



European Network of  
Transmission System Operators  
for Electricity

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**ENTSO-E  
CRITICAL NETWORK ELEMENT  
IMPLEMENTATION GUIDE**

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2019-06-26  
APPROVED DOCUMENT  
VERSION 2.3

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22 an absolute requirement of the specification.
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35 it or because the vendor feels that it enhances the product while another vendor may  
36 omit the same item. An implementation which does not include a particular option  
37 MUST be prepared to interoperate with another implementation which does include the  
38 option, though perhaps with reduced functionality. In the same vein an implementation  
39 which does include a particular option MUST be prepared to interoperate with another  
40 implementation which does not include the option (except, of course, for the feature  
41 the option provides.).

## Revision History

Version	Release	Date	Comments
0	0	2015-01-15	Initial release
1	0	2015-09-01	Review by WG EDI and PT CGM
1	1	2015-11-10	Following the maintenance request from EMFIP, change to the UML model to enable "anonymous" publication.
2	0	2017-10-24	Update of the UML model and the associated dependency tables following alignment with the CRAC document for capacity calculation processes: <ul style="list-style-type: none"> <li>- Addition of the classes present in the CRAC document with the related associations and attributes</li> <li>- Addition of a new Border_Series class to describe corners</li> <li>- Addition of a new ReferenceCalculation_DateAndOrTime class to describe reference dates used for capacity calculation</li> </ul>
2	1	2018-06-19	Approved by MC <ul style="list-style-type: none"> <li>- Addition of a MarketObjectStatus.status attribute in the AdditionalConstraint_RegisteredResource</li> <li>- Addition of a Monitored_Series</li> <li>- Addition of an association between the Party_MarketParticipant class and the sub_Series</li> <li>- Creation of an association between Border_Series and Point</li> </ul>
2	2	2018-10-10	<ul style="list-style-type: none"> <li>- Addition of a businessType attribute in the Border_Series class</li> <li>- Addition of an association between Border_Series and Monitored_RegisteredResource (ConnectingLine_RegisteredResource)</li> </ul>
2	3	2019-06-26	Following the maintenance request from EMFIP 54: <ul style="list-style-type: none"> <li>• Addition of a 0..1 constraint status attribute in Constraint_Series class to specify whether a constraint is resolved or not.</li> <li>• Addition of 0..1 psrType and location attributes in Contingency_RegisteredResource class and Monitored_RegisteredResource class to include the type and location of the network elements when downloading publications from transparency platform.</li> <li>• New dependency tables for the Flow-Based publication in TP.</li> </ul> Changes due to the alignment between CRAC an CNE document: <ul style="list-style-type: none"> <li>• -Addition of a 0..* association between the RemedialAction_RegisteredResource class and the Analog class.</li> <li>• Addition of the optional</li> </ul>

			<p>“currency_Unit.name” and “price_Measure_Unit.name’ attributes at TimeSeries level</p> <ul style="list-style-type: none"><li>• -Addition of the optional “priceAmount” attribute at RemedialAction_Series level</li><li>• mRID of Document, Series and Timeseries (ID_String type) was enlarged from 35 to 60 characters.</li></ul> <p>Approved by MC.</p>
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145

## INTRODUCTION

146 This document is drafted based on IEC 62325 series. In particular, the IEC 62325-450  
147 methodology was applied to develop the conceptual and assembly models.

148 This methodology is described in the following document: *ENTSO-E Common information*  
149 *model (CIM) European style market profile User guide*.

### 150 **1 Scope**

151 The objective of this implementation guide is to make it possible for software vendors to  
152 develop an IT application for market players to exchange information relative to critical  
153 network elements used for interconnection capacity determination process.

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

### 157 **2 Normative references**

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

162 IEC TS 61970-2, *Energy management system application program interface (EMS-API) – Part*  
163 *2: Glossary*

164 IEC 62325-301, *Framework for energy market communications – Part 301: Common*  
165 *information model (CIM) extensions for markets*

166 IEC 62325-351, *Framework for energy market communications – Part 351: CIM European*  
167 *market model exchange profile*

168 IEC 62325-450, *Framework for energy market communications – Part 450: Profile and context*  
169 *modeling rules*

170 IEC 62325-451-1, *Framework for energy market communications – Part 451-1:*  
171 *Acknowledgement business process and contextual model for CIM European market*

172 IEC 62325-451-3, *Framework for energy market communications – Part 451-3: ENTSO-E*  
173 *Capacity Allocation and Nomination business process and contextual model for CIM European*  
174 *market*

### 175 **3 Terms and definitions**

#### 176 **3.1** 177 **constraint situation**

178 It is a network configuration, corresponding either to the expected nominal state, or to an  
179 hypothetical degraded state where one or several contingencies occur. In both cases,  
180 associated remedial actions can be included in the network configuration.

181

#### 182 **3.2** 183 **critical network element**

184 A network element either within a bidding zone or between bidding zones taken into account  
185 in the capacity calculation process, limiting the amount of power that can be exchanged.

186 Depending on the chosen implementation, there may be only one or several critical network  
187 elements which will be monitored in a given constraint situation.



- 188 **3.3**  
189 **final adjusted margin value**  
190 **FAV**  
191 This is the amount of MW that is manually added or subtracted to the capacity of the critical  
192 network element. A negative value for FAV simulates the effect of an additional margin due to  
193 complex remedial actions which cannot be modelled and so calculated in the flow-based  
194 parameter calculation. A positive value for FAV, as a consequence of the verification phase of  
195 the flow-based domain, leads to the need to reduce the margin on one or more critical  
196 network elements for system security reasons.
- 197 **3.4**  
198 **flow**  
199 This is the computed physical flow, resulting from a load flow calculation, corresponding to  
200 the critical network element in the constraint situation ("N Situation", "N-1 Situation" ...) after  
201 the capacity calculation. The flow is expressed in A, %, or MW.
- 202 **3.5**  
203 **flow based remaining available margin**  
204 **RAM**  
205 This is the remaining available margin (RAM) for one critical network element in a constraint  
206 situation. This is the amount of MW or A that is left for the limiting element in a computed  
207 constraint situation, i.e. the amount that can be traded or used.
- 208 **3.6**  
209 **flow based study domain**  
210 This is the area for which the flow-based study is carried out.
- 211 **3.7**  
212 **flow reliability margin**  
213 This is the flow reliability margin for a given critical network element in each considered  
214 constraint situation. The amount of MW or A that is reserved for this critical network element  
215 and shall not be used for the computed outage situation, in order to secure the power  
216 network.
- 217 **3.8**  
218 **long term allocation margin**  
219 This is the amount of MW that is added to the capacity of the critical network element in order  
220 to automatically include the long-term allocation domain into the flow based domain.
- 221 **3.9**  
222 **market coupling domain**  
223 This is the market coupling area or a part of the market coupling area for which the social  
224 welfare impact due to the critical network element is computed.
- 225 **3.10**  
226 **monitored registered resource**  
227 This is the critical network element of the power network in the constraint situation. Some  
228 analog measurements are of interest in order to provide information about the limitation and  
229 the physical impact on this element in such a constraint situation.
- 230 **3.11**  
231 **outage registered resource**  
232 This is one of the network elements which are in outage for the studied constraint situation.
- 233 **3.12**  
234 **power transfer distribution factor**  
235 This is a factor (PTDF) representing the impact of 1 MW variation of the net position of the  
236 corresponding bidding zone on the critical network element.

- 237 **3.13**  
238 **PTDF domain**  
239 This is a bidding zone of the market coupling region which may be impacted by the critical  
240 network element.
- 241 **3.14**  
242 **remedial action registered resource**  
243 This is one of the network elements on which remedial action are carried out to improve the  
244 constraint situation. Those elements are used to alleviate the constraints induced by the  
245 constraint situation. The remedial actions may be identified as automatic, preventive or  
246 curative. The type of the remedial action includes generation, load and/or topology changes.
- 247 **3.15**  
248 **shadow price**  
249 This is the price variation of the market welfare for the variation of 1 MW or A on this  
250 particular critical network element. This identifies the impacts of the limiting element on the  
251 market coupling welfare.
- 252 **3.16**  
253 **spanning margin value**  
254 **SMV**  
255 This is the margin that is taken into account when spanning is applied. SMV is an historical  
256 based parameter which specifies the amount of MW that reduces the RAM when spanning is  
257 applied.
- 258 **3.17**  
259 **Special Protection Scheme (SPS)**  
260 A remedial action consisting in an automatic device triggered after contingency.

## 261 4 The critical network element calculation and publication process

### 262 4.1. Overall business context

263 The business process described in this document is related to the determination of the critical  
264 network elements and their publication for capacity allocation purposes.

265 The critical network elements determination process is based on a set of inputs data that are  
266 out of the scope of this document.

267 The focus is put on the results of the critical network elements calculation which is provided to  
268 TSOs for operational and publication purposes and market operator, such as power  
269 exchanges (PXs), for market coupling allocation process.

270 This document describes for the flow-based process or the capacity coordinated  
271 determination process the necessary set of results on the critical network elements.

272 The critical network elements are determined based on a set of operational input data which  
273 are out of the scope of this document, such as:

- 274 - DACF
- 275 - D-2CF
- 276 - GSK
- 277 - Available preventive remedial actions
- 278 - Potential outage cases

279 Those operational input data are called “network data” in this document. In a first step the  
280 input data are given in individual models; in a second step they will respect the Common Grid  
281 Model (CGM).

282 These steps are the identified use cases for the critical network elements determination  
283 process and are to be carried out by the TSOs on day ahead (D-1). Figure 1 provides the use  
284 case for the critical network element process.

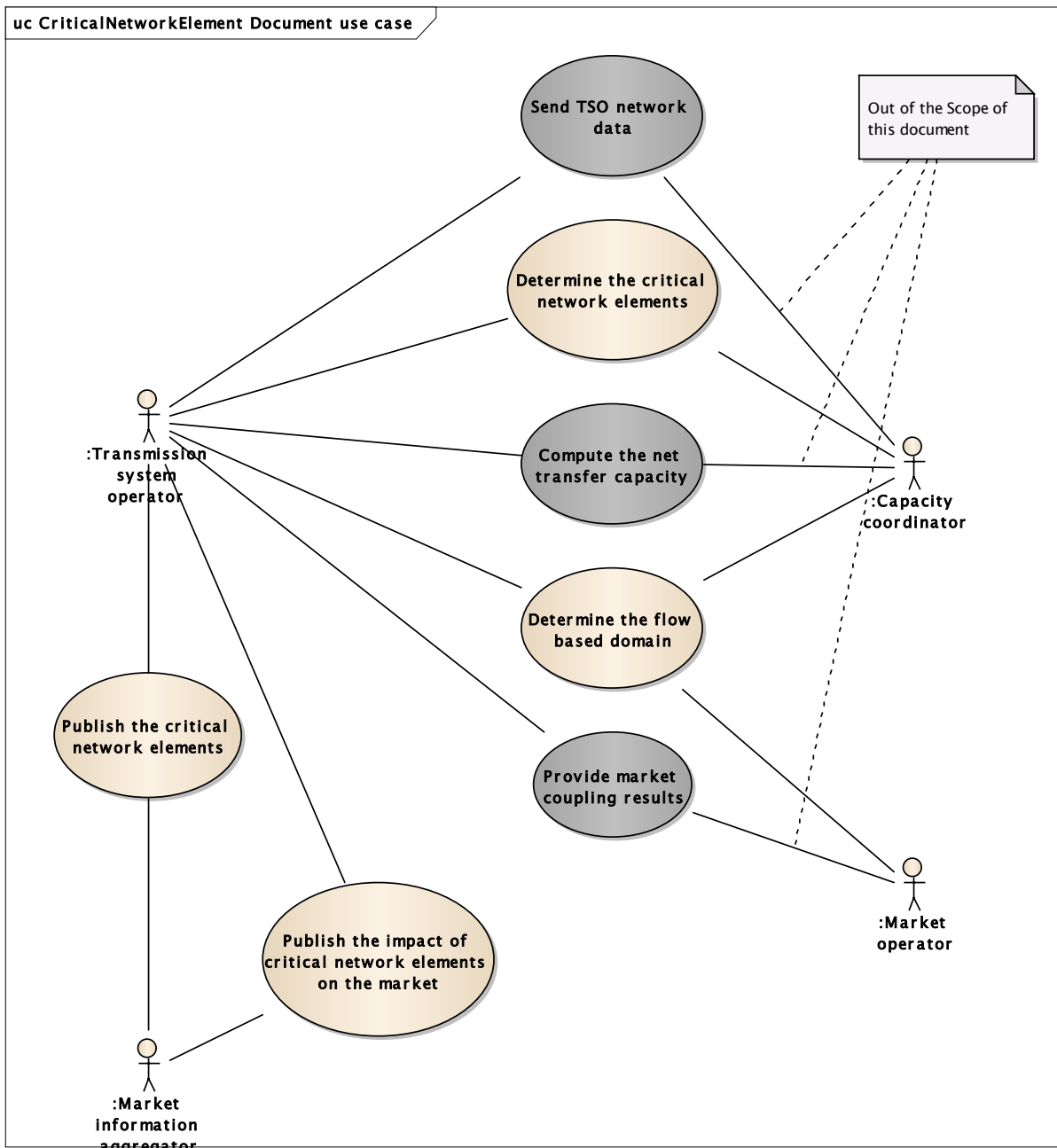
285 Each TSO sends firstly their network data to the capacity coordinator. The data that are sent  
286 are out of the scope of this document as considered of operational concerns.

287 Based on the network data of all the TSOs, the capacity coordinator performs a merge of  
288 these data and computes the critical network elements. This part of the process refers directly  
289 to guidelines CACM and CGMES. The calculation basically enables to identify which are the  
290 most important limiting elements of the power network in several studied constraint situation,  
291 i.e. outages. Once the calculation performed, the capacity coordinator provides the TSOs with  
292 a list of critical network elements for internal process. The critical network elements are  
293 provided in day ahead for a specific period of time.

294 The critical network elements enable to define then the net transfer capacity (NTC) on day  
295 ahead to be used for daily allocation process. This part of the process refers directly to IEC  
296 62325-451-3 business process.

297 The critical network elements may be provided, complemented by flow-based parameters in  
298 case flow-based calculation is run instead of NTC determination. Those flow-based  
299 parameters will include the influence of the critical network elements on the market coupling  
300 process. The critical network elements with flow-based parameters define the so-called flow-  
301 based domain. The details of the flow-based domain calculation process are out of the scope  
302 of this document.

303 This flow-based domain is provided by the capacity coordinator to the TSOs. An “anonymous”  
304 version of the flow-based domain (without identifying precisely the limiting elements of the  
305 network) is sent to the market operator in order to be used for the market coupling calculation  
306 process.



307

308

**Figure 1 – Use case of the critical network elements process**

309

The market coupling process itself is out of the scope of this document.

310

However, the market coupling results enable to identify the impact of the previously identified critical network elements on the social welfare of the flow-based market coupling area. This impact is identified by the shadow price of the critical network element.

311

312

313

Finally, the shadow prices are published with the flow-based domain to the market information aggregator.

314

315

In case of NTC determination process, the critical network elements which effectively constrained the allocation market position (market coupling or explication auction) are published to the market information aggregator.

316

317

318

**4.2 Critical network elements determination and publication**

319

In a context of regional coordinated capacity calculation, it is of interest to perform a capacity calculation on a common grid model (merge of each TSO network model) to identify the main

320

321 critical network elements of the region which will limit the net transfer capacity for the  
322 allocation market.

323 The details of such a process are out of the scope of this document and those are  
324 summarized by the two steps:

- 325 - Sending of TSOs network data to the capacity coordinator
- 326 - Critical network elements determination

327 Once the critical network elements determination process is performed in day ahead, the  
328 capacity coordinator sends the list of identified critical network elements that constraint the  
329 power network and induces congestions. Those critical network elements are identified for  
330 one specific point of time hour of a delivery day.

331 There may be one or several constraint situations identified on the power network for one  
332 specific point of time. Per constraint situation, one or several critical network elements may be  
333 identified. It is of TSOs' responsibility to monitor each critical network element. In this  
334 condition, threshold values are provided as "monitored analog measurements" of the  
335 "monitored elements" for TSOs internal process.

336 The net transfer capacity (NTC) will be calculated based on the critical network elements  
337 determined by the capacity coordinator. The related oriented border associated to the critical  
338 network elements calculation is provided in the critical network elements results. This  
339 information is needed as an input for NTC determination. For instance, the critical network  
340 elements identified in the calculation of the full export situation (from France to Italy) will be  
341 used as inputs for NTC calculation on France-to-Italy border.

342 The details of the NTC calculation are out of the scope of this document. The publication of  
343 NTC is out of the scope this document since for NTC, as described in IEC 62325-451-3, the  
344 information is provided by using Capacity\_MarketDocument.

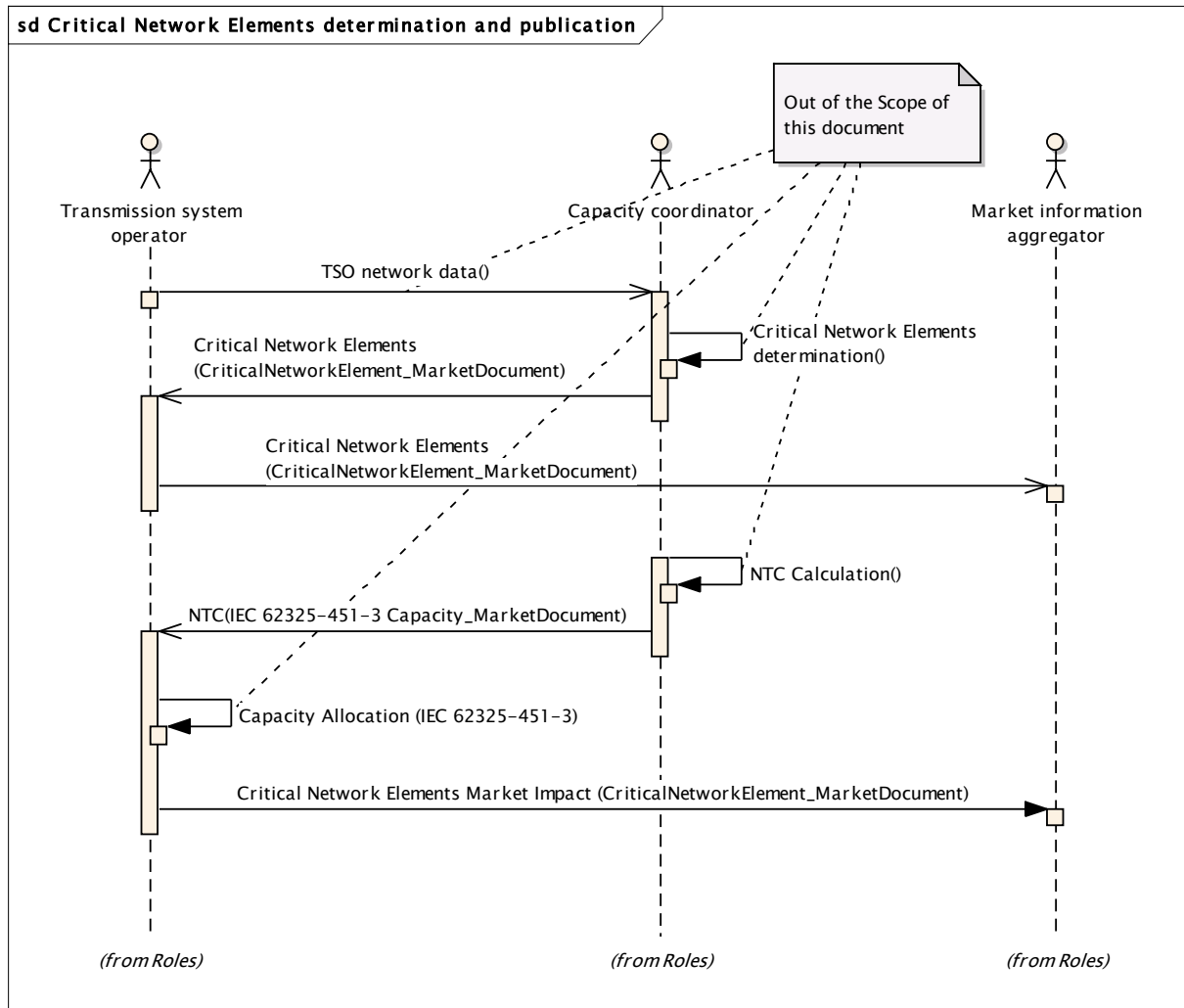
345 The critical network elements results are published by the TSOs to the market information  
346 aggregator without the monitored measurement information.

347 The NTC is then used for capacity allocation as described within IEC 62325-451-3. After  
348 allocation, the critical network elements which effectively impacted the market position are  
349 sent to the market information aggregator.

350 Figure 2 provides the sequence diagram for the critical network elements determination and  
351 publication process.

352 The capacity coordinator sends the list of critical network elements to TSOs by using the  
353 CriticalNetworkElement\_MarketDocument.

354 The TSOs are using the CriticalNetworkElement\_MarketDocument to publish the critical  
355 network elements. The information about the limiting TSO and the location of the critical  
356 network element is also of publication interest.



357

358

**Figure 2 – Critical network elements determination and publication**

359 **4.3 Flow based domain determination and publication**

360 In the context of flow-based capacity calculation, once the critical network elements  
 361 determination process is performed in day ahead, the capacity coordinator sends the defined  
 362 flow-based domain to TSOs.

363 The flow-based domain identifies the domain where the power system is safely operated  
 364 depending upon commercial exchanged flows and congestion management on the borders.  
 365 The flow-based domain is identified per point of time by a set of critical network elements  
 366 influencing the allocation market with given weighting factors defined by the PTFD factors and  
 367 their associated RAM. Those critical network elements are identified for one specific point of  
 368 time of a delivery day.

369 There may be one or several constraint situations identified on the power network for one  
 370 specific point of time. Per constraint situation, only one critical network element is identified  
 371 by the flow-based calculation. It is of TSOs’ responsibility to monitor each critical network  
 372 element. In this condition, threshold values are provided as “monitored analog measurements”  
 373 of the “monitored elements” for TSOs internal process.

374 The flow-based domain is sent by the capacity coordinator to the market operator to take into  
 375 account the critical network elements with their PTFDs and RAM in the market coupling  
 376 calculation process. In this case, the critical network elements are sent in an anonymous way  
 377 and the analog measurements are not sent.

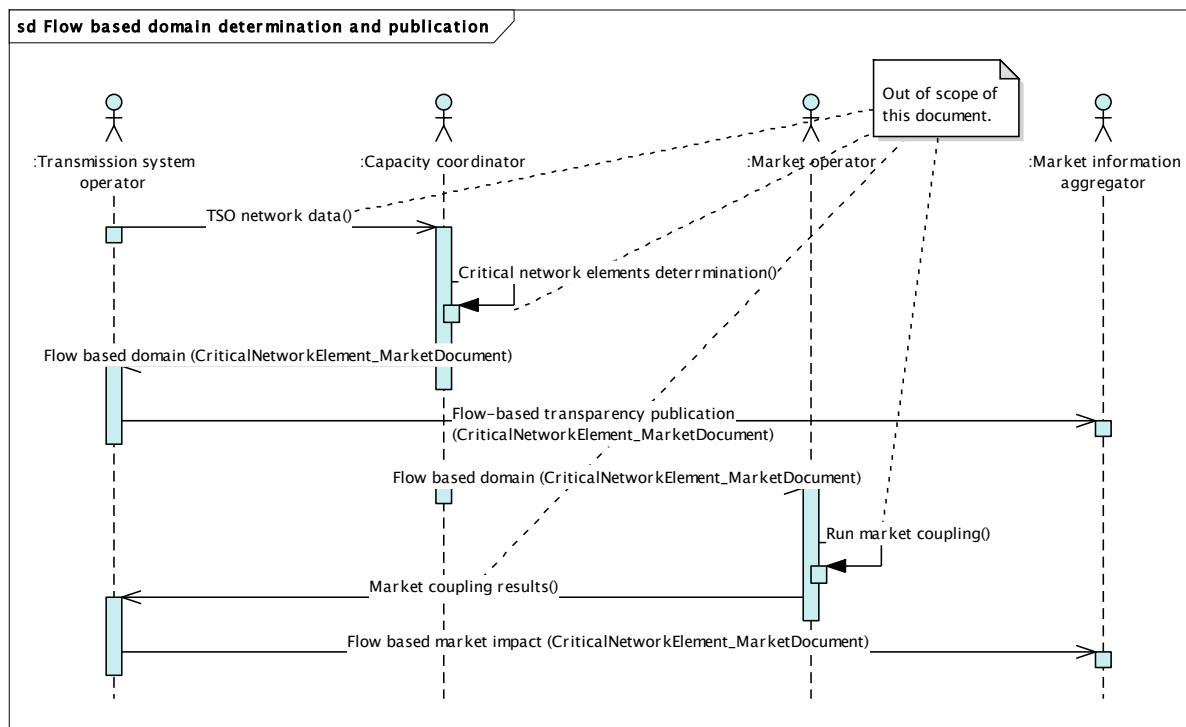
378 The same flow-based domain result as for the market operator is also sent to the market  
 379 information aggregator.

380 Then, once the market coupling process is performed and the calculation done, the impact of  
 381 each critical network element of the flow-based domain on the social welfare of the flow-  
 382 based market coupling region is available.

383 This impact is published as the shadow price of the critical network elements of the flow-  
 384 based domain.

385 Figure 3 provides the sequence diagram for the critical network elements determination and  
 386 publication process.

387



388

**Figure 3 – Flow based domain determination and publication**

389

390 The capacity coordinator sends the flow-based domain to TSOs by using the  
 391 CriticalNetworkElement\_MarketDocument.

392 The TSOs are using the CriticalNetworkElement\_MarketDocument to publish the relevant  
 393 flow-based parameters as required by transparency regulation article 11.1.b. The information  
 394 about the limiting TSO and the location of the critical network element is also of a publication  
 395 interest.

396 When the market coupling process is over, the TSOs are using the  
 397 CriticalNetworkElement\_MarketDocument to publish the flow-based domain with the shadow  
 398 prices.

**399 4.4 Business rules for the critical network element determination process**

**400 4.4.1 General rules**

401 The generic rules defined in IEC 62325-351 applied to all the documents described in this  
 402 part. In particular, IEC 62325-351 describes the concept of curve type that is to be used to  
 403 define the pattern of the critical network elements for a day.

404 For each electronic data interchange defined in this document, an application  
 405 acknowledgement is required as defined in IEC 62325-451-1.

406 When a document is received, it shall be checked at the application level to ensure that there  
 407 are no faults in it that could prevent its normal processing. After this check, an

408 acknowledgement document, as defined in IEC 62325-451-1, shall be generated either  
409 accepting in its entirety the document in question or rejecting it.

#### 410 **4.4.2 Dependencies governing the CriticalNetworkElement\_MarketDocument**

411 The following rules applied to the CriticalNetworkElement\_MarketDocument:

412 - A CriticalNetworkElement\_MarketDocument may contain for a specific position several  
413 Constraint\_Series.

414 - For each position, a set of Border\_Series can be used to describe different “corner”  
415 situation which has been studied depending on the code specified in the businessType  
416 attribute (e.g. maximum flow or maximum flow after remedial actions on an oriented  
417 border, or maximum Net Position of a zone).

418 - A Border\_Series class may contain for a specific position several  
419 ConnectingLine\_RegisteredResource

420 - In case of NTC Determination process, the TimeSeries of the  
421 CriticalNetworkElement\_MarketDocument provides the main related oriented border of  
422 the calculation study used for NTC calculation:

423 - In\_Domain.mRID: the area of the related oriented border study where the energy flows  
424 into.

425 - Out\_Domain.mRID: the area of the related oriented border study where the energy  
426 comes from.

427 - There are two types of Constraint\_Series. The BusinessType is used to distinguish  
428 between both types:

429 - The studied constraint situation identified by a constraint situation and the associated  
430 critical network elements:

431 • The Constraint\_Series contains:

432 - A mRID which identifies a constraint situation. If a business process used a  
433 coding scheme to identify the constraint situation (for example a Critical  
434 Network Element and Critical Outage (CBCO) code), the mRID can bring this  
435 information.

436 - A BusinessType which identifies the case: Critical Network Element, Red flag,  
437 etc.

438 - A Name which maybe use to provide the outage situation name.

439 - A ReferenceCalculation\_DateAndOrTime that can be used to provide the  
440 reference date and time that were used within the capacity calculation process  
441 to determine the constraint situation.

442 - An Optimization\_MarketObjectStatus which allows to describe the status of the  
443 constraint situation for a Remedial Action Optimization process (branch which  
444 margin must be optimized, constraint for the optimization...).

445 - A list of AdditionalConstraint\_Series which identify additional constraints which  
446 limited flows in the studied case, like an imposed bilateral exchange or a net  
447 position for a given area.

448 • The business type identifies the nature of the additional constraint (TTC,  
449 NTC, Net Position, or Phase Shift Angle).

450 • If the additional constraint is an exchange or a net position constraint,  
451 In\_Domain and Out\_Domain shall identify the direction of the exchange or the  
452 area concerned by a net position.

453 If the additional constraint is a phase shift angle, the  
454 AdditionalConstraint\_Series is associated with  
455 AdditionalConstraint\_RegisteredResource elements, which describe the  
456 elements between which a maximum phase shift angle must not be exceeded.  
457 Within the AdditionalConstraint\_RegisteredResource, the direction of the phase  
458 shift angle is provided by the MarketObjectStatus.status attribute.



- 459 – A list of Contingency\_Series which identify the network elements in outage for  
460 this studied case:
- 461 • There are as many Contingency\_Series as contingencies simulated in the  
462 studied case.
  - 463 • In case of N Situation studied case, there is no Contingency\_Series present  
464 in the Constraint\_Series.
  - 465 • Each Contingency\_Series is associated with one or several  
466 Contingency\_RegisteredResource elements, which describe the network  
467 elements in fault. The Contingency\_RegisteredResource are identified by  
468 their EIC code.
  - 469 • The name of the Contingency\_Series may be provided.
  - 470 • The location of a Contingency\_RegisteredResource is provided by  
471 In\_Domain and Out\_Domain, using EIC code.
- 472 – A list of RemedialAction\_Series, identifying the Remedial Actions which are  
473 performed to relieve the constraints for the studied case. Each  
474 RemedialAction\_Series is associated with one or several  
475 RemedialAction\_RegisteredResource which identify the network elements on  
476 which the remedial action is performed:
- 477 • In case no remedial action is performed, there is no RemedialAction\_Series  
478 present in the Constraint\_Series.
  - 479 • The RemedialAction\_RegisteredResource is identified by its EIC code.
  - 480 • The name of the RemedialAction\_Series or of the  
481 RemedialAction\_RegisteredResource may be provided.
  - 482 • The location of the RemedialAction\_RegisteredResource is provided by  
483 In\_Domain and Out\_Domain, using EIC code.
  - 484 • For orientation purpose, In\_AggregatedNode and Out\_AggregatedNode,  
485 using EIC code, may be used.
  - 486 • The remedial action type shall be provided as Tieline, Line, Generation,  
487 Load, Redispatching, etc.
  - 488 • The remedial action status shall be provided as automatic, preventive or  
489 curative action.
- 490 – A list of Monitored\_Series which identifies the sets of limiting network elements  
491 (so-called Critical network elements) in the studied case. Each  
492 Monitored\_Series is associated with one or several  
493 Monitored\_RegisteredResource which identify the network elements monitored  
494 for a given set (ConnectingLine\_RegisteredResource follows the same rules  
495 that Monitored\_Series):
- 496 • There are as many Monitored\_Series as sets of critical network elements  
497 identified in the studied case.
  - 498 • There is at least one Monitored\_Series present in the Constraint\_Series. The  
499 Monitored\_RegisteredResource is identified by its EIC code.
  - 500 • The name of the Monitored\_RegisteredResource may be provided.
  - 501 • The location of the Monitored\_RegisteredResource is provided by  
502 In\_Domain and Out\_Domain, using EIC code.
  - 503 • For orientation purpose, In\_AggregateNode and Out\_AggregateNode, using  
504 EIC code, may be used.
  - 505 • A list of measurements of interest for the Monitored\_RegisteredResource  
506 may be provided through the usage of the class Analog.
  - 507 • In case of Flow Based, a set of flow Based Parameters may be provided for  
508 the Monitored\_RegisteredResource. In this case:

- 509 The Flow Based Remedial available Margin shall be provided for the studied  
510 flow based Studied Area (using EIC code).
- 511 The shadow price may be provided for the market coupling area (using EIC  
512 code).
- 513 A set of PTDF factors shall be provided. One PTDF factor shall be provided  
514 per bidding zone (using EIC code).
- 515 • The class Analog shall be used to provide the measurements of interest for the  
516 Monitored\_RegisteredResource of the Constraint\_Series:
- 517 – There are as many Analog as measurements of interest for the  
518 Monitored\_RegisteredResource.
- 519 – For one Monitored\_RegisteredResource, the Analog contains:
- 520 • A measurementType which defines the nature of the monitored  
521 measurement. The list of authorized measurementType is: flow, maximum  
522 flow, reference flow, flow reliability margin, spanning margin value, long  
523 term allocation margin, final adjustment margin value.
- 524 • A unitSymbol which identifies the unit of the measurement.
- 525 • A positiveFlowIn which identifies on which direction the  
526 Monitored\_RegisteredResource element is monitored.
- 527 – For each measurement, the values shall be provided by AnalogValues:
- 528 • There is one AnalogValue per Analog measurement.
- 529 • For each AnalogValues:
- 530 – The value of the measurement shall be provided.
- 531 – The constraint duration of such a measurement may be provided.
- 532 – The condition description of such a measurement may be provided as  
533 “Before Outage”, “After Outage”, “After curative action”, etc.
- 534
- 535 – The external constraint identified by a global capacity constraint as a total transfer  
536 capacity (TTC) or a net position limitation (bidding zone import or export) for instance.
- 537 • The Constraint\_Series contains:
- 538 – A BusinessType which identifies the External Constraint. The external  
539 constraint may be of TTC (Total Transfer Capacity), NTC (Net Transfer  
540 Capacity), ATC min, net position, etc.
- 541 – A Name may be used to provide the external constraint name.
- 542 – The external constraint quantity shall be used to provide the quantity  
543 BusinessType-related constraint.
- 544 • In case of external Constraint\_Series, the Contingency\_Series,  
545 RemedialAction\_Series, Monitored\_Series classes shall not be used.
- 546 - Two types of document are identified depending on the two processes of critical  
547 network elements calculation:
- 548 – The critical network elements determination document that is used for a coordinated  
549 NTC calculation process.
- 550 – The flow-based domain document that replaces the ATC in usual IEC 62325-451-3  
551 process and is used directly for Flow Based capacity allocation.
- 552 - Specific types of document for publication are also identified:
- 553 – The critical network elements publication which is used to provide only relevant  
554 information to market information aggregator.
- 555 – The critical network elements market impact publication which is used to provide the  
556 critical network elements which effectively impacted the allocation market.

- 557 – The flow-based domain publication which is used to publish only the relevant  
558 information to market information aggregator.
- 559 – The flow-based market impact document which is used to publish the shadow prices of  
560 the critical network elements to market information aggregator.
- 561 - As defined previously, there shall be at least one monitored element per  
562 Constraint\_Series of constraint situation type:
- 563 – For flow based, only one critical network element shall be identified per constraint  
564 situation.
- 565 – For coordinated NTC calculation, several critical network elements may be identified  
566 per constraint situation.
- 567 - In case no constraint situation can be provided for one specific position of time, the  
568 point shall not provide any Constraint\_Series:
- 569 – The reason class associated to the class Point shall be used to inform that no  
570 constraint situation is provided.
- 571 - In case no constraint situation can be provided for the whole delivery period,  
572 document shall not provide any TimeSeries:
- 573 – The reason class associated to the class MarketDocument shall be used to inform that  
574 no constraint situation is provided for the whole delivery period.
- 575 The dependencies are listed in:
  - 576 - Table 1: Flow Based Domain
  - 577 - Table 2: Flow Based Transparency Publication
  - 578 - Table 3: Flow Based Market Impact Publication
  - 579 - Table 4: Critical Network Element Determination
  - 580 - Table 5: Critical Network Element Publication
  - 581 - Table 6: Critical Network Element Market Impact Publication

582

**Table 1 – Flow based Domain dependency**

Class	Attribute	Flow Based Process
CriticalNetworkElement MarketDocument	type	B08 = Flow Based Domain
	process.processType	A43 = Flow Based domain constraint Day Ahead A44 = Flow Based domain constraint Intraday
	sender_MarketParticipant.marketRole.type	A36 = Capacity Coordinator
	receiver_MarketParticipant.marketRole.type	A04 = TSO
	docStatus	A40: Proposed A37: Confirmed A34: Rejected
	received_MarketDocument.mRID	mRID of the received document in case of a CNE anomaly report
	received_MarketDocument.version	version of the received document in case of a CNE anomaly report
	Related_MarketDocument.mRID	mRID of a related MarketDocument within a given process
	Related_MarketDocument.RevisionNumber	RevisionNumber of a related MarketDocument within a given process
	domain.mRID	used as EIC code of the Flow Based Study Area
Time Series	mRID	used to identify the TS
	businessType	B37 = Constraint Situation B38 = Initial Domain B39 = Flow based Domain Adjusted to Long Term schedules
	In_Domain.mRID	not used
	Out_Domain.mRID	not used
	CurveType	used
Series_Period		
Point		

583

		Constraint Situation Type	External Constraint Type
Border_Series	mRID	used to identify a given maximum flow situation	not used
	businessType	Used C12 = Maximum power exchange	not used
	In_Domain.mRID	used to identify the inArea of the flow	not used
	out_Domain.mRID	used to identify the OutArea of the flow	not used
	flow_Quantity.quantity	used to identify the maximum flow value	not used
Constraint_Series	mRID	used to identify the Constraint_Series	used to identify the Constraint_Series
	businessType	used B40 = Network Element Constraint B41 = Calculation opposition (Red Flag)	used B09 = Net position
	name	may be used To provide a Name to the Constraint Situation	may be used To provide a Name to the External Constraint
	Quantity_Measurement_Unit.name	used for the Flow Based Margin	used for External Constraint (= MW)
	ExternalConstraint_Quantity.quantity	not used	used to provide External Constraint Quantity
	pTDF_Measurement_Unit.name	used for PTDF	not used
	shadowPrice_Measurement_Unit.name	not used	not used
	currency_Unit.name	not used	not used
	Party_MarketParticipant.mRID	used to identify the limiting TSOs	used to identify the limiting TSOs
	Optimization_MarketObjectStatus.status	used to identify the status of the Series for a Remedial Action optimization process	not used

		Constraint Situation Type	External Constraint Type
AdditionalConstraint_Series	mRID	Used to identify the additional constraint	not used
	Business Type	A81 : TTC B09 : Net position A27 : NTC B87 : Phase Shift Angle	not used
	name	Used as the name of the Additional Constraint	not used
	Party_MarketParticipant.mRID	Used to identify the owner of the Additional Constraint	not used
	In_Domain.mRID	If the additional constraint is an exchange or a net position constraint: used to identify area where the energy flows into	not used
	Out_Domain.mRID	If the additional constraint is an exchange or a net position constraint: used to identify area where the energy comes from	not used
	Measurement_unit.name	The measurement unit of the additional constraint	not used
	Quantity.quantity	The value of the additional constraint	not used
RegisteredResource	mRID	used as the EIC or CGMES code of one of the registered resources between which there is a maximum phase shift angle	not used
	name	not used	not used
	In_Domain.mRID	not used	not used
	Out_Domain.mRID	not used	not used
	marketObjectStatus.status	Used to provide the direction of the phase shift angle A46: Importing element A47: Exporting element	not used
Contingency_Series	mRID	Used to identify a given contingency	not used
	name	Used as the name of the contingency to be simulated	not used
	Party_MarketParticipant.mRID	Used to identify the owner of the contingency	not used
Contingency_Registered_Resource	mRID	used as EIC code of the Outage element	not used
	name	used as the name of the Outage element	not used
	In_Domain	used to identify InArea	not used
	Out_Domain	used to identify OutArea	not used
Monitored_Series	mRID	Used to identify a given set of monitored elements	not used
	name	Used as the name of the set of monitored elements	not used
	Party_MarketParticipant.mRID	used to identify the owner of the set of monitored elements	not used
Monitored_RegisteredResource	mRID	used as EIC code of the Monitored element	not used
	name	used as the name of the Monitored element	not used
	In_Domain	used to identify InArea	not used
	Out_Domain	used to identify OutArea	not used
	In_AggregateNode	used to identify InAggregateNode for element orientation	not used
	Out_AggregateNode	used to identify OutAggregateNode for element orientation	not used
	flowBasedStudy_Domain.mRID	used as EIC code of the Flow Based Study Area	not used
	flowBasedStudy_Domain.flowBasedMargin_Quantity.quantity	used for the RAM	not used

		Constraint Situation Type	External Constraint Type
	marketCoupling_Domain.mRID	not used	not used
	marketCoupling_Domain.shadow_Price.amount	not used	not used
Analog	measurementType	used to identify the monitored measurements A01 = Flow A02 = Maximum Flow A03 = Flow Reliability Margin A04 = Spanning Margin Value A05 = Long Term Allocation Margin A06 = Final adjustment margin value	not used
	unitSymbol	used to identify the unit of the measurement "A", "MW", "%"...	not used
	positiveFlowIn	may be used to identify on which direction the element is monitored A01 = Direct A02 = Opposite Not used = Double	not used
	analogValues.value	used to provide the measurement value	not used
	analogValues.timeStamp	may be used to provide the constraint duration	not used
	analogValues.description	may be used to identify the situation of the measurement point "Before Outage", "After Curative Action"...	not used
RemedialAction_Series	mRID	Used to identify the set of remedial actions	not used
	name	used as the name of the element on which a remedial action is carried out	not used
	BusinessType	B58 ; Busbar B59 : Network Element A60 : SPS A27 : NTC A81 : TTC	not used
	ApplicationMode_marketObjectStatus.status	Used to identify the status of the remedial action A18 = Preventive A19 = Curative A27 = Curative or preventive A20 = Automatic	not used
	Party_MarketParticipant.mRID	used to identify the owner of the set of remedial actions	not used
	In_Domain.mRID	If Business Type = TTC or NTC, used to identify the area where the energy is going to	not used
	Out_Domain.mRID	If Business Type = TTC or NTC, used to identify the area where the energy comes from	not used
	Measurement.unit.name	If Business Type = TTC or NTC, the measurement unit of the quantity	not used
	Quantity.quantity	If Business Type = TTC or NTC, the value of the new bilateral exchange	not used
	RemedialAction_RegisteredResource	mRID	used as EIC code of the element on which a remedial action is carried out
name		used as the name of the element on which a remedial action is carried out	not used
pSRType.psrType		used to identify the type of the remedial action A01 = Tieline, A02 = line, A04 = Generation, A05 = Load	not used
In_Domain		used to identify InArea	not used
Out_Domain		used to identify OutArea	not used
In_AggregateNode		may be used to identify InAggregateNode for element orientation	not used

		<b>Constraint Situation Type</b>	<b>External Constraint Type</b>
	Out_AggregateNode	may be used to identify OutAggregateNode for element orientation	not used
	marketObjectStatus_status	Used to identify the status of the remedial action A18 = Preventive A19 = Curative	not used
	resourceCapacity.maximumCapacity	If marketObjectStatus_status = Relative or Absolute : Used to identify the maximum variation or the maximum target value of tap, generation or load	not used
	resourceCapacity.minimumCapacity	If marketObjectStatus_status = Relative or Absolute : Used to identify the minimum variation or the minimum target value of tap, generation or load	not used
	resourceCapacity.defaultCapacity	If marketObjectStatus_status = Relative or Absolute : Used to identify the variation or target value of tap, generation or load	not used
	resourceCapacity.unitSymbol	If marketObjectStatus_status = Relative or Absolute : Used to identify the unit of the target values described	not used
Shared_Domain	Shared_Domain.mRID	EIC code of the area which can use the remedial action	not used
PTDF Domain	mRID	used to identify the impacted bidding zone	not used
	pTDF_Quantity.quantity	used to provide the PTFD factor for the Bidding zone	not used

584

585

**Table 2 – Flow-based transparency publication dependency table**

586

Class	Attribute	Values
CriticalNetworkElement_MarketDocument	mRID	Identification of the document
	revisionNumber	Version of the document
	type	B09 = Flow based domain publication
	process.processType	A43 = Flow based domain constraint day-ahead A44 = Flow based domain constraint intraday
	sender_MarketParticipant.mRID	EIC X code of the sender
	sender_MarketParticipant.marketRole.type	A04 = System Operator A07 = Transmission Capacity Allocator
	receiver_MarketParticipant.mRID	EIC X code of the receiver (Transparency Platform)
	receiver_MarketParticipant.marketRole.type	A32 = Market Information Aggregator
	createdDateTime	UTC time when the document is created in the sender application
	docStatus	May be used. A13: Withdrawn
	received_MarketDocument.mRID	not used
	received_MarketDocument.revisionNumber	not used
	related_MarketDocument.mRID	not used
	related_MarketDocument.RevisionNumber	not used
	time_Period.timeInterval	Delivery period covered by the document.
domain.mRID	used as EIC code of the Flow Based Study Capacity Calculation Region	
Time Series	mRID	used to identify the TS
	businessType	B39: Flowbased Domain Adjusted to Long Term schedules
	In_Domain.mRID	not used
	Out_Domain.mRID	not used
	curveType	A01: Sequential fixed size block
Series_Period	<b>Attribute</b>	<b>Values</b>
	timeInterval	Start and end time of the period EG: <start>2018-03-16T00:00Z</start><end>2018-03-16T00:30Z</end>
	resolution	PT60M
Point	<b>Attribute</b>	<b>Values</b>
	point	used
	Reason.code	May be used: B27: Calculation process failed → This code may be used to indicate that the normal calculation process failed in the given hour and Default FB parameters computation was used instead. B48: Estimated value → This code may be used to indicate that the normal calculation process failed in the given hour and extrapolated or interpolated values were used instead Not used in case calculation process terminated normally for the given hour Not used in case that there are no results for a given point
	Reason.text	May be used Not used in case calculation process terminated normally for the given hour Not used in case that there are no results for a given point

587

588 Note: Within this Business Process, a constraint consists of exactly one critical branch and  
589 optionally a single outage. Therefore, exactly one instance of monitored time series and  
590 monitored registered resource shall be provided per constraint series and not more than one  
591 Contingency\_Series instance shall be provided per Constraint\_Series.

592 In case that there were no available results or no constraints for a given point, no instance of  
593 Constraint\_Series will be provided.



Class	Attribute	Values
Constraint_Series	mRID	used to identify the Constraint_Series
	businessType	B37: Constraint situation → May be used to identify an external constraint situation B40 = Network Element Constraint
	name	not used
	referenceCalculation_DateAndOrTime.Date	not used
	referenceCalculation_DateAndOrTime.Time	Not used
	quantity_Measurement_Unit.name	MAW
	externalConstraint_Quantity.quantity	not used
	externalConstraint_Quantity.quality	not used
	pTDF_Measurement_Unit.name	MAW
	shadowPrice_Measurement_Unit.name	not used
	currency_Unit.name	not used
	Party_MarketParticipant.mRID	not used
	Optimization_MarketObjectStatus.status	not used
	ConstraintStatus_MarketObjectStatus.status	Used only when the constraint is pre-solved A54: Presolved
Reason.code	may be used: B42: Constraint by the market → This code is used to indicate if a branch is virtual.	
Reason.text	may be used	

594

595 Note: There shall not be any instance of contingency\_Series when the constraint is external  
596 (indicated by BusinessType code B37 in Constraint\_Series) or when a Reason with code B27  
597 has been associated with the Point

598

Contingency_Series	Attribute	Values
Contingency_Series	mRID	Used to identify the contingency series
	name	Not used
	Party_MarketParticipant.mRID	Not used

599

600 Note: The location and PSRtype of network elements in contingency/outage are recorded in  
601 transparency platform's master data and will be populated when downloading publications  
602 from transparency platform, but not when data provider submits the flow-based parameters to  
603 the transparency platform.

604 There shall be exactly one instance of contingency\_RegisteredResource associated with  
605 every Contingency\_Series

606

Contingency_RegisteredResource	Attribute	Values
Contingency_RegisteredResource	mRID	EIC code of the Outage element
	name	used in download only (Master data)
	in_Domain	used in download only (Master data)
	out_Domain	used in download only (Master data)
	pSRType.psrType	used in download only (Master data)
	location.type	used in download only (Master data)
Monitored_Series	mRID	Used to identify a given set of monitored elements
	name	not used
	Party_MarketParticipant.mRID	not used

607

608 Note: The location and PSRtype of network elements in critical branch are recorded in  
609 transparency platform's master data and will be populated when downloading publications  
610 from transparency platform, but not when data provider submits the flow-based parameters to  
611 the transparency platform.

612 There shall be only one instance of monitored\_RegisteredResource associated with every  
613 Monitored\_Series.

Monitored_Series	Attribute	Values
Monitored_Series	mRID	EIC code of the monitored element

		Populated with a dummy EIC code when the monitored_RegisteredResource is associated with an external constraint (indicated by BusinessType=B37 in Constraint_Series) or when default values were applied for a given MTU period (indicated by Reason with code B27 associated to the Point)
	Name	used in download only (Master data)
	In_Domain	used in download only (Master data)
	Out_Domain	used in download only (Master data)
	In_AggregateNode	Not used
	Out_AggregateNode	Not used
	pSRType.psrType	used in download only (Master data)
	location.type	used in download only (Master data)
	flowBasedStudy_Domain.mRID	not used
	flowBasedStudy_Domain.flowBasedMargin_Quantity.quantity	used to provide the remaining available margin (RAM)
	flowBasedStudy_Domain.flowBasedMargin_Quantity.quality	not used
	marketCoupling_Domain.mRID	not used
	marketCoupling_Domain.shadow_Price.amount	not used
	Reason.code	B41: Exclusion for SoS reasons → This code may be used to indicate an AMR exclusion.
Reason.text	may be used together with reason code B41 to provide additional explanation	
Analog	measurementType	A02 = Permanent admissible transmission limit (PATL) → Used to specify the maximum allowable power flow (Fmax) A03 = Flow reliability margin A06 = Final adjustment margin value → Used when the final adjustment value is positive A09 = Negative Final adjustment value → Used when the final adjustment value is negative A18 = Adjustment for minimum RAM → (AMR) A22 = Reference Flow → Used to specify the reference flow.
	unitSymbol	Used MAW
	positiveFlowIn	Not used
	analogValues.value	used to provide the measurement value. This value is always zero or positive.
	analogValues.timeStamp	not used
	analogValues.description	not used
PTDF Domain	mRID	Used as PTDF domain/hub EIC code of the bidding zone
	pTDF_Quantity.quantity	Used The PTDF factor for the bidding zone. The value may be positive or negative

614

615

616

**Table 3 – Flow based Market Impact Publication dependency**

Class	Attribute	Flow Based Process
CriticalNetworkElement MarketDocument	type	B10 = Flow Based domain Market Impact Publication
	process.processType	A43 = Flow Based domain constraint DayAhead A44 = Flow Based domain constraint Intraday
	sender_MarketParticipant.marketRole.type	A36 = Capacity Coordinator or A04 = TSO
	receiver_MarketParticipant.marketRole.type	A32 = Market Information Aggregator or A11 = Market Operator
	docStatus	not used
	received_MarketDocument.mRID	not used
	received_MarketDocument.version	not used
	Related_MarketDocument.mRID	mRID of a related MarketDocument within a given process
	Related_MarketDocument.RevisionNumber	RevisionNumber of a related MarketDocument within a given process
domain.mRID	used as EIC code of the Flow Based Study Area	
Time Series	mRID	used to identify the TS
	businessType	B39 = Flow based Domain Adjusted to Long Term schedules
	In_Domain.mRID	not used
	Out_Domain.mRID	not used
	CurveType	used
Series_Period		
Point		

617

		Constraint Situation Type	External Constraint Type
Border_Series	mRID	used to identify a given maximum flow situation	not used
	businessType	Used C12 = Maximum power exchange	not used
	In_Domain.mRID	used to identify the inArea of the flow	not used
	out_Domain.mRID	used to identify the OutArea of the flow	not used
	flow_Quantity.quantity	used to identify the maximum flow value	not used
Constraint_Series	mRID	used to identify the Constraint_Series	used to identify the Constraint_Series
	businessType	used B40 = Network Element Constraint B41 = Calculation opposition (Red Flag)	used B09 = Net position
	name	may be used To provide a Name to the Constraint Situation	may be used To provide a Name to the External Constraint
	Quantity_Measurement_Unit.name	used for the Flow Based Margin	used for External Constraint (= MW)
	ExternalConstraint_Quantity.quantity	not used	used to provide External Constraint Quantity
	pTDF_Measurement_Unit.name	used for PTDF	not used
	shadowPrice_Measurement_Unit.name	not used	not used
	currency_Unit.name	not used	not used
	Party_MarketParticipant.mRID	used to identify the limiting TSOs	used to identify the limiting TSOs
	Optimization_MarketObjectStatus.status	used to identify the status of the Series for a Remedial Action optimization process	not used
Additional	mRID	Used to identify the additional constraint	not used

		Constraint Situation Type	External Constraint Type
	Business Type	A81 : TTC B09 : Net position A27 : NTC B87 : Phase Shift Angle	not used
	name	Used as the name of the Additional Constraint	not used
	Party_MarketParticipant.mRID	Used to identify the owner of the Additional Constraint	not used
	In_Domain.mRID	If the additional constraint is an exchange or a net position constraint: used to identify area where the energy flows into	not used
	Out_Domain.mRID	If the additional constraint is an exchange or a net position constraint: used to identify area where the energy comes from	not used
	Measurement_unit.name	The measurement unit of the additional constraint	not used
	Quantity.quantity	The value of the additional constraint	not used
RegisteredResource	mRID	used as the EIC or CGMES code of one of the registered resources between which there is a maximum phase shift angle	not used
	name	not used	not used
	In_Domain.mRID	not used	not used
	Out_Domain.mRID	not used	not used
	marketObjectStatus.status	Used to provide the direction of the phase shift angle A46: Importing element A47: Exporting element	not used
Contingency_Series	mRID	Used to identify a given contingency	not used
	name	Used as the name of the contingency to be simulated	not used
	Party_MarketParticipant.mRID	Used to identify the owner of the contingency	not used
Contingency_Registered_Resource	mRID	used as EIC code of the Outage element	not used
	name	used as the name of the Outage element	not used
	In_Domain	used to identify InArea	not used
	Out_Domain	used to identify OutArea	not used
Monitored_Series	mRID	Used to identify a given set of monitored elements	not used
	name	Used as the name of the set of monitored elements	not used
	Party_MarketParticipant.mRID	used to identify the owner of the set of monitored elements	not used
Monitored_RegisteredResource	mRID	used as EIC code of the Monitored element	not used
	name	used as the name of the Monitored element	not used
	In_Domain	used to identify InArea	not used
	Out_Domain	used to identify OutArea	not used
	In_AggregateNode	used to identify InAggregateNode for element orientation	not used
	Out_AggregateNode	used to identify OutAggregateNode for element orientation	not used
	flowBasedStudy_Domain.mRID	used as EIC code of the Flow Based Study Area	not used
	flowBasedStudy_Domain.flowBasedMargin_Quantity.quantity	used for the RAM	not used
	marketCoupling_Domain.mRID	not used	not used
marketCoupling_Domain.shadow_Price.amount	not used	not used	
Analog	measurementType	used to identify the monitored measurements A01 = Flow	not used

		Constraint Situation Type	External Constraint Type
		A02 = Maximum Flow A03 = Flow Reliability Margin A04 = Spanning Margin Value A05 = Long Term Allocation Margin A06 = Final adjustment margin value	
	unitSymbol	used to identify the unit of the measurement "A", "MW", "%"...	not used
	positiveFlowIn	may be used to identify on which direction the element is monitored A01 = Direct A02 = Opposite Not used = Double	not used
	analogValues.value	used to provide the measurement value	not used
	analogValues.timeStamp	may be used to provide the constraint duration	not used
	analogValues.description	may be used to identify the situation of the measurement point "Before Outage", "After Curative Action"...	not used
RemedialAction_Series	mRID	Used to identify the set of remedial actions	not used
	name	used as the name of the element on which a remedial action is carried out	not used
	BusinessType	B58 ; Busbar B59 : Network Element A60 : SPS A27 : NTC A81 : TTC	not used
	ApplicationMode_marketObjectStatus.status	Used to identify the status of the remedial action A18 = Preventive A19 = Curative A27 = Curative or preventive A20 = Automatic	not used
	Party_MarketParticipant.mRID	used to identify the owner of the set of remedial actions	not used
	In_Domain.mRID	If Business Type = TTC or NTC, used to identify the area where the energy is going to	not used
	Out_Domain.mRID	If Business Type = TTC or NTC, used to identify the area where the energy comes from	not used
	Measurement.unit.name	If Business Type = TTC or NTC, the measurement unit of the quantity	not used
	Quantity.quantity	If Business Type = TTC or NTC, the value of the new bilateral exchange	not used
RemedialAction_RegisteredResource	mRID	used as EIC code of the element on which a remedial action is carried out	not used
	name	used as the name of the element on which a remedial action is carried out	not used
	pSRType.psrType	used to identify the type of the remedial action A01 = Tieline, A02 = line, A04 = Generation, A05 = Load	not used
	In_Domain	used to identify InArea	not used
	Out_Domain	used to identify OutArea	not used
	In_AggregateNode	may be used to identify InAggregateNode for element orientation	not used
	Out_AggregateNode	may be used to identify OutAggregateNode for element orientation	not used
	marketObjectStatus_status	Used to identify the status of the remedial action A18 = Preventive	not used

		<b>Constraint Situation Type</b>	<b>External Constraint Type</b>
		A19 = Curative	
	resourceCapacity.maximumCapacity	If marketObjectStatus_status = Relative or Absolute : Used to identify the maximum variation or the maximum target value of tap, generation or load	not used
	resourceCapacity.minimumCapacity	If marketObjectStatus_status = Relative or Absolute : Used to identify the minimum variation or the minimum target value of tap, generation or load	not used
	resourceCapacity.defaultCapacity	If marketObjectStatus_status = Relative or Absolute : Used to identify the variation or target value of tap, generation or load	not used
	resourceCapacity.unitSymbol	If marketObjectStatus_status = Relative or Absolute : Used to identify the unit of the target values described	not used
Shared_Domain	Shared_Domain.mRID	EIC code of the area which can use the remedial action	not used
PTDF Domain	mRID	used to identify the impacted bidding zone	not used
	pTDF_Quantity.quantity	used to provide the PTFD factor for the Bidding zone	not used

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**Table 4 – NTC Coordinated Determination dependency**

Class	Attribute	Flow Based Process
CriticalNetworkElement MarketDocument	type	B06 = Critical Network Element Determination
	process.processType	A15 = Capacity Determination or A40 = Intraday Process
	sender_MarketParticipant.marketRole.type	A36 = Capacity Coordinator
	receiver_MarketParticipant.marketRole.type	A04 = TSO
	docStatus	A40: Proposed A37: Confirmed A34: Rejected
	received_MarketDocument.mRID	mRID of the received document in case of a CNE anomaly report
	received_MarketDocument.version	version of the received document in case of a CNE anomaly report
	Related_MarketDocument.mRID	mRID of a related MarketDocument within a given process
	Related_MarketDocument.RevisionNumber	RevisionNumber of a related MarketDocument within a given process
	domain.mRID	used as EIC code of the Flow Based Study Area
Time Series	mRID	used to identify the TS
	businessType	B37 = Constraint Situation
	In_Domain.mRID	used as EIC code of the InArea of the oriented border study impacted by the listed Critical network elements
	Out_Domain.mRID	used as EIC code of the OutArea of the oriented border study impacted by the listed Critical network elements
	CurveType	used
Series_Period		
Point		

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		Constraint Situation Type	External Constraint Type
Border_Series	mRID	used to identify a given maximum flow situation	not used
	businessType	Used C12 = Maximum power exchange	not used
	In_Domain.mRID	used to identify the inArea of the flow	not used
	out_Domain.mRID	used to identify the OutArea of the flow	not used
	flow_Quantity.quantity	used to identify the maximum flow value	not used
Constraint_Series	mRID	used to identify the Constraint_Series	used to identify the Constraint_Series
	businessType	used B40 = Network Element Constraint B41 = Calculation opposition (Red Flag)	used B09 = Net position
	name	may be used To provide a Name to the Constraint Situation	may be used To provide a Name to the External Constraint
	Quantity_Measurement_Unit.name	used for the Flow Based Margin	used for External Constraint (= MW)
	ExternalConstraint_Quantity.quantity	not used	used to provide External Constraint Quantity
	pTDF_Measurement_Unit.name	not used	not used
	shadowPrice_Measurement_Unit.name	not used	not used
	currency_Unit.name	not used	not used
	Party_MarketParticipant.mRID	used to identify the limiting TSOs	used to identify the limiting TSOs
	Optimization_MarketObjectStatus.status	used to identify the status of the Series for a Remedial Action optimization process	not used

		Constraint Situation Type	External Constraint Type
AdditionalConstraint_Series	mRID	Used to identify the additional constraint	not used
	Business Type	A81 : TTC B09 : Net position A27 : NTC B87 : Phase Shift Angle	not used
	name	Used as the name of the Additional Constraint	not used
	Party_MarketParticipant.mRID	Used to identify the owner of the Additional Constraint	not used
	In_Domain.mRID	If the additional constraint is an exchange or a net position constraint: used to identify area where the energy flows into	not used
	Out_Domain.mRID	If the additional constraint is an exchange or a net position constraint: used to identify area where the energy comes from	not used
	Measurement_unit.name	The measurement unit of the additional constraint	not used
	Quantity.quantity	The value of the additional constraint	not used
RegisteredResource	mRID	used as the EIC or CGMES code of one of the registered resources between which there is a maximum phase shift angle	not used
	name	not used	not used
	In_Domain.mRID	not used	not used
	Out_Domain.mRID	not used	not used
	marketObjectStatus.status	Used to provide the direction of the phase shift angle A46: Importing element A47: Exporting element	not used
Contingency_Series	mRID	Used to identify a given contingency	not used
	name	Used as the name of the contingency to be simulated	not used
	Party_MarketParticipant.mRID	used to identify the owner of the set of monitored elements	not used
Contingency_Registered_Resource	mRID	used as EIC code of the Outage element	not used
	name	used as the name of the Outage element	not used
	In_Domain	used to identify InArea	not used
	Out_Domain	used to identify OutArea	not used
Monitored_RegisteredResource	mRID	used as EIC code of the Monitored element	not used
	name	used as the name of the Monitored element	not used
	In_Domain	used to identify InArea	not used
	Out_Domain	used to identify OutArea	not used
	In_AggregateNode	used to identify InAggregateNode for element orientation	not used
	Out_AggregateNode	used to identify OutAggregateNode for element orientation	not used
	flowBasedStudy_Domain.mRID	not used	not used
	flowBasedStudy_Domain.flowBasedMargin_Quantity.quantity	not used	not used
	marketCoupling_Domain.mRID	not used	not used
marketCoupling_Domain.shadow_Price.amount	not used	not used	
Analog	measurementType	used to identify the monitored measurements A01 = Flow A02 = Maximum Flow A03 = Flow Reliability Margin A04 = Spanning Margin Value	not used



		Constraint Situation Type	External Constraint Type
		A05 = Long Term Allocation Margin A06 = Final adjustment margin value	
	unitSymbol	used to identify the unit of the measurement "A", "MW", "%"...	not used
	positiveFlowIn	may be used to identify on which direction the element is monitored A01 = Direct A02 = Opposite Not used = Double	not used
	analogValues.value	used to provide the measurement value	not used
	analogValues.timeStamp	may be used to provide the constraint duration	not used
	analogValues.description	may be used to identify the situation of the measurement point "Before Outage", "After Curative Action"...	not used
RemedialAction_Series	mRID	Used to identify the set of remedial actions	not used
	name	used as the name of the element on which a remedial action is carried out	not used
	BusinessType	B58 ; Busbar B59 : Network Element A60 : SPS A27 : NTC A81 : TTC	not used
	ApplicationMode_marketObjectStatus.status	Used to identify the status of the remedial action A18 = Preventive A19 = Curative A27 = Curative or preventive A20 = Automatic	not used
	Party_MarketParticipant.mRID	used to identify the owner of the set of remedial actions	not used
	In_Domain.mRID	If Business Type = TTC or NTC, used to identify the area where the energy is going to	not used
	Out_Domain.mRID	If Business Type = TTC or NTC, used to identify the area where the energy comes from	not used
	Measurement.unit.name	If Business Type = TTC or NTC, the measurement unit of the quantity	not used
	Quantity.quantity	If Business Type = TTC or NTC, the value of the new bilateral exchange	not used
RemedialAction_RegisteredResource	mRID	used as EIC code of the element on which a remedial action is carried out	not used
	name	used as the name of the element on which a remedial action is carried out	not used
	pSRType.psrType	used to identify the type of the remedial action A01 = Tieline, A02 = line, A04 = Generation, A05 = Load	not used
	In_Domain	used to identify InArea	not used
	Out_Domain	used to identify OutArea	not used
	In_AggregateNode	may be used to identify InAggregateNode for element orientation	not used
	Out_AggregateNode	may be used to identify OutAggregateNode for element orientation	not used
	marketObjectStatus_status	Used to identify the status of the remedial action A18 = Preventive A19 = Curative	not used
	resourceCapacity.maximumCapacity	If marketObjectStatus_status = Relative or Absolute :	not used

		Constraint Situation Type	External Constraint Type
		Used to identify the maximum variation or the maximum target value of tap, generation or load	
	resourceCapacity.minimumCapacity	If marketObjectStatus_status = Relative or Absolute : Used to identify the minimum variation or the minimum target value of tap, generation or load	not used
	resourceCapacity.defaultCapacity	If marketObjectStatus_status = Relative or Absolute : Used to identify the variation or target value of tap, generation or load	not used
	resourceCapacity.unitSymbol	If marketObjectStatus_status = Relative or Absolute : Used to identify the unit of the target values described	not used
Shared_Domain	Shared_Domain.mRID	EIC code of the area which can use the remedial action	not used
PTDF Domain	mRID	not used	not used
	pTDF_Quantity.quantity	not used	not used

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**Table 5 – Critical Network Element Publication dependency**

Class	Attribute	Flow Based Process
CriticalNetworkElement MarketDocument	type	B07 = Critical Network Element Publication
	process.processType	A15 = Capacity Determination or A40 = Intraday Process
	sender_MarketParticipant.marketRole.type	A36 = Capacity Coordinator or A04 = TSO
	receiver_MarketParticipant.marketRole.type	A32 = Market Information Aggregator
	docStatus	not used
	received_MarketDocument.mRID	not used
	received_MarketDocument.version	not used
	Related_MarketDocument.mRID	mRID of a related MarketDocument within a given process
	Related_MarketDocument.RevisionNumber	RevisionNumber of a related MarketDocument within a given process
	domain.mRID	used as EIC code of the Flow Based Study Area
Time Series	mRID	used to identify the TS
	businessType	B37 = Constraint Situation
	In_Domain.mRID	used as EIC code of the InArea of the oriented border study impacted by the listed Critical network elements
	Out_Domain.mRID	used as EIC code of the OutArea of the oriented border study impacted by the listed Critical network elements
	CurveType	used
Series_Period		
Point		

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		Constraint Situation Type	External Constraint Type
Border_Series	mRID	used to identify a given maximum flow situation	not used
	businessType	Used C12 = Maximum power exchange	not used
	In_Domain.mRID	used to identify the inArea of the flow	not used
	out_Domain.mRID	used to identify the OutArea of the flow	not used
	flow_Quantity.quantity	used to identify the maximum flow value	not used
Constraint_Series	mRID	used to identify the Constraint_Series	used to identify the Constraint_Series
	businessType	used B40 = Network Element Constraint B41 = Calculation opposition (Red Flag)	used B09 = Net position
	name	may be used To provide a Name to the Constraint Situation	may be used To provide a Name to the External Constraint
	Quantity_Measurement_Unit.name	used for the Flow Based Margin	used for External Constraint (= MW)
	ExternalConstraint_Quantity.quantity	not used	used to provide External Constraint Quantity
	pTDF_Measurement_Unit.name	not used	not used
	shadowPrice_Measurement_Unit.name	not used	not used
	currency_Unit.name	not used	not used
	Party_MarketParticipant.mRID	used to identify the limiting TSOs	used to identify the limiting TSOs
	Optimization_MarketObjectStatus.status	used to identify the status of the Series for a Remedial Action optimization process	not used

		Constraint Situation Type	External Constraint Type
AdditionalConstraint_Series	mRID	Used to identify the additional constraint	not used
	Business Type	A81 : TTC B09 : Net position A27 : NTC B87 : Phase Shift Angle	not used
	name	Used as the name of the Additional Constraint	not used
	Party_MarketParticipant.mRID	Used to identify the owner of the Additional Constraint	not used
	In_Domain.mRID	If the additional constraint is an exchange or a net position constraint: used to identify area where the energy flows into	not used
	Out_Domain.mRID	If the additional constraint is an exchange or a net position constraint: used to identify area where the energy comes from	not used
	Measurement_unit.name	The measurement unit of the additional constraint	not used
	Quantity.quantity	The value of the additional constraint	not used
RegisteredResource	mRID	used as the EIC or CGMES code of one of the registered resources between which there is a maximum phase shift angle	not used
	name	not used	not used
	In_Domain.mRID	not used	not used
	Out_Domain.mRID	not used	not used
	marketObjectStatus.status	Used to provide the direction of the phase shift angle A46: Importing element A47: Exporting element	not used
Contingency_Series	mRID	Used to identify a given contingency	not used
	name	Used as the name of the contingency to be simulated	not used
	Party_MarketParticipant.mRID	Used to identify the owner of the contingency	not used
Contingency_RegisteredResource	mRID	used as EIC code of the Outage element	not used
	name	used as the name of the Outage element	not used
	In_Domain	used to identify InArea	not used
	Out_Domain	used to identify OutArea	not used
Monitored_Series	mRID	Used to identify a given set of monitored elements	not used
	name	Used as the name of the set of monitored elements	not used
	Party_MarketParticipant.mRID	used to identify the owner of the set of monitored elements	not used
Monitored_RegisteredResource	mRID	used as EIC code of the Monitored element	not used
	name	used as the name of the Monitored element	not used
	In_Domain	used to identify InArea	not used
	Out_Domain	used to identify OutArea	not used
	In_AggregateNode	used to identify InAggregateNode for element orientation	not used
	Out_AggregateNode	used to identify OutAggregateNode for element orientation	not used
	flowBasedStudy_Domain.mRID	not used	not used
	flowBasedStudy_Domain.flowBasedMargin_Quantity.quantity	not used	not used
	marketCoupling_Domain.mRID	not used	not used
	marketCoupling_Domain.shadow_Price.amount	not used	not used
Acasoo	measurementType	used to identify the monitored measurements	not used

		Constraint Situation Type	External Constraint Type
		A01 = Flow A02 = Maximum Flow A03 = Flow Reliability Margin A04 = Spanning Margin Value A05 = Long Term Allocation Margin A06 = Final adjustment margin value	
	unitSymbol	used to identify the unit of the measurement "A", "MW", "%"...	not used
	positiveFlowIn	may be used to identify on which direction the element is monitored A01 = Direct A02 = Opposite Not used = Double	not used
	analogValues.value	used to provide the measurement value	not used
	analogValues.timeStamp	may be used to provide the constraint duration	not used
	analogValues.description	may be used to identify the situation of the measurement point "Before Outage", "After Curative Action"...	not used
RemedialAction_Series	mRID	Used to identify the set of remedial actions	not used
	name	used as the name of the element on which a remedial action is carried out	not used
	BusinessType	B58 ; Busbar B59 : Network Element A60 : SPS A27 : NTC A81 : TTC	not used
	ApplicationMode_marketObjectStatus.status	Used to identify the status of the remedial action A18 = Preventive A19 = Curative A27 = Curative or preventive A20 = Automatic	not used
	Party_MarketParticipant.mRID	used to identify the owner of the set of remedial actions	not used
	In_Domain.mRID	If Business Type = TTC or NTC, used to identify the area where the energy is going to	not used
	Out_Domain.mRID	If Business Type = TTC or NTC, used to identify the area where the energy comes from	not used
	Measurement.unit.name	If Business Type = TTC or NTC, the measurement unit of the quantity	not used
	Quantity.quantity	If Business Type = TTC or NTC, the value of the new bilateral exchange	not used
RemedialAction_RegisteredResource	mRID	used as EIC code of the element on which a remedial action is carried out	not used
	name	used as the name of the element on which a remedial action is carried out	not used
	pSRType.psrType	used to identify the type of the remedial action A01 = Tieline, A02 = line, A04 = Generation, A05 = Load	not used
	In_Domain	used to identify InArea	not used
	Out_Domain	used to identify OutArea	not used
	In_AggregateNode	may be used to identify InAggregateNode for element orientation	not used
	Out_AggregateNode	may be used to identify OutAggregateNode for element orientation	not used
	marketObjectStatus_status	Used to identify the status of the remedial action	not used

		<b>Constraint Situation Type</b>	<b>External Constraint Type</b>
		A18 = Preventive A19 = Curative	
	resourceCapacity.maximumCapacity	If marketObjectStatus_status = Relative or Absolute : Used to identify the maximum variation or the maximum target value of tap, generation or load	not used
	resourceCapacity.minimumCapacity	If marketObjectStatus_status = Relative or Absolute : Used to identify the minimum variation or the minimum target value of tap, generation or load	not used
	resourceCapacity.defaultCapacity	If marketObjectStatus_status = Relative or Absolute : Used to identify the variation or target value of tap, generation or load	not used
	resourceCapacity.unitSymbol	If marketObjectStatus_status = Relative or Absolute : Used to identify the unit of the target values described	not used
Shared_Domain	Shared_Domain.mRID	EIC code of the area which can use the remedial action	not used
PTDF Domain	mRID	not used	not used
	pTDF_Quantity.quantity	not used	not used

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625 **Table 6 – Critical Network Element Market Impact Publication dependency**

Class	Attribute	Flow Based Process
CriticalNetworkElement MarketDocument	type	B12 = Critical Network Element Market Impact Publication
	process.processType	A15 = Capacity Determination or A40 = Intraday Process
	sender_MarketParticipant.marketRole.type	A36 = Capacity Coordinator or A04 = TSO
	receiver_MarketParticipant.marketRole.type	A32 = Market Information Aggregator
	docStatus	not used
	received_MarketDocument.mRID	not used
	received_MarketDocument.version	not used
	Related_MarketDocument.mRID	mRID of a related MarketDocument within a given process
	Related_MarketDocument.RevisionNumber	RevisionNumber of a related MarketDocument within a given process
	domain.mRID	used as EIC code of the Flow Based Study Area
Time Series	mRID	used to identify the TS
	businessType	B37 = Constraint Situation
	In_Domain.mRID	used as EIC code of the InArea of the oriented border study impacted by the listed Critical network elements
	Out_Domain.mRID	used as EIC code of the OutArea of the oriented border study impacted by the listed Critical network elements
	CurveType	used
Series_Period		
Point		

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		Constraint Situation Type	External Constraint Type
Border_Series	mRID	used to identify a given maximum flow situation	not used
	businessType	Used C12 = Maximum power exchange	not used
	In_Domain.mRID	used to identify the inArea of the flow	not used
	out_Domain.mRID	used to identify the OutArea of the flow	not used
	flow_Quantity.quantity	used to identify the maximum flow value	not used
Constraint_Series	mRID	used to identify the Constraint_Series	used to identify the Constraint_Series
	businessType	used B40 = Network Element Constraint B41 = Calculation opposition (Red Flag)	used B09 = Net position
	name	may be used To provide a Name to the Constraint Situation	may be used To provide a Name to the External Constraint
	Quantity_Measurement_Unit.name	used for the Flow Based Margin	used for External Constraint (= MW)
	ExternalConstraint_Quantity.quantity	not used	used to provide External Constraint Quantity
	pTDF_Measurement_Unit.name	not used	not used
	shadowPrice_Measurement_Unit.name	not used	not used
	currency_Unit.name	not used	not used
	Party_MarketParticipant.mRID	used to identify the limiting TSOs	used to identify the limiting TSOs
	Optimization_MarketObjectStatus.status	used to identify the status of the Series for a Remedial Action optimization process	not used

		Constraint Situation Type	External Constraint Type
AdditionalConstraint_Series	mRID	Used to identify the additional constraint	not used
	Business Type	A81 : TTC B09 : Net position A27 : NTC B87 : Phase Shift Angle	not used
	name	Used as the name of the Additional Constraint	not used
	Party_MarketParticipant.mRID	Used to identify the owner of the Additional Constraint	not used
	In_Domain.mRID	If the additional constraint is an exchange or a net position constraint: used to identify area where the energy flows into	not used
	Out_Domain.mRID	If the additional constraint is an exchange or a net position constraint: used to identify area where the energy comes from	not used
	Measurement_unit.name	The measurement unit of the additional constraint	not used
	Quantity.quantity	The value of the additional constraint	not used
RegisteredResource	mRID	used as the EIC or CGMES code of one of the registered resources between which there is a maximum phase shift angle	not used
	name	not used	not used
	In_Domain.mRID	not used	not used
	Out_Domain.mRID	not used	not used
	marketObjectStatus.status	Used to provide the direction of the phase shift angle A46: Importing element A47: Exporting element	not used
Contingency_Series	mRID	Used to identify a given contingency	not used
	name	Used as the name of the contingency to be simulated	not used
	Party_MarketParticipant.mRID	Used to identify the owner of the contingency	not used
Contingency_Registered_Resource	mRID	used as EIC code of the Outage element	not used
	name	used as the name of the Outage element	not used
	In_Domain	used to identify InArea	not used
	Out_Domain	used to identify OutArea	not used
Monitored_Series	mRID	Used to identify a given set of monitored elements	not used
	name	Used as the name of the set of monitored elements	not used
	Party_MarketParticipant.mRID	used to identify the owner of the set of monitored elements	not used
Monitored_RegisteredResource	mRID	used as EIC code of the Monitored element	not used
	name	used as the name of the Monitored element	not used
	In_Domain	used to identify InArea	not used
	Out_Domain	used to identify OutArea	not used
	In_AggregateNode	used to identify InAggregateNode for element orientation	not used
	Out_AggregateNode	used to identify OutAggregateNode for element orientation	not used
	flowBasedStudy_Domain.mRID	not used	not used
	flowBasedStudy_Domain.flowBasedMargin_Quantity.quantity	not used	not used
	marketCoupling_Domain.mRID	not used	not used
	marketCoupling_Domain.shadow_Price.amount	not used	not used
Acasoo	measurementType	used to identify the monitored measurements	not used



		Constraint Situation Type	External Constraint Type
		A01 = Flow A02 = Maximum Flow A03 = Flow Reliability Margin A04 = Spanning Margin Value A05 = Long Term Allocation Margin A06 = Final adjustment margin value	
	unitSymbol	used to identify the unit of the measurement "A", "MW", "%"...	not used
	positiveFlowIn	may be used to identify on which direction the element is monitored A01 = Direct A02 = Opposite Not used = Double	not used
	analogValues.value	used to provide the measurement value	not used
	analogValues.timeStamp	may be used to provide the constraint duration	not used
	analogValues.description	may be used to identify the situation of the measurement point "Before Outage", "After Curative Action"...	not used
RemedialAction_Series	mRID	Used to identify the set of remedial actions	not used
	name	used as the name of the element on which a remedial action is carried out	not used
	BusinessType	B58 ; Busbar B59 : Network Element A60 : SPS A27 : NTC A81 : TTC	not used
	ApplicationMode_marketObjectStatus.status	Used to identify the status of the remedial action A18 = Preventive A19 = Curative A27 = Curative or preventive A20 = Automatic	not used
	Party_MarketParticipant.mRID	used to identify the owner of the set of remedial actions	not used
	In_Domain.mRID	If Business Type = TTC or NTC, used to identify the area where the energy is going to	not used
	Out_Domain.mRID	If Business Type = TTC or NTC, used to identify the area where the energy comes from	not used
	Measurement.unit.name	If Business Type = TTC or NTC, the measurement unit of the quantity	not used
	Quantity.quantity	If Business Type = TTC or NTC, the value of the new bilateral exchange	not used
RemedialAction_RegisteredResource	mRID	used as EIC code of the element on which a remedial action is carried out	not used
	name	used as the name of the element on which a remedial action is carried out	not used
	pSRType.psrType	used to identify the type of the remedial action A01 = Tieline, A02 = line, A04 = Generation, A05 = Load	not used
	In_Domain	used to identify InArea	not used
	Out_Domain	used to identify OutArea	not used
	In_AggregateNode	may be used to identify InAggregateNode for element orientation	not used
	Out_AggregateNode	may be used to identify OutAggregateNode for element orientation	not used
	marketObjectStatus_status	Used to identify the status of the remedial action	not used

