



European Network of
Transmission System Operators
for Electricity

CACM LIST OF INFORMATION TO ACER

IMPLEMENTATION GUIDE

2021-06-01

APPROVED DOCUMENT
VERSION 1.2

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24 absolute prohibition of the specification.
- 25 • **SHOULD:** This word, or the adjective "RECOMMENDED", means that there may exist valid
26 reasons in particular circumstances to ignore a particular item, but the full implications must
27 be understood and carefully weighed before choosing a different course.
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29 exist valid reasons in particular circumstances when the particular behaviour is acceptable
30 or even useful, but the full implications should be understood and the case carefully weighed
31 before implementing any behaviour described with this label.
- 32 • **MAY:** This word, or the adjective "OPTIONAL", means that an item is truly optional.

Revision History

Version	Release	Date	Paragraph	Comments
0	1	2018-05-29		First draft of the ACER CACM Implementation guide.
0	2	2018-10-01		Second draft of the IG. All comments from EDI members have been considered.
0	3	2018-11-08		Third draft of the IG. Comments from EDI members, CGMES and RSC experts have been considered.
1	0	2018-11-08		Approved by MC
1	1	2020-09-16		In order to facilitate the reporting of the different attributes and give some flexibility to data providers, all report attributes are now considered as optional. References to CGMES UUIDs are deleted because TP does not support them currently. In order to facilitate the mapping between EIC codes and UUIDs, a reference to the Coding Schemes Mapping IG was introduced. Capacity Coordinator role was updated to Coordinated Capacity Calculator in order to align the IG with the last version of the HRM. Approved by MC.
1	2	2021-06-01		When data providers submit data describing NTC-based capacity allocation and network utilisation, the CNE document contains a reference to a publication document. In NTC methodology part of the sequence diagram, the exchange of publication market document now occurs before the exchange of the CNE document. Some explanatory notes were also added. Approved by MC.

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108 1 Scope

109 The objective of this implementation guide is to make possible for ENTSO-E and TSOs to submit
110 data on the list of information elaborated by ACER in cooperation with ENTSO-E, in accordance
111 with Article 82(4, 5) of the CACM guideline.

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

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

117

118 2 References

119 2.1 Normative references

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

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

126 • [IEC 62325-450:2013, Framework for energy market communications – Part 450: Profile](#)
127 [and context modelling rules.](#)

128 • [IEC 62325-451-1:2017, Framework for energy market communications – Part 451-1:](#)
129 [Acknowledgement business process and contextual model for CIM European market.](#)

130 • [IEC 62325-451-3:2014+AMD1:2017 CSV, Framework for energy market](#)
131 [communications – Part 451-3: ENTSO-E Capacity Allocation and Nomination business](#)
132 [process and contextual model for CIM European market.](#)

133 • [IEC 62325-451-6:2018 Framework for energy market communications - Part 451-6:](#)
134 [Publication of information on market, contextual and assembly models for European-](#)
135 [style markets](#)

136 • [IEC TS 61970-600-1:2017 Energy management system application program interface](#)
137 [\(EMS-API\) - Part 600-1: Common Grid Model Exchange Specification \(CGMES\) -](#)
138 [Structure and rules](#)

139 • [IEC TS 61970-600-2:2017 Energy management system application program interface](#)
140 [\(EMS-API\) - Part 600-2: Common Grid Model Exchange Specification \(CGMES\) -](#)
141 [Exchange profiles specification](#)

142

143 2.2 Other references

144 • [Articles 82\(4\) and \(5\) of the CACM Guideline \(Commission Regulation \(EU\) N°](#)
145 [1222/2015 of 24 July 2015 establishing a guideline on capacity allocation and](#)
146 [congestion management\)](#)

147 • [Article 8\(9\) of Regulation 714/2009](#)

148 • [Critical Network Element Document UML Model and Schema](#)

149 • [Coding Schemes Mapping Implementation Guide](#)

150 • [The Harmonised Electricity Market Role Model](#)

- 151 • Detailed Data Descriptions for the purpose of the ACER CACM list of information
- 152 • Business Requirements Specification for ACER CACM

153 **3 Terms and definitions**

154 **ACER: Agency for the Cooperation of Energy Regulators.**

155 **Actual network losses on the relevant interconnectors:** means the quantity of energy (in
156 MW) over a market time unit that is consumed due to losses.

157 **Applied loss factor on the relevant interconnectors:** means the assumed linearization of the
158 loss (in % of the nominal flow) on a particular cross-border grid element.

159 **Available margin (MW), Article 29(7)(e) CACM:** means the maximum flow of the CNEC
160 reduced by base case flow, reliability margin and the calculated flow from previously allocated
161 capacities.

162 **Available margin (MW), Article 29(7)(f) CACM:** means the available margin pursuant to Article
163 29(7)(e) CACM adjusted for the consideration of remedial actions in capacity calculation.

164 **Base case flow (MW), Article 29(7)(d) CACM:** means the calculated physical flow on the
165 CNEC assuming no cross zonal exchanges within the concerned CCR as specified in the
166 capacity calculation methodology.

167 **Begin date and time:** means the first day and exact time including the market time unit of the
168 curtailment.

169 **Bidding zone border:** means the borders between two bidding zones, a bidding zone being
170 the largest geographical area within which market participants are able to exchange energy
171 without capacity allocation.

172 **Binding constraint in defining cross-zonal capacity:** means the most critical network
173 element(s) with contingency limiting the cross-zonal capacity.

174 **Calculated realised physical flow in real time (MW):** means for those Critical Network
175 Element & Contingency with non-zero shadow prices the actual flow over the selected critical
176 network element that would occur in the specified contingency.

177 **Capacity calculation market time unit (date, hour):** means the period for which the market
178 price is established or the shortest possible common time period for the two bidding zones, if
179 their market time units are different, all times are expressed in UTC time zone.

180 **Capacity calculation region (CCR):** means the concerned capacity calculation region as
181 defined in Article 2(3) CACM.

182 **Capacity calculation timeframes:**

183 • Day-ahead timeframe means the period of time within which the day-ahead market is
184 organized. It starts with the closure of the long-term market and ends with the gate
185 closure of the day-ahead market. Delivery is for the following day for each market time
186 unit.

187 • Intraday timeframe means the period of time within which the intraday market is
188 organized. It starts with the gate opening of the intraday market and ends with the
189 closure of the intraday market. Delivery is either for the following day or within the day
190 for each market time unit.

191

192 **CIM:** Common Information Model, set of standards for modelling data exchanges in an electrical
193 utility enterprise developed under IEC TC 57.

194 **Common Grid Model (CGM):** means a Union-wide data set agreed between TSOs describing
195 the main characteristic of the power system (generation, loads and grid topology) and rules for
196 changing these characteristics during the capacity calculation process.

- 197 **CGMES:** Common Grid Model Exchange Specification
- 198 **CGMES v2.4.15:** means the Edition 1 of the IEC Technical Specifications of CGMES: [IEC TS](#)
199 [61970-600-1:2017](#) and [IEC TS 61970-600-2:2017](#).
- 200 **Compensation/reimbursement:** means the amount of money paid by TSO(s) for each
201 individual curtailment, expressed in €.
- 202 **Critical Network Element & Contingency (CNEC):** means a critical network element limiting
203 the cross-zonal exchanges, potentially associated to a contingency which is defined as the
204 tripping of one single or several network elements.
- 205 **Cross-Zonal Capacity (MW), Article 29(8)(e) CACM:** means maximum admissible power flow
206 between two bidding zones calculated in accordance with Article 29(8)(c) CACM taking into
207 account reliability margin, previously allocated cross-zonal capacity and rules for efficiently
208 sharing the power flow capabilities of critical network elements among different bidding zone
209 borders.
- 210 **Curtailment:** means the cancellation or reduction of already allocated cross-border
211 transmission rights before or after their nomination.
- 212 **DACF:** Day Ahead Congestion Forecast.
- 213 **DEP:** Data Exchange Processes.
- 214 **End date and time:** means the last day and exact time including the market time unit of the
215 curtailment.
- 216 **EQ:** Equipment.
- 217 **Flow-based approach, Article 2(9) CACM:** means a capacity calculation method in which
218 energy exchanges between bidding zones are limited by power transfer distribution factors and
219 available margins on critical network elements.
- 220 **Flow from previously allocated capacity (MW), Article 29(7)(c) CACM:** cross-zonal capacity
221 allocated in previous timeframes in a form of long term transmission rights per bidding zone
222 border for each market time unit.
- 223 **IGM:** Individual Grid Model.
- 224 **Maximum Flow (MW), Article 29(7)(a) CACM:** means the maximum admissible power flow
225 when considering the operational security limits e.g. permanent admissible transmission
226 loading (PATL) as defined in the capacity calculation methodology of the concerned CCR.
- 227 **MIA:** Market Information Aggregator.
- 228 **Power Transfer Distribution Factors (PTDF):** indicates the incremental change in real power
229 that occurs on transmission lines due to real power transfers between two regions.
- 230 **Previously allocated cross zonal capacity (MW), Article 29(8)(e) CACM:** means the cross-
231 zonal capacity allocated in previous timeframes in a form of long-term transmission rights per
232 bidding zone border for each market time unit.
- 233 **Resource Description Framework (RDF):** Is a data model for objects ("resources") and
234 relations between them, provides a simple semantics for this data model, and these data models
235 can be represented in an XML syntax.
- 236 **Resource Description Framework Schema (RDFS):** Is a vocabulary for describing properties
237 and classes of RDF resources, with a semantics for generalization-hierarchies of such
238 properties and classes.
- 239 **Reduction in cross-zonal capacity:** means the value of reduction of the cross zonal capacity
240 for each market time unit between begin and end time expressed in MW.
- 241 **Reliability margin (MW), Article 22(5) CACM:** means the transmission reliability margin
242 calculated and applied for each bidding zone border in accordance with the capacity calculation.

- 243 **RSC:** Regional Security Coordinator.
- 244 **Shadow price of critical branches (€/MW):** means the marginal increase of market surplus
245 when the constraint of the critical branches is marginally relaxed.
- 246 **SSH:** Steady State Hypothesis.
- 247 **SV:** State Variables.
- 248 **TP:** Topology.
- 249 **TSO:** Transmission System Operator.
- 250

251 4 The ACER list of information Business Process

252 4.1 Overview

253 Article 82(4) of the CACM guideline says that “The Agency, in cooperation with ENTSO for Electricity,
254 shall draw up by six months after the entry into force of this Regulation a list of the relevant information
255 to be communicated by ENTSO for Electricity to the Agency in accordance with Articles 8(9) and 9(1)
256 of Regulation (EC) No 714/2009. The list of relevant information may be subject to updates. ENTSO-E
257 shall maintain a comprehensive, standardised format, digital data archive of the information required
258 by the Agency.”

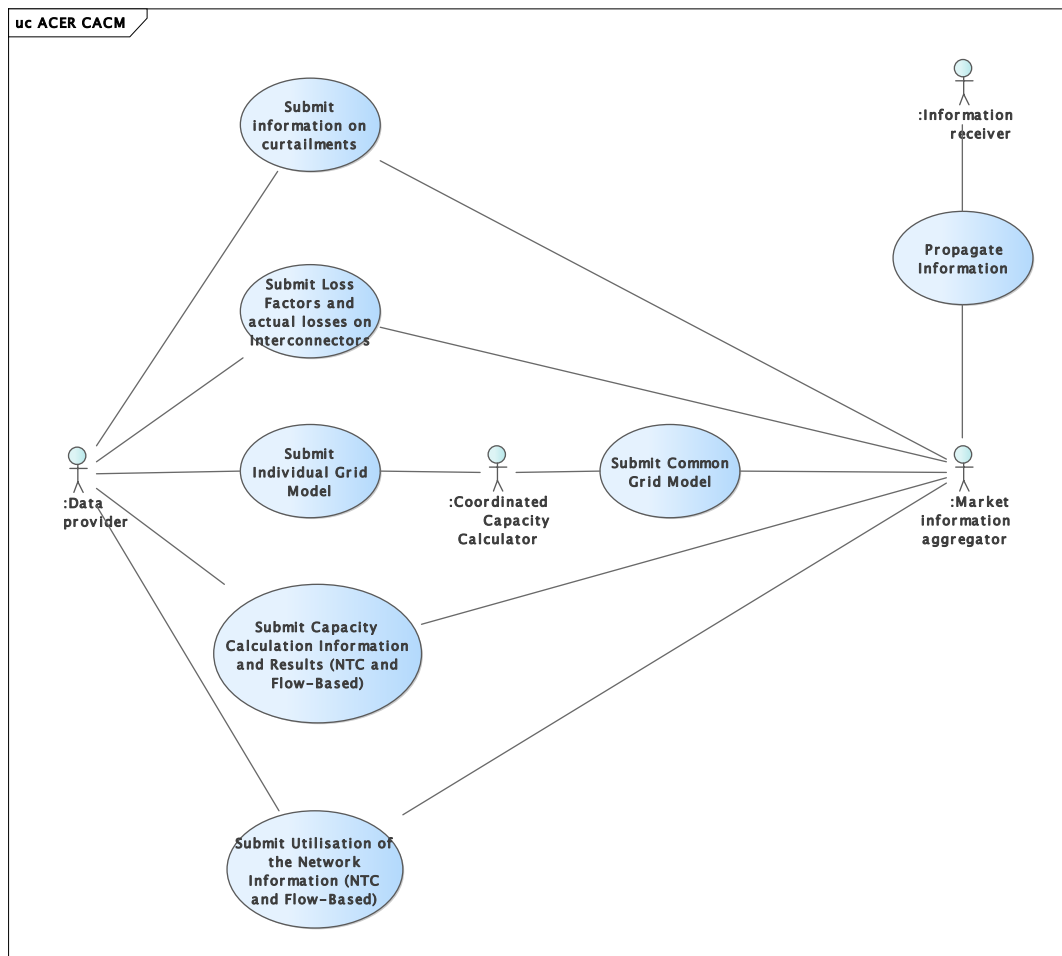
259
260 Article 82(5) of the CACM says also that “All TSOs shall submit to ENTSO for Electricity the
261 information required to perform the tasks in accordance with paragraphs 2 and 4.”

262
263 These articles provide a legal basis for ACER to request ENTSO-E and TSOs to provide the
264 information required to monitor the implementation of the CACM regulation. Following these articles,
265 ACER prepared a list of information that focuses on the information needed to monitor the effect of the
266 implementation of the CACM Regulation on the harmonisation of applicable rules aimed at facilitating
267 market integration, non-discrimination, effective competition and the efficient functioning of the market.
268

269 In practice, the different categories of information to be submitted are:

- 270
271 • Monitoring the efficiency of bidding zones.
272 To monitor the efficiency between bidding zones, it is necessary to provide the curtailments on
273 a border during a certain time interval. It is also mandatory to provide the DACF CGM in
274 CGMES format. The DACF process is executed every calendar day, whereby the RSCs get
275 the individual grid models as input and merge them into a common grid models.
276
- 277 • Information on Capacity Calculation Process and result
 - 278 ○ Critical network elements and contingencies and results
279 This information consists on data extracted from the capacity calculation process such
280 as contingencies, monitored elements and remedial actions. Additionally, maximum
281 flows studied by the load flow calculation per border and interconnectors will be
282 provided. For flow-based approach, PTDF factors and shadow price of the critical
283 elements are also included in the data submission.
284
 - 285 ○ Results of capacity calculation
286 It is mandatory to provide also the results of the capacity calculation like the allocated
287 capacities or reliability margins.
288
- 289
290 • Incremental social welfare
291 Finally, it is mandatory to send the loss factors on the interconnectors, and the actual losses
292 per market time unit period.
293

294 4.2 Use Cases



295

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Figure 1 - Use Cases

Table 1 gives a list of actors involved in ACER list of information from CACM data exchanges.

Table 1 - Actor labels and descriptions

Actor Label	Actor Description
Data provider	Data provider is responsible for providing to MIA the curtailments, loss factors and actual losses, capacity calculation information and results and utilisation of the network. He also provides the IGM to the coordinated capacity calculator. This role will be played by the TSOs and/or RSCs.
Coordinated Capacity Calculator	For doing the capacity calculation, coordinated capacity calculator has to do a merging of the different IGM received from the data providers and create a CGM. This merged CGM will be submitted to MIA. This role will be played by the RSCs.
Market information aggregator (MIA)	MIA is the role that receives, validates and acknowledges all submitted information from data provider and coordinated capacity calculator. The role subsequently propagates this information to the information receiver. This role will be played by the ENTSO-E.

Information receiver	Information receiver receives the information propagated by MIA. This role will be played by ACER.
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Table 2 gives a list of use cases for ACER list of information from CACM data exchanges.

Table 2 - ACER CACM Data Exchange use cases

Use case label	Actors involved	Action descriptions and assertions
Submit information on curtailments	Data provider, MIA	Data providers send to the MIA the curtailment information. MIA acknowledges the received information.
Submit Loss Factors and actual losses on Interconnectors	Data provider, MIA	Data providers send to MIA the loss factors and actual losses on the interconnectors. MIA acknowledges the received information.
Submit Individual Grid Model.	Data provider, Coordinated capacity calculator	Data providers send to coordinated capacity calculator their IGM. This way coordinated capacity calculator can do the merge into a CGM,
Submit Capacity Calculation Information and Results (NTC or flow-based)	Data provider, MIA	Data provider submits to MIA the maximum flows in different situations (N, N-1...) between bidding zones and also per interconnectors. For flow-based approach, PTDF factors are also provided with the information previously described. For both methodologies contingencies and critical network elements have to be included. MIA acknowledges the received information.
Submit Utilisation of the Network Information (NTC or flow-based)	Data provider, MIA	Data Provider submits to MIA the contingencies and critical network elements for both methodologies like in the previous use case. But in this case physical flows in real time per critical network element have to be included. In flow base methodology the shadow price of critical network elements has to be included. MIA acknowledges the received information.
Submit Common Grid Model	Coordinated Capacity Calculator, MIA	Coordinated capacity calculators are the ones who merge all the

		received IGMs into one CGM and provide it to the MIA.
Propagate information	MIA, information receiver	MIA propagates all the gathered information to the information receiver. Information receiver acknowledges the received information.

306

307 **4.3 Document exchange processes**

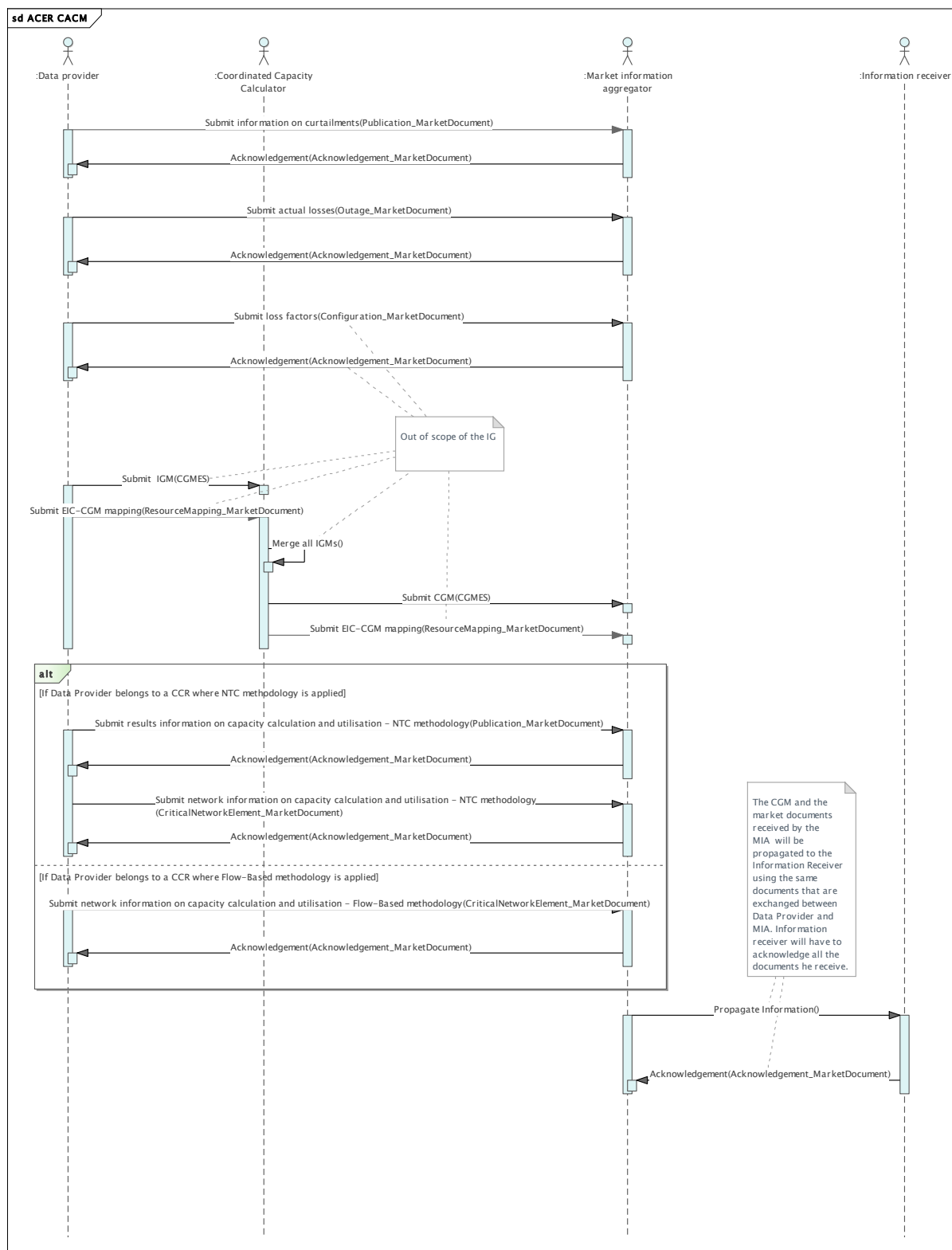
308 **4.3.1 Overview**

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

- 310 • Submit information on curtailments - Publication_MarketDocument
- 311 • Submit actual losses - Outage_MarketDocument
- 312 • Submit loss factors – Configuration_MarketDocument (Out of Scope)
- 313 • Submit IGM and CGM - CGMES v2.4.15
- 314 • Submit EIC-CGM mapping – ResourceMapping_MarketDocument (Out of scope)
- 315 • Submit network information on capacity calculation and utilisation (NTC or flow-based)
- 316 - CriticalNetworkElement_MarketDocument
- 317 • Submit results information on capacity calculation and utilisation (NTC only) -
- 318 Publication_MarketDocument
- 319 • Reply Acknowledgement_MarketDocument

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

321



322
323
324
325
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Figure 2 - Sequence diagram for ACER CACM

- The above sequence diagram describes the exchange of documents between the different actors that participate in the data interchange.

327 **4.3.2 Submission of information on curtailments Publication_MarketDocument**

328 Data Providers should initiate the document exchange by submitting the curtailments to the
329 MIA. Once MIA receives the document, he has to acknowledge it. If curtailments contained in
330 the submitted document are rejected by a receiver (MIA or Information receiver), it sends a
331 negative acknowledgement (A02 Message fully rejected) to the sender (Data provider or MIA),
332 which gives a list of rejected curtailments and reasons for rejection. Else if curtailments are
333 correct, receiver sends a positive acknowledgement (A01 fully accepted).
334
335

336 **4.3.3 Submission of actual losses Outage_MarketDocument**

337 Next information that data providers have to submit to MIA are the actual losses in the
338 interconnectors. Loss factors are static data that rarely change and are therefore to be recorded
339 as master data using the Configuration_MarketDocument. Once MIA receives the document,
340 he has to acknowledge it. If losses contained in the submitted document are rejected by the
341 MIA, he sends a negative acknowledgement (A02 Message fully rejected) to the data provider,
342 which gives a list of rejected losses and reasons for rejection. Else if losses are correct MIA
343 send a positive acknowledgement (A01 fully accepted)

344 When this document is propagated from MIA to information receiver, the process is the same.
345 In this case information receiver has to acknowledge the reception of the document.
346
347

348 **4.3.4 Submission of loss factors Configuration_MarketDocument (Out of Scope)**

349 The loss factors on a line, are static values that rarely change. For this reason, it was decided
350 to keep them separately as Master Data. ACER requires to submit the loss factors only for the
351 interconnectors.

352 For submitting these factors, it is mandatory to use the configuration document. The
353 dependency tables, structure and rules for using this document are available in the
354 Configuration Transparency Process Implementation Guide that is available in the EDI library.
355

356 **4.3.5 Submission of CGM CGMES v2.4.15**

357 The DACF process is executed every calendar day, whereby the RSCs get the individual grid
358 models as input and merge them into a common grid model for each hour of a given day. These
359 CGM, which are outputs of the DACF process need to be provided by the coordinated capacity
360 calculators (RSCs) to the MIA (ENTSO-E). MIA will do the appropriate checking in the model
361 just to be sure that the merging is correct and has no inconsistencies on it. Once is checked,
362 MIA will provide it to the information receiver.
363

364 The CGM needs to be transferred with the version **2.4.15** of the CGMES. For getting more
365 information about CGMES format please visit the next documents and files:

- 366 • [HTML documents](#) - This is HTML export of all profiles belonging to CGMES.
- 367 • [HTML Enterprise Architect Export](#) - This is HTML export directly from Enterprise
368 Architect (EA). It has different views in comparison with HTML documents. The HTML
369 export from EA is similar to the view in the EA - i.e. as if directly browsing the UML.
- 370 • [RDFS of the CGMES profiles](#) - This is RDFS export of the profiles belonging to the
371 CGMES. It is used by vendors for processing the profile information.
- 372 • [XML of CGMES](#) - This is the XML export from EA. This file can be used for transfer of
373 CGMES package from one EA file to another.
- 374 • [OCL documentation of CGMES](#) - This contains all OCL validation rules included in the
375 CGMES.
- 376 • [CGMES issue list and change log \(09/08/2017\) - Quality of CGMES datasets and
377 calculations \(18/11/2016\)](#)
- 378 • [Energy management system application program interface \(EMS-API\) - Part 600-1:
379 Common Grid Model Exchange Specification \(CGMES\) - Structure and rules](#)
- 380 • [Energy management system application program interface \(EMS-API\) - Part 600-2:
381 Common Grid Model Exchange Specification \(CGMES\) - Exchange profiles
382 specification](#)

383

384 The merging of IGMs into CGMs in day-ahead is required by the network codes: SOGL Art
385 64(1)(c) and Art 70; CACM Art 17, art 18(2) and art 14(1)(b). It is further explained in the
386 Common Grid Model Methodology (CGMM). For getting more information about the process of
387 merging, please check the following documents:

- 388 • [All TSOs proposal for a common grid model methodology in accordance with Articles](#)
389 [67\(1\) and 70\(1\) of Commission Regulation \(EU\) 2017/1485 of 02 August 2017](#)
390 [establishing a guideline on electricity transmission system operation.](#)
- 391 • [All TSOs' proposal for a common grid model methodology in accordance with Article](#)
392 [17 of Commission Regulation \(EU\) 2015/1222 of 24 July 2015 establishing a guideline](#)
393 [on capacity allocation and congestion management](#)

394

395 **4.3.6 Submission of EIC-CGM mapping (Out of Scope)**

396 CGMES models use UUIDs to uniquely identify the grid assets within the model. However,
397 Transparency Platform does not currently support the usage of UUIDs, it only manages EIC
398 codes to identify the grid assets. For this reason, data providers need to provide an EIC code-
399 CGMES UUID mapping. For submitting the mapping, it is mandatory to use the Resource
400 Mapping document. The dependency tables, structure and rules for using this document are
401 available in the Coding Schemes Mapping Implementation Guide that is available in the EDI
402 library.
403

404 **4.3.7 Submit network information on capacity calculation and utilisation (NTC or** 405 **flow-based) CriticalNetworkElement_MarketDocument**

406 Depending on whether the data provider is in a region where NTC methodology is applied, he
407 will provide a document with the NTC methodology information, else if data provider is in a
408 region where flow-based approach is applied, he will provide a document with the flow-based
409 approach information.
410

411 Data providers have to provide in both document submissions (NTC and flow-based) the
412 maximum flows in different situations (N, N-1...) between bidding zones and also per
413 interconnectors. Also, contingencies and critical network elements have to be included.
414 For flow-based approach, PTDF factors are also provided with the information previously
415 described.
416

417 Once MIA receives the document, he has to acknowledge it. If data contained in the submitted
418 document is rejected by the MIA, he sends a negative acknowledgement (A02 Message fully
419 rejected) to the data provider, which gives a list of rejected issues and reasons for rejection.
420 Else if the document is correct MIA send a positive acknowledgement (A01 fully accepted)
421 When this document is propagated from MIA to information receiver, the process is the same.
422 In this case information receiver has to acknowledge the reception of the document.
423

424 **Note:** For NTC-based methodology, the data provider must receive positive application
425 acknowledgement from the MIA of the Publication_MarketDocument before submitting the
426 CriticalNetworkElement_MarketDocument to the MIA. Reason is that the MIA validates that the
427 attribute Related_MarketDocument in the CriticalNetworkElement_MarketDocument contains a
428 reference to a Publication_MarketDocument that has been positively acknowledged.
429

430 **4.3.8 Submit results information on capacity calculation and utilisation (Only for** 431 **NTC) Publication_MarketDocument**

432 This document will be only provided if data provider belongs to a region where NTC
433 methodology is applied. There's no need to send this document for the flow-based approach
434 due to Critical Network Element document covers all the needs for the data submission of the
435 different capacity results. For the flow-based approach it is not required to send capacity results
436 per bidding zones, only for critical network elements. For this reason, this document will be
437 used only for the NTC methodology.
438

439 If data provider is in a region where NTC methodology is applied, he will provide a document
440 with the capacity results of the NTC methodology information.

441
442 Once MIA receives the document, he has to acknowledge it. If capacities contained in the
443 submitted document are rejected by the MIA, he sends a negative acknowledgement (A02
444 Message fully rejected) to the data provider, which gives a list of rejected issues and reasons
445 for rejection. Else if capacity results are correct MIA send a positive acknowledgement (A01
446 fully accepted)
447 When this document is propagated from MIA to information receiver, the process is the same.
448 In this case information receiver has to acknowledge the reception of the document.

449

450

451 **4.3.9 Propagate Information**

452 The CGM and the market documents received by the MIA will be propagated to the information
453 receiver using the same documents that are exchanged between data provider and MIA. The
454 only difference is that in this case, the sender of the document will be the MIA and the receiver
455 will be the information receiver.

456 To be more explicit, the market documents to be sent are:

- 457 • Publication_MarketDocument for submitting the curtailments and the results of the
458 capacity calculation for the NTC methodology
- 459 • Outage_MarketDocument for submitting the actual losses.
- 460 • Configuration_MarketDocument for submitting the loss factors.
- 461 • CriticalNetworkElement_MarketDocument for sending the network information on
462 capacity calculation and utilisation information
- 463 • Acknowledgement document for sending the acknowledges. Information receiver will
464 have to acknowledge all the documents he receives from MIA.

465 Moreover, MIA will provide the CGM to the Information Receiver.

466 **5 General rules for document exchange**

467 **5.1 Overview**

468 The document exchange processes of ACER CACM described in the previous chapter require
469 sending and receiving various EDI documents and CGMES. The information to be exchanged
470 is:

- 471 • Publication_MarketDocument v7.1 based on IEC 62325-451-3:2017 Ed1.1
- 472 • Outage_MarketDocument (Unavailability) v4.0 based on IEC 62325-451-6:2018 Ed2
- 473 • CGMES v2.4.15 based on IEC TS 61970-600-1:2017 Ed1 and IEC TS 61970-600-
474 2:2017 Ed1
- 475 • CriticalNetworkElement_MarketDocument v2.2
- 476 • Acknowledgement_MarketDocument v8 based on IEC 62325-451-1:2017 Ed. 2

477 These EDI documents and CGMES shall be used to carry out the communication tasks

- 478 • **submit** - The document contains data to be processed by the receiver.
- 479
- 480 • **reply** - It is the acknowledge sent by the receiver to the sender when receiving a submit
481 document.

482

483 Next table gives an overview, which EDI document and CGMES shall be used to carry out the
484 communication tasks of document exchange processes (DEP). For reducing the size of the
485 table, the next abbreviations are going to be used:

- 486 • PMD: Publication_MarketDocument
- 487 • OMD: Outage_MarketDocument
- 488 • CGMES: Common Grid Model Exchange Specification
- 489 • CNE: CriticalNetworkElement_MarketDocument
- 490 • ACK: Acknowledgement_MarketDocument

491

492 **Table 3 – Document Exchange**

DEP Chapter	DEP label	send/submit document	Reply document	Reply conditions
4.3.2	Submit curtailments information	PMD	ACK	PMD fully accepted.
				Fully rejected due to errors in the PMD.
4.3.3	Submit actual losses	OMD	ACK	OMD fully accepted.
				Fully rejected due to errors in the OMD

4.3.5	Submission of IGM and CGM	CGMES	Done through OPDE and quality (QAS). portal	Done through OPDE and quality (QAS). portal
4.3.7	Submission of capacity calculation and utilisation of the network information	CNE	ACK	CNE fully accepted.
				Fully rejected due to errors in the CNE.
4.3.8	Submission of Capacity Allocation Results	PMD	ACK	PMD fully accepted.
				Fully rejected due to errors in the PMD

493

494

495 5.2 **Publication_MarketDocument dependency table for Curtailments**

496 The dependency table below only apply to the curtailments

497 **Table 4 - Publication_MarketDocument dependency table for curtailments**

Publication_MarketDocument			
Attributes	Business View Values	Description	XSD Requirements
mRID	Unique ID (Max 35 characters)	Identification of the document.	Mandatory
revisionNumber	Consecutive number. Pattern ([1-9]([0-9]){0,2})	Version of the document.	Mandatory
type	B30: Notification data market document	The document type describes the principal characteristic of the document.	Mandatory
sender_MarketParticipant.mRID	EIC-X code of the sender Coding Scheme: A01	The identification of the sender.	Mandatory
sender_MarketParticipant.marketRole.type	A32: Market Information Aggregator A39: Data Provider	The role of the sender.	Mandatory
receiver_MarketParticipant.mRID	EIC-X code of the receiver Coding Scheme: A01	The identification of the receiver.	Optional
receiver_MarketParticipant.marketRole.type	A32: Market Information Aggregator A33: Information Receiver	The role of the receiver.	Optional
createdDateTime	E.G: 2018-03-23T12:04:39Z	UTC time when the document is created in the sender application.	Mandatory
period.timeInterval	E.G: <start>2018-03-16T00:00Z</start> <end>2018-03-17T00:00Z</end>	Target time interval covered by the document.	Mandatory
domain	Not used	Domain of the document	Optional
docStatus	May be used: A13: Withdrawn	The identification of the condition or position of the document with regard to its standing.	Optional

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Table 5 – TimeSeries Publication Document dependency table

TimeSeries			
Attributes	Business View Values	Description	XSD Requirements
mRID	Unique ID (Max 35 characters)	Identification of the time series	Mandatory
auction.mRID	Not used	The unique identification of the auction	Optional
auction.type	Not used	The kind of the auction (e.g. implicit, explicit, ...).	Optional
auction.category	Not used	The product category of an auction	Optional
businessType	A58: Curtailed capacity compensation	The exact business nature identifying the principal characteristic of time series.	Mandatory
in_Domain	EIC-Y code of the importer bidding zone Coding Scheme: A01	Import bidding zone code	Mandatory
out_Domain	EIC-Y code of the exporter bidding zone Coding Scheme: A01	Export bidding zone code	Mandatory
contract_MarketAgreement	Not used	The specification of the kind of the agreement, e.g. long term, daily contract	Optional
quantity_Measure_Unit.name	MAW: Megawatt	Name of the unit measurement.	Optional
currency_Unit.name	EUR: Euro	Type of currency for the compensation or	Optional

		reimbursement incurred.	
price_Measure_Unit.name	Not used	The unit of measure in which the price in the time series is expressed per unit of currency (MW per unit, MWh per unit, etc.).	Optional
classificationSequence_Attribute InstanceComponent.position	Not used	A sequential value representing a relative sequence number. Used only for auctions.	Optional
participantNumber_Attribute InstanceComponent.position	Not used	A sequential value representing a relative sequence number. Used only for auctions.	Optional
winnerParticipantNumber_Attribute InstanceComponent.position	Not used	A sequential value representing a relative sequence number. Used only for auctions.	Optional
curveType	A01: Sequential fixed size block A03: Variable sized Block	The identification of the coded representation of the type of curve being described.	Optional
Reason.code	A97: Force majeure curtailment A98: Network security curtailment B26: Emergency Situation Curtailment	Indicates the reason of the curtailment. If necessary, additional codes can be added to the codelist	Optional
Reason.text	The textual explanation corresponding to the reason code.	Indicates the reason of the curtailment.	Optional

Winners_MarketParticipant.mRID	Not used	The identification of a party in the energy market.	Optional
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Table 6 – Series_Period Publication Document dependency table

Series_Period			
Attributes	Business View Values	Description	XSD Requirements
timeInterval	E.G: <start>2018-03-16T00:00Z</start> <end>2018-03-16T00:30Z</end>	Time interval covered by elements of Point class. It must be included within header Time_Period.timeInterval.	Mandatory
resolution	PT15M PT30M PT60M	Resolution used in the Point class.	Mandatory

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Table 7 – Point Publication Document dependency table

Point			
Attributes	Business View Values	Description	XSD Requirements
position	Integer value > 0	A sequential value representing the relative position within a given time interval.	Mandatory
quantity	Decimal value (Float)	Used to specify the reduction of the cross zonal capacity.	Optional
Price.amount	Decimal value (Float)	The amount of money paid by TSO for the curtailment	Optional
Reason.code	Should not be used at point level.	Indicates the reason of the curtailment.	Optional
Reason.text	Should not be used at point level.	Indicates the reason of the curtailment.	Optional

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507 5.3 **Outage_MarketDocument dependency table**

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Table 8 - Outage_MarketDocument dependency table

Outage_MarketDocument			
Attributes	Business View Values	Description	XSD Requirements
mRID	Unique ID (Max 35 characters)	Identification of the document.	Mandatory
revisionNumber	Consecutive number. Pattern ([1-9]([0-9]){0,2})	Version of the document.	Mandatory
type	B30: Notification data market document	The document type describes the principal characteristic of the document.	Mandatory
process.processType	A16: Realised	The identification of the nature of process that the document addresses.	Mandatory
createdDateTime	E.G: 2018-03-23T12:04:39Z	UTC time when the document is created in the sender application.	Mandatory
sender_MarketParticipant.mRID	EIC-X code of the sender. Coding Scheme: A01	The identification of the sender.	Mandatory
sender_MarketParticipant.marketRole.type	A32: Market Information Aggregator A39: Data Provider	The role of the sender.	Mandatory
receiver_MarketParticipant.mRID	EIC-X code of the receiver. Coding Scheme: A01	The identification of the receiver.	Mandatory
receiver_MarketParticipant.marketRole.type	A32: Market Information Aggregator A33: Information Receiver	The role of the receiver.	Mandatory

unavailability_Time_Period.timeInterval	E.G: <start>2018-03-16T00:00Z</start> <end>2018-03-17T00:00Z</end>	The start and end date and time for a given interval.	Mandatory
docstatus	May be used: A13: Withdrawn		Optional

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Table 9 - TimeSeries Outage Document dependency table

TimeSeries			
Attributes	Values	Description	XSD Requirements
mRID	Unique ID (Max 35 characters)	Identification of the time series	Mandatory
businessType	A15: Losses	The exact business nature identifying the principal characteristic of time series.	Mandatory
biddingZone_Domain.mRID	Not used	Bidding zone code	Optional
in_Domain.mRID	Not used (MasterData)	Control Area 1	Optional
out_Domain.mRID	Not used (MasterData)	Control Area 2	Optional
start_DateAndOrTime.date	Date as "yyyy-mm-dd", which conforms with ISO 8601.	Start date of the losses	Mandatory

start_DateAndOrTime.time	Time as "hh:mm:ss.ss sZ", which conforms with ISO 8601.	Start time of the losses	Mandatory
end_DateAndOrTime.date	Date as "yyyy-mm-dd", which conforms with ISO 8601.	End date of the losses	Mandatory
end_DateAndOrTime.time	Time as "hh:mm:ss.ss sZ", which conforms with ISO 8601.	End time of the losses	Mandatory
quantity_Measure_Unit.name	MAW: Megawatt	Measurement unit of the losses.	Mandatory
curveType	A01: Sequential fixed size block A03: Variable sized Block	The identification of the coded representation of the type of curve being described.	Mandatory
production_RegisteredResource.mRID	Not used	Identification of the interconnector	Optional
production_RegisteredResource.name	Not used	Name of the interconnector.	Optional
production_RegisteredResource.location.name	Not used	Location of the interconnector.	Optional
production_RegisteredResource.pSRType.psrType	Not used	Type of the interconnector.	Optional
production_RegisteredResource.pSRType.psrType.powerSystemResources.mRID	Not used	The unique identification of the power system resources	Optional
production_RegisteredResource.pSRType.psrType.powerSystemResources.name	Not used	The name of a production unit resource.	Optional
production_RegisteredResource.pSRType.psrType.powerSystemResources.nominalP	Not used	The nominal power of a production unit resource.	Optional

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Table 10 - Asset Outage Document dependency table

Asset_RegisteredResource			
Attributes	Business View Values	Description	XSD Requirements
mRID	EIC-T code. Coding Scheme: A01	Identification of the interconnector	Mandatory
name	Not used (MasterData)	Name of the resource.	Optional
asset_PSRTYPE.psrType	Not used (MasterData)	Type of the resource.	Optional
location.name	Not used (MasterData)	Location of the resource.	Optional

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Table 11 – Series_Period Outage Document dependency table

Series_Period			
Attributes	Business View Values	Description	XSD Requirements
timeInterval	E.G: <start>2018-03-16T00:00Z</start> <end>2018-03-16T00:30Z</end>	Time interval covered by elements of Point class. It must be included within header unavailability_Time_Period.timeInterval.	Mandatory
resolution	PT15M PT30M PT60M	Resolution used in the Point class.	Mandatory

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Table 12 - Point Outage Document dependency table

Point			
Attributes	Business View Values	Description	XSD Requirements
position	Integer value > 0	A sequential value representing the relative position within a given time interval.	Mandatory
quantity	Float value with exactly one and only one decimal.	Used to specify the lost capacity per period.	Mandatory

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Table 13 - Reason Outage Document dependency table

Reason			
Attributes	Business View Values	Description	XSD Requirements
Reason.code	Not used.	Indicates the reason at the Timeseries and Header level if necessary	Optional
Reason.text	Not used.	Indicates the reason at the Timeseries and Header level if necessary	Optional

523

524

525 5.4 **Publication_MarketDocument dependency table for the Capacity Results**

526 **Note:** Publication_MarketDocument for the Capacity Results must be used only for NTC
527 approach results.

528
529 There shall not be any time series present for a given In and Out area couple in case none of
530 the attributes Already Allocated Capacity, Transmission Reliability Margin or Capacity Rights
531 can be provided. The Publication Market document shall not be submitted if those attributes
532 cannot be provided for any In and Out area couple whatsoever.

533

534 **Table 14 - Publication_MarketDocument dependency table (Capacity Results)**

Publication_MarketDocument			
Attributes	Business View Values	Description	XSD Requirements
mRID	Unique ID (Max 35 characters)	Identification of the document.	Mandatory
revisionNumber	Consecutive number. Pattern ([1-9]([0-9]){0,2})	Version of the document.	Mandatory
type	A26: Capacity Document	The document type describes the principal characteristic of the document.	Mandatory
sender_MarketParticipant.mRID	EIC-X code of the sender. Coding Scheme: A01	The identification of the sender.	Mandatory
sender_MarketParticipant.marketRole.type	A32: Market Information Aggregator A39: Data Provider	The role of the sender.	Mandatory
receiver_MarketParticipant.mRID	EIC-X code of the receiver. Coding Scheme: A01	The identification of the receiver.	Optional
receiver_MarketParticipant.marketRole.type	A32: Market Information Aggregator A33: Information Receiver	The role of the receiver.	Optional
createdDateTime	E.G: 2018-03-23T12:04:39Z	UTC time when the document is created in the	Mandatory

		sender application.	
period.timeInterval	E.G: <start>2018-03-16T00:00Z</start> <end>2018-03-17T00:00Z</end>	Target time interval covered by the document.	Mandatory
domain.mRID	EIC code of the capacity calculation region. Coding Scheme: A01	The domain covered within the document.	Optional
docStatus	May be used: A13: Withdrawn	The identification of the condition or position of the document with regard to its standing.	Optional

535

536

Table 15 - Timeseries Publication Document for capacities dependency table

TimeSeries			
Attributes	Business View Values	Description	XSD Requirements
mRID	Unique ID (Max 35 characters)	Identification of the time series	Mandatory
auction.mRID	Not used	The unique identification of the auction	Optional
auction.type	Not used	The kind of the auction (e.g. implicit, explicit, ...).	Optional
auction.category	Not used	The product category of an auction	Optional

businessType	<p><u>NTC</u></p> <p>A29: Already allocated capacity (AAC)</p> <p>B31: Transmission Reliability Margin (TRM)</p> <p>A34: Capacity rights</p>	The exact business nature identifying the principal characteristic of time series.	Mandatory (Only for NTC)
in_Domain	<p>EIC-Y code of the importer bidding zone.</p> <p>Coding Scheme: A01</p>	Import bidding zone code	Mandatory
out_Domain	<p>EIC-Y code of the exporter bidding zone.</p> <p>Coding Scheme: A01</p>	Export bidding zone code	Mandatory
contract_MarketAgreement	<p>A01: Daily → Used as day ahead</p> <p>A07: Intraday contract → Used as intraday</p>	The specification of the kind of the agreement, e.g. long term, daily contract	Optional
quantity_Measure_Unit.name	MAW: Megawatt	Name of the unit measurement.	Optional
currency_Unit.name	Not used	Type of currency for the compensation or reimbursement incurred.	Optional

price_Measure_Unit.name	Not used	The unit of measure in which the price in the time series is expressed per unit of currency (MW per unit, MWh per unit, etc.).	Optional
classificationSequence_AttributeInstanceComponent.position	Integer value >0 (Used when the allocation has more than one round)	Used as round attribute to distinguish two different allocations, occurring at different points in time but concerning the same border and delivery period	Optional
participantNumber_AttributeInstanceComponent.position	Not used	A sequential value representing a relative sequence number. Used only for auctions.	Optional
winnerParticipantNumber_AttributeInstanceComponent.position	Not used	A sequential value representing a relative sequence number. Used only for auctions.	Optional
curveType	A01: Sequential fixed size block	The identification of the coded	Optional

	A03: Variable sized Block	representation of the type of curve being described.	
Reason.code	Not used.	Indicates the reason at TimeSeries level	Optional
Reason.text	Not used.	Indicates the reason at TimeSeries level	Optional
Winners_MarketParticipant.mRID	Not used	The identification of a party in the energy market.	Optional

537

538 **Table 16 - Series_Period Publication Document for capacities dependency table**

Series_Period			
Attributes	Business View Values	Description	XSD Requirements
timeInterval	E.G: <start>2018-03-16T00:00Z</start> <end>2018-03-16T00:30Z</end>	Time interval covered by elements of Point class. It must be included within header Time_Period.timeInterval.	Mandatory
resolution	PT15M PT30M PT60M	Resolution used in the Point class.	Mandatory

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Table 17 - Point Publication Document for capacities dependency table

Point			
Attributes	Business View Values	Description	XSD Requirements

position	Integer value > 0	A sequential value representing the relative position within a given time interval.	Mandatory
quantity	Decimal value (Float)	Used to specify the quantity of the capacity.	Optional
Price.amount	Not used.	The quantity of the price.	Optional
Reason.code	Not used.	Indicates the reason at the Point level.	Optional
Reason.text	Not used.	Indicates the reason at the Point level.	Optional

542

543 5.5 **CriticalNetworkElement_MarketDocument dependency table for the capacity**
544 **allocation and utilisation of the network information**

545

546 **Table 18 - CriticalNetworkElement_MarketDocument dependency table**

CriticalNetworkElement_MarketDocument				
Attributes	Business View Values		Description	XSD Requirements
mRID	Unique ID (Max 35 characters)		Identification of the document.	Mandatory
revisionNumber	Consecutive number. Pattern ([1-9]([0-9]){0,2})		Version of the document.	Mandatory
type	B07: Critical Network Element Publication		The document type describes the principal characteristic of the document.	Mandatory
process.processType	<u>NTC</u>	<u>Flow-based</u>	The identification of the process	Mandatory
	A01: Day Ahead A40: Intraday process	A43: Flow based domain constraint day-ahead A44: The information provided concerns the flow-based process in intraday.		
sender_MarketParticipant.mRID	EIC-X code of the sender. Coding Scheme: A01		The identification of the sender.	Mandatory
sender_MarketParticipant.marketRole.type	A32: Market Information Aggregator A39: Data Provider		The role of the sender.	Mandatory
receiver_MarketParticipant.mRID	EIC-X code of the receiver. Coding Scheme: A01		The identification of the receiver.	Mandatory

receiver_MarketParticipant.marketRole.type	A32: Market Information Aggregator A33: Information Receiver	The role of the receiver.	Mandatory
createdDateTime	E.G: 2018-03-23T12:04:39Z	UTC time when the document is created in the sender application.	Mandatory
docstatus	May be used A13: Withdrawn	The identification of the condition or position of the document with regard to its standing.	Optional
time_Period.timeInterval	E.G: <start>2018-03-16T00:00Z</start> <end>2018-03-17T00:00Z</end>	Delivery period covered by the document.	Mandatory
domain.mRID	EIC code of the capacity calculation region. Coding Scheme: A01	Used as EIC code of the NTC or Flow Based Study Area	Optional
Related_MarketDocument.mRID	<u>Optional only for NTC. Not applicable for flow-based</u> Unique ID (Max 35 characters)	ID of the publication document that contains the capacity results. Note: The publication document must have been positively acknowledged by the MIA.	Optional
Related_MarketDocument.RevisionNumber	<u>Optional only for NTC. Not applicable for flow-based</u>	Revision Number of the publication	Optional

	Revision Number	document that contains the capacity results. Note: The publication document must have been positively acknowledged by the MIA	
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Table 19 - Timeseries CriticalNetworkElement Document dependency table

Timeseries				
Attributes	Business View Values		Description	XSD Requirements
mRID	Unique ID (Max 35 characters)		Identification of the timeseries.	Mandatory
businessType	<u>NTC</u>	<u>Flow-based</u>	The exact business nature identifying the principal characteristic of time series.	Mandatory
	B37: Constraint Situation	B39: Flow-based Domain Adjusted to Long Term schedules		
In_Domain.mRID	Not used		Used as EIC code of the InArea of the oriented border study impacted by the listed Critical network elements	Optional
Out_Domain.mRID	Not used		Used as EIC code of the OutArea of the oriented border study impacted by the listed Critical network elements	Optional

CurveType	A01: Sequential fixed size block	The identification of the coded representation of the type of curve being described.	Mandatory
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Note: Border_Series class shall be populated for NTC-based allocations only

Table 20 - Border_Series CriticalNetworkElement Document dependency table

Border_Series			
Attributes	Business View Values	Description	XSD Requirements
mRID	Unique ID (Max 35 characters)	Identification of the border series.	Mandatory
businessType	<u>Optional for NTC. Not applicable for flow-based.</u>	The exact business nature identifying the principal characteristic of time series.	Mandatory
	C12: Maximum power exchange C13: Maximum power exchange after remedial actions		
In_Domain.mRID	EIC-Y code. Coding Scheme: A01	Used to identify the inArea of the flow	Optional
out_Domain.mRID	EIC-Y code. Coding Scheme: A01	Used to identify the outArea of the flow	Optional
flow_Quantity.quantity	Decimal value (Float)	Used to specify the quantity of the specified businessType code	Optional

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Note: The ConnectingLine_RegisteredResource class may be populated with the interconnectors for either instance of the border series class (with business type C12 or C13) but not for both at the same time.

Note: The maximum flow shall be recorded in an instance of the Analog class which must be associated with the connectingLine_RegisteredResource class.

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Table 21 - ConnectingLine_RegisteredResource

ConnectingLine_RegisteredResource			
Attributes	Business View Values	Description	XSD Requirements
mRID	EIC code of the interconnector. Coding Scheme: A01	ID of the monitored element	Mandatory
name	Not used. (Master Data)	Used as the name of the interconnector.	Optional
In_Domain.mRID	Not used.	Used to identify the bidding zone border.	Optional
Out_Domain.mRID	Not used.	Used to identify the bidding zone border.	Optional
In_AggregateNode	Not used	Used to identify InAggregateNode for element orientation	Optional
Out_AggregateNode	Not used	Used to identify OutAggregateNode for element orientation	Optional
flowBasedStudy_Domain.mRID	Not used	Used as EIC code of the Flow Based Study Area	Optional
flowBasedStudy_Domain.flowBasedMargin_Quantity.quantity	Not used	Used to specify the available margin CACM Article 29.7.e	Optional
marketCoupling_Domain.mRID	Not used	ID of the market coupling domain	Optional

marketCoupling_Domain.shadow_Price.amount	Not used	Used to specify the shadow price amount.	Optional
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Table 22 - Constraint_Series CriticalNetworkElement Document dependency table

Constraint_Series			
Attributes	Business View Values	Description	XSD Requirements
mRID	Unique ID (Max 35 characters)	Identification of the of the binding constraint	Mandatory
businessType	B40: Network Element Constraint	The exact business nature identifying the principal characteristic of time series.	Mandatory
name	Name of the binding constraint	Used to provide the name of the binding constraint.	Optional
Quantity_Measurement_Unit.name	MAW	The unit measurement	Optional
ExternalConstraint_Quantity.quantity	Not used	Quantity of the external constraint	Optional
pTDF_Measurement_Unit.name	Mandatory if PTDF provided	The unit measurement of the PTDF	Optional
	MAW		
shadowPrice_Measurement_Unit.name	Mandatory if shadow price provided for flow-based. Not used for NTC-based	Measurement of the marginal relax of the constraint of the critical branches to get the shadow price	Optional
	MAW		

currency_Unit.name	Mandatory if shadow price provided for flow-based. Not used for NTC-based	Currency of the marginal increase of market surplus to get the shadow price	Optional
	EUR		
Party_MarketParticipant.mRID	Not used	Used to identify the limiting TSOs	Optional
Optimization_MarketObjectStatus.status	Not used	Used to identify the status of the Series for a Remedial Action optimization process	Optional

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Table 23 - Contingency_Series CriticalNetworkElement Document dependency table

Contingency_Series			
Attributes	Business View Values	Description	XSD Requirements
mRID	ID of the contingency series	Used to identify the contingency series	Mandatory
name	Name of the contingency series	Name of the resource.	Optional
Party_MarketParticipant.mRID	Not used	Used to identify the owner of the contingency	Optional

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Table 24 - Contingency_RegisteredResource CriticalNetworkElement Document dependency table

Contingency_RegisteredResource			
Attributes	Business View Values	Description	XSD Requirements
mRID	EIC code of the contingency. Coding Scheme: A01	Used as EIC code of the Outage element	Mandatory

name	Not used (Master Data)	Used as the name of the contingency network element.	Optional
In_Domain.mRID	Not used (Master Data)	Used to identify InArea	Optional
Out_Domain.mRID	Not used (Master Data)	Used to identify OutArea	Optional

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Table 25 - Monitored_Series CriticalNetworkElement Document dependency table

Monitored_Series			
Attributes	Business View Values	Description	XSD Requirements
mRID	ID of the monitored series	Used to identify a given set of monitored elements	Mandatory
name	Name of the monitored series	Used as the name of the set of monitored elements	Optional
Party_MarketParticipant.mRID	Not used	Used to identify the owner of the set of monitored elements	Optional

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Table 26 - Monitored_RegisteredResource CriticalNetworkElement Document dependency table

Monitored_RegisteredResource			
Attributes	Business View Values	Description	XSD Requirements
mRID	EIC code of the monitored element. Coding Scheme: A01	ID of the monitored element	Mandatory

name	Not used. (Master Data)	Used as the name of the monitored element	Optional
In_Domain.mRID	Not used. (Master Data)	Used to identify InArea	Optional
Out_Domain.mRID	Not used. (Master Data)	Used to identify OutArea	Optional
In_AggregateNode	Not used	Used to identify InAggregateNode for element orientation	Optional
Out_AggregateNode	Not used	Used to identify OutAggregateNode for element orientation	Optional
flowBasedStudy_Domain.mRID	<u>Optional for flow-based. Not used for NTC-based</u>	Used as EIC code of the Flow Based Study Area	Optional
	EIC-Y code. Coding Scheme: A01		
flowBasedStudy_Domain.flowBasedMargin_Quantity.quantity	<u>Optional for flow-based. Not used for NTC-based</u>	Used to specify the available margin CACM Article 29.7.e	Optional
	Decimal value (Float)		
marketCoupling_Domain.mRID	Not used	ID of the market coupling domain	Optional
marketCoupling_Domain.shadow_Price.amount	<u>Optional for flow-based. Not used for NTC-based</u>	Used when non-zero shadow price.	Optional
	Decimal value (Float)		

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Table 27 - Analog CriticalNetworkElement Document dependency table

Analog				
Attributes	Business View Values		Description	XSD Requirements
measurementType	<u>Optional for NTC</u>	<u>Optional for Flow-base</u>	Used to identify the monitored measurement	Mandatory
	A01: Flow A02: Permanent admissible transmission limit (PATL) A15: Base Case flow	A01: Flow A02: Permanent admissible transmission limit (PATL) A03: Flow reliability margin A05: Long term allocation margin A15: Base Case flow A16: Available margin after remedial actions	A01 = Flow shall normally be provided when non-zero shadow price (flow-based) or when binding constraint (NTC) A02: Used for maximum flow A05: Used for flow for previous allocated capacity	
unitSymbol	MAW		Used to identify the unit of the measurement	Mandatory
positiveFlowIn	Not used		May be used to identify on which direction the element is monitored	Optional
analogValues.value	Decimal value (Float)		Used to provide the analog value	Optional
analogValues.timeStamp	Not used		May be used to provide the constraint duration	Optional

analogValues.description	Not used	May be used to identify the situation of the measurement point	Optional
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Table 28 - PTDF domain CriticalNetworkElement Document dependency table

Note: PTDF class instances are optional for both NTC and flow-based allocations.

PTDF Domain			
Attributes	Business View Values	Description	XSD Requirements
mRID	EIC-Y code of the bidding zone. Coding Scheme: A01	Used to identify the impacted bