediumTermAdequacyPrognosis_MarketDocument
- AMD: Acknowledgement_MarketDocument IEC62325-451-1
- SMTARD: ShortMediumTermAdequacyResults_MarketDocument

<table>
<thead>
<tr>
<th>DEP Chapter</th>
<th>DEP label</th>
<th>send/submit document</th>
<th>Reply document</th>
<th>Reply conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.3.2</td>
<td>Submit load and generation forecasts</td>
<td>SMTAPD</td>
<td>AMD</td>
<td>SMTAPD fully accepted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SMTAPD partially accepted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fully rejected due to errors in the SMTAPD</td>
</tr>
<tr>
<td>4.3.3</td>
<td>If SO submit NTCs</td>
<td>CMD</td>
<td>AMD</td>
<td>CMD fully accepted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>CMD partially accepted</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Fully rejected due to errors in the CMD</td>
</tr>
<tr>
<td>4.3.5</td>
<td>Send STA results</td>
<td>SMTARD</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>
To have a more complete view of the reply conditions, please check the quality rules wrote by the business.
5.2 Data exchange with STA platform

The Implementation Guide describes the data exchange with the STA platform. Inputs are sent from TSOs to the STA platform. An ACK is sent from STA platform to TSOs. The next figure describes the data exchange:

The input files are expected to contain data at least from 7 days on the period, from D-1 to maximum D-10. To take into account TSO data for calculation, both load and generation must be provided. NTC can also be provided in a separated file. Providing NTC information to STA software platform is not mandatory.
5.3 ShortMediumTermAdequacyPrognosis_MarketDocument dependency table

General Notes:

- It’s mandatory to use the codes specified under the column with the values for the businessType attribute.
- If the sender, for some reason, doesn’t provide the information related with the code, then it’s not mandatory to include a Timeseries with that businessType code in the document.
- As you are obliged to use only EIC codes to identify parties, zones or assets, you must write in the coding scheme attribute of your XML document code A01 (EIC).
- For all Generation and Load data business type exchanges, TSOs shall be able to use either bidding zone or control area. TSOs shall always use the same bidding zone or control area code when sending data across time.
- To avoid sending quantity values with a lot of decimals, please restrict the number of decimals to five as maximum. EG: 0.86578

Table 4 - ShortMediumTermAdequacyPrognosisDocument_MarketDocument dependency table

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Values</th>
<th>Description</th>
<th>XSD Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>mRID</td>
<td>Unique ID (Max 35 characters)</td>
<td>Identification of the document.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>revisionNumber</td>
<td>Consecutive number. Pattern ([1-9][0-9][0,2])</td>
<td>Version of the document.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>type</td>
<td>B14: Energy prognosis document</td>
<td>The document type describes the principal characteristic of the document.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>process.processType</td>
<td>A31: Week ahead</td>
<td>Indicates the nature of process that the document addresses.</td>
<td>Mandatory</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Starts on D-1 to D-7 CET/CEST time</td>
<td></td>
</tr>
<tr>
<td>sender_MarketParticipant.mRID</td>
<td>EIC-X code of the TSO</td>
<td>The identification of the sender.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>sender_MarketParticipant.marketRole.type</td>
<td>A04: System Operator</td>
<td>The role of the sender.</td>
<td>Mandatory</td>
</tr>
</tbody>
</table>
Table 5 – TimeSeries Prognosis Document dependency table

<table>
<thead>
<tr>
<th>TimeSeries</th>
<th>Attributes</th>
<th>Values</th>
<th>Description</th>
<th>XSD Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>mRID</td>
<td>Unique ID (Max 35 characters)</td>
<td>Identification of the time series</td>
<td>Mandatory</td>
<td></td>
</tr>
<tr>
<td>businessType</td>
<td><strong>Generation Forecasts</strong></td>
<td>A38: Available generation</td>
<td>The exact business nature identifying the principal characteristic of time series. If the prognosis document is going to contain Generation forecasts, you’ll have to use the business type codes under Generation Forecasts column. On the other hand, if the prognosis document is going to contain Load forecasts, you’ll have to use the business type code under Load Forecasts column.</td>
<td>Mandatory</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A95: Frequency containment reserve</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>A96: Automatic frequency restoration reserve</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>A97: Manual frequency restoration reserve</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B81: Outage (OUT)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B94: Must Run</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C54: Available Energy</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Load Forecasts</strong></td>
<td>A13: Load Profile</td>
<td></td>
<td></td>
</tr>
<tr>
<td>curveType</td>
<td>A02: Point</td>
<td>The type of curve being defined in the time series</td>
<td>Mandatory</td>
<td></td>
</tr>
<tr>
<td>measurement_Unit.name</td>
<td>MAW: megawatt GWH: gigawatt hour (Only for available energy)</td>
<td>Name of the unit measurement.</td>
<td>Mandatory</td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>---------------------------------------------------------</td>
<td>-------------------------------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td>domain.mRID</td>
<td>EIC-Y Area Code</td>
<td>ID of the control area or bidding zone.</td>
<td>Mandatory</td>
<td></td>
</tr>
<tr>
<td>mktPSRType.psrType</td>
<td><strong>Generation Forecasts</strong></td>
<td>Used as asset type: The identification of the type of asset</td>
<td>Optional</td>
<td></td>
</tr>
<tr>
<td></td>
<td>B01: Biomass</td>
<td>Mandatory only for (Generation) Business Type Codes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B02: Fossil Brown coal/Lignite</td>
<td>• A38: Available generation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B03: Fossil Coal-derived gas</td>
<td>• A95: Frequency containment reserve</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B04: Fossil Gas</td>
<td>• A96: Automatic frequency restoration reserve</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B05: Fossil Hard coal</td>
<td>• A97: Manual frequency restoration reserve</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B06: Fossil Oil</td>
<td>• B81: Outage (OUT)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B07: Fossil Oil shale</td>
<td>• B94: Must Run</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B08: Fossil Peat</td>
<td>• C54: Available Energy</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B09: Geothermal</td>
<td>If the prognosis document is going</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B10: Hydro Pumped Storage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B11: Hydro Run-of-river and poundage</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B12: Hydro Water Reservoir</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B13: Marine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B14: Nuclear</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B15: Other renewable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B16: Solar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B17: Waste</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B18: Wind Offshore</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B19: Wind Onshore</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B20: Other</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B27: Dispatchable hydro resource (Only used with Available Energy businessType code)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>to contain Generation forecasts, you’ll have to use the asset type codes under Generation Forecasts column. Else if the prognosis document is going to contain Load forecasts (businessType codes A13), is not necessary to specify here any code.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **flowDirection.direction** | A01: UP  
A02: DOWN |
| Used to characterize the direction (downward or upward) of the system services. Mandatory only for Business Type Codes:  
• A95: Frequency containment reserve  
• A96: Automatic frequency restoration reserve,  
• A97: Manual frequency restoration reserve | Optional |
### Table 6 – Series_Period Prognosis Document dependency table

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Values</th>
<th>Description</th>
<th>XSD Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>timeInterval</td>
<td>E.G: &lt;start&gt;2018-03-16T00:00Z&lt;/start&gt; &lt;end&gt;2018-03-16T00:30Z&lt;/end&gt;</td>
<td>Time interval covered by elements of Point class. It must be included within header Time_Period.timeInterval.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>resolution</td>
<td>PT60M, P1D, P7D</td>
<td>Resolution used in the Point class.</td>
<td>Mandatory</td>
</tr>
</tbody>
</table>

### Table 7 – Point Prognosis Document dependency table

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Values</th>
<th>Description</th>
<th>XSD Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>position</td>
<td>Integer value &gt; 0</td>
<td>A sequential value representing the relative position within a given time interval.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>Quantity</td>
<td>Decimal value (Float)</td>
<td>The principal quantity identified for a point.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>generationOutage</td>
<td>Decimal value (Float) between 0 and 1</td>
<td>Generation Outage probability value.</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>EG: 0.87546</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attributes</td>
<td>Values</td>
<td>Description</td>
<td>XSD Requirements</td>
</tr>
<tr>
<td>------------</td>
<td>--------</td>
<td>-------------</td>
<td>------------------</td>
</tr>
<tr>
<td>type</td>
<td>05: Percentile 05 95: Percentile 95</td>
<td>The description of the type of percentile. Mandatory only for Business Type Codes: • A13: Load Profile • A38: Available generation combined with mktPSRtype B16, B18, B19</td>
<td>Mandatory</td>
</tr>
<tr>
<td>quantity</td>
<td>Decimal value (Float)</td>
<td>The quantity value. Mandatory only for Business Type Codes: • A13: Load Profile • A38: Available generation combined with mktPSRtype B16, B18, B19</td>
<td>Mandatory</td>
</tr>
</tbody>
</table>
5.4 Generation and Load Input data to STA software platform

ShortMediumTermAdequacyPrognosis_MarketDocument is described in this Implementation Guide as the exchange data document to deliver generation and load inputs from TSOs to STA platform.

Using this document, TSOs can send separately load and generation information. Possible examples of mRID pattern convention for load and generation files will be described in this point.

The assembly model for data input (Generation and Load) from TSOs is shown in chapter Error! Reference source not found.:

- **ShortMediumTermAdequacyPrognosis_MarketDocument**
  - mRID: ID_String is a unique ID of maximum 35 characters.
  - Proposed patterns of the STA project for the mRID are the following ones:
    - Load_XXX_YYYY-MM-DD YYYY-MM-DDTHHMM
    - Gen_XXX_YYYY-MM-DD YYYY-MM-DDTHHMM
  - Load pattern can be used for load input document, Gen pattern can be used for generation input document. STA platform will not refuse a document if the pattern is not respected. CIM EG recommends using non-significant mRIDs generated by the IT Systems.
  - Receiver_MarketParticipant.mRID: PartyID_String EIC-V code of STA platform, not yet decided.

- **Timeseries**
  - mRID: ID_String is a unique ID of maximum 35 characters.
  - A proposed pattern of the STA project for this mRID in Timeseries is the following:
    - BBB_PPP_XXX_YYYY-MM-DDTHHMM
  - BBB is the business type code described in the Timeseries. PPP is the PSRtype code described in the Timeseries. PPP not used for mRID of Timeseries containing load and NTC information. STA platform will not refuse a document if the pattern is not respected. CIM EG recommends using non-significant mRIDs generated by the IT Systems.
  - flowDirection.direction: DirectionKind_String used for service system direction (up or down).

- **Series_Period**
  - In our case, the timInterval for Series_Period is expected being the same as the timInterval of the document.
• **Point**

generationOutageProbability.Quantity.quantity is a decimal value between 0 and 1 giving the probability of loss of a certain amount of MW (given in quantity:Decimal). This information is mandatory only with business type B81

• **Percentile.Quantity**

Mandatory for load (timeseries with business type A13), solar, wind onshore and wind offshore information (timeseries with business type A38 combined with mktPSRtype B16, B18, B19). If a TSO does not have the information available (e.g. no relevant solar installation), it is not mandatory to provide values.

The next table shows an example of mRID following the given convention.

### Table 9 - mRID examples for input TSO files

<table>
<thead>
<tr>
<th>mRID document level</th>
<th>Load convention example</th>
<th>Generation convention example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business type codes</td>
<td>Only for business type code A13 related to load information</td>
<td>Only for business type codes A38, B95, B96, B97, B81, B94 related to generation information</td>
</tr>
</tbody>
</table>

5.4.1 **Special remarks concerning inputs**

a) If a TSO does not have a specific energy type, TSO should not provide the Timeseries related to this businessType - mktPSRTyp.

b) For mktPSRTyp = B10 (hydro pumped storage), values can be positive (generating mode) or negative (pumping mode).

5.4.2 **Outage consideration methodology**

TSOs can send outage probability and outage value using business type code B81 in Timeseries. Then, in Point, TSOs specify the outage value through attribute "quantity: Decimal".

TSOs specify outage probability through attribute "generationOutageProbability.Quantity.quantity: Decimal". This information can be delivered for each mktPSRTyp. This information is not mandatory.

In case TSOs provide this information, TSOs shall consider the following methodology to provide outage values:

TSOs shall consider the loss of a foreseen available power plant. Considering each power plant as $G_i$, with probability of outage, and active power capacity available equal to $AP_i$. In the case that there are more than 1 power plant per cluster, considering $n_i$, the number of power plants in the same cluster "i" (parameters $P_i$ and $AP_i$ equal for all power plants in the cluster "i"), in order to estimate the outage value, TSOs shall select the plant $G_i$ to maximize the formula:
Once power plant from cluster "i" is selected, the expected power outage value to provide is $AP_i$ and the expected forced outage rate to provide is $P_i$. 

Select $i$: $(\max) P_i \times AP \times n_i$
Notice that all the XML examples are provided only for information purposes.

5.4.3 XML input load examples – ShortMediumTermAdequacyPrognosis_MarketDocument

Find below an example of ShortMediumTermAdequacyPrognosis_MarketDocument XML document using the given conventions for sending load values. The document contains a Timeseries class to provide the necessary information. The Timeseries will be depicted hereafter.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!--SMTA Prognosis v1.0 Example-->
<!--This is a SMTA confidential file-->
  <mRID>Load_ES_2018-06-15T08:11</mRID>
  <revisionNumber>1</revisionNumber>
  <type>B14</type>
  <processType_Process.processType>A31</processType_Process.processType>
  <!--As we are going to provide only EIC codes, in the coding schemes we only write code A01-->
  <sender_MarketParticipant.mRID codingScheme="A01">10XES-REE-----E</sender_MarketParticipant.mRID>
  <sender_MarketParticipant.marketRole.type>A04</sender_MarketParticipant.marketRole.type>
  <!--The IEC code I wrote in the receiver is fictitious. It's just to provide an example. To put here the correct code of the SMTA IT Tool-->
  <receiver_MarketParticipant.mRID codingScheme="A01">SMTA-CODE--1</receiver_MarketParticipant.mRID>
  <receiver_MarketParticipant.marketRole.type>A44</receiver_MarketParticipant.marketRole.type>
  <createdDateTime>2018-06-15T08:11:31Z</createdDateTime>
  <time_Period.timeInterval>
    <start>2018-06-15T22:00Z</start>
    <end>2018-06-22T00:00Z</end>
  </time_Period.timeInterval>
  <TimeSeries>
    <!--Example of Timeseries for sending load data is given below-->
  </TimeSeries>
</ShortMediumTermAdequacyPrognosis_MarketDocument>
```

Figure 4 - Load XML input prognosis document

ShortMediumTermAdequacyPrognosis_MarketDocument
Find below an example of Timeseries class for sending load values in prognosis document.

```xml
<TimeSeries>
  <mRID>A13_ES_2018-06-15T0811</mRID>
  <businessType>A13</businessType>
  <curveType>A02</curveType>
  <measurement_Unit.name>MAW</measurement_Unit.name>
  <domain.mRID codingScheme="A01">10YES-REE------0</domain.mRID>
  <Series_Period>
    <timeInterval>
      <start>2018-06-15T22:00Z</start>
      <end>2018-06-22T22:00Z</end>
    </timeInterval>
    <resolution>PT60M</resolution>
    <Point>
      <position>1</position>
      <quantity>33000.0</quantity>
      <Percentile_Quantity>
        <type>05</type>
        <quantity>31000.0</quantity>
      </Percentile_Quantity>
      <Percentile_Quantity>
        <type>95</type>
        <quantity>35000.0</quantity>
      </Percentile_Quantity>
    </Point>
    <Point>
      <position>2</position>
      <quantity>34000.0</quantity>
      <Percentile_Quantity>
        <type>05</type>
        <quantity>32000.0</quantity>
      </Percentile_Quantity>
      <Percentile_Quantity>
        <type>95</type>
        <quantity>36000.0</quantity>
      </Percentile_Quantity>
    </Point>
  </Series_Period>
</TimeSeries>
```

Figure 5 - Timeseries for load values. Forecast load, percentile 05 and 95.
### 5.4.4 XML input Gen examples – ShortMediumTermAdequacyPrognosis_MarketDocument

Find below an example of ShortMediumTermAdequacyPrognosis_MarketDocument XML document using the given conventions for sending generation values. The document contains several Timeseries to provide the necessary information to STA platform. Timeseries examples will be given hereafter to present solar information and outage probability.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!--SMTA Prognosis v1.0 Example-->
<!--This is a SMTA confidential file-->...for sending generation data is given below-->
</TimeSeries>
</ShortMediumTermAdequacyPrognosis_MarketDocument>
```

---

**Figure 6 - Generation XML input prognosis document**

ShortMediumTermAdequacyPrognosis_MarketDocument

---

---
Find below an example of Timeseries class for sending generation values in prognosis document. In the example below, solar generation forecast is provided along with its percentile forecast.

```xml
<TimeSeries>
  <mRID>A38_B16_ES_2018-06-15T0811</mRID>
  <businessType>A38</businessType>
  <curveType>A02</curveType>
  <measurement_Unit.name>MAW</measurement_Unit.name>
  <domain.mRID codingScheme="A01">10YES-REE------0</domain.mRID>
  <Series_Period>
    <timeInterval>
      <start>2018-06-15T22:00Z</start>
      <end>2018-06-22T22:00Z</end>
    </timeInterval>
    <resolution>PT60M</resolution>
    <Point>
      <position:1</position:
        <quantity:13000.0</quantity:
          <Percentile_Quantity
            <type>05</type>
            <quantity:11000.0</quantity:
          </Percentile_Quantity
          <Percentile_Quantity
            <type>95</type>
            <quantity:15000.0</quantity:
          </Percentile_Quantity>
        </Point:
      <Point>
        <position:2</position:
          <quantity:14000.0</quantity:
            <Percentile_Quantity
              <type>05</type>
              <quantity:12000.0</quantity:
            </Percentile_Quantity
            <Percentile_Quantity
              <type>95</type>
              <quantity:16000.0</quantity:
            </Percentile_Quantity>
          </Point:
        </Point>
      </Series_Period>
</TimeSeries>
```

**Figure 7 - Timeseries for generation values. Example of solar forecast values with its percentile 05 and 95**
Find below an example of Timeseries class for sending outage values to be used for probabilistic assessment. This Timeseries for outage values must be delivered in the generation input file. In the example below, there is a chance of 3% to trip 1000 MW of nuclear generation at position 1.

```
<TimeSeries>
  <mRID>B81_B14_ES_2018-06-15T0811</mRID>
  <businessType>B81</businessType>
  <curveType>A02</curveType>
  <measurement_Unit.name>MAW</measurement_Unit.name>
  <domain.mRID codingScheme="A01">10YES-REE-----0</domain.mRID>
  <mktPSRType.psrType>B14</mktPSRType.psrType>
  <Series_Period>
    <timeInterval>
      <start>2018-06-15T22:00Z</start>
      <end>2018-06-22T22:00Z</end>
    </timeInterval>
    <resolution>PT60M</resolution>
    <Point>
      <position>1</position>
      <quantity>1000.0</quantity>
      <generationOutageProbability_Quantity.quantity>0.03</generationOutageProbability_Quantity.quantity>
    </Point>
    <Point>
      <position>2</position>
      <quantity>1000.0</quantity>
      <generationOutageProbability_Quantity.quantity>0.03</generationOutageProbability_Quantity.quantity>
    </Point>
    <!--To write more points-->
  </Series_Period>
</TimeSeries>
```

Figure 8 - Timeseries outage values for probabilistic assessment
Find below an example of Timeseries class for sending weekly availabilities.

```xml
<TimeSeries>
  <mRID>C54_B27_ES_2018-06-15T0811</mRID>
  <businessType>C54</businessType> <!--Available Energy code-->
  <curveType>A02</curveType>
  <measurement_Unit.name>GWH</measurement_Unit.name>
  <domain.mRID codingScheme="A01">10YES-REE------0</domain.mRID>
  <mktPSRType.psrType>B27</mktPSRType.psrType>
  <Series_Period>
    <timeInterval>
      <start>2018-06-15T22:00Z</start>
      <end>2018-06-22T22:00Z</end>
    </timeInterval>
    <resolution>P7D</resolution>
    <Point>
      <position>1</position>
      <quantity>1300.0</quantity>
    </Point>
  </Series_Period>
  <Series_Period>
    <timeInterval>
      <start>2018-06-16T22:00Z</start>
      <end>2018-06-23T22:00Z</end>
    </timeInterval>
    <resolution>P7D</resolution>
    <Point>
      <position>1</position>
      <quantity>1200.0</quantity>
    </Point>
  </Series_Period>
  <Series_Period>
    <timeInterval>
      <start>2018-06-17T22:00Z</start>
      <end>2018-06-24T22:00Z</end>
    </timeInterval>
    <resolution>P7D</resolution>
    <Point>
      <position>1</position>
      <quantity>1400.0</quantity>
    </Point>
  </Series_Period>
  <Series_Period>
    <timeInterval>
      <start>2018-06-18T22:00Z</start>
      <end>2018-06-25T22:00Z</end>
    </timeInterval>
    <resolution>P7D</resolution>
    <Point>
      <position>1</position>
      <quantity>1200.0</quantity>
    </Point>
  </Series_Period>
</TimeSeries>
```

Figure 9 - Timeseries for weekly energy availabilities
Find below an example of Timeseries class for sending daily availabilities. Example below takes into account 8 days.

```xml
<TimeSeries>
  <mRID>C54_B27_ES_2018-06-15T0811</mRID>
  <businessType>C54</businessType> <!—Available Energy code--> 
  <curveType>A02</curveType>
  <measurement_Unit.name>GWH</measurement_Unit.name>
  <domain.mRID codingScheme="A01">10YES-REE------0</domain.mRID>
  <mktPSRType.psrType>B27</mktPSRType.psrType>
  <Series_Period>
    <timeInterval>
      <start>2018-06-15T22:00Z</start>
      <end>2018-06-23T22:00Z</end>
    </timeInterval>
    <resolution>P1D</resolution>
    <Point>
      <position>1</position>
      <quantity>120.0</quantity>
    </Point>
    <Point>
      <position>2</position>
      <quantity>110.0</quantity>
    </Point>
    <Point>
      <position>3</position>
      <quantity>130.0</quantity>
    </Point>
    <Point>
      <position>4</position>
      <quantity>120.0</quantity>
    </Point>
    <Point>
      <position>5</position>
      <quantity>110.0</quantity>
    </Point>
    <Point>
      <position>6</position>
      <quantity>130.0</quantity>
    </Point>
    <Point>
      <position>7</position>
      <quantity>120.0</quantity>
    </Point>
    <Point>
      <position>8</position>
      <quantity>110.0</quantity>
    </Point>
  </Series_Period>
</TimeSeries>
```

Figure 10 - Timeseries for daily energy availabilities

---

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ENTSO-E | Rue de Spa, 8 | 1000 Brussels | info@entsoe.eu | www.entsoe.eu | @entso_e
5.5 Capacity_MarketDocument dependency table

General Notes:

- As you are obliged to use only EIC codes to identify parties, zones or assets, you must write in the coding scheme attribute of your XML document code A01 (EIC).
- To avoid sending quantity values with a lot of decimals, please restrict the number of decimals to five as maximum. EG: 0.86578

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Values</th>
<th>Description</th>
<th>XSD Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>mRID</td>
<td>Unique ID (Max 35 characters)</td>
<td>Identification of the document.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>revisionNumber</td>
<td>Consecutive number. Pattern (<a href="0-9">1-9</a>{0,2})</td>
<td>Version of the document.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>type</td>
<td>A26: Capacity document</td>
<td>The document type describes the principal characteristic of the document.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>process.processType</td>
<td>A31: Week ahead</td>
<td>Indicates the nature of process that the document addresses. Starts on D-1 to D-7 CET/CEST time</td>
<td>Mandatory</td>
</tr>
<tr>
<td>sender_MarketParticipant.mRID</td>
<td>EIC-X code of the TSO</td>
<td>The identification of the sender.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>sender_MarketParticipant.marketRole.type</td>
<td>A04: System Operator</td>
<td>The role of the sender.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>receiver_MarketParticipant.mRID</td>
<td>EIC-V code of the STA IT System</td>
<td>The identification of the receiver.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>receiver_MarketParticipant.marketRole.type</td>
<td>A44: RSC</td>
<td>The role of the receiver.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>createdDateTime</td>
<td>E.G: 2018-03-23T12:04:39Z</td>
<td>UTC Time.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>docstatus</td>
<td>Not used.</td>
<td>The identification of the condition or position of the document.</td>
<td>Optional</td>
</tr>
<tr>
<td><strong>Attribute</strong></td>
<td><strong>Values</strong></td>
<td><strong>Description</strong></td>
<td><strong>XSD Requirements</strong></td>
</tr>
<tr>
<td>--------------</td>
<td>-----------</td>
<td>----------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>mRID</td>
<td>Unique ID (Max 35 characters)</td>
<td>Identification of the time series</td>
<td>Mandatory</td>
</tr>
<tr>
<td>businessType</td>
<td>A27: NTC</td>
<td>The exact business nature identifying the principal characteristic of time series.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>attribute</td>
<td>Value</td>
<td>Description</td>
<td>XSD Requirements</td>
</tr>
<tr>
<td>----------------------------</td>
<td>------------------------------</td>
<td>------------------------------------------------------------------------------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>product</td>
<td>8716867000016: Active Power</td>
<td>The identification of the nature of an energy product such as power, energy, reactive power, etc.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>in_Domain</td>
<td>EIC-Y Area Code</td>
<td>Import bidding zone or control area ID</td>
<td>Mandatory</td>
</tr>
<tr>
<td>out_Domain</td>
<td>EIC-Y Area Code</td>
<td>Export bidding zone or control area ID</td>
<td>Mandatory</td>
</tr>
<tr>
<td>measure_Unit.name</td>
<td>MAW</td>
<td>Name of the unit measurement.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>auction.mRID</td>
<td>Not used.</td>
<td>The unique identification of the auction.</td>
<td>Optional</td>
</tr>
<tr>
<td>auction.category</td>
<td>Not used.</td>
<td>The product category of an auction.</td>
<td>Optional</td>
</tr>
<tr>
<td>curveType</td>
<td>A02: Point</td>
<td>The type of curve being defined in the time series</td>
<td>Optional</td>
</tr>
<tr>
<td>connectingLine_RegisteredResource</td>
<td>Not used.</td>
<td>The identification of a set of lines that connect two areas</td>
<td>Optional</td>
</tr>
<tr>
<td>reason.code</td>
<td>It can be used all codes in the ReasonCodeType Codelist.</td>
<td>Indicates if the capacity document is correct or has errors at the TimeSeries level. Mandatory only if there are errors at the header level.</td>
<td>Optional</td>
</tr>
<tr>
<td>reason.text</td>
<td>May be used Text</td>
<td>Text explaining possible problem. Mandatory only if there are errors at the Timeseries level.</td>
<td>Optional</td>
</tr>
</tbody>
</table>

Table 12 - Series_Period Capacity Document dependency table

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Values</th>
<th>Description</th>
<th>XSD Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>timeInterval</td>
<td>E.G: &lt;start&gt;2018-03-16T00:00Z&lt;/start&gt;</td>
<td>Time interval covered by elements of Point class.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>Attributes</td>
<td>Values</td>
<td>Description</td>
<td>XSD Requirements</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------</td>
<td>-------------------------------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>position</td>
<td>Integer value &gt; 0</td>
<td>The position must begin with 1 and increment by 1 for each subsequent position forming a series of contiguous numbers covering the complete range of the period.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>quantity</td>
<td>Decimal value (Float)</td>
<td>The principal quantity identified for a point.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>reason.code</td>
<td>It can be used all codes in the ReasonCodeType Codelist.</td>
<td>Indicates if the capacity document is correct or has errors at the point level.</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mandatory_only if there are errors at the header level.</td>
<td></td>
</tr>
<tr>
<td>reason.text</td>
<td>May be used Text</td>
<td>Text explaining possible problem.</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mandatory_only if there are errors at the point level.</td>
<td></td>
</tr>
</tbody>
</table>

### 5.6 NTC Input data to STA software platform

Capacity_MarketDocument is described in this Implementation Guide as the exchange data document to deliver NTC inputs from TSOs to STA platform.

Using this document, TSOs can send separately NTCs information. mRID naming convention for NTC files will be described in this point.

The assembly model for NTC data input from TSOs can be found in IEC 62325-451-3:2014+AMD1:2017 CSV Consolidated version.

- **Capacity_MarketDocument**
o **mRID: ID_String** is a unique ID of maximum 35 characters.

A proposed pattern of the STA project for this mRID is the following:

**NTC_XXX_YYYY-MM-DD_YYYY-MM-DDTHHMM**

STA platform will not refuse a document if the pattern is not respected. CIM EG recommends using non-significant mRIDs generated by the IT Systems.

o **Receiver_MarketParticipant.mRID: PartyID_String** EIC-V code of STA platform, not yet decided.

### Timeseries

o **mRID: ID_String** is a unique ID of maximum 35 characters.

A proposed pattern of the STA project for mRID in Timeseries is the following:

**BBBB_PPP_XXX_YYYY-MM-DDTHHMM**

BBB is the business type code described in the Timeseries. PPP not used for mRID of Timeseries containing NTC information.

STA platform will not refuse a document if the pattern is not respected. CIM EG recommends using non-significant mRIDs generated by the IT Systems.

### Series_Period

In our case, the timeInterval for Series_Period is expected being the same as the timeInterval of the document.
• **Point**

In this attribute we specify the different values for the NTCs.

The next table shows an example of mRID following the given convention.

<table>
<thead>
<tr>
<th>mRID document level</th>
<th>NTC convention</th>
</tr>
</thead>
<tbody>
<tr>
<td>NTC_BE_2018-06-16_2018-06-15T0803</td>
<td></td>
</tr>
</tbody>
</table>

| mRID Timeseries level | A27_BE_2018-06-15T0803 |

| Business type codes | A27: NTC |

---

Table 14 - mRID examples for input TSO files
Notice that all the XML examples are provided only for information purposes.

5.6.1 XML input NTC examples – Capacity_MarketDocument

Find below an example of Capacity_MarketDocument XML document using the given conventions for sending NTC values. The document contains one Timeseries to provide the necessary information to STA platform. Timeseries example will be given hereafter to present NTC information.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!--Capacity Document v8.0 Example-->
<!--This is a SMTA confidential file-->
xmlns="urn:iec62325.351:tc57wg16:451-3:capacitydocument:8:0"
xsi:schemaLocation="urn:iec62325.351:tc57wg16:451-3:capacitydocument:8:0
iec62325-451-3-capacity_v8_0.xsd">
  <mRID>NTC_ES_2018-06-15T0811</mRID>
  <revisionNumber>1</revisionNumber>
  <type>A26</type>
  <sender_MarketParticipant.mRID codingScheme="A01">10XES-REE--------E</sender_MarketParticipant.mRID>
  <sender_MarketParticipant.marketRole.type>A04</sender_MarketParticipant.marketRole.type>
  <receiver_MarketParticipant.mRID codingScheme="A01">SMTA-CODE-1</receiver_MarketParticipant.mRID>
  <receiver_MarketParticipant.marketRole.type>A44</receiver_MarketParticipant.marketRole.type>
  <createdDateTime>2018-06-15T08:11:31Z</createdDateTime>
  <period.timeInterval>
    <start>2018-06-15T22:00Z</start>
    <end>2018-06-22T00:00Z</end>
  </period.timeInterval>
  <domain.mRID codingScheme="A01">10XES-REE--------E</domain.mRID>
  <TimeSeries>
    <!--Reason attribute is optional-->
    <Reason>
      <code>B11</code>
      <text>a</text>
    </Reason>
  </TimeSeries>
</Capacity_MarketDocument>
```

Figure 11 - NTC XML input Capacity_MarketDocument
Find below an example of Timeseries containing NTC information for border ES→FR.

```
<TimeSeries>
  <mRID> A27_ES_2018-06-15T0811 </mRID>
  <businessType> A27 </businessType>
  <product> 8716867000016 </product>
  <in_Domain.mRID codingScheme="A01"> 10YFR-RTE------C </in_Domain.mRID>
  <out_Domain.mRID codingScheme="A01"> 10YES-REE------0 </out_Domain.mRID>
  <measure_Unit.name> MAW </measure_Unit.name>
  <curveType> A01 </curveType>
  <Period>
    <timeInterval>
      <start> 2018-06-15T22:00Z </start>
      <end> 2018-06-22T22:00Z </end>
    </timeInterval>
    <resolution> PT60M </resolution>
    <Point>
      <position> 1 </position>
      <quantity> 1000.0 </quantity>
      <!—Reason attribute is optional—>
      <Reason>
        <code> B37 </code>
        <text> The reason text </text>
      </Reason>
    </Point>
    <Point>
      <position> 2 </position>
      <quantity> 1000.0 </quantity>
    </Point>
    <!—To write more points—>
  </Period>
</TimeSeries>
```

Figure 12 - Timeseries NTC information – example for ES→FR border
5.7 **ShortMediumTermAdequacyResults_MARKETDocument dependency table**

**General Notes:**

- As you are obliged to use only EIC codes to identify parties, zones or assets, you must write in the coding scheme attribute of your XML document code A01 (EIC).
- To avoid sending quantity values with a lot of decimals, please restrict the number of decimals to five as maximum. EG: 0.86578

**Table 15 - ShortMediumTermAdequacyResults_MARKETDocument dependency table**

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Values</th>
<th>Description</th>
<th>XSD Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>mRID</td>
<td>Unique ID (Max 35 characters)</td>
<td>Identification of the document.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>revisionNumber</td>
<td>Consecutive number. Pattern ([1-9][0-9])(0,2)</td>
<td>Version of the document.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>type</td>
<td>B19: Reporting information market document</td>
<td>The document type describes the principal characteristic of the document.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>process.processType</td>
<td>A31: Week ahead</td>
<td>Indicates the nature of process that the document addresses.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>sender_MarketParticipant.mRID</td>
<td>EIC-V code of the STA IT System</td>
<td>The identification of the sender.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>sender_MarketParticipant.marketRole.type</td>
<td>A44: RSC</td>
<td>The role of the sender.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>receiver_MarketParticipant.mRID</td>
<td>EIC-X code of the TSO</td>
<td>The identification of the receiver.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>receiver_MarketParticipant.marketRole.type</td>
<td>A04: System Operator</td>
<td>The role of the receiver.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>createdDateTime</td>
<td>E.G: 2018-03-23T12:04:39Z</td>
<td>UTC Time.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>Attribute</td>
<td>Values</td>
<td>Description</td>
<td>XSD Requirements</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>time_Period.TimeInterval</td>
<td>E.G: <code>&lt;start&gt;2018-03-16T00:00Z&lt;/start&gt;</code> <code>&lt;end&gt;2018-03-17T00:00Z&lt;/end&gt;</code></td>
<td>STA Results target time interval covered by the document.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>Reason.code</td>
<td>May be used.</td>
<td>Indicates if the results document is correct or has errors at the header level.</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>It can be used all codes in the ReasonCodeType Codelist.</td>
<td>Mandatory only if there are errors at the header level.</td>
<td></td>
</tr>
<tr>
<td>Reason.text</td>
<td>May be used</td>
<td>Text explaining possible problem.</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td>Text</td>
<td>Mandatory only if there are errors at the header level.</td>
<td></td>
</tr>
</tbody>
</table>

**Table 16 – TimeSeries Results Document dependency table**

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Values</th>
<th>Description</th>
<th>XSD Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>mRID</td>
<td>Unique ID (Max 35 characters)</td>
<td>Identification of the time series.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>businessType</td>
<td>A01: Production</td>
<td>The exact business nature identifying the principal characteristic of time series.</td>
<td>Mandatory</td>
</tr>
<tr>
<td></td>
<td>A13: Load profile</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A27: Net transfer capacity (NTC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A38: Available generation</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B63: Aggregated netted external schedule</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B64: Netted area AC position</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B65: Netted area position</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B94: Must Run</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B99: Load Shedding</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>C01: Remaining Capacity</td>
<td>The identification of the nature of an energy product such as power, energy, reactive power, etc.</td>
<td>Mandatory</td>
<td></td>
</tr>
<tr>
<td>C02: Indicator of generation capacity adequacy</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C55: Production Curtailment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>product</td>
<td>8716867000016: Active Power</td>
<td></td>
<td></td>
</tr>
<tr>
<td>curveType</td>
<td>A02: Point</td>
<td>The type of curve being defined in the time series.</td>
<td></td>
</tr>
<tr>
<td>measurement_Unit.name</td>
<td>MAW</td>
<td>Name of the unit measurement.</td>
<td></td>
</tr>
<tr>
<td>in_Domain.mRID</td>
<td>EIC-Y Area Code</td>
<td>Import control area or bidding zone ID</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If businessType code is A27 (NTC) or B63 (Aggregated Netted external schedule): Import control area or bidding zone ID.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If businessType code is B64, B65, C01, C02. The export or import situation is defined by filling the attribute with code “10YEU-CONT-SYNC0” inside “in_Domain.mRID” or “outDomain.mRID”</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>For the rest of the businessType codes: ID of the control area or bidding zone. To write the same control area/bidding zone id in both domains (in and out).</td>
<td></td>
</tr>
<tr>
<td>out_Domain.mRID</td>
<td>EIC-Y Area Code</td>
<td>Export control area or bidding zone ID</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If businessType code is A27 (NTC) or B63 (Aggregated Netted external schedule): Export control area or bidding zone ID.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>If businessType code is B64, B65, C01, C02. The export or import situation is defined by filling the attribute with code “10YEU-CONT-SYNC0” inside “in_Domain.mRID” or “outDomain.mRID”</td>
<td></td>
</tr>
</tbody>
</table>
import situation is defined by filling the attribute with code "10YEU-CONT-SYNC0" inside "in_Domain.mRID" or "outDomain.mRID"

For the rest of the businessType codes: ID of the control area or bidding zone. To write the same control area/bidding zone id in both domains (in and out).

<table>
<thead>
<tr>
<th>connectingLine_RegisteredResource.mRID</th>
<th>EIC-T Code</th>
<th>ID of the connecting line.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Mandatory only for Business Type Code:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• B63: Aggregated netted external schedule</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>mktPSRType.psrType</th>
<th>B01: Biomass</th>
<th>Used as asset type: The identification of the type of asset.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B02: Fossil Brown coal/Lignite</td>
<td>Mandatory only for Business Type Code:</td>
</tr>
<tr>
<td></td>
<td>B03: Fossil Coal-derived gas</td>
<td>• A01: Production</td>
</tr>
<tr>
<td></td>
<td>B04: Fossil Gas</td>
<td>• B94: Must Run</td>
</tr>
<tr>
<td></td>
<td>B05: Fossil Hard coal</td>
<td>• C55: Production Curtailment</td>
</tr>
<tr>
<td></td>
<td>B06: Fossil Oil</td>
<td></td>
</tr>
<tr>
<td>Reason code</td>
<td>May be used. It can be used all codes in the ReasonCodeType Codelist.</td>
<td>Indicates if the results document is correct or has errors at the timeseries level. <strong>Mandatory only if there are errors at the timeseries level.</strong></td>
</tr>
<tr>
<td>-------------</td>
<td>-------------------------------------------------</td>
<td>---------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Reason text</td>
<td>May be used Text</td>
<td>Text explaining possible problem. <strong>Mandatory only if there are errors at the timeseries level.</strong></td>
</tr>
</tbody>
</table>
### Table 17 – Series_Period Results Document dependency table

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Values</th>
<th>Description</th>
<th>XSD Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>timInterval</td>
<td>E.G: &lt;start&gt;2018-03-16T00:00Z&lt;/start&gt;</td>
<td>Time interval covered by elements of Point class.</td>
<td>Mandatory</td>
</tr>
<tr>
<td></td>
<td>&lt;end&gt;2018-03-16T00:30Z&lt;/end&gt;</td>
<td>It must be included within header Time_Period.timInterval.</td>
<td></td>
</tr>
<tr>
<td>resolution</td>
<td>PT60M</td>
<td>Resolution used in the Point class.</td>
<td>Mandatory</td>
</tr>
</tbody>
</table>

### Table 18 - Point Results Document dependency table

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Values</th>
<th>Description</th>
<th>XSD Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>position</td>
<td>Integer value &gt; 0</td>
<td>A sequential value representing the relative position within a given time interval.</td>
<td>Mandatory</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The position must begin with 1 and increment by 1 for each subsequent position forming a series of contiguous numbers covering the complete range of the period.</td>
<td></td>
</tr>
<tr>
<td>quantity</td>
<td>Decimal value (Float)</td>
<td>The principal quantity identified for a point.</td>
<td>Mandatory</td>
</tr>
<tr>
<td>posFR_Quantity.quantity</td>
<td>Not used</td>
<td>Positive feasibility range.</td>
<td>Optional</td>
</tr>
<tr>
<td>negFR_Quantity.quantity</td>
<td>Not used</td>
<td>Negative feasibility range.</td>
<td>Optional</td>
</tr>
<tr>
<td>Reason.code</td>
<td>May be used. It can be used all codes in the ReasonCodeType Codelist.</td>
<td>Indicates if the results document is correct or has errors at the timeseries level.</td>
<td>Optional</td>
</tr>
<tr>
<td>Reason.text</td>
<td>May be used Text</td>
<td>Text explaining possible problem.</td>
<td>Optional</td>
</tr>
<tr>
<td></td>
<td><strong>Mandatory only if there are errors at the point level.</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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5.8 Output data from STA software platform

ShortMediumTermAdequacyResults_MarketDocument is a document to provide results of STA calculation to TSOs and RSCs. The next table describes the expected results from STA calculation contained in the output file.

<table>
<thead>
<tr>
<th>Label</th>
<th>BusinessType Code</th>
<th>Business Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>A01</td>
<td>Expected results for A01 are generation per energy type started in each area minimizing the objective function described in Business Process Document.</td>
</tr>
<tr>
<td>Load profile</td>
<td>A13</td>
<td>The load profile of given area.</td>
</tr>
<tr>
<td>Generation profile</td>
<td>A38</td>
<td>The input RAC provided by TSOs</td>
</tr>
<tr>
<td>Net Transfer Capacity (NTC)</td>
<td>A27</td>
<td>The selected NTC of each border used for STA calculation according to the selection rules defined in Business Process Document.</td>
</tr>
<tr>
<td>Aggregated netted external schedule</td>
<td>B63</td>
<td>Exchange on borders found after STA calculation.</td>
</tr>
<tr>
<td>Netted area AC position</td>
<td>B64</td>
<td>The AC net position for a given area (without DC flows). This data is similar to Vulcanus program. Convention for Export or Import sign is given in B64 example here after.</td>
</tr>
<tr>
<td>Netted area position</td>
<td>B65</td>
<td>The AC and DC netted position for a given area. This code takes in account flows on DC lines. Convention for Export or Import sign is given in B64 example here after.</td>
</tr>
<tr>
<td>Must run generation</td>
<td>B94</td>
<td>The amount of output of the generators which, for various reasons, must be connected to the transmission/distribution grid.</td>
</tr>
<tr>
<td>Load shedding</td>
<td>B99</td>
<td>Load shedding in a given area if there is adequacy absence after calculation. The amount of load shedding calculated shows directly the level of absence of adequacy.</td>
</tr>
<tr>
<td>Remaining Capacity</td>
<td>C01</td>
<td>RAC minus load for a given area. This is the TSO input to STA. Convention for Export or Import sign is given in B64 example here after.</td>
</tr>
<tr>
<td>Indicator of generation capacity adequacy</td>
<td>C02</td>
<td>This is the final Remaining Capacity after STA</td>
</tr>
<tr>
<td>Calculation</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>It is calculated as initial Remaining Capacity + Imports - Exports. Convention for Export or Import sign is given in B64 example here after.</td>
<td></td>
</tr>
<tr>
<td>Production curtailment</td>
<td>C55</td>
<td></td>
</tr>
<tr>
<td></td>
<td>This is the amount of production curtailment of each generation type for particular bidding zone.</td>
<td></td>
</tr>
</tbody>
</table>
5.8.1 XML output results examples – ShortMediumTermAdequacyResults_MarketDocument

You can find the assembly model of SMTA results document in chapter Error! Reference source not found.

- **ShortMediumTermAdequacyResults_MarketDocument**
  - **mRID**: ID_String is a unique ID of maximum 35 characters. This is the results document mRID. A proposed pattern of the STA project for the mRID at that document level:
    
    STA_YYYY-MM-DD_YYYY-MM-DDTHHMM

    TSO platform will not refuse a document if the pattern is not respected. CIM EG recommends using non-significant mRIDs generated by the IT Systems.

- **Sender_MarketParticipant.mRID**: PartyID_String is the EIC-V code of STA platform. This code is not available yet.

- **Timeseries**
  - **mRID**: ID_String is a unique ID of maximum 35 characters. A proposed pattern of the STA project for the mRID at the timeseries level:
    
    BBB_PPP_XXX_YYYY-MM-DDTHHMM

    BBB is the business type code of related Timeseries. PPP is the PSRtype code related of Timeseries. XXX is the TSO iso code for Timeseries with business types A01, A13, A38, B64, B65, B99, C01 and C02. For other Timeseries, XXXXXX is maximum length of 6 characters. For business types A27 and B63, that is the merge iso codes of TSOs corresponding border (e.g. XXXX=BENL). YYYYY-MM-DDTHHMM is the created date time of document.

    This convention is used with Timeseries with business types A01. When Timeseries describe business codes A13, B64, B65, B99, C01 and C02, there is no PSRtype. Thus, the convention becomes:

    BBB_XXX_YYYY-MM-DDTHHMM

    TSO platform will not refuse a document if the pattern is not respected. CIM EG recommends using non-significant mRIDs generated by the IT Systems.

<table>
<thead>
<tr>
<th>Convention Timeseries</th>
<th>Generation output example</th>
<th>Other outputs example</th>
</tr>
</thead>
</table>
2) B63_BENL_2018-06-15T0905 |
<table>
<thead>
<tr>
<th>Used for</th>
<th>Only for business type code A01</th>
<th>1) Only for business type codes A13, B64, B65, B99, C01 and C02. 2) Only for business type codes A27 and B63</th>
</tr>
</thead>
</table>

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### 5.8.2 XML output document ShortMediumTermAdequacyResults_MarketDocument

Find below an example of ShortMediumTermAdequacyResults_MarketDocument XML document.

```xml
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE ShortMediumTermAdequacyResults_MarketDocument SYSTEM "smtaresultsdocument:1:0.iec62325-451-n-smartresults_v_1_0.xsd">

<ShortMediumTermAdequacyResults_MarketDocument>
  <mRID>SMTA_2018-06-16_2018-06-15T0905</mRID>
  <revisionNumber>1</revisionNumber>
  <businessType>B65</businessType>
  <sender_MarketParticipant.mRID codingScheme="A01">EIC-V tool code</sender_MarketParticipant.mRID>
  <receiver_MarketParticipant.mRID codingScheme="A01">10YES-REE------E</receiver_MarketParticipant.mRID>
  <createdDateTime>2018-06-15T09:05:47Z</createdDateTime>
  <time_Period.timeInterval start="2018-06-15T22:00Z" end="2018-06-22T22:00Z">
    <timeSeries>
      <!--Example of Timeseries for sending results data are given below -->
      <!--More Timeseries-->  
    </timeSeries>
  </time_Period.timeInterval>
</ShortMediumTermAdequacyResults_MarketDocument>
```

#### Figure 13 - Result XML document ShortMediumTermAdequacyResults_MarketDocument

### 5.8.3 XML output Timeseries B64, B65, C01, C02 example

Attached to the ShortMediumTermAdequacyResults_MarketDocument class, find an example of the Timeseries class below with business type B65 to describe netted area position in Spain. Every Timeseries will describe a different business result.

```xml
<TimeSeries>
  <mRID>B65_ES_2018-06-15T0905</mRID>
  <businessType>B65</businessType>
  <product>871667000016</product>
  <curveType>A02</curveType>
  <measurement_Unit.name>MAW</measurement_Unit.name>
  <in_Domain.mRID codingScheme="A01">10YES-REE------E</in_Domain.mRID>
  <out_Domain.mRID codingScheme="A01">10YES-REE------E</out_Domain.mRID>
  <Period>
    <TimeInterval start="2018-06-15T22:00Z" end="2018-06-22T22:00Z">
      <Point>
        <position>1</position>
        <quantity>1350.0</quantity>
      </Point>
      <Point>
        <position>2</position>
        <quantity>1350.0</quantity>
      </Point>
    </TimeInterval>
  </Period>
</TimeSeries>
```

#### Figure 14 - Timeseries of BusinessType B65 netted area position
Quantity is always a positive number. The export or import situation is defined by filling the tag “10YEU-CONT-SYNC0” inside “in_Domain.mRID” or “outDomain.mRID”. The other domain tag must be filled by the TSO EIC code related to the value. The table below shows how export or import are described.
This rule is used for business types B64, B65, C01 and C02.

5.8.4 XML output Timeseries B63 example

Attached to the ShortMediumTermAdequacyResults_MarketDocument class, find an example of the Timeseries class below with business type B63 to describe aggregated netted external schedule. We can distinguish 4 different border situations:

- AC border
- DC border between synchronous areas
- Mix AC and DC border
- DC border in same synchronous area

Each situation will be presented hereafter.

This example below describes a Timeseries involving business type B63 netted external schedule on AC border. The Timeseries is given for an exchange on border BE towards NL.

```
<TimeSeries>
    <mRID>B63_BENL_2018-06-15T0905</mRID>
    <businessType>B63</businessType>
    ... 
    <quantity>1350.0</quantity> 
  </Point>
...</Period>
</TimeSeries>
```

Figure 15 - Timeseries with BusinessType B63 on AC border connection

The second Timeseries example with situation on DC border between synchronous areas is given below. This example shows the situation on NorNed DC cable between NL and NO, considering the direction NL towards NO. One particularity on borders with DC cable between synchronous area is the use of a middle point which is the border. Because of that, two Timeseries are necessary to describe the exchange. The next figure describes this element.
Flow direction NLNO

Figure 16 - HVDC cable between synchronous areas

Figure 17 - Timeseries with BusinessType B63 on DC border between synchronous areas
The third case to describe is the mixed AC and DC border, for instance border between Italy and France in the future. For such border, we need 3 Timeseries to describe the exchange:

- 1 Timeseries to describe the AC exchange
- 2 Timeseries to describe the DC exchange

It is a combination of Timeseries of the 2 previous cases.

The fourth example is the DC border in same synchronous area, for instance Italy – Greece. If the DC cable is considered in AC-mode, it is considered as AC border (Timeseries as first case).

### 5.8.5 XML output Timeseries A27 NTC example

BusinessType A27 is used to share NTC selected by STA tool according to the Business Process document. For each border in each direction, a specific Timeseries will share the selected NTC. Here is an example on border BE→NL.

```
<TimeSeries>
  <mRID>A27_BENL_2018-06-15T0905</mRID>
  <businessType>A27</businessType>
  <product>8716670000016</product>
  <curveType>A02</curveType>
  <measurement_Unit.name>MAW</measurement_Unit.name>
  <in_Domain.mRID codingScheme="A01">10YNL--------</in_Domain.mRID>
  <out_Domain.mRID codingScheme="A01">10YBE--------2</out_Domain.mRID>
  <Period>
    <timeInterval>
      <start>2018-06-15T22:00Z</start>
      <end>2018-06-15T22:00Z</end>
    </timeInterval>
    <resolution>PT60M</resolution>
    <Point>
      <position>1</position>
      <quantity>2000.0</quantity>
    </Point>
    <Point>
      <position>2</position>
      <quantity>2000.0</quantity>
    </Point>
  </Period>
</TimeSeries>
```

**Figure 18 - Timeseries with BusinessType A27 on border BE→NL**
5.8.6 XML output Timeseries A01 generation started example

This Timeseries A01 provides the generation per energy type started in each area after STA calculation. The code EiC-Y of TSOs is given in both attributes out_Domain.mRID and in_Domain.mRID. The decimal value can be positive (generating mode) or negative for B10 (pumping mode). Here below an example with nuclear generation (mktPSRType = B14).

```
<TimeSeries>
  <mRID>A01_ES_2018-06-15T0905</mRID>
  <businessType>A01</businessType>
  ...  
  <Point> 
   <position>2</position>
   <quantity>9780.0</quantity>
  </Point>
  ...  
</TimeSeries>
```

**Figure 19 - Timeseries of BusinessType A01 RAC of TSOs**

5.8.7 XML output Timeseries A38 generation input example

This Timeseries A38 provides the generation input of each TSO per energy type started in each area after STA calculation. The code EiC-Y of TSO is given in both attributes out_Domain.mRID and in_Domain.mRID. The decimal value can be positive (generating mode) or negative for B10 (pumping mode). Here below an example with nuclear generation (mktPSRType = B14).

```
<TimeSeries>
  <mRID>A38_ES_2018-06-15T0905</mRID>
  <businessType>A38</businessType>
  ...  
  <Point> 
   <position>2</position>
   <quantity>9780.0</quantity>
  </Point>
  ...  
</TimeSeries>
```

**Figure 20 - Timeseries of BusinessType A38 generation input of TSOs**
5.8.8 XML output Timeseries A13 Total Load example

Find below an example of Timeseries for sharing the Total load of TSOs. TSO is specified by its EIC-Y code in both attributes out_Domain.mRID and in_Domain.mRID. The decimal value is positive.

```
<TimeSeries>
  <mRID>A13_BE_2018-06-15T0905</mRID>
  <businessType>A13</businessType>
  <product>876867000016</product>
  <curveType>A02</curveType>
  <measurement_Unit.name>MAW</measurement_Unit.name>
  <in_Domain.mRID codingScheme="A01">10YBE--------------2</in_Domain.mRID>
  <out_Domain.mRID codingScheme="A01">10YBE--------------2</out_Domain.mRID>
  <Period>
    <timeInterval>
      <start>2018-06-15T22:00Z</start>
      <end>2018-06-15T22:00Z</end>
    </timeInterval>
    <resolution>PT60M</resolution>
    <Point>
      <position>1</position>
      <quantity>10050.0</quantity>
    </Point>
    <Point>
      <position>2</position>
      <quantity>11050.0</quantity>
    </Point>
    ...
  </Period>
</TimeSeries>
```

Figure 21 - Timeseries with BusinessType A13 Total Load

Find below an example of Timeseries for sharing the Total load of TSOs. TSO is specified by its EIC-Y code in attribute out_Domain.mRID. In attribute in_Domain.mRID, the code 10YEU-CONT-SYNC0 is used. When the tool does not forecast Load Shedding, the Timeseries with BusinessType B99 is not provided in the result document.
5.8.9 XML output Timeseries B99 Load Shedding example

Find below an example of Timeseries for sharing the Total load of TSOs. The code EIC-Y of TSOs is given in both attributes `out_Domain.mRID` and `in_Domain.mRID`. When the tool does not forecast Load Shedding, the Timeseries with BusinessType B99 is not provided in the result document. The load shedding quantity value can only be positive.

```xml
<TimeSeries> 
  <mRID>B99_BE_2018-06-15T0905</mRID> 
  <businessType>B99</businessType> 
  <product>8716867000016</product> 
  <curveType>A02</curveType> 
  <measurement_Unit.name>MAW</measurement_Unit.name> 
  <in_Domain.mRID codingScheme="A01">10YBE-------2</in_Domain.mRID> 
  <out_Domain.mRID codingScheme="A01">10YBE-------2</out_Domain.mRID> 
  <Period> 
    <timeInterval> 
      <start>2018-06-15T22:00Z</start> 
      <end>2018-06-22T22:00Z</end> 
    </timeInterval> 
    <resolution>PT60M</resolution> 
    <Point> 
      <position>1</position> 
      <quantity>1050.0</quantity> 
    </Point> 
    <Point> 
      <position>2</position> 
      <quantity>1243.0</quantity> 
    </Point> 
  </Period> 
</TimeSeries>
```

Figure 22 - Timeseries with BusinessType B99 Load Shedding
### 5.8.10 XML output Timeseries B94 Must Run example

Find below an example of Timeseries for sharing must run generation. This example is valid for both input and output must run. The code EIC-Y of TSOs is given in both attributes out_Domain.mRID and in_Domain.mRID. When the tool does not forecast must run, the Timeseries with BusinessType B94 is not provided in the result document. Together with the Must Run business type, the asset type shall be defined in psrType attribute. In the example below the must run type is B14 which is Nuclear. The must run production quantity value can only be positive.

```xml
<TimeSeries>
  <mRID>B94_BE_2018-06-15T0905</mRID>
  <businessType>B94</businessType>
  <product>8716867800016</product>
  <curveType>A02</curveType>
  <measurement_Unit.name>MAW</measurement_Unit.name>
  <in_Domain.mRID codingScheme="A01">10YBE--------2</in_Domain.mRID>
  <out_Domain.mRID codingScheme="A01">10YBE--------2</out_Domain.mRID>
  <mktPSRType.psrType>B14</mktPSRType.psrType>
  <Period>
    <timeInterval>
      <start>2018-06-15T22:00Z</start>
      <end>2018-06-15T22:00Z</end>
    </timeInterval>
    <resolution>PT60M</resolution>
    <Point>
      <position>1</position>
      <quantity>100.0</quantity>
    </Point>
    <Point>
      <position>2</position>
      <quantity>90.0</quantity>
    </Point>
  </Period>
</TimeSeries>
```

**Figure 23 - Timeseries with BusinessType B94 Must Run**
5.8.11 XML output Timeseries C55 production curtailment example

This Timeseries C55 provides the production curtailment of each TSO in each area after STA calculation. The code EIC-Y of TSO is given in both attributes out_Domain.mRID and in_Domain.mRID. The production curtailment quantity value shall be available for each generation type (not summed values) and they can only be positive.

```
<TimeSeries>
  <mRID>C55_ES_2018-06-15T0905</mRID>
  <businessType>C55</businessType>
  <product>8716867000016</product>
  <curveType>A02</curveType>
  <measurement_Unit.name>MAW</measurement_Unit.name>
  <in_Domain.mRID codingScheme="A01">10YES-REE------0</in_Domain.mRID>
  <out_Domain.mRID codingScheme="A01">10YES-REE------0</out_Domain.mRID>
  <mktPSRType.psrType>B04</mktPSRType.psrType>
  <Period>
    <start>2018-06-15T22:00Z</start>
    <end>2018-06-22T22:00Z</end>
    <resolution>PT60M</resolution>
    <Point>
      <position>1</position>
      <quantity>150.0</quantity>
    </Point>
    <Point>
      <position>2</position>
      <quantity>140.0</quantity>
    </Point>
    ...
  </Period>
</TimeSeries>
```

Figure 24 - Timeseries of BusinessType A38 generation input of TSOs
Advices for Acknowledgement document

Acknowledgement document is an IEC standard and its ownership has passed to IEC, so ENTSO-E cannot publish the Implementation Guide for Acknowledgement document. In case you want to get it, you must purchase it at IEC website. The version of Acknowledgement standard to be used in STA project is IEC 62325-451-1:2017.

Acknowledgement XSD (iec62325-451-1-acknowledgement_v8_0.xsd) is available on EDI Library for free.

The acknowledgement business process is generic and can be used in all electricity market business processes at two levels:
- Technical level: To detect syntax errors (XML parsing errors, etc.)
- Application level: To detect semantic errors (invalid data, wrong process, etc.).

The acknowledgement document shall contain both technical and application quality checks of TSOs input files. Technical test corresponds to the test on document structure to check whether inputs correspond to XSD document. Application checks correspond to the business rules to check whether they are respected or not.

The next figure provides the sequence diagram of the STA acknowledgement process.

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**Figure 25 - Acknowledgement process**

One can specify various errors (reasons per timeseries). In the reason attributes one can introduce the reason code that one can find in the ENTSO-E Codelist. In the reasonText attribute, one can be more specific and write a message describing the error.

The application checks shall be designed by the software vendor. Business requirements for application test shall be designed together with vendor in cooperation with TF&PG evaluation group.
File naming convention

Please notice that based on the STA cross regional tool functional requirement document, the use of ECCoSP platform (ECP+EDx) is required to exchange data, please consult the file naming convention for File System Shared Folder in chapter (7.1) of the ECP Public interface document v4.6.0
Annex

8.1 Annex 1 – Country ISO code list
You can find the list of ISO codes (ISO 3166-1) in the following link.

8.2 Annex 2 – EIC-code list
You can find the list of EIC codes in the following link.

8.3 Annex 3 – ENTSO-E code list
You can find the ENTSO-E code list in the following link.