		Constraint Situation Type	External Constraint Type
		A18 = Preventive A19 = Curative	
	resourceCapacity.maximumCapacity	If marketObjectStatus_status = Relative or Absolute : Used to identify the maximum variation or the maximum target value of tap, generation or load	not used
	resourceCapacity.minimumCapacity	If marketObjectStatus_status = Relative or Absolute : Used to identify the minimum variation or the minimum target value of tap, generation or load	not used
	resourceCapacity.defaultCapacity	If marketObjectStatus_status = Relative or Absolute : Used to identify the variation or target value of tap, generation or load	not used
	resourceCapacity.unitSymbol	If marketObjectStatus_status = Relative or Absolute : Used to identify the unit of the target values described	not used
Shared_Domain	Shared_Domain.mRID	EIC code of the area which can use the remedial action	not used
PTDF Domain	mRID	not used	not used
	pTDF_Quantity.quantity	not used	not used

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635

636 **4.5.2 IsBasedOn relationships from the European style market profile**

637 Table 7 shows the traceability dependency of the classes used in this package towards the  
638 upper level.

639

**Table 7 - IsBasedOn dependency**

Name	Complete IsBasedOn Path
AdditionalConstraint_Measure_Unit	TC57CIM::IEC62325::MarketManagement::Unit
AdditionalConstraint_RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
AdditionalConstraint_Series	TC57CIM::IEC62325::MarketManagement::Series
AggregateNode	TC57CIM::IEC62325::MarketOperations::ReferenceData::AggregateNode
Analog	TC57CIM::IEC61970::Base::Meas::Analog
AnalogValue	TC57CIM::IEC61970::Base::Meas::AnalogValue
Border_Series	TC57CIM::IEC62325::MarketManagement::Series
Constraint_Series	TC57CIM::IEC62325::MarketManagement::Series
ConstraintStatus_MarketObjectStatus	TC57CIM::IEC62325::MarketManagement::MarketObjectStatus
Contingency_RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
Contingency_Series	TC57CIM::IEC62325::MarketManagement::Series
CriticalNetworkElement_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Currency_Unit	TC57CIM::IEC62325::MarketManagement::Unit
Domain	TC57CIM::IEC62325::MarketManagement::Domain
ExternalConstraint_Quantity	TC57CIM::IEC62325::MarketManagement::Quantity
Flow_Quantity	TC57CIM::IEC62325::MarketManagement::Quantity
FlowBasedMargin_Quantity	TC57CIM::IEC62325::MarketManagement::Quantity
FlowBasedStudy_Domain	TC57CIM::IEC62325::MarketManagement::Domain
Location	TC57CIM::IEC61968::Common::Location
MarketCoupling_Domain	TC57CIM::IEC62325::MarketManagement::Domain
MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
MarketObjectStatus	TC57CIM::IEC62325::MarketManagement::MarketObjectStatus
MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
MarketRole	TC57CIM::IEC62325::MarketCommon::MarketRole
Measure_Unit	TC57CIM::IEC62325::MarketManagement::Unit
MktPSRType	TC57CIM::IEC62325::MarketManagement::MktPSRType
Monitored_RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
Monitored_Series	TC57CIM::IEC62325::MarketManagement::Series
Party_MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
Point	TC57CIM::IEC62325::MarketManagement::Point
Price	TC57CIM::IEC62325::MarketManagement::Price
Process	TC57CIM::IEC62325::MarketManagement::Process
PTDF_Domain	TC57CIM::IEC62325::MarketManagement::Domain

Name	Complete IsBasedOn Path
PTDF_Quantity	TC57CIM::IEC62325::MarketManagement::Quantity
Quantity	TC57CIM::IEC62325::MarketManagement::Quantity
Reason	TC57CIM::IEC62325::MarketManagement::Reason
ReferenceCalculation_DateAndOrTime	TC57CIM::IEC62325::MarketManagement::DateAndOrTime
RegisteredResource_Reason	TC57CIM::IEC62325::MarketManagement::Reason
RemedialAction_AggregateNode	TC57CIM::IEC62325::MarketOperations::ReferenceData::AggregateNode
RemedialAction_Measure_Unit	TC57CIM::IEC62325::MarketManagement::Unit
RemedialAction_RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
RemedialAction_Series	TC57CIM::IEC62325::MarketManagement::Series
ResourceCapacity	TC57CIM::IEC62325::MarketCommon::ResourceCapacity
Series_Period	TC57CIM::IEC62325::MarketManagement::Period
Series_Reason	TC57CIM::IEC62325::MarketManagement::Reason
Shadow_Price	TC57CIM::IEC62325::MarketManagement::Price
Shared_Domain	TC57CIM::IEC62325::MarketManagement::Domain
Time_Period	TC57CIM::IEC62325::MarketManagement::Period
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

640

641



649

650 **4.6.2 IsBasedOn relationships from the European style market profile**

651 Table 8 shows the traceability dependency of the classes used in this package towards the  
652 upper level.

653

**Table 8 - IsBasedOn dependency**

Name	Complete IsBasedOn Path
AdditionalConstraint_RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
AdditionalConstraint_Series	TC57CIM::IEC62325::MarketManagement::Series
Analog	TC57CIM::IEC61970::Base::Meas::Analog
Border_Series	TC57CIM::IEC62325::MarketManagement::Series
Constraint_Series	TC57CIM::IEC62325::MarketManagement::Series
Contingency_RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
Contingency_Series	TC57CIM::IEC62325::MarketManagement::Series
CriticalNetworkElement_MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
MarketDocument	TC57CIM::IEC62325::MarketManagement::MarketDocument
Monitored_RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
Monitored_Series	TC57CIM::IEC62325::MarketManagement::Series
Party_MarketParticipant	TC57CIM::IEC62325::MarketCommon::MarketParticipant
Point	TC57CIM::IEC62325::MarketManagement::Point
PTDF_Domain	TC57CIM::IEC62325::MarketManagement::Domain
Reason	TC57CIM::IEC62325::MarketManagement::Reason
RegisteredResource_Reason	TC57CIM::IEC62325::MarketManagement::Reason
RemedialAction_RegisteredResource	TC57CIM::IEC62325::MarketCommon::RegisteredResource
RemedialAction_Series	TC57CIM::IEC62325::MarketManagement::Series
Series_Period	TC57CIM::IEC62325::MarketManagement::Period
Series_Reason	TC57CIM::IEC62325::MarketManagement::Reason
Shared_Domain	TC57CIM::IEC62325::MarketManagement::Domain
TimeSeries	TC57CIM::IEC62325::MarketManagement::TimeSeries

654

655

656 **4.6.3 Detailed CriticalNetworkElement assembly model**

657 **4.6.3.1 CriticalNetworkElement\_MarketDocument root class**

658 This document provides the computed critical network elements to be used for capacity  
659 allocation and publication. The critical network elements are the main limiting elements  
660 identified after a coordinated network study.

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

663 Table 9 shows all attributes of CriticalNetworkElement\_MarketDocument.

664 **Table 9 - Attributes of CriticalNetworkElement assembly**  
665 **model::CriticalNetworkElement\_MarketDocument**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	The unique identification of the document being exchanged within a business process flow.
1	[1..1]	revisionNumber ESMPVersion_String	The identification of the version that distinguishes one evolution of a document from another.
2	[1..1]	type MessageKind_String	The coded type of a document. The document type describes the principal characteristic of the document.
3	[1..1]	process.processType ProcessKind_String	The identification of the nature of process that the document addresses. --- The process dealt with in the document.
4	[1..1]	sender_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- Document owner.
5	[1..1]	sender_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- Document owner. --- The role associated with a MarketParticipant.
6	[1..1]	receiver_MarketParticipant.mRID PartyID_String	The identification of a party in the energy market. --- Document recipient.
7	[1..1]	receiver_MarketParticipant.marketRole.type MarketRoleKind_String	The identification of the role played by a market player. --- Document recipient. --- The role associated with a MarketParticipant.
8	[1..1]	createdDateTime ESMP_DateTime	The date and time of the creation of the document.
9	[0..1]	docStatus Action_Status	The identification of the condition or position of the document with regard to its standing.
12	[1..1]	time_Period.timeInterval ESMP_DateTimeInterval	The start and end date and time for a given interval. --- This information provides the start and end date and time of the critical network elements study time interval. All time intervals for the time series in the document shall be within the total time interval for the study. The receiver will discard any time intervals outside the time period.
13	[0..1]	domain.mRID AreaID_String	The unique identification of the domain. --- The identification of the domain that is covered in the critical network element document. It is in general the coordinated capacity determination area that is the subject of the schedule plan.

666

667 Table 10 shows all association ends of CriticalNetworkElement\_MarketDocument with other  
668 classes.



669  
670

**Table 10 - Association ends of CriticalNetworkElement assembly model::CriticalNetworkElement\_MarketDocument with other classes**

Order	mult.	Class name / Role	Description
10	[0..1]	MarketDocument Received_MarketDocument	Association Based On: CriticalNetworkElement contextual model::MarketDocument.Received_MarketDocument[0..1] ----- CriticalNetworkElement contextual model::CriticalNetworkElement_MarketDocument.[]
11	[0..*]	MarketDocument Related_MarketDocument	The identification of an electronic document that is related to an electronic document header. Association Based On: CriticalNetworkElement contextual model::CriticalNetworkElement_MarketDocument.[] ----- CriticalNetworkElement contextual model::MarketDocument.Related_MarketDocument[0..*]
14	[0..*]	TimeSeries TimeSeries	The time series that is associated with an electronic document. Association Based On: CriticalNetworkElement contextual model::CriticalNetworkElement_MarketDocument.[] ----- CriticalNetworkElement contextual model::TimeSeries.TimeSeries[0..*]
15	[0..*]	Reason Reason	The Reason associated with the electronic document header providing different motivations for the creation of the document. Association Based On: CriticalNetworkElement contextual model::Reason.Reason[0..*] ----- CriticalNetworkElement contextual model::CriticalNetworkElement_MarketDocument.[]

671

#### 672 4.6.3.2 AdditionalConstraint\_RegisteredResource

673 This is a resource contributing to the relevant additional constraint.

674 Table 11 shows all attributes of AdditionalConstraint\_RegisteredResource.

675  
676

**Table 11 - Attributes of CriticalNetworkElement assembly model::AdditionalConstraint\_RegisteredResource**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ResourceID_String	The unique identification of a resource. In the ESMP context, the "model authority" is defined as an authorized issuing office that provides an agreed identification coding scheme for market participant, domain, measurement point, resources (generator, lines, substations, etc.) identification. Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.
1	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.
2	[0..1]	in_Domain.mRID AreaID_String	The unique identification of the domain. --- The identification of the domain linked by the registered resource.
3	[0..1]	out_Domain.mRID AreaID_String	The unique identification of the domain. --- The identification of the domain linked by the registered resource.

Order	mult.	Attribute name / Attribute type	Description
4	[0..1]	marketObjectStatus.status Status_String	The status of the remedial action resource. It may be preventive or curative. The coded condition or position of an object with regard to its standing. --- The status of the registered resource, e.g. connected, disconnected, outage, ...

677

678 Table 12 shows all association ends of AdditionalConstraint\_RegisteredResource with other  
679 classes.

680

681

**Table 12 - Association ends of CriticalNetworkElement assembly  
model::AdditionalConstraint\_RegisteredResource with other classes**

Order	mult.	Class name / Role	Description
5	[0..*]	RegisteredResource_Reason Reason	The reason information associated with a RegisteredResource providing motivation information. Association Based On: CriticalNetworkElement contextual model::AdditionalConstraint_RegisteredResource.[] ----- CriticalNetworkElement contextual model::RegisteredResource_Reason.Reason[0..*]

682

#### 683 4.6.3.3 AdditionalConstraint\_Series

684 An additional constraint limiting capacity in the load flow study

685 Table 13 shows all attributes of AdditionalConstraint\_Series.

686

687

**Table 13 - Attributes of CriticalNetworkElement assembly  
model::AdditionalConstraint\_Series**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	A unique identification of the time series. In the ESMP context, the "model authority" is defined as a party (originator of the exchange) that provides a unique identification in the context of a business exchange such as time series identification, bid identification, ... Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.
1	[0..1]	businessType BusinessKind_String	The identification of the nature of the time series.
2	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.
4	[0..1]	in_Domain.mRID AreaID_String	The unique identification of the domain. --- The domain associated with a TimeSeries.
5	[0..1]	out_Domain.mRID AreaID_String	The unique identification of the domain. --- The domain associated with a TimeSeries.
6	[0..1]	measurement_Unit.name MeasurementUnitKind_String	The identification of the formal code for a measurement unit (UN/ECE Recommendation 20). --- The unit of measure associated with the quantities in a TimeSeries.

Order	mult.	Attribute name / Attribute type	Description
7	[0..1]	quantity.quantity Decimal	The quantity value. The association role provides the information about what is expressed. --- The quantity information associated to a TimeSeries.

688

689 Table 14 shows all association ends of AdditionalConstraint\_Series with other classes.

690

**Table 14 - Association ends of CriticalNetworkElement assembly model::AdditionalConstraint\_Series with other classes**

691

Order	mult.	Class name / Role	Description
3	[0..*]	Party_MarketParticipant Party_MarketParticipant	The identification of a market participant associated with a TimeSeries. Association Based On: CriticalNetworkElement contextual model::Party_MarketParticipant.Party_MarketParticipant[0..*] ----- CriticalNetworkElement contextual model::AdditionalConstraint_Series.[]
8	[0..*]	AdditionalConstraint_RegisteredResource RegisteredResource	The identification of a resource associated with a TimeSeries. Association Based On: CriticalNetworkElement contextual model::AdditionalConstraint_RegisteredResource.RegisteredResource[0..*] ----- CriticalNetworkElement contextual model::AdditionalConstraint_Series.[]
9	[0..*]	Series_Reason Reason	The reason information associated with a TimeSeries providing motivation information. Association Based On: CriticalNetworkElement contextual model::Series_Reason.Reason[0..*] ----- CriticalNetworkElement contextual model::AdditionalConstraint_Series.[]

692

#### 693 4.6.3.4 Analog

694 Analog represents an analog Measurement.

695 Analog provides the analog measurements monitored for one specific  
696 Monitored\_RegisteredResource.

697 Table 15 shows all attributes of Analog.

698

**Table 15 - Attributes of CriticalNetworkElement assembly model::Analog**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	measurementType AnalogType_String	Specifies the type of measurement. For example, this specifies if the measurement represents line flow, maximum line flow, reference line flow, etc.
1	[1..1]	unitSymbol UnitSymbol	The unit of measure of the measured quantity.
2	[0..1]	positiveFlowIn ESMPBoolean_String	If true then this measurement is an active power, reactive power or current with the convention that a positive value measured at the Terminal means power is flowing into the related Monitored_RegisteredResource depending on the In_AggregateNode and the Out_AggregateNode.

Order	mult.	Attribute name / Attribute type	Description
3	[1..1]	analogValues.value ESMP_Float	The value to supervise. --- Measurement to which this value is connected.
4	[0..1]	analogValues.timeStamp DateTime	The date and time to which the value refers to; it may be before or after the outage time (attribute position of class Point). --- Measurement to which this value is connected.
5	[0..1]	analogValues.description String	It provides information about when the measurement point is computed, i.e. before the outage, after the outage, after curative action, etc. --- Measurement to which this value is connected.

699

#### 700 4.6.3.5 Border\_Series

701 This Series defines the specific maximum flow studied by the load flow calculation. It can  
702 either be a maximum bilateral flow on a border, or a maximum/minimum Net Position between  
703 two zones.

704 Table 16 shows all attributes of Border\_Series.

705 **Table 16 - Attributes of CriticalNetworkElement assembly model::Border\_Series**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	A unique identification of the time series. In the ESMP context, the "model authority" is defined as a party (originator of the exchange) that provides a unique identification in the context of a business exchange such as time series identification, bid identification, ... Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.
1	[1..1]	businessType BusinessKind_String	The identification of the nature of the time series.
2	[0..1]	in_Domain.mRID AreaID_String	The unique identification of the domain. --- The domain associated with a TimeSeries.
3	[0..1]	out_Domain.mRID AreaID_String	The unique identification of the domain. --- The domain associated with a TimeSeries.
4	[0..1]	flow_Quantity.quantity Decimal	The quantity value. The association role provides the information about what is expressed. --- The quantity information associated to a TimeSeries.

706

707 Table 17 shows all association ends of Border\_Series with other classes.

708 **Table 17 - Association ends of CriticalNetworkElement assembly model::Border\_Series**  
709 **with other classes**

Order	mult.	Class name / Role	Description
5	[0..*]	Monitored_RegisteredResource ConnectingLine_RegisteredResource	The identification of a resource associated with a TimeSeries. Association Based On: CriticalNetworkElement contextual model::Monitored_RegisteredResource.ConnectingLine_RegisteredResource[0..*] ----- CriticalNetworkElement contextual model::Border_Series.[]

710

711 **4.6.3.6 Constraint\_Series**

712 A set of constraint situations for one specific position which results from the critical network  
713 elements determination process and which may have an impact on the market by inducing  
714 congestions.

715 Table 18 shows all attributes of Constraint\_Series.

716 **Table 18 - Attributes of CriticalNetworkElement assembly model::Constraint\_Series**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	A unique identification of the time series. In the ESMP context, the "model authority" is defined as a party (originator of the exchange) that provides a unique identification in the context of a business exchange such as time series identification, bid identification, ... Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.
1	[1..1]	businessType BusinessKind_String	The identification of the nature of the time series.
2	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.
3	[0..1]	referenceCalculation_DateAndOrTime.date Date	The date as "YYYY-MM-DD", which conforms with ISO 8601. --- A date and/or time associated with a TimeSeries.
4	[0..1]	referenceCalculation_DateAndOrTime.time Time	The time as "hh:mm:ss.sssZ", which conforms with ISO 8601. --- A date and/or time associated with a TimeSeries.
5	[0..1]	quantity_Measurement_Unit.name MeasurementUnitKind_String	The identification of the formal code for a measurement unit (UN/ECE Recommendation 20). --- The unit of measure associated with the quantities in a TimeSeries.
6	[0..1]	externalConstraint_Quantity.quantity Decimal	The quantity value associated to the business type of the Constraint_TimeSeries. The association role provides the information about what is expressed. --- The quantity information associated to a TimeSeries.
7	[0..1]	externalConstraint_Quantity.quality Quality_String	The description of the quality of the quantity. --- The quantity information associated to a TimeSeries.
8	[0..1]	pTDF_Measurement_Unit.name MeasurementUnitKind_String	The identification of the formal code for a measurement unit (UN/ECE Recommendation 20). --- The unit of measure associated with the quantities in a TimeSeries.
9	[0..1]	shadowPrice_Measurement_Unit.name MeasurementUnitKind_String	The identification of the formal code for a measurement unit (UN/ECE Recommendation 20). --- The unit of measure associated with the quantities in a TimeSeries.
10	[0..1]	currency_Unit.name CurrencyCode_String	The identification of the formal code for a currency (ISO 4217). --- The currency associated with a TimeSeries.
12	[0..1]	optimization_MarketObjectStatus.status Status_String	The status of the remedial action resource. It may be preventive or curative. The coded condition or position of an object with regard to its standing. --- The status of an object associated with a TimeSeries.

Order	mult.	Attribute name / Attribute type	Description
13	[0..1]	constraintStatus_MarketObjectStatus.status Status_String	The coded condition or position of an object with regard to its standing. --- The status of an object associated with a TimeSeries.

717

718 Table 19 shows all association ends of Constraint\_Series with other classes.

719 **Table 19 - Association ends of CriticalNetworkElement assembly**  
720 **model::Constraint\_Series with other classes**

Order	mult.	Class name / Role	Description
11	[0..*]	Party_MarketParticipant Party_MarketParticipant	The identification of a market participant associated with a TimeSeries. Association Based On: CriticalNetworkElement contextual model::Constraint_Series.[] ----- CriticalNetworkElement contextual model::Party_MarketParticipant.Party_MarketParticipant[0..*]
14	[0..*]	AdditionalConstraint_Series AdditionalConstraint_Series	Association Based On: CriticalNetworkElement contextual model::AdditionalConstraint_Series.AdditionalConstraint_Series[0..*] ----- CriticalNetworkElement contextual model::Constraint_Series.[]
15	[0..*]	Contingency_Series Contingency_Series	Association Based On: CriticalNetworkElement contextual model::Constraint_Series.[] ----- CriticalNetworkElement contextual model::Contingency_Series.Contingency_Series[0..*]
16	[0..*]	Monitored_Series Monitored_Series	Association Based On: CriticalNetworkElement contextual model::Monitored_Series.Monitored_Series[0..*] ----- CriticalNetworkElement contextual model::Constraint_Series.[]
17	[0..*]	RemedialAction_Series RemedialAction_Series	Association Based On: CriticalNetworkElement contextual model::RemedialAction_Series.RemedialAction_Series[0..*] ----- CriticalNetworkElement contextual model::Constraint_Series.[]
18	[0..*]	Reason Reason	The reason information associated with a TimeSeries providing motivation information. Association Based On: CriticalNetworkElement contextual model::Constraint_Series.[] ----- CriticalNetworkElement contextual model::Reason.Reason[0..*]

721

#### 722 4.6.3.7 Contingency\_RegisteredResource

723 This is one of the network elements which are in outage for the studied constraint situation  
724 defined by the Constraint\_Series.

725 Table 20 shows all attributes of Contingency\_RegisteredResource.

726  
727

**Table 20 - Attributes of CriticalNetworkElement assembly model::Contingency\_RegisteredResource**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ResourceID_String	This is one of the network elements which are in outage for the studied constraint situation defined by the Constraint_Time Series. The unique identification of a resource.
1	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.
2	[0..1]	in_Domain.mRID AreaID_String	The unique identification of the domain. --- The control area where an extremity of the resource is located. This is used to provide orientation information.
3	[0..1]	out_Domain.mRID AreaID_String	The unique identification of the domain. --- The control area where an extremity of the resource is located. This is used to provide orientation information.
4	[0..1]	pSRType.psrType PsrType_String	The coded type of a power system resource. --- The identification of the type of resource associated with this RegisteredResource.
5	[0..1]	location.name String	The name is any free human readable and possibly non unique text naming the object. --- Location of this power system resource.

728

729 Table 21 shows all association ends of Contingency\_RegisteredResource with other classes.

730  
731

**Table 21 - Association ends of CriticalNetworkElement assembly model::Contingency\_RegisteredResource with other classes**

Order	mult.	Class name / Role	Description
6	[0..*]	RegisteredResource_Reason Reason	The reason information associated with a RegisteredResource providing motivation information. Association Based On: CriticalNetworkElement contextual model::RegisteredResource_Reason.Reason[0..*] ----- CriticalNetworkElement contextual model::Contingency_RegisteredResource.[]

732

#### 733 4.6.3.8 Contingency\_Series

734 A contingency defined by a set of elements on which a modification is applied in order to  
735 simulate a defect.

736 Table 22 shows all attributes of Contingency\_Series.

737 **Table 22 - Attributes of CriticalNetworkElement assembly model::Contingency\_Series**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	A unique identification of the time series. In the ESMP context, the "model authority" is defined as a party (originator of the exchange) that provides a unique identification in the context of a business exchange such as time series identification, bid identification, ... Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.

Order	mult.	Attribute name / Attribute type	Description
1	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.

738

739 Table 23 shows all association ends of Contingency\_Series with other classes.

740

**Table 23 - Association ends of CriticalNetworkElement assembly model::Contingency\_Series with other classes**

741

Order	mult.	Class name / Role	Description
2	[0..*]	Party_MarketParticipant Party_MarketParticipant	The identification of a market participant associated with a TimeSeries. Association Based On: CriticalNetworkElement contextual model::Party_MarketParticipant.Party_MarketParticipant[0..*] ----- CriticalNetworkElement contextual model::Contingency_Series.[]
3	[0..*]	Contingency_RegisteredResource RegisteredResource	The identification of a resource associated with a TimeSeries. Association Based On: CriticalNetworkElement contextual model::Contingency_RegisteredResource.RegisteredResource[0..*] ----- CriticalNetworkElement contextual model::Contingency_Series.[]
4	[0..*]	Series_Reason Reason	The reason information associated with a TimeSeries providing motivation information. Association Based On: CriticalNetworkElement contextual model::Series_Reason.Reason[0..*] ----- CriticalNetworkElement contextual model::Contingency_Series.[]

742

#### 743 4.6.3.9 MarketDocument

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

746 Table 24 shows all attributes of MarketDocument.

**747 Table 24 - Attributes of CriticalNetworkElement assembly model::MarketDocument**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	The unique identification of the document being exchanged within a business process flow. In the ESMP context, the "model authority" is defined as a party (originator of the exchange) that provides an identification in the context of a business exchange such as document identification, ... Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.
1	[1..1]	revisionNumber ESMPVersion_String	The identification of the version that distinguishes one evolution of a document from another.

748



749 **4.6.3.10 Monitored\_RegisteredResource**

750 This is the critical network element of the power network in the constraint situation described  
751 by the Constraint\_Series. Analog measurements are monitored for this resource to identify  
752 the impact of this critical network element on the market.

753 Table 25 shows all attributes of Monitored\_RegisteredResource.

754 **Table 25 - Attributes of CriticalNetworkElement assembly**  
755 **model::Monitored\_RegisteredResource**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ResourceID_String	This is the network element of the power network in the constraint situation described by the Constraint_TimeSeries. The unique identification of a resource.
1	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.
2	[0..1]	in_Domain.mRID AreaID_String	The unique identification of the domain. --- The control area where the flow measurement enters for the monitored resource.
3	[0..1]	out_Domain.mRID AreaID_String	The unique identification of the domain. --- The control area connected to the monitored resource where the flow measurement comes out.
4	[0..1]	in_AggregateNode.mRID ResourceID_String	The unique identification of an AggregateNode. In the ESMP context, the "model authority" is defined as an authorized issuing office that provides an agreed identification coding scheme for market participant, domain, measurement point, resources (generator, lines, substations, etc.) identification. Master resource identifier issued by a model authority. The mRID is unique within an exchange context. Global uniqueness is easily achieved by using a UUID, as specified in RFC 4122, for the mRID. The use of UUID is strongly recommended. For CIMXML data files in RDF syntax conforming to IEC 61970-552 Edition 1, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements. --- The identification of the aggregate node that is linked to the registered resource.

Order	mult.	Attribute name / Attribute type	Description
5	[0..1]	out_AggregateNode.mRID ResourceID_String	The unique identification of an AggregateNode. In the ESMP context, the "model authority" is defined as an authorized issuing office that provides an agreed identification coding scheme for market participant, domain, measurement point, resources (generator, lines, substations, etc.) identification. Master resource identifier issued by a model authority. The mRID is unique within an exchange context. Global uniqueness is easily achieved by using a UUID, as specified in RFC 4122, for the mRID. The use of UUID is strongly recommended. For CIMXML data files in RDF syntax conforming to IEC 61970-552 Edition 1, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements. --- The identification of the aggregate node that is linked to the registered resource.
6	[0..1]	pSRType.psrType PsrType_String	The coded type of a power system resource. --- The identification of the type of resource associated with this RegisteredResource.
7	[0..1]	location.name String	The name is any free human readable and possibly non unique text naming the object. --- Location of this power system resource.
8	[0..1]	flowBasedStudy_Domain.mRID AreaID_String	The area used for running the flow based calculation. The unique identification of the domain. --- The identification of the flow based study area linked to the critical network element.
9	[0..1]	flowBasedStudy_Domain.flowBasedMargin_Quantity.quantity Decimal	The quantity value of remaining available margin of the critical network element identified in Monitored_RegisteredResource.. The association role provides the information about what is expressed. --- The identification of the flow based study area linked to the critical network element. --- This is the associated RAM quantity of the critical network element for a flow based study domain.
10	[0..1]	flowBasedStudy_Domain.flowBasedMargin_Quantity.quality Quality_String	The description of the quality of the quantity. --- The identification of the flow based study area linked to the critical network element. --- This is the associated RAM quantity of the critical network element for a flow based study domain.
11	[0..1]	marketCoupling_Domain.mRID AreaID_String	The identification of the flow based market coupling area. The unique identification of the domain. --- The identification of the flow based market coupling domain impacted by the critical network element.

Order	mult.	Attribute name / Attribute type	Description
12	[0..1]	marketCoupling_Domain.shadow_Price.amount Amount_Decimal	A number of monetary units specified in a unit of currency. --- The identification of the flow based market coupling domain impacted by the critical network element. --- The impact of the critical network element on the variation of the social welfare of the market coupling domain.

756

757 Table 26 shows all association ends of Monitored\_RegisteredResource with other classes.

758 **Table 26 - Association ends of CriticalNetworkElement assembly**  
759 **model::Monitored\_RegisteredResource with other classes**

Order	mult.	Class name / Role	Description
13	[0..*]	PTDF_Domain PTDF_Domain	The bidding zone impacted by the critical network element and for which a PTDF factor is calculated. Association Based On: CriticalNetworkElement contextual model::PTDF_Domain.PTDF_Domain[0..*] ----- CriticalNetworkElement contextual model::Monitored_RegisteredResource.[]
14	[0..*]	Analog Measurements	The monitored measurements for the critical network element. Association Based On: CriticalNetworkElement contextual model::Analog.Measurements[0..*] ----- CriticalNetworkElement contextual model::Monitored_RegisteredResource.[]
15	[0..*]	RegisteredResource_Reason Reason	The reason information associated with a RegisteredResource providing motivation information. Association Based On: CriticalNetworkElement contextual model::RegisteredResource_Reason.Reason[0..*] ----- CriticalNetworkElement contextual model::Monitored_RegisteredResource.[]

760

761 **4.6.3.11 Monitored\_Series**

762 A situation to be monitored defined by a set of elements on which a coupled monitoring must  
763 be performed.

764 Table 27 shows all attributes of Monitored\_Series.

765 **Table 27 - Attributes of CriticalNetworkElement assembly model::Monitored\_Series**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	A unique identification of the time series. In the ESMP context, the "model authority" is defined as a party (originator of the exchange) that provides a unique identification in the context of a business exchange such as time series identification, bid identification, ... Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.
1	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.

766

767 Table 28 shows all association ends of Monitored\_Series with other classes.

768 **Table 28 - Association ends of CriticalNetworkElement assembly**  
769 **model::Monitored\_Series with other classes**

Order	mult.	Class name / Role	Description
2	[0..*]	Party_MarketParticipant Party_MarketParticipant	The identification of a market participant associated with a TimeSeries. Association Based On: CriticalNetworkElement contextual model::Party_MarketParticipant.Party_MarketParticipant[0..*] ----- CriticalNetworkElement contextual model::Monitored_Series.[]
3	[0..*]	Monitored_RegisteredResource RegisteredResource	The identification of a resource associated with a TimeSeries. Association Based On: CriticalNetworkElement contextual model::Monitored_RegisteredResource.RegisteredResource[0..*] ----- CriticalNetworkElement contextual model::Monitored_Series.[]
4	[0..*]	Series_Reason Reason	The reason information associated with a TimeSeries providing motivation information. Association Based On: CriticalNetworkElement contextual model::Monitored_Series.[] ----- CriticalNetworkElement contextual model::Series_Reason.Reason[0..*]

770

#### 771 4.6.3.12 Party\_MarketParticipant

772 The identification of the limiting TSOs for the given contingency, obtained after the network  
773 studies. It can also identify the TSO that provides the Series.

774 Table 29 shows all attributes of Party\_MarketParticipant.

775 **Table 29 - Attributes of CriticalNetworkElement assembly**  
776 **model::Party\_MarketParticipant**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID PartyID_String	The identification of the limiting TSO associated to the Constraint_TimeSeries.

777

#### 778 4.6.3.13 Point

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

780 Table 30 shows all attributes of Point.

781 **Table 30 - Attributes of CriticalNetworkElement assembly model::Point**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	position Position_Integer	A sequential value representing the relative position within a given time interval.

782

783 Table 31 shows all association ends of Point with other classes.

784 **Table 31 - Association ends of CriticalNetworkElement assembly model::Point with**  
785 **other classes**

Order	mult.	Class name / Role	Description
1	[0..*]	Border_Series Border_Series	TheTimeSeries provides additional information related to a Position within a given time interval. Association Based On: CriticalNetworkElement contextual model::Border_Series.Border_Series[0..*] ----- CriticalNetworkElement contextual model::Point.[]
2	[0..*]	Constraint_Series Constraint_Series	Association Based On: CriticalNetworkElement contextual model::Constraint_Series.Constraint_Series[0..*] ----- CriticalNetworkElement contextual model::Point.[]
3	[0..*]	Reason Reason	The Reason information associated with a Point providing motivation information. Association Based On: CriticalNetworkElement contextual model::Point.[] ----- CriticalNetworkElement contextual model::Reason.Reason[0..*]

786

787 **4.6.3.14 PTDF\_Domain**

788 The bidding zone impacted by the critical network element.

789 A domain covering a number of related objects, such as market balance area, grid area,  
790 borders etc.

791 Table 32 shows all attributes of PTDF\_Domain.

792 **Table 32 - Attributes of CriticalNetworkElement assembly model::PTDF\_Domain**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID AreaID_String	The bidding zone impacted by the critical network element. The unique identification of the domain.
1	[1..1]	pTDF_Quantity.quantity Decimal	The PTDF factor value associated to the bidding zone for the critical network element. The association role provides the information about what is expressed. --- The PTDF factor value associated to the bidding zone for the critical network element.
2	[0..1]	pTDF_Quantity.quality Quality_String	The description of the quality of the quantity. --- The PTDF factor value associated to the bidding zone for the critical network element.

793

794 **4.6.3.15 Reason**

795 The motivation of an act.

796 Table 33 shows all attributes of Reason.

797 **Table 33 - Attributes of CriticalNetworkElement assembly model::Reason**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	code ReasonCode_String	The motivation of an act in coded form.
1	[0..1]	text ReasonText_String	The textual explanation corresponding to the reason code.

798

799 **4.6.3.16 RegisteredResource\_Reason**

800 The reason information associated with a RegisteredResource providing motivation  
801 information.

802 Table 34 shows all attributes of RegisteredResource\_Reason.

803 **Table 34 - Attributes of CriticalNetworkElement assembly**  
804 **model::RegisteredResource\_Reason**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	code ReasonCode_String	The motivation of an act in coded form.
1	[0..1]	text ReasonText_String	The textual explanation corresponding to the reason code.

805

806 **4.6.3.17 RemedialAction\_RegisteredResource**

807 This is one of the network element on which remedial action are carried out to improve the  
808 constraint situation. Those elements are used to remedy to critical constraints induced by the  
809 constraint situation.

810 The type of the remedial action is also provided: generation, load and topology.

811 Table 35 shows all attributes of RemedialAction\_RegisteredResource.

812 **Table 35 - Attributes of CriticalNetworkElement assembly**  
813 **model::RemedialAction\_RegisteredResource**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ResourceID_String	This is one of the network element on which remedial action are carried out to improve the constraint situation. Those elements are used to remedy to critical constraints induced by the constraint situation. The unique identification of a resource.
1	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.
2	[1..1]	pSRType.psrType PsrType_String	The coded type of a power system resource. --- The identification of the type of resource associated with this RegisteredResource.
3	[0..1]	in_Domain.mRID AreaID_String	The unique identification of the domain. --- The control area where an extremity of the resource is located. This is used to provide orientation information.
4	[0..1]	out_Domain.mRID AreaID_String	The unique identification of the domain. --- The control area where an extremity of the resource is located. This is used to provide orientation information.

Order	mult.	Attribute name / Attribute type	Description
5	[0..1]	in_AggregateNode.mRID ResourceID_String	The unique identification of an AggregateNode. In the ESMP context, the "model authority" is defined as an authorized issuing office that provides an agreed identification coding scheme for market participant, domain, measurement point, resources (generator, lines, substations, etc.) identification. Master resource identifier issued by a model authority. The mRID is unique within an exchange context. Global uniqueness is easily achieved by using a UUID, as specified in RFC 4122, for the mRID. The use of UUID is strongly recommended. For CIMXML data files in RDF syntax conforming to IEC 61970-552 Edition 1, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements. --- The identification of the aggregate node that is linked to the registered resource.
6	[0..1]	out_AggregateNode.mRID ResourceID_String	The unique identification of an AggregateNode. In the ESMP context, the "model authority" is defined as an authorized issuing office that provides an agreed identification coding scheme for market participant, domain, measurement point, resources (generator, lines, substations, etc.) identification. Master resource identifier issued by a model authority. The mRID is unique within an exchange context. Global uniqueness is easily achieved by using a UUID, as specified in RFC 4122, for the mRID. The use of UUID is strongly recommended. For CIMXML data files in RDF syntax conforming to IEC 61970-552 Edition 1, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements. --- The identification of the aggregate node that is linked to the registered resource.
7	[1..1]	marketObjectStatus.status Status_String	The status of the remedial action resource. It may be preventive or curative. The coded condition or position of an object with regard to its standing. --- The status of the registered resource, e.g. connected, disconnected, outage, ...
8	[0..1]	resourceCapacity.maximumCapacity Decimal	The maximum capacity.
9	[0..1]	resourceCapacity.minimumCapacity Decimal	The minimum capacity.
10	[0..1]	resourceCapacity.defaultCapacity Decimal	The default capacity.
11	[0..1]	resourceCapacity.unitSymbol UnitSymbol	Unit selection for the capacity values.

814

815 Table 36 shows all association ends of RemedialAction\_RegisteredResource with other  
816 classes.

817 **Table 36 - Association ends of CriticalNetworkElement assembly**  
818 **model::RemedialAction\_RegisteredResource with other classes**

Order	mult.	Class name / Role	Description
12	[0..*]	Analog Measurements	The power system resource that contains the measurement. Association Based On: CriticalNetworkElement contextual model::Analog.Measurements[0..*] ----- CriticalNetworkElement contextual model::RemedialAction_RegisteredResource.[]

Order	mult.	Class name / Role	Description
13	[0..*]	RegisteredResource_Reason Reason	The reason information associated with a RegisteredResource providing motivation information. Association Based On: CriticalNetworkElement contextual model::RegisteredResource_Reason.Reason[0..*] ----- CriticalNetworkElement contextual model::RemedialAction_RegisteredResource.[]

819

#### 820 4.6.3.18 RemedialAction\_Series

821 A set of remedial actions provided to relieve a network constraint after applying the  
822 contingencies provided in the Constraint\_Series.

823 Table 37 shows all attributes of RemedialAction\_Series.

824 **Table 37 - Attributes of CriticalNetworkElement assembly**  
825 **model::RemedialAction\_Series**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	A unique identification of the time series. In the ESMP context, the "model authority" is defined as a party (originator of the exchange) that provides a unique identification in the context of a business exchange such as time series identification, bid identification, ... Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.
1	[0..1]	name String	The name is any free human readable and possibly non unique text naming the object.
2	[0..1]	businessType BusinessKind_String	The identification of the nature of the time series.
3	[0..1]	applicationMode_MarketObjectStatus.status Status_String	The status of the remedial action resource. It may be preventive or curative. The coded condition or position of an object with regard to its standing. --- The status of an object associated with a TimeSeries.
5	[0..1]	in_Domain.mRID AreaID_String	The unique identification of the domain. --- The domain associated with a TimeSeries.
6	[0..1]	out_Domain.mRID AreaID_String	The unique identification of the domain. --- The domain associated with a TimeSeries.
7	[0..1]	measurement_Unit.name MeasurementUnitKind_String	The identification of the formal code for a measurement unit (UN/ECE Recommendation 20). --- The unit of measure associated with the quantities in a TimeSeries.
8	[0..1]	quantity.quantity Decimal	The quantity value. The association role provides the information about what is expressed. --- The quantity information associated to a TimeSeries.
9	[0..1]	price.amount Amount_Decimal	A number of monetary units specified in a unit of currency. --- The price information associated to a TimeSeries.

826

827 Table 38 shows all association ends of RemedialAction\_Series with other classes.



828  
829

**Table 38 - Association ends of CriticalNetworkElement assembly model::RemedialAction\_Series with other classes**

Order	mult.	Class name / Role	Description
4	[0..*]	Party_MarketParticipant Party_MarketParticipant	The identification of a market participant associated with a TimeSeries. Association Based On: CriticalNetworkElement contextual model::Party_MarketParticipant.Party_MarketParticipant[0..*] ----- CriticalNetworkElement contextual model::RemedialAction_Series.[]
10	[0..*]	RemedialAction_RegisteredResource RegisteredResource	The identification of a resource associated with a TimeSeries. Association Based On: CriticalNetworkElement contextual model::RemedialAction_Series.[] ----- CriticalNetworkElement contextual model::RemedialAction_RegisteredResource.RegisteredResource[0..*]
11	[0..*]	Shared_Domain Shared_Domain	The domain associated with a TimeSeries. Association Based On: CriticalNetworkElement contextual model::Shared_Domain.Shared_Domain[0..*] ----- CriticalNetworkElement contextual model::RemedialAction_Series.[]
12	[0..*]	Series_Reason Reason	The reason information associated with a TimeSeries providing motivation information. Association Based On: CriticalNetworkElement contextual model::Series_Reason.Reason[0..*] ----- CriticalNetworkElement contextual model::RemedialAction_Series.[]

830

831 **4.6.3.19 Series\_Period**

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

833 Table 39 shows all attributes of Series\_Period.

834 **Table 39 - Attributes of CriticalNetworkElement assembly model::Series\_Period**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	timeInterval ESMP_DateTimeInterval	The start and end time of the period.
1	[1..1]	resolution Duration	The definition of the number of units of time that compose an individual step within a period.

835

836 Table 40 shows all association ends of Series\_Period with other classes.

837 **Table 40 - Association ends of CriticalNetworkElement assembly model::Series\_Period**  
838 **with other classes**

Order	mult.	Class name / Role	Description
2	[1..*]	Point Point	The Point information associated with a given Series_Period.within a TimeSeries. Association Based On: CriticalNetworkElement contextual model::Series_Period.[] ----- CriticalNetworkElement contextual model::Point.Point[1..*]

839

840 **4.6.3.20 Series\_Reason**

841 The reason information associated with a Series providing motivation information.

842 Table 41 shows all attributes of Series\_Reason.

843 **Table 41 - Attributes of CriticalNetworkElement assembly model::Series\_Reason**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	code ReasonCode_String	The motivation of an act in coded form.
1	[0..1]	text ReasonText_String	The textual explanation corresponding to the reason code.

844

845 **4.6.3.21 Shared\_Domain**

846 The areas allowed to use the remedial action.

847 Table 42 shows all attributes of Shared\_Domain.

848 **Table 42 - Attributes of CriticalNetworkElement assembly model::Shared\_Domain**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID AreaID_String	The unique identification of the domain. In the ESMP context, the "model authority" is defined as an authorized issuing office that provides an agreed identification coding scheme for market participant, domain, measurement point, resources (generator, lines, substations, etc.) identification. Master resource identifier issued by a model authority. The mRID is globally unique within an exchange context. Global uniqueness is easily achieved by using a UUID for the mRID. It is strongly recommended to do this. For CIMXML data files in RDF syntax, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements.

849

850 **4.6.3.22 TimeSeries**

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

852 Table 43 shows all attributes of TimeSeries.

853 **Table 43 - Attributes of CriticalNetworkElement assembly model::TimeSeries**

Order	mult.	Attribute name / Attribute type	Description
0	[1..1]	mRID ID_String	A unique identification of the time series.

Order	mult.	Attribute name / Attribute type	Description
1	[1..1]	businessType BusinessKind_String	The identification of the nature of the time series.
2	[0..1]	in_Domain.mRID AreaID_String	The unique identification of the domain. --- In case of NTC determination process, this is the area of the related oriented border study in which the energy flows into.
3	[0..1]	out_Domain.mRID AreaID_String	The unique identification of the domain. --- In case of NTC determination process, this is the area of the related oriented border study in which the energy comes from.
4	[1..1]	curveType CurveType_String	The identification of the coded representation of the type of curve being described.
5	[0..1]	currency_Unit.name CurrencyCode_String	The identification of the formal code for a currency (ISO 4217). --- The currency associated with a TimeSeries.
6	[0..1]	price_Measurement_Unit.name MeasurementUnitKind_String	The identification of the formal code for a measurement unit (UN/ECE Recommendation 20). --- The unit of measure associated with the quantities in a TimeSeries.

854

855 Table 44 shows all association ends of TimeSeries with other classes.

856 **Table 44 - Association ends of CriticalNetworkElement assembly model::TimeSeries**  
857 **with other classes**

Order	mult.	Class name / Role	Description
7	[1..*]	Series_Period Period	The time interval and resolution for a period associated with a TimeSeries. Association Based On: CriticalNetworkElement contextual model::TimeSeries.[] ----- CriticalNetworkElement contextual model::Series_Period.Period[1..*]
8	[0..*]	Reason Reason	At the TimeSeries level the reason code is used to enable processing of the reason text which, depending on market conditions, should be provided in intra day trading. In this context only one reason code has been defined (A48, modification reason). No other codes are permitted. Association Based On: CriticalNetworkElement contextual model::TimeSeries.[] ----- CriticalNetworkElement contextual model::Reason.Reason[0..*]

858

#### 859 4.6.4 Datatypes

860 The list of datatypes used for the CriticalNetworkElement assembly model is as follows:

- 861 • Action\_Status compound
- 862 • ESMP\_DateTimeInterval compound
- 863 • Amount\_Decimal datatype
- 864 • AnalogType\_String datatype, codelist AnalogTypeList
- 865 • AreaID\_String datatype, codelist CodingSchemeTypeList
- 866 • BusinessKind\_String datatype, codelist BusinessTypeList
- 867 • CurrencyCode\_String datatype, codelist CurrencyTypeList
- 868 • CurveType\_String datatype, codelist CurveTypeList
- 869 • ESMP\_DateTime datatype
- 870 • ESMP\_Float datatype
- 871 • ESMPBoolean\_String datatype, codelist IndicatorTypeList
- 872 • ESMPVersion\_String datatype
- 873 • ID\_String datatype
- 874 • MarketRoleKind\_String datatype, codelist RoleTypeList

- 875 • MeasurementUnitKind\_String datatype, codelist UnitOfMeasureTypeList
- 876 • MessageKind\_String datatype, codelist MessageTypeList
- 877 • PartyID\_String datatype, codelist CodingSchemeTypeList
- 878 • Position\_Integer datatype
- 879 • ProcessKind\_String datatype, codelist ProcessTypeList
- 880 • PsrType\_String datatype, codelist AssetTypeList
- 881 • Quality\_String datatype, codelist QualityTypeList
- 882 • ReasonCode\_String datatype, codelist ReasonCodeTypeList
- 883 • ReasonText\_String datatype
- 884 • ResourceID\_String datatype, codelist CodingSchemeTypeList
- 885 • Status\_String datatype, codelist StatusTypeList
- 886 • UnitSymbol datatype, codelist UnitSymbol
- 887 • YMDHM\_DateTime datatype

888

889

890 This version of the CriticalNetworkElement Implementation Guide refers to the schemas as defined in  
891 version 2.4 of the CriticalNetworkElement XSD.