



European Network of  
Transmission System Operators  
for Electricity

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**SHORT TERM ADEQUACY  
FORECASTS  
(STA)  
IMPLEMENTATION GUIDE**

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2021-04-21

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APPROVED DOCUMENT  
VERSION 2.2

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23 absolute prohibition of the specification.
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25 reasons in particular circumstances to ignore a particular item, but the full implications must  
26 be understood and carefully weighed before choosing a different course.
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28 exist valid reasons in particular circumstances when the particular behaviour is acceptable  
29 or even useful, but the full implications should be understood and the case carefully weighed  
30 before implementing any behaviour described with this label.
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## Revision History

Version	Release	Date	Paragraph	Comments
1	0	2018-06-04		Approved by MC
2	0	2019-04-03		<p>Inclusion of inputs from STA project team to give more details</p> <p>Version 2.0 contains the following updates regarding previous published version (1.0)</p> <ul style="list-style-type: none"> <li>• More detailed explanations regarding the different documents to be used and examples of use.</li> <li>• New use case and sequence diagrams for allowing NTC data submissions</li> <li>• Addition of the Capacity Market Document to exchange the NTCs.</li> <li>• New dependency tables for the different documents used in this IG.</li> <li>• Small typos were amended.</li> </ul> <p>Approved by SOC</p>
2	1	2020-02-12		<p>File naming convention chapter was updated to align it with the ECP Public interface document.</p> <p>Approved by SOC</p>
2	2	2021-04-21		<p>Must run businessType code (B94) and Production curtailment codes were included in the STA results dependency table.</p> <p>A 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.</p> <p>New resolutions for businessType code Available Energy are also introduced. In case of weekly availabilities, resolution P7D should be used. For daily availabilities, resolution P1D should be used instead</p> <p>Gigawatt hour (GWH) unit of measure code is used together with the new Available Energy businessType code.</p> <p>Approved by SOC.</p>

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141 **Scope**

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

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

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

149

150 **References**

151 **2.1 Normative references**

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

- 156 • [IEC 62325-351:2016, Framework for energy market communications – Part 351: CIM](#)  
157 [European market model exchange profile](#)

- 158 • [IEC 62325-450:2013, Framework for energy market communications – Part 450: Profile](#)  
159 [and context modelling rules](#)
- 160 • [IEC 62325-451-1:2017, Framework for energy market communications – Part 451-1:](#)  
161 [Acknowledgement business process and contextual model for CIM European market](#)
- 162 • [IEC 62325-451-3:2014+AMD1:2017 CSV Consolidated version, Framework for energy](#)  
163 [market communications - Part 451-3: Transmission capacity allocation business](#)  
164 [process \(explicit or implicit auction\) and contextual models for European market](#)
- 165 2.2 **Other references**
- 166 • [Article 81 of the Guideline on electricity transmission system operation \(SO GL\).](#)
- 167 • Coordinated Week Ahead Adequacy Assessment STA Methodology v1.5
- 168 • BP Coordinated Week Ahead Adequacy Assessment v2.4
- 169 • STA - Cross Regional Adequacy Tool - Functional Specification v2.0  
170
- 171 • [ECP public interface documentation](#)
- 172
- 173 • Short Medium Term Adequacy Prognosis document UML model and schema.  
174
- 175 • Short Medium Term Adequacy Results document UML model and schema.  
176  
177

## 178 Terms and definitions

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

183  
184 **Biomass:** Biomass electrical power in [MW] at the reference point.

185  
186 **Coal-derived gas:** Coal-derived gas electrical power in [MW] at the reference point.

187  
188 **Dispatchable hydro:** A resource referring to dispatchable hydro generation. Hydro pump  
189 storage and Hydro Water Reservoir are considered as Dispatchable Hydro.

190  
191 **Force Outage Rate:** A measure of the probability that a generating unit will not be available  
192 due to forced outages or forced deratings.

193 **Fossil Brown coal/lignite:** Fossil Brown coal/lignite electrical power in [MW] at the reference  
194 point.

195  
196 **Fossil oil shale:** Fossil oil shale electrical power in [MW] at the reference point.

197  
198 **Fossil peat:** Fossil peat electrical power in [MW] at the reference point.

199  
200 **Gas:** Gas electrical power in [MW] at the reference point

201  
202 **Generation in Forced outages:** Aggregates forced – i.e. not scheduled - unavailability of  
203 generating capacity.

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

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

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

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

217  
218 **Hard coal:** Hard coal electrical power in [MW] at the reference point.

219  
220 **Hydro Pump storage:** Pump-Storage is a hydro unit in which water can be raised by means of  
221 pumps and stored to be used later for the generation of electrical energy in [MW] at the  
222 reference point.

223  
224 **Hydro Run of the river and poundage:** Hydro Run of the river and poundage electrical power  
225 in [MW] at the reference point.

226  
227 **Hydro Water reservoir:** Hydro Water reservoir electrical power in [MW] at the reference point.



228  
229 **Load reduction:** Load Reduction is a voluntary reduction in demand performed by a consumer  
230 or a group of consumers in order to help the Balancing of the system. Load Reduction can be  
231 remunerated.  
232  
233 **Load:** Total Load, including losses without power used for energy storage, means a load equal  
234 to generation on transmission and distribution grids.  
235  
236 **Marine:** Marine (wave, tidal and sea current) electrical power in [MW] at the reference point.  
237  
  
238 **Must Run:** The amount of output of the generators which, for various reasons, must be  
239 connected to the transmission/distribution grid. Such reasons may include: network constraints  
240 (overload management, voltage control), specific policies, minimum number of units needed to  
241 provide system services, system inertia, subsidies, environmental causes etc  
  
242 **Net Generating Capacity (NGC):** Net generating capacity is the maximum electrical net active  
243 power a power plant can feed-in continuously without exceeding the designed thermal limits.  
  
244 **Non-Usable Capacity:** Aggregates reductions of the net generating capacities due to the  
245 following causes:  
246 - Temporary limitation due to constraints, like power stations in mothball or test  
247 operation, heat extraction for CHP's  
248 - Limitation due to fuel constraints management  
249 - Limitation reflecting the average availability of the primary energy source (e.g.  
250 reservoir level for pump storage hydro units)  
251 - Power stations with output power limitation due to environmental and ambient  
252 constraints  
253 - Non-available part of the wind and solar total installed capacity due to variable  
254 weather conditions.  
255  
256 **Nuclear:** Nuclear electrical power in [MW] at the reference point.  
257  
258 **Offshore Wind:** Offshore wind electrical power in [MW] at the reference point.  
259  
260 **Oil:** Oil electrical power in [MW] at the reference point.  
261  
262 **Onshore Wind:** Onshore wind electrical power in [MW] at the reference point  
263  
264 **Others Renewable:** Others RES are energies from renewable non-fossil sources, namely  
265 aerothermal, geothermal, hydrothermal, tidal, ocean energy, hydropower, run of river, biomass,  
266 landfill gas, waste, sewage treatment plant gas and biogases in [MW] at the reference point.  
267  
268 **Others:** Others are energies from fossil sources not accounted for gas, nuclear and coal, such  
269 as oil, oil shades, and mixed fuels in [MW] at the reference point.  
270  
271 **PEMMDB:** Pan European Market Modelling Data Base.  
272  
273 **PV Solar:** PV Solar electrical power in [MW] at the reference point  
274  
275 **PXX Load Forecast:** The XXth percentile of load is the value in [MW] below which XX% of the  
276 observations may be found at the reference point.  
277  
278 **PXX Solar Forecast:** The XXth percentile of PV Solar is the value in [MW] below which XX%  
279 of the observations may be found at the reference point.  
280

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

283  
284 **PXX Wind Onshore forecast:** The XXth percentile of Wind Onshore is the value in [MW] below  
285 which XX% of the observations may be found at the reference point.

286  
287 **Reference point:** The dates and times for which power data are collected. Reference points  
288 are characteristic enough of the entire period studied to limit the data to be collected to the data  
289 at the reference points. Reference point refers to hourly values. An hourly value is a forecast  
290 data foreseen at XX:30 (XX is the hour)

291  
292 **Reliable Available Capacity (RAC):** The RAC on a power system is the difference between  
293 the Net Generating capacity (NGC) and the Unavailable Capacity. The RAC is the part of the  
294 NGC that is currently available to cover the load at a reference point.

295 **Reliable available capacity (RAC) formula:**  $RAC = \text{Net Generating Capacity} -$   
296  $\text{Unavailable capacity}$

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

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

302 **Remaining capacity (RC) formula:**  $RC = \text{Reliably Available Capacity} - \text{Load}$

303  
304 A positive RC means that a TSO has more available generation than its load. In the opposite,  
305 a negative RC means its load isn't covered by its reliably available generation. If RC is null,  
306 then load and available generation are equal. This item is a pragmatic indicator to define TSOs  
307 which need energy to cover their load or are able to export surplus of energy to help others  
308 TSOs to feed their load.

309  
310 **TP:** Transparency Platform. This platform provides free, continuous access to pan-European  
311 electricity market data for all users.

312  
313 **Unavailable Capacity:** This is the part of the NGC which is not reliably available to power plant  
314 operators due to limitations on the output power of power plants. It consists of the Non-Usable  
315 Capacity, power plants in scheduled Maintenance and Overhauls or in forced Outages or  
316 reserved for System Services.

317  
318 **Waste:** Waste electrical power in [MW] at the reference point

319  
320 **Week Ahead Load forecast:** This represents the load forecast value as predicted by a  
321 Transmission System Operator for its control area at W-1. The W-1 load forecast represents  
322 hourly average values of the load figures for the entire week.

323  
324 **Week Ahead Load reduction forecast:** This represents the load reduction forecast value as  
325 predicted by a Transmission System Operator for its control area at W-1. The W-1 load forecast  
326 represents hourly average values of the load figures for the entire week.

327  
328 **Week Ahead PXX Load Forecast:** This represents the PXX load forecast value as predicted  
329 by a system Operator for its control area at W-1. The W-1 system PXX load forecast represents  
330 hourly average values of the XXth percentile of load figures for the entire week.

331  
332 **Week Ahead PXX PV Solar Forecast:** This represents the PXX PV Solar forecast value as  
333 predicted by a system Operator for its control area at W-1. The W-1 system PXX PV Solar  
334 forecast represents hourly average values of the 5th percentile of PV Solar figures for the entire  
335 week.

336

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

341  
342 **Week Ahead PXX Wind Onshore Forecast:** This represents the PXX wind onshore forecast  
343 value as predicted by a system Operator for its control area at W-1. The W-1 system PXX wind  
344 onshore forecast represents hourly average values of the XXth percentile of wind onshore  
345 figures for the entire week W.

346  
347 **Week Ahead Remaining capacity:** This represents Remaining Capacity applied to week-  
348 ahead operational period.

349  
350 **Week-ahead (W-1) operational period:** Starts on D-1 to D-7 CET/CEST time

351  
352 **Week-ahead operational granularity:** Week Ahead values are hourly values from the Week Ahead  
353 operational period.

354

355

## 356 The STA Business Process

### 357 4.1 Overview

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

362

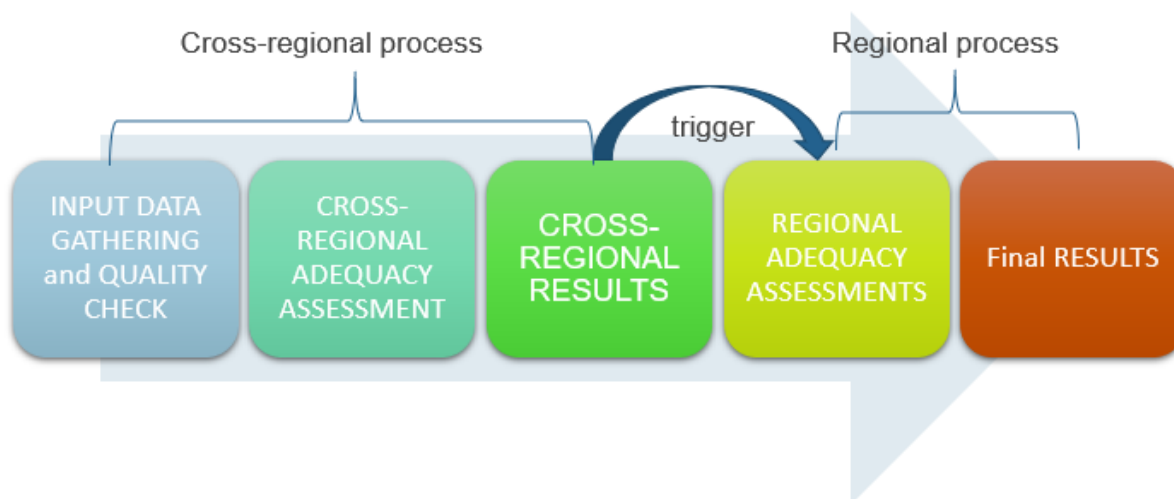
363 Based on these hourly forecasts for next week (from D-1 until D-7), Regional Security Coordinator shall  
364 perform adequacy assessments for at least the week-ahead timeframe with the aim of detecting  
365 situations where a lack of adequacy is expected in any of the control areas or at regional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

367

368 Following this,

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

375



376

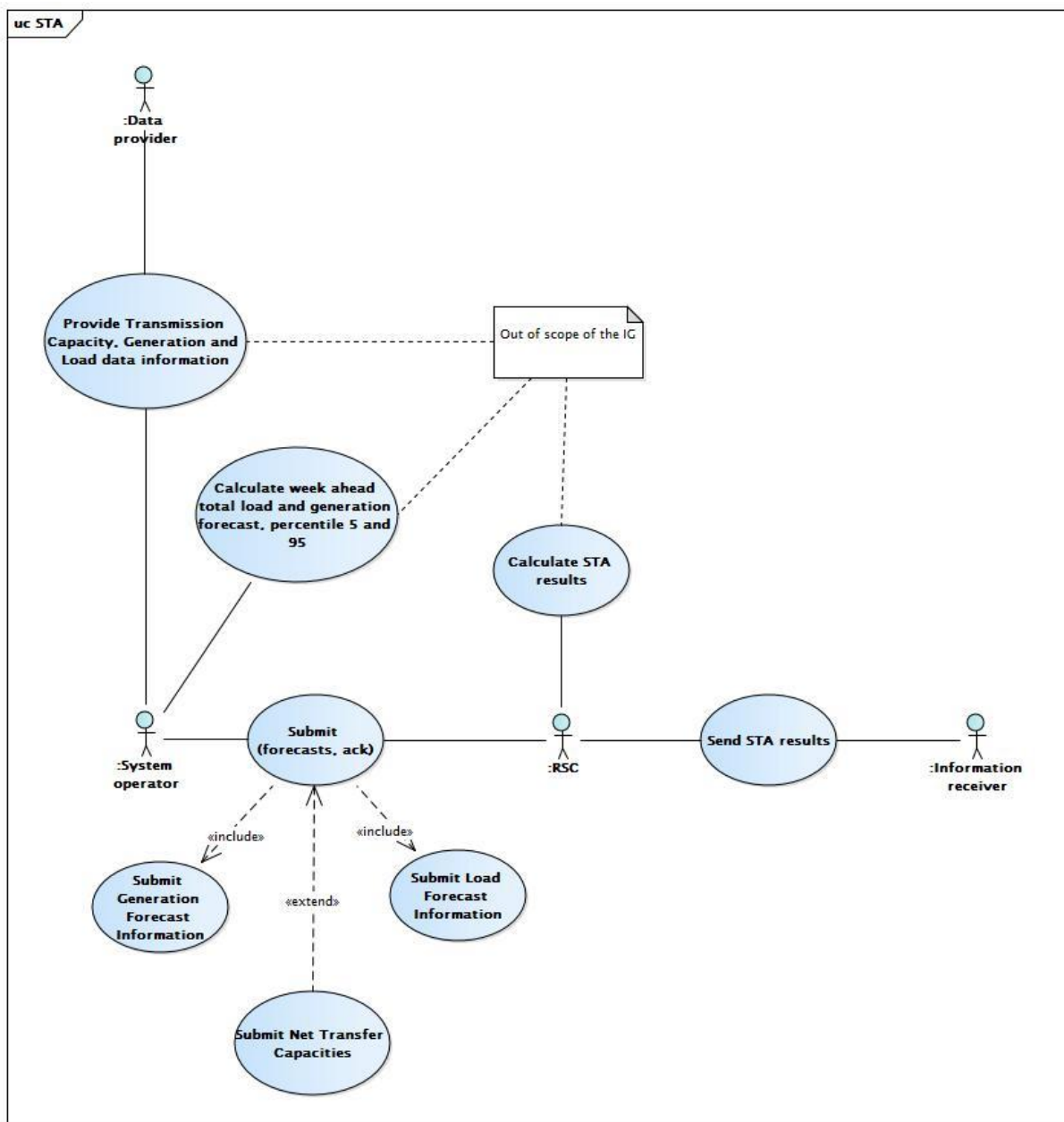
377

378

*High level business process*

379 The current Implementation Guide focuses only on the cross regional process.

380 4.2 Use Case



381

382

383

384

385

Figure 1 - Use Cases

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

Table 1 - Actor labels and descriptions

Actor Label	Actor Description
Data provider	Data provider is responsible for providing transmission capacity, generation and load data information
System operator	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.

RSC	The Regional Security Coordinator calculates STA results (Net positions, adequacy flags, interchange zones...) and send the acknowledgements and STA results
Information Receiver	An Information receiver only receives STA results. Information receivers can be SO or RSC as well.

386  
387  
388  
389

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

**Table 2 – STA Data Exchange**

Use case label	Actors involved	Action descriptions and assertions
Provide Transmission Capacity, Generation and Load data information	Data provider, System operator	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.
Calculate week ahead total load and generation forecast, percentile 5 and 95	System operator	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.
Submit (forecasts, ack)	System operator, RSC	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.
Calculate STA results	RSC	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.

		This use case is out of the scope of the implementation guide.
Send STA Results	RSC, Information Receiver	Once RSC has calculated the results, he sends them to the information receivers

390

391 4.3 Document exchange processes

392 4.3.1 Overview

393 The use cases are supported by the following document exchanges:

- 394 • Submit ShortMediumTermAdequacyPrognosis\_MarketDocument
- 395 • Submit Capacity\_MarketDocument
- 396 • Reply Acknowledgement\_MarketDocument
- 397 • Send ShortMediumTermAdequacyResults\_MarketDocument

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

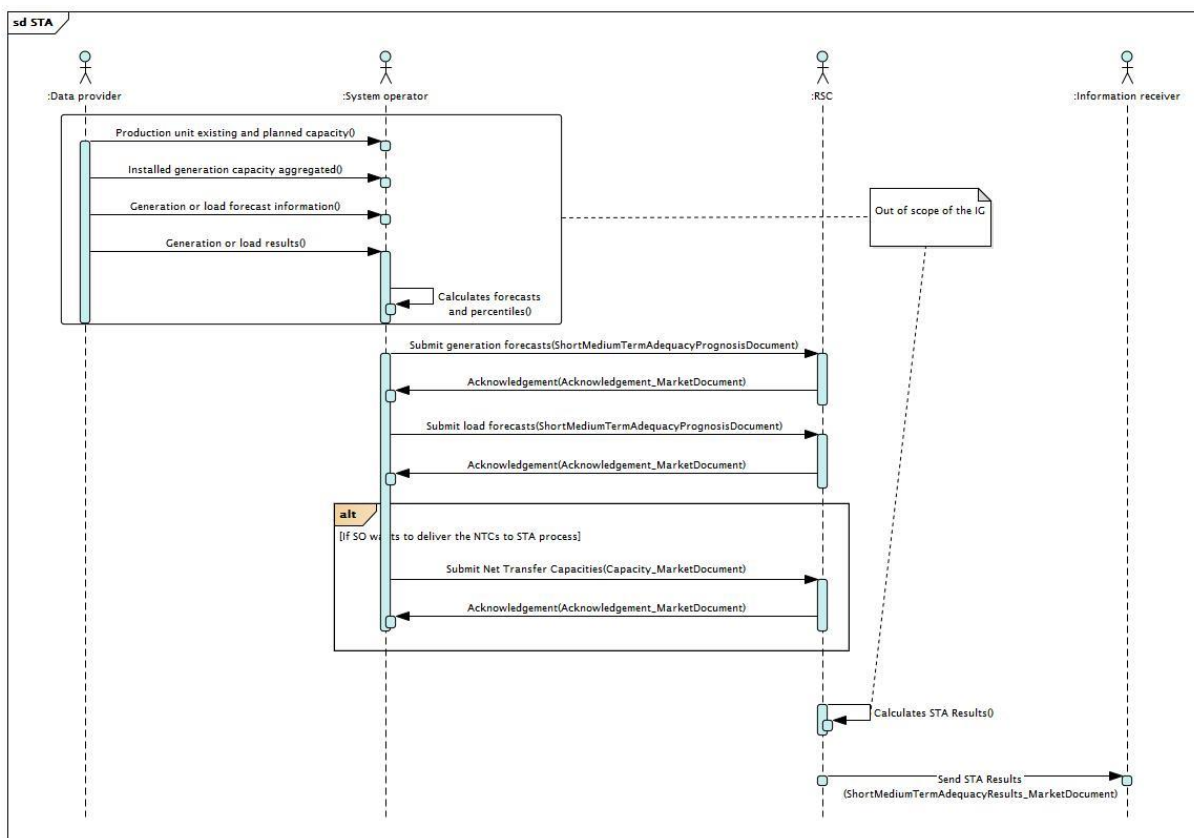


Figure 2 - Sequence diagram for STA

- 399 • The above sequence diagram describes how the system operator submits week ahead
- 400 generation, load forecast and NTCs (Optional submission for TSOs) to enable the RSC
- 401 to calculate the STA results (Net positions, adequacy flags, interchange zones...).
- 402
- 403
- 404
- 405
- 406



407

#### 408 **4.3.2 Submit ShortMediumTermAdequacyPrognosis\_MarketDocument**

- 409 • First, data providers send to the SO all the necessary data to perform the calculation of  
410 the percentiles. As an example, we can quote:
- 411 ○ The Production unit existing and planned capacity
  - 412 ○ The Installed generation capacity aggregated
  - 413 ○ The Generation or load forecast information
- 414 • These data exchanges between the data provider and the SO are out of the scope of  
415 this implementation guide.
- 416 • Once the SO has received these data, the SO calculates total load and generation  
417 forecast percentile 5 and 95 and submits them (In a  
418 ShortMediumTermAdequacyPrognosis\_MarketDocument CIM format) to the RSC.  
419

#### 420 **4.3.3 Submit Capacity\_MarketDocument**

421 In case, SO wants to submit the NTCs, they should send them separately using the capacity  
422 market document.  
423

#### 424 **4.3.4 Reply Acknowledgement**

425 It is a syntax and business acknowledgment: When the RSC receives the forecasts, the RSC  
426 checks that the technical and functional validity of the information and send an acknowledgment  
427 to the SO. The acknowledgement can be positive (A01 fully accepted), partially accepted (A03  
428 Message contains errors at the time series level) or negative (A02 fully rejected).  
429  
430

#### 431 **4.3.5 Send ShortMediumTermAdequacyResults\_MarketDocument**

432 Then RSC calculates Adequacy and send the results to the information receiver.  
433

434 **General rules for document exchange**

435 **5.1 Overview**

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

- 438 • ShortMediumTermAdequacyPrognosis\_MarketDocument (v1.0.xsd)
- 439 • Capacity\_MarketDocument (iec62325-451-3-capacity\_v8\_0.xsd)
- 440 • Acknowledgement\_MarketDocument (iec62325-451-1-acknowledgement\_v8\_0.xsd)
- 441 • ShortMediumTermAdequacyResults\_MarketDocument (v1.0.xsd)

442  
443 These CIM based documents shall be used to carry out the communication tasks

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

448  
449 Next table gives an overview, which document shall be used to carry out the communication  
450 tasks of document exchange processes (DEP). For reducing the size of the table, we are going  
451 to use the following abbreviations:

- 452 • SMTAPD: ShortMediumTermAdequacyPrognosis\_MarketDocument
- 453 • CMD: Capacity\_MarketDocument IEC62325-451-3
- 454 • AMD: Acknowledgement\_MarketDocument IEC62325-451-1
- 455 • SMTARD: ShortMediumTermAdequacyResults\_MarketDocument

456 **Table 3 – Document Exchange**

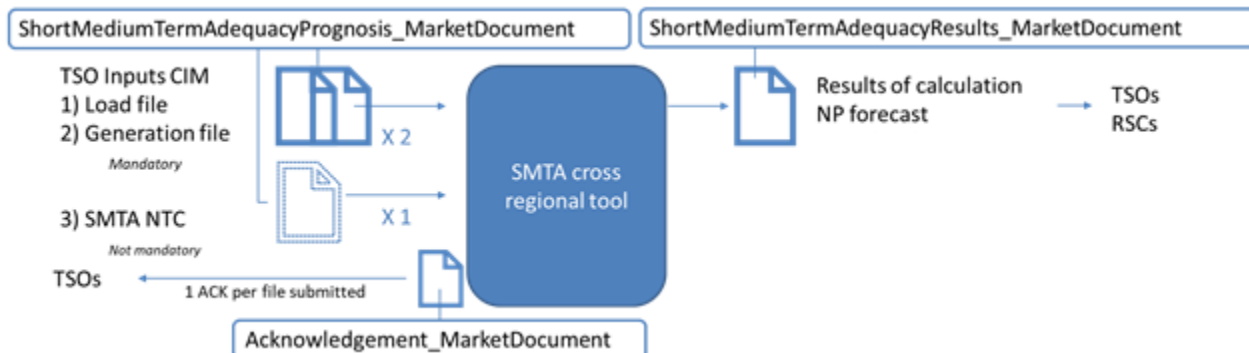
DEP Chapter	DEP label	send/submit document	Reply document	Reply conditions
4.3.2	Submit load and generation forecasts	SMTAPD	AMD	SMTAPD fully accepted.
				SMTAPD partially accepted.
				Fully rejected due to errors in the SMTAPD
4.3.3	If SO submit NTCs	CMD	AMD	CMD fully accepted.
				CMD partially accepted
				Fully rejected due to errors in the CMD
4.3.5	Send STA results	SMTARD	None	

457

458 To have a more complete view of the reply conditions, please check the quality rules wrote by  
459 the business.

460 5.2 Data exchange with STA platform

461 The Implementation Guide describes the data exchange with the STA platform. Inputs are sent  
462 from TSOs to the STA platform. An ACK is sent from STA platform to TSOs. The next figure  
463 describes the data exchange:  
464



465  
466 **Figure 3- Data exchange diagram**  
467

465  
466  
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471  
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473  
474

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 in 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.

475 5.3 **ShortMediumTermAdequacyPrognosis\_MarketDocument dependency table**

476 General Notes:

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

489 **Table 4 - ShortMediumTermAdequacyPrognosisDocument\_MarketDocument**  
490 **dependency table**

ShortMediumTermAdequacyPrognosisDocument_MarketDocument			
Attributes	Values	Description	XSD Requirements
mRID	Unique ID (Max 35 characters)	Identification of the document.	Mandatory
revisionNumber	Consecutive number. Pattern ([1-9]([0-9]){0,2})	Version of the document.	Mandatory
type	B14: Energy prognosis document	The document type describes the principal characteristic of the document.	Mandatory
process.processType	A31: Week ahead	Indicates the nature of process that the document addresses.  Starts on D-1 to D-7 CET/CEST time	Mandatory
sender_MarketParticipant.mRID	EIC-X code of the TSO	The identification of the sender.	Mandatory
sender_MarketParticipant.marketRole.type	A04: System Operator	The role of the sender.	Mandatory

receiver_MarketParticipant.mRID	EIC-V code of the STA IT System	The identification of the receiver.	Mandatory
receiver_MarketParticipant.marketRole.type	A44: RSC	The role of the receiver.	Mandatory
createdDateTime	E.G: 2018-03-23T12:04:39Z	UTC Time.	Mandatory
time_Period.timeInterval	E.G: <start>2018-03-16T00:00Z</start> <end>2018-03-17T00:00Z</end>	STA target time interval covered by the document.	Mandatory

491  
492

**Table 5 – TimeSeries Prognosis Document dependency table**

TimeSeries				
Attributes	Values		Description	XSD Requirements
mRID	Unique ID (Max 35 characters)		Identification of the time series	Mandatory
businessType	<b><u>Generation Forecasts</u></b>	<b><u>Load Forecasts</u></b>	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.	Mandatory
	A38: Available generation A95: Frequency containment reserve A96: Automatic frequency restoration reserve A97: Manual frequency restoration reserve B81: Outage (OUT) B94: Must Run C54: Available Energy	A13: Load Profile		
curveType	A02: Point		The type of curve being defined in the time series	Mandatory

measurement_Unit.name	MAW: megawatt  GWH: gigawatt hour (Only for available energy)	Name of the unit measurement.	Mandatory
domain.mRID	EIC-Y Area Code	ID of the control area or bidding zone.	Mandatory
mktPSRType.psrType	<p><b><u>Generation Forecasts</u></b></p> <p>B01: Biomass</p> <p>B02: Fossil Brown coal/Lignite</p> <p>B03: Fossil Coal-derived gas</p> <p>B04: Fossil Gas</p> <p>B05: Fossil Hard coal</p> <p>B06: Fossil Oil</p> <p>B07: Fossil Oil shale</p> <p>B08: Fossil Peat</p> <p>B09: Geothermal</p> <p>B10: Hydro Pumped Storage</p> <p>B11: Hydro Run-of-river and poundage</p> <p>B12: Hydro Water Reservoir</p> <p>B13: Marine</p> <p>B14: Nuclear</p> <p>B15: Other renewable</p> <p>B16: Solar</p> <p>B17: Waste</p> <p>B18: Wind Offshore</p> <p>B19: Wind Onshore</p> <p>B20: Other</p> <p>B27: Dispatchable hydro resource (Only used with Available Energy businessType code)</p>	<p>Used as asset type: The identification of the type of asset</p> <p><u>Mandatory only for (Generation) Business Type Codes:</u></p> <ul style="list-style-type: none"> <li>• A38: Available generation</li> <li>• A95: Frequency containment reserve</li> <li>• A96: Automatic frequency restoration reserve</li> <li>• A97: Manual frequency restoration reserve</li> <li>• B81: Outage (OUT)</li> <li>• B94: Must Run</li> <li>• C54: Available Energy</li> </ul> <p>If the prognosis document is going</p>	Optional

		<p>to contain Generation forecasts, you'll have to use the asset type codes under Generation Forecasts column.</p> <p>Else if the prognosis document is going to contain Load forecasts (businessType codes A13), is not necessary to specify here any code.</p>	
flowDirection.direction	<p>A01: UP</p> <p>A02: DOWN</p>	<p>Used to characterize the direction (downward or upward) of the system services.</p> <p><u>Mandatory only</u> for Business Type Codes:</p> <ul style="list-style-type: none"> <li>• A95: Frequency containment reserve</li> <li>• A96: Automatic frequency restoration reserve,</li> <li>• A97: Manual frequency restoration reserve</li> </ul>	Optional

493

494



495

496

**Table 6 – Series\_Period Prognosis Document dependency table**

Series_Period			
Attributes	Values	Description	XSD Requirements
timeInterval	E.G: <start>2018-03-16T00:00Z</start>  <end>2018-03-16T00:30Z</end>	Time interval covered by elements of Point class.  It must be included within header Time_Period.timeInterval.	Mandatory
resolution	PT60M  P1D (Only used with Available Energy businessType code for daily availability)  P7D (Only used with Available Energy businessType code for weekly availability)	Resolution used in the Point class.	Mandatory

497

498

499

**Table 7 – Point Prognosis Document dependency table**

Point			
Attributes	Values	Description	XSD Requirements
position	Integer value > 0  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.	A sequential value representing the relative position within a given time interval.	Mandatory
Quantity	Decimal value (Float)	The principal quantity identified for a point.	Mandatory
generationOutageProbability_Quantity.quantity	Decimal value (Float) between 0 and 1  EG: 0.87546	Generation Outage probability value.	Optional

		<p><u>Mandatory only</u> for Business Type Code:</p> <ul style="list-style-type: none"> <li>• B81: Outage</li> </ul>	
--	--	--	--

500  
501  
502  
503

**Table 8 – Percentile\_Quantity Prognosis Document dependency table**

Percentile_Quantity			
Attributes	Values	Description	XSD Requirements
type	05: Percentile 05  95: Percentile 95	<p>The description of the type of percentile.</p> <p><u>Mandatory only</u> for Business Type Codes:</p> <ul style="list-style-type: none"> <li>• A13: Load Profile</li> <li>• A38: Available generation combined with mktPSRtype B16, B18, B19</li> </ul>	Mandatory
quantity	Decimal value (Float)	<p>The quantity value.</p> <p><u>Mandatory only</u> for Business Type Codes:</p> <ul style="list-style-type: none"> <li>• A13: Load Profile</li> <li>• A38: Available generation combined with mktPSRtype B16, B18, B19</li> </ul>	Mandatory

504  
505  
506

507 5.4 **Generation and Load Input data to STA software platform**

508 ShortMediumTermAdequacyPrognosis\_MarketDocument is described in this Implementation  
509 Guide as the exchange data document to deliver generation and load inputs from TSOs to STA  
510 platform.

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

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

516 • **ShortMediumTermAdequacyPrognosis\_MarketDocument**

517 ○ **mRID: ID\_String** is a unique ID of maximum 35 characters.

518 Proposed patterns of the STA project for the mRID are the following ones:

519 **Load\_XXX\_YYYY-MM-DD\_YYYY-MM-DDTHHMM**

520 **Gen\_XXX\_YYYY-MM-DD\_YYYY-MM-DDTHHMM**

521 Load pattern can be used for load input document, Gen pattern can be used for  
522 generation input document. STA platform will not refuse a document if the pattern  
523 is not respected. CIM EG recommends using non-significant mRIDs generated  
524 by the IT Systems.

525 ○ **Receiver\_MarketParticipant.mRID: PartyID\_String** EIC-V code of STA  
526 platform, not yet decided.

527

528 • **Timeseries**

529 ○ **mRID: ID\_String** is a unique ID of maximum 35 characters.

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

532 **BBB\_PPP\_XXX\_YYYY-MM-DDTHHMM**

533 BBB is the business type code described in the Timeseries. PPP is the PSRtype  
534 code described in the Timeseries. PPP not used for mRID of Timeseries  
535 containing load and NTC information. STA platform will not refuse a document if  
536 the pattern is not respected. CIM EG recommends using non-significant mRIDs  
537 generated by the IT Systems.

538 ○ **flowDirection.direction: DirectionKind\_String** used for service system  
539 direction (up or down).

540

541 • **Series\_Period**

542 In our case, the timeInterval for Series\_Period is expected being the same as the  
543 timeInterval of the document.

544

545 • **Point**

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

549 • **Percentile\_Quantity**

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

554  
555 The next table shows an example of mRID following the given convention.  
556  
557

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

	<b>Load convention example</b>	<b>Generation convention example</b>
<b>mRID document level</b>	Load_BE_2018-06-16_2018-06-15T0803	Gen_BE_2018-06-16_2018-06-15T0803
<b>mRID Timeseries level</b>	A13_BE_2018-06-15T0803	A38_B01_BE_2018-06-15T0803 B95_B14_BE_2018-06-15T0803
<b>Business type codes</b>	Only for business type code A13 related to load information	Only for business type codes A38, B95, B96, B97, B81, B94 related to generation information

558  
559 **5.4.1 Special remarks concerning inputs**

- 560 a) If a TSO does not have a specific energy type, TSO should not provide the Timeseries  
561 related to this businessType - mktPSRtype.
- 562 b) For mktPSRtype = B10 (hydro pumped storage), values can be positive (generating  
563 mode) or negative (pumping mode).

564 **5.4.2 Outage consideration methodology**

565 TSOs can send outage probability and outage value using business type code B81 in  
566 Timeseries. Then, in Point, TSOs specify the outage value through attribute “quantity: Decimal”.  
567 TSOs specify outage probability through attribute  
568 “generationOutageProbability\_Quantity.quantity: Decimal”. This information can be delivered  
569 for each mktPSRtype. This information is not mandatory.

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

572 TSOs shall consider the loss of a foreseen available power plant. Considering each power plant  
573 as  $G_i$ , with probability of outage, and active power capacity available equal to  $AP_i$  .  
574 In the case that there are more than 1 power plant per cluster, considering  $n_i$  the number of  
575 power plants in the same cluster “ $i$ ” (parameters  $P_i$  and  $AP_i$  equal for all power plants in the  
576 cluster “ $i$ ”). in order to estimate the outage value, TSOs shall select the plant  $G_i$  to maximize  
577 the formula:  
578

579                                      Select  $i$ ;  $(max) P_i * AP * n_i$   
580  
581        Once power plant from cluster “ $i$ ” is selected, the expected power outage value to provide is  
582         $AP_i$  and the expected forced outage rate to provide is  $P_i$ .

583 Notice that all the XML examples are provided only for information purposes.  
584

585 **5.4.3 XML input load examples –**  
586 **ShortMediumTermAdequacyPrognosis\_MarketDocument**

587 Find below an example of ShortMediumTermAdequacyPrognosis\_MarketDocument XML  
588 document using the given conventions for sending load values. The document contains a  
589 Timeseries class to provide the necessary information. The Timeseries will be depicted  
590 hereafter.

```
<?xml version="1.0" encoding="UTF-8"?>
<!--SMTA Prognosis v1.0 Example-->
<!--This is a SMTA confidential file-->
<ShortMediumTermAdequacyPrognosis_MarketDocument xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:iec62325.351:tc57wg16:451-n:smtaprognosisdocument:1:0"
xsi:schemaLocation="urn:iec62325.351:tc57wg16:451-n:smtaprognosisdocument:1:0 iec62325-451-n-
smtaprognosis_v_1_0.xsd">
  <mRID>Load_ES_2018-06-16_2018-06-15T0811</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>
```

591

592 **Figure 4 - Load XML input prognosis document**  
593 **ShortMediumTermAdequacyPrognosis\_MarketDocument**  
594

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

```

<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>
    <!--To write more points-->
  </Series_Period>
</TimeSeries>

```

596

597 **Figure 5 - Timeseries for load values. Forecast load, percentile 05 and 95**

598

599

600 **5.4.4 XML input Gen examples –**  
601 **ShortMediumTermAdequacyPrognosis\_MarketDocument**

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

```
<?xml version="1.0" encoding="UTF-8"?>
<!--SMTA Prognosis v1.0 Example-->
<!--This is a SMTA confidential file-->
<ShortMediumTermAdequacyPrognosis_MarketDocument xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="urn:iec62325.351:tc57wg16:451-n:smtaprognosisdocument:1:0"
xsi:schemaLocation="urn:iec62325.351:tc57wg16:451-n:smtaprognosisdocument:1:0 iec62325-451-n-
smtaprognosis_v_1_0.xsd">
  <mRID>Gen_ES_2018-06-16_2018-06-15T0811</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 generation data is given below-->
  </TimeSeries>
</ShortMediumTermAdequacyPrognosis_MarketDocument>
```

606

607 **Figure 6 - Generation XML input prognosis document**  
608 **ShortMediumTermAdequacyPrognosis\_MarketDocument**

609

610



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

```
<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>
    <!--To write more points-->
  </Series_Period>
</TimeSeries>
```

614

615 **Figure 7 - Timeseries for generation values. Example of solar forecast values with its**  
616 **percentile 05 and 95**

617

618

619 Find below an example of Timeseries class for sending outage values to be used for  
620 probabilistic assessment. This Timeseries for outage values must be delivered in the generation  
621 input file. In the example below, there is a chance of 3% to trip 1000 MW of nuclear generation  
622 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>
      <!--1000 MW of nuclear to trip-->
      <quantity>1000.0</quantity>
      <!--Probability to trip = 3%-->
      <generationOutageProbability_Quantity.quantity>0.03</generationOutageProbability_
Quantity.quantity>
    </Point>
    <Point>
      <position>2</position>
      <!--1000 MW of nuclear to trip-->
      <quantity>1000.0</quantity>
      <!--Probability to trip = 3%-->
      <generationOutageProbability_Quantity.quantity>0.03</generationOutageProbability_
Quantity.quantity>
    </Point>
    <!--To write more points-->
  </Series_Period>
</TimeSeries>
```

623

624

**Figure 8 - Timeseries outage values for probabilistic assessment**

625

626

627 Find below an example of Timeseries class for sending weekly availabilities.

```

<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>

```

628

629

**Figure 9 - Timeseries for weekly energy availabilities**

630

631 Find below an example of Timeseries class for sending daily availabilities. Example below takes  
632 into account 8 days.

```

<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>

```

633

634

635

636

**Figure 10 - Timeseries for daily energy availabilities**

637

638 **5.5 Capacity\_MarketDocument dependency table**

639 General Notes:

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

644 **Table 10 - Capacity\_MarketDocument dependency table**

Capacity_MarketDocument			
Attributes	Values	Description	XSD Requirements
mRID	Unique ID (Max 35 characters)	Identification of the document.	Mandatory
revisionNumber	Consecutive number. Pattern ([1-9]([0-9]){0,2})	Version of the document.	Mandatory
type	A26: Capacity document	The document type describes the principal characteristic of the document.	Mandatory
process.processType	A31: Week ahead	Indicates the nature of process that the document addresses.  Starts on D-1 to D-7 CET/CEST time	Mandatory
sender_MarketParticipant.mRID	EIC-X code of the TSO	The identification of the sender.	Mandatory
sender_MarketParticipant.marketRole.type	A04: System Operator	The role of the sender.	Mandatory
receiver_MarketParticipant.mRID	EIC-V code of the STA IT System	The identification of the receiver.	Mandatory
receiver_MarketParticipant.marketRole.type	A44: RSC	The role of the receiver.	Mandatory
createdDateTime	E.G: 2018-03-23T12:04:39Z	UTC Time.	Mandatory
docstatus	Not used.	The identification of the condition or position of the	Optional

		document with regard to its standing.	
received_MarketDocument.mRID	Not used.	The identification of an electronic document that is related to an electronic document header.	Optional
received_MarketDocument.revisionNumber	Not used.	The identification of an electronic document that is related to an electronic document header.	Optional
period.timeInterval	E.G: <start>2018-03-16T00:00Z</start>  <end>2018-03-17T00:00Z</end>	Target time interval covered by the document.	Mandatory
domain.mRID	EIC-Y code of the control area.	The domain covered within the Capacity_MarketDocument.	Mandatory
reason.code	It can be used all codes in the ReasonCodeType Codelist.	Indicates if the capacity document is correct or has errors at the header level.  <u>Mandatory only</u> if there are errors at the header level.	Optional
reason.text	May be used  Text	Text explaining possible problem.  <u>Mandatory only</u> if there are errors at the header level.	Optional

645

646

**Table 11 - TimeSeries Capacity Document dependency table**

<b>TimeSeries</b>			
<b>Attributes</b>	<b>Values</b>	<b>Description</b>	<b>XSD Requirements</b>
mRID	Unique ID (Max 35 characters)	Identification of the time series	Mandatory
businessType	A27: NTC	The exact business nature identifying the principal characteristic of time series.	Mandatory

product	8716867000016: Active Power	The identification of the nature of an energy product such as power, energy, reactive power, etc.	Mandatory
in_Domain	EIC-Y Area Code	Import bidding zone or control area ID	Mandatory
out_Domain	EIC-Y Area Code	Export bidding zone or control area ID	Mandatory
measure_Unit.name	MAW	Name of the unit measurement.	Mandatory
auction.mRID	Not used.	The unique identification of the auction.	Optional
auction.category	Not used.	The product category of an auction.	Optional
curveType	A02: Point	The type of curve being defined in the time series	Optional
connectingLine_Regis- teredResource	Not used.	The identification of a set of lines that connect two areas	Optional
reason.code	It can be used all codes in the ReasonCodeType Codelist.	Indicates if the capacity document is correct or has errors at the TimeSeries level.  <u>Mandatory only</u> if there are errors at the header level.	Optional
reason.text	May be used  Text	Text explaining possible problem.  <u>Mandatory only</u> if there are errors at the Timeseries level.	Optional

647

648

**Table 12 - Series\_Period Capacity Document dependency table**

<b>Series_Period</b>			
<b>Attributes</b>	<b>Values</b>	<b>Description</b>	<b>XSD Requirements</b>
timeInterval	E.G: <start>2018-03-16T00:00Z</start>	Time interval covered by elements of Point class.	Mandatory

	<end>2018-03-16T00:30Z</end>	It must be included within header Time_Period.timeInterval.	
resolution	PT60M	Resolution used in the Point class.	Mandatory

649  
650

**Table 13 - Point Capacity Document dependency table**

Point			
Attributes	Values	Description	XSD Requirements
position	Integer value > 0  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.	A sequential value representing the relative position within a given time interval.	Mandatory
quantity	Decimal value (Float)	The principal quantity identified for a point.	Mandatory
reason.code	It can be used all codes in the ReasonCodeType Codelist.	Indicates if the capacity document is correct or has errors at the point level.  <u>Mandatory only</u> if there are errors at the header level.	Optional
reason.text	May be used  Text	Text explaining possible problem.  <u>Mandatory only</u> if there are errors at the point level.	Optional

651

## 652 5.6 NTC Input data to STA software platform

653 Capacity\_MarketDocument is described in this Implementation Guide as the exchange data  
654 document to deliver NTC inputs from TSOs to STA platform.

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

657 The assembly model for NTC data input from TSOs can be found in [IEC 62325-451-3:2014+AMD1:2017 CSV Consolidated version](#).  
658

- 659 • **Capacity\_MarketDocument**



660 ○ **mRID: ID\_String** is a unique ID of maximum 35 characters.

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

662 **NTC\_XXX\_YYYY-MM-DD\_YYYY-MM-DDTHHMM**

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

665 ○ **Receiver\_MarketParticipant.mRID: PartyID\_String** EIC-V code of STA  
666 platform, not yet decided.

667

668 • **Timeseries**

669 ○ **mRID: ID\_String** is a unique ID of maximum 35 characters.

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

671 **BBB\_PPP\_XXX\_YYYY-MM-DDTHHMM**

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

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

676

677 • **Series\_Period**

678 In our case, the `timeInterval` for `Series_Period` is expected being the same as the  
679 `timeInterval` of the document.

680

681

682       • **Point**

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

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

685

686

**Table 14 - mRID examples for input TSO files**

	<b>NTC convention</b>
<b>mRID document level</b>	NTC_BE_2018-06-16_2018-06-15T0803
<b>mRID Timeseries level</b>	A27_BE_2018-06-15T0803
<b>Business type codes</b>	A27: NTC

687

688

689 Notice that all the XML examples are provided only for information purposes.  
690

### 691 5.6.1 XML input NTC examples – Capacity\_MarketDocument

692 Find below an example of Capacity\_MarketDocument XML document using the given  
693 conventions for sending NTC values. The document contains one Timeseries to provide the  
694 necessary information to STA platform. Timeseries example will be given hereafter to present  
695 NTC information.

```

?xml version="1.0" encoding="UTF-8"?>
<!--Capacity Document v8.0 Example-->
<!--This is a SMTA confidential file-->
<Capacity_MarketDocument xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="urn:iec62325.351:tc57wg16:451-3:capacitydocument:8:0" xsi:schemaLoca-
tion="urn:iec62325.351:tc57wg16:451-3:capacitydocument:8:0 iec62325-451-3-capacity_v8_0.xsd">
  <mRID>NTC_ES_2018-06-16_2018-06-15T0811</mRID>
  <revisionNumber>1</revisionNumber>
  <type>A26</type>
  <process.processType>A31</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>
  <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>
    <!--Example of Timeseries for sending NTCs data is given below-->
  </TimeSeries>
  <!--Reason attribute is optional-->
  <Reason>
    <code>B11</code>
    <text>a</text>
  </Reason>
</Capacity_MarketDocument>

```

696

697  
698

**Figure 11 - NTC XML input Capacity\_MarketDocument**

699

700 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>
```

701

702

703

704

**Figure 12 - Timeseries NTC information – example for ES→FR border**

705

706 **5.7 ShortMediumTermAdequacyResults\_MarketDocument dependency table**

707 General Notes:

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

712

713 **Table 15 - ShortMediumTermAdequacyResults\_MarketDocument dependency table**

<b>ShortMediumTermAdequacyResults_MarketDocument</b>			
<b>Attributes</b>	<b>Values</b>	<b>Description</b>	<b>XSD Requirements</b>
mRID	Unique ID (Max 35 characters)	Identification of the document.	Mandatory
revisionNumber	Consecutive number. Pattern ([1-9]([0-9]){0,2})	Version of the document.	Mandatory
type	B19: Reporting information market document	The document type describes the principal characteristic of the document.	Mandatory
process.processType	A31: Week ahead	Indicates the nature of process that the document addresses.  Starts on D-1 to D-7 CET/CEST time	Mandatory
sender_MarketParticipant.mRID	EIC-V code of the STA IT System	The identification of the sender.	Mandatory
sender_MarketParticipant.marketRole.type	A44: RSC	The role of the sender.	Mandatory
receiver_MarketParticipant.mRID	EIC-X code of the TSO	The identification of the receiver.	Mandatory
receiver_MarketParticipant.marketRole.type	A04: System Operator	The role of the receiver.	Mandatory
createdDateTime	E.G: 2018-03-23T12:04:39Z	UTC Time.	Mandatory

time_Period.TimeInterval	E.G: <start>2018-03-16T00:00Z</start>  <end>2018-03-17T00:00Z</end>	STA Results target time interval covered by the document.	Mandatory
Reason.code	May be used.  It can be used all codes in the ReasonCodeType Codelist.	Indicates if the results document is correct or has errors at the header level.  <u>Mandatory only</u> if there are errors at the header level.	Optional
Reason.text	May be used  Text	Text explaining possible problem.  <u>Mandatory only</u> if there are errors at the header level.	Optional

714

715

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

<b>Timeseries</b>			
<b>Attributes</b>	<b>Values</b>	<b>Description</b>	<b>XSD Requirements</b>
mRID	Unique ID (Max 35 characters)	Identification of the time series.	Mandatory
businessType	A01: Production A13: Load profile A27: Net transfer capacity (NTC) A38: Available generation B63: Aggregated netted external schedule B64: Netted area AC position B65: Netted area position B94: Must Run B99: Load Shedding	The exact business nature identifying the principal characteristic of time series.	Mandatory

	<p>C01: Remaining Capacity</p> <p>C02: Indicator of generation capacity adequacy</p> <p>C55: Production Curtailment</p>		
product	8716867000016: Active Power	The identification of the nature of an energy product such as power, energy, reactive power, etc.	Mandatory
curveType	A02: Point	The type of curve being defined in the time series.	Mandatory
measurement_Unit.name	MAW	Name of the unit measurement.	Mandatory
in_Domain.mRID	EIC-Y Area Code	<p>Import control area or bidding zone ID</p> <p>If businessType code is A27 (NTC) or B63 (Aggregated Netted external schedule): Import control area or bidding zone ID.</p> <p>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"</p> <p>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).</p>	Optional
out_Domain.mRID	EIC-Y Area Code	<p>Export control area or bidding zone ID</p> <p>If businessType code is A27 (NTC) or B63 (Aggregated Netted external schedule): Export control area or bidding zone ID.</p> <p>If businessType code is B64, B65, C01, C02. The export or</p>	Optional

		<p>import situation is defined by filling the attribute with code "10YEU-CONT-SYNCO" inside "in_Domain.mRID" or "outDomain.mRID"</p> <p>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).</p>	
connectingLine_RegisteredResource.mRID	EIC-T Code	<p>ID of the connecting line.</p> <p><u>Mandatory only</u> for Business Type Code:</p> <ul style="list-style-type: none"> <li>B63: Aggregated netted external schedule</li> </ul>	Optional
mktPSRType.psrType	<p>B01: Biomass</p> <p>B02: Fossil Brown coal/Lignite</p> <p>B03: Fossil Coal-derived gas</p> <p>B04: Fossil Gas</p> <p>B05: Fossil Hard coal</p> <p>B06: Fossil Oil</p> <p>B07: Fossil Oil shale</p> <p>B08: Fossil Peat</p> <p>B09: Geothermal</p> <p>B10: Hydro Pumped Storage</p> <p>B11: Hydro Run-of-river and pondage</p> <p>B12: Hydro Water Reservoir</p> <p>B013: Marine</p> <p>B14: Nuclear</p> <p>B15: Other renewable</p> <p>B16: Solar</p>	<p>Used as asset type: The identification of the type of asset.</p> <p><u>Mandatory only</u> for Business Type Code:</p> <ul style="list-style-type: none"> <li>A01: Production</li> <li>B94: Must Run</li> <li>C55: Production Curtailment</li> </ul>	Optional



	<p>B17: Waste</p> <p>B18: Wind Offshore</p> <p>B19: Wind Onshore</p> <p>B20: Other</p>		
Reason.code	<p>May be used.</p> <p>It can be used all codes in the ReasonCodeType Codelist.</p>	<p>Indicates if the results document is correct or has errors at the timeseries level.</p> <p><u>Mandatory only</u> if there are errors at the timeseries level.</p>	Optional
Reason.text	<p>May be used</p> <p>Text</p>	<p>Text explaining possible problem.</p> <p><u>Mandatory only</u> if there are errors at the timeseries level.</p>	Optional

716  
717

718  
719

**Table 17 – Series\_Period Results Document dependency table**

Timeseries			
Attributes	Values	Description	XSD Requirements
timeInterval	E.G: <start>2018-03-16T00:00Z</start>  <end>2018-03-16T00:30Z</end>	Time interval covered by elements of Point class.  It must be included within header Time_Period.timeInterval.	Mandatory
resolution	PT60M	Resolution used in the Point class.	Mandatory

720  
721

**Table 18 - Point Results Document dependency table**

Point			
Attributes	Values	Description	XSD Requirements
position	Integer value > 0  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.	A sequential value representing the relative position within a given time interval.	Mandatory
quantity	Decimal value (Float)	The principal quantity identified for a point.	Mandatory
posFR_Quantity.quantity	Not used	Positive feasibility range.	Optional
negFR_Quantity.quantity	Not used	Negative feasibility range.	Optional
Reason.code	May be used.  It can be used all codes in the ReasonCodeType Codelist.	Indicates if the results document is correct or has errors at the timeseries level.  <u>Mandatory only</u> if there are errors at the point level.	Optional
Reason.text	May be used  Text	Text explaining possible problem.	Optional

722

		Mandatory only if there are errors at the point level.	
--	--	--	--

723 5.8 Output data from STA software platform

724 ShortMediumTermAdequacyResults\_MarketDocument is a document to provide results of STA  
725 calculation to TSOs and RSCs. The next table describes the expected results from STA  
726 calculation contained in the output file.

727 **Table 19 - BusinessType codes of SMTA result document**

<b>Label</b>	<b>BusinessType Code</b>	<b>Business Description</b>
Production	A01	Expected results for A01 are generation per energy type started in each area minimizing the objective function described in Business Process Document.
Load profile	A13	The load profile of given area.
Generation profile	A38	The input RAC provided by TSOs
Net Transfer Capacity (NTC)	A27	The selected NTC of each border used for STA calculation according to the selection rules defined in Business Process Document.
Aggregated netted external schedule	B63	Exchange on borders found after STA calculation
Netted area AC position	B64	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.
Netted area position	B65	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.
Must run generation	B94	The amount of output of the generators which, for various reasons, must be connected to the transmission/distribution grid.
Load shedding	B99	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.
Remaining Capacity	C01	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.
Indicator of generation capacity adequacy	C02	This is the final Remaining Capacity after STA

		calculation. It is calculated as initial Remaining Capacity + Imports – Exports. Convention for Export or Import sign is given in B64 example here after.
Production curtailment	C55	This is the amount of production curtailment of each generation type for particular bidding zone.

728  
729

730 **5.8.1 XML output results examples –**  
731 **ShortMediumTermAdequacyResults\_MarketDocument**

732 You can find the assembly model of SMTA results document in chapter **Error! Reference s**  
733 **ource not found.**

734 • **ShortMediumTermAdequacyResults\_MarketDocument**

- 735 ○ **mRID: ID\_String** is a unique ID of maximum 35 characters. This is the results  
736 document mRID. A proposed pattern of the STA project for the mRID at that  
737 document level:  
738

739 **STA\_YYYY-MM-DD\_YYYY-MM-DDTHHMM**  
740  
741

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

744 **Sender\_MarketParticipant.mRID: PartyID\_String** is the EIC-V code of STA  
745 platform. This code is not available yet.  
746

747 • **Timeseries**

- 748 ○ **mRID: ID\_String** is a unique ID of maximum 35 characters. A proposed  
749 pattern of the STA project for the mRID at the timeseries level:  
750

751 **BBB\_PPP\_XXX\_YYYY-MM-DDTHHMM**  
752

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

759 This convention is used with Timeseries with business types A01. When  
760 Timeseries describe business codes A13, B64, B65, B99, C01 and C02, there is  
761 no PSRtype. Thus, the convention becomes:  
762

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

765 **BBB\_XXX\_YYYY-MM-DDTHHMM**  
766  
767

768 The next table shows an example of mRID following the given convention.  
769  
770

**Table 20 - mRID examples for Timeseries of SMTA result document**

	<b>Generation output example</b>	<b>Other outputs example</b>
<b>Convention Timeseries</b>	BBB_PPP_XXX_YYYY-MM-DDTHHMM	BBB_XXX_YYYY-MM-DDTHHMM
<b>Example</b>	A01_B14_BE_2018-06-15T0905	1) A13_BE_2018-06-15T0905 2) B63_BENL_2018-06-15T0905

<b>Used for</b>	Only for business type code A01	1) Only for business type codes A13, B64, B65, B99, C01 and C02. 2) Only for business type codes A27 and B63
-----------------	---------------------------------	---

771

772

773 Notice that all the XML examples are provided only for information purposes.  
774

### 775 5.8.2 XML output document ShortMediumTermAdequacyResults\_MarketDocument

776 Find below an example of ShortMediumTermAdequacyResults\_MarketDocument XML  
777 document.  
778

```
<?xml version="1.0" encoding="UTF-8"?>
<!--SMTA Results Example created by Alvaro Marciel-->
<!--This is a STA CONFIDENTIAL file -->
<ShortMediumTermAdequacyResults_MarketDocument xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns="urn:iec62325.351:tc57wg16:451-n:smtaresultsdocument:1:0" xsi:schemaLoca-
tion="urn:iec62325.351:tc57wg16:451-n:smtaresultsdocument:1:0 iec62325-451-n-smtaresults_v_1_0.xsd">
  <mRID>SMTA_2018-06-16_2018-06-15T0905</mRID>
  <revisionNumber>1</revisionNumber>
  <type>B19</type>
  <process.processType>A31</process.processType>
  <sender_MarketParticipant.mRID codingScheme="A01">EIC-V tool code</sender_MarketParticipant.mRID>
  <sender_MarketParticipant.marketRole.type>A44</sender_MarketParticipant.marketRole.type>
  <receiver_MarketParticipant.mRID codingScheme="A01">10XES-REE-----E</receiver_MarketParticipant.mRID>
  <receiver_MarketParticipant.marketRole.type>A04</receiver_MarketParticipant.marketRole.type>
  <createdDateTime>2018-06-15T09:05:47Z</createdDateTime>
  <time_Period.timeInterval>
    <start>2018-06-15T22:00Z</start>
    <end>2018-06-22T22:00Z</end>
  </time_Period.timeInterval>
  <TimeSeries>
  <!--Example of Timeseries for sending results data are given below -->
  </TimeSeries>
  ... <!--More Timeseries...-->
</ShortMediumTermAdequacyResults_MarketDocument>
```

779 **Figure 13 - Result XML document ShortMediumTermAdequacyResults\_MarketDocument**  
780  
781

### 782 5.8.3 XML output Timeseries B64, B65, C01, C02 example

783 Attached to the ShortMediumTermAdequacyResults\_MarketDocument class, find an example  
784 of the Timeseries class below with business type B65 to describe netted area position in Spain.  
785 Every Timeseries will describe a different business result.  
786

```
<TimeSeries>
  <mRID>B65_ES_2018-06-15T0905</mRID>
  <businessType>B65</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">10YEU-CONT-SYNC0</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>1550.0</quantity>
    </Point>
    <Point>
      <position>2</position>
      <quantity>1350.0</quantity>
    </Point>
  </Period>
</TimeSeries>
```

787 **Figure 14 - Timeseries of BusinessType B65 netted area position**  
788  
789



790 Quantity is always a positive number. The export or import situation is defined by filling the tag  
791 “10YEU-CONT-SYNC0” inside “in\_Domain.mRID” or “outDomain.mRID”. The other domain tag  
792 must be filled by the TSO EIC code related to the value. The table below shows how export or  
793 import are described.

Sign	In or out Domain tag
Export	<code>&lt;in_Domain.mRID codingScheme="A01"&gt;10YEU-CONT-SYNC0&lt;/in_Domain.mRID&gt;</code> <code>&lt;out_Domain.mRID codingScheme="A01"&gt;EIC of exporting area&lt;/out_Domain.mRID&gt;</code>
Import	<code>&lt;in_Domain.mRID codingScheme="A01"&gt; EIC of importing area&lt;/in_Domain.mRID&gt;</code> <code>&lt;out_Domain.mRID codingScheme="A01"&gt;10YEU-CONT-SYNC0&lt;/out_Domain.mRID&gt;</code>

794  
795 This rule is used for business types B64, B65, C01 and C02.  
796

#### 797 5.8.4 XML output Timeseries B63 example

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

- 801 • AC border
- 802 • DC border between synchronous areas
- 803 • Mix AC and DC border
- 804 • DC border in same synchronous area

805  
806 Each situation will be presented hereafter.

807  
808 This example below describes a Timeseries involving business type B63 netted external  
809 schedule on AC border. The Timeseries is given for an exchange on border BE towards NL.  
810

```

<TimeSeries>
  <mRID>B63_BENL_2018-06-15T0905</mRID>
  <businessType>B63</businessType>
  <product>8716867000016</product>
  <curveType>A02</curveType>
  <measurement_Unit.name>MAW</measurement_Unit.name>
  <in_Domain.mRID codingScheme="A01">10YNL-----L</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>1550.0</quantity>
    </Point>
    <Point>
      <position>2</position>
      <quantity>1350.0</quantity>
    </Point>
  </Period>
</TimeSeries>

```

811  
812 **Figure 15 - Timeseries with BusinessType B63 on AC border connection**  
813

814 The second Timeseries example with situation on DC border between synchronous areas is  
815 given below. This example shows the situation on NorNed DC cable between NL and NO,  
816 considering the direction NL towards NO. One particularity on borders with DC cable between  
817 synchronous area is the use of a middle point which is the border. Because of that, two  
818 Timeseries are necessary to describe the exchange. The next figure describes this element.  
819

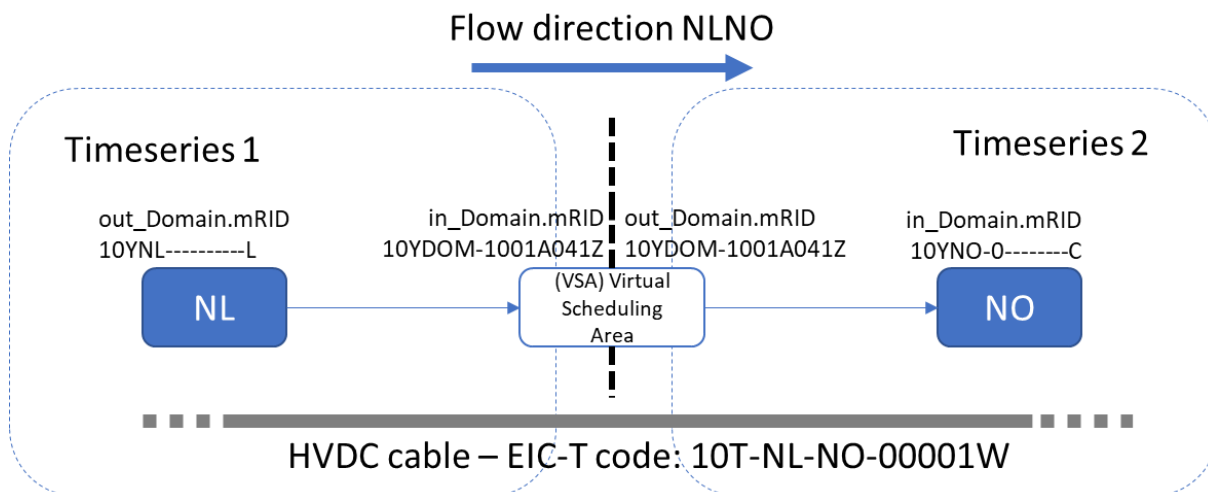


Figure 16 - HVDC cable between synchronous areas

820  
821  
822

```

<TimeSeries>
  <mRID>B63_NLNO_2018-06-15T0905</mRID>
  <businessType>B63</businessType>
  <product>8716867000016</product>
  <measurement_Unit.name>MAW</measurement_Unit.name>
  <in_Domain.mRID codingScheme="A01">10YDOM-1001A041Z</in_Domain.mRID>
  <out_Domain.mRID codingScheme="A01">10YNL-----L</out_Domain.mRID>
  <connectingLine_RegisteredResource.mRID codingScheme="A01">10T-NL-NO-00001W</connectingLine_RegisteredResource.mRID>
  <curveType>A03</curveType>
  <Period>
    <resolution>PT60M</resolution>
    <timeInterval>
      <start>2018-06-14T22:00Z</start>
      <end>2018-06-15T22:00Z</end>
    </timeInterval>
    <Point>
      <position>1</position>
      <quantity>0.00</quantity>
    </Point>
  </Period>
</TimeSeries>
<TimeSeries>
  <mRID>B63_NLNO_2018-06-15T0905</mRID>
  <businessType>B63</businessType>
  <product>8716867000016</product>
  <measurement_Unit.name>MAW</measurement_Unit.name>
  <in_Domain.mRID codingScheme="A01">10YNO-0-----C</in_Domain.mRID>
  <out_Domain.mRID codingScheme="A01">10YDOM-1001A041Z</out_Domain.mRID>
  <connectingLine_RegisteredResource.mRID codingScheme="A01">10T-NL-NO-00001W</connecting-
Line_RegisteredResource.mRID>
  <curveType>A03</curveType>
  <Period>
    <resolution>PT60M</resolution>
    <timeInterval>
      <start>2018-06-15T22:00Z</start>
      <end>2018-06-22T22:00Z</end>
    </timeInterval>
    <Point>
      <position>1</position>
      <quantity>0.00</quantity>
    </Point>
  </Period>
</TimeSeries>

```

823  
824  
825

Figure 17 - Timeseries with BusinessType B63 on DC border between synchronous areas

826  
827 The third case to describe is the mixed AC and DC border, for instance border between Italy  
828 and France in the future. For such border, we need 3 Timeseries to describe the exchange.  
829 • 1 Timeseries to describe the AC exchange  
830 • 2 Timeseries to describe the DC exchange  
831 It is a combination of Timeseries of the 2 previous cases.

832  
833 The fourth example is the DC border in same synchronous area, for instance Italy – Greece. If  
834 the DC cable is considered in AC-mode, it is considered as AC border (Timeseries as first case).  
835  
836

### 837 5.8.5 XML output Timeseries A27 NTC example

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

```
<TimeSeries>
  <mRID>A27_BENL_2018-06-15T0905</mRID>
  <businessType>A27</businessType>
  <product>8716867000016</product>
  <curveType>A02</curveType>
  <measurement_Unit.name>MAW</measurement_Unit.name>
  <in_Domain.mRID codingScheme="A01">10YNL-----L</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>2000.0</quantity>
    </Point>
    <Point>
      <position>2</position>
      <quantity>2000.0</quantity>
    </Point>
  </Period>
</TimeSeries>
```

841  
842 **Figure 18 - Timeseries with BusinessType A27 on border BE-->NL**  
843

844 **5.8.6 XML output Timeseries A01 generation started example**

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

```
<TimeSeries>
  <mRID>A01_ES_2018-06-15T0905</mRID>
  <businessType>A01</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>B14</mktPSRType.psrType>
  <Period>
    <timeInterval>
      <start>2018-06-15T22:00Z</start>
      <end>2018-06-22T22:00Z</end>
    </timeInterval>
    <resolution>PT60M</resolution>
    <Point>
      <position>1</position>
      <quantity>10050.0</quantity>
    </Point>
    <Point>
      <position>2</position>
      <quantity>9780.0</quantity>
    </Point>
  </Period>
</TimeSeries>
```

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

852 **5.8.7 XML output Timeseries A38 generation input example**

853 This Timeseries A38 provides the generation input of each TSO per energy type started in each  
854 area after STA calculation. The code EIC-Y of TSO is given in both attributes out\_Domain.mRID  
855 and in\_Domain.mRID. The decimal value can be positive (generating mode) or negative for B10  
856 (pumping mode). Here below an example with nuclear generation (mktPSRType = B14).  
857

```
<TimeSeries>
  <mRID>A38_ES_2018-06-15T0905</mRID>
  <businessType>A38</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>B14</mktPSRType.psrType>
  <Period>
    <timeInterval>
      <start>2018-06-15T22:00Z</start>
      <end>2018-06-22T22:00Z</end>
    </timeInterval>
    <resolution>PT60M</resolution>
    <Point>
      <position>1</position>
      <quantity>10050.0</quantity>
    </Point>
    <Point>
      <position>2</position>
      <quantity>9780.0</quantity>
    </Point>
  </Period>
</TimeSeries>
```

858 **Figure 20 - Timeseries of BusinessType A38 generation input of TSOs**

861 **5.8.8 XML output Timeseries A13 Total Load example**

862 Find below an example of Timeseries for sharing the Total load of TSOs. TSO is specified by  
863 its EIC-Y code in both attributes out\_Domain.mRID and in\_Domain.mRID. The decimal value is  
864 positive.

```
<TimeSeries>
  <mRID>A13_BE_2018-06-15T0905</mRID>
  <businessType>A13</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>10050.0</quantity>
    </Point>
    <Point>
      <position>2</position>
      <quantity>11050.0</quantity>
    </Point>
  </Period>
</TimeSeries>
```

865

866 **Figure 21 - Timeseries with BusinessType A13 Total Load**

867 Find below an example of Timeseries for sharing the Total load of TSOs. TSO is specified by  
868 its EIC-Y code in attribute out\_Domain.mRID. In attribute in\_Domain.mRID, the code 10YEU-  
869 CONT-SYNC0 is used. When the tool does not forecast Load Shedding, the Timeseries with  
870 BusinessType B99 is not provided in the result document.

871

872

873 **5.8.9 XML output Timeseries B99 Load Shedding example**

874 Find below an example of Timeseries for sharing the Total load of TSOs. The code EIC-Y of  
875 TSOs is given in both attributes out\_Domain.mRID and in\_Domain.mRID. When the tool does  
876 not forecast Load Shedding, the Timeseries with BusinessType B99 is not provided in the result  
877 document. The load shedding quantity value can only be positive.  
878

```

<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>

```

879  
880  
881

**Figure 22 - Timeseries with BusinessType B99 Load Shedding**

882 **5.8.10 XML output Timeseries B94 Must Run example**

883 Find below an example of Timeseries for sharing must run generation. This example is valid for  
884 both input and output must run. The code EIC-Y of TSOs is given in both attributes  
885 out\_Domain.mRID and in\_Domain.mRID. When the tool does not forecast must run, the  
886 Timeseries with BusinessType B94 is not provided in the result document. Together with the  
887 Must Run business type, the asset type shall be defined in psrType attribute. In the example  
888 below the must run type is B14 which is Nuclear. The must run production quantity value can  
889 only be positive.  
890

```

<TimeSeries>
  <mRID>B94_BE_2018-06-15T0905</mRID>
  <businessType>B94</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>
  <mktPSRType.psrType>B14</mktPSRType.psrType>
  <Period>
    <timeInterval>
      <start>2018-06-15T22:00Z</start>
      <end>2018-06-22T22:00Z</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>

```

891  
892  
893  
894

**Figure 23 - Timeseries with BusinessType B94 Must Run**



895

896 **5.8.11 XML output Timeseries C55 production curtailment example**

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

901

```

<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>
    <timeInterval>
      <start>2018-06-15T22:00Z</start>
      <end>2018-06-22T22:00Z</end>
    </timeInterval>
    <resolution>PT60M</resolution>
    <Point>
      <position>1</position>
      <quantity>150.0</quantity>
    </Point>
    <Point>
      <position>2</position>
      <quantity>140.0</quantity>
    </Point>
  </Period>
</TimeSeries>

```

902

903

904

**Figure 24 - Timeseries of BusinessType A38 generation input of TSOs**

905

906 **Advices for Acknowledgement document**

907 Acknowledgment document is an IEC standard and its ownership has passed to IEC, so  
908 ENTSO-E cannot publish the Implementation Guide for Acknowledgement document. In case  
909 you want to get it, you must purchase it at IEC website. The version of Acknowledgement  
910 standard to be used in STA project is [IEC 62325-451-1:2017](https://www.iec.ch/iec62325-451-1-2017)

911  
912 Acknowledgement XSD (iec62325-451-1-acknowledgement\_v8\_0.xsd) is available on [EDI](#)  
913 [Library](#) for free.

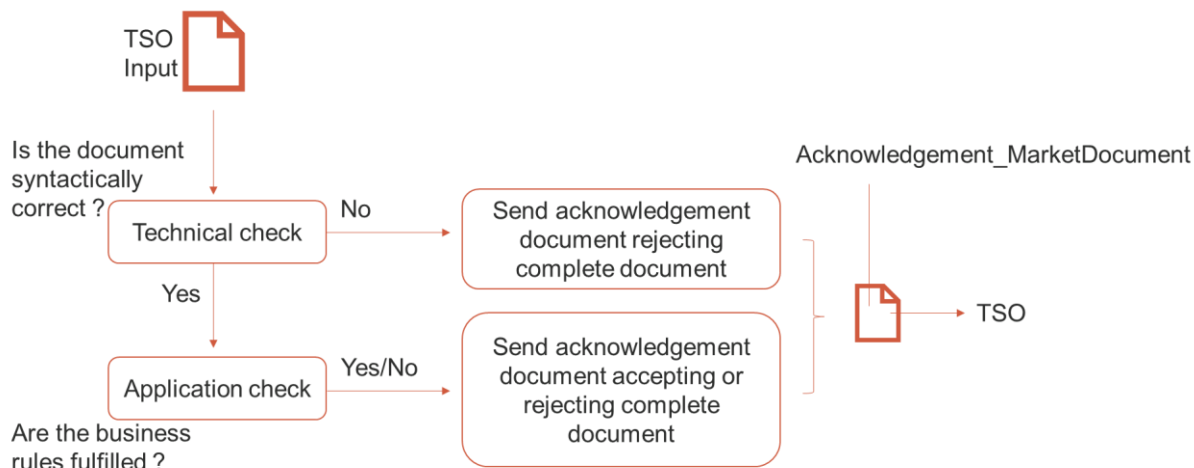
914  
915 The acknowledgement business process is generic and can be used in all electricity market  
916 business processes at two levels:

- 917 • Technical level: To detect syntax errors (XML parsing errors, etc.)
- 918 • Application level: To detect semantic errors (invalid data, wrong process, etc.).

919  
920 The acknowledgement document shall contain both technical and application quality checks of  
921 TSOs input files. Technical test corresponds to the test on document structure to check whether  
922 inputs correspond to XSD document. Application checks correspond to the business rules to  
923 check whether they are respected or not.

924  
925 The next figure provides the sequence diagram of the STA acknowledgement process.

926



927

928

929

**Figure 25 - Acknowledgement process**

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

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

936 **File naming convention**

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

941

942 **Annex**

943 8.1 **Annex 1 – Country ISO code list**

944 You can find the list of ISO codes (ISO 3166-1) in the following [link](#).

945

946 8.2 **Annex 2 – EIC-code list**

947 You can find the list of EIC codes in the following [link](#).

948

949 8.3 **Annex 3 – ENTSO-E code list**

950 You can find the ENTSO-E code list in the following [link](#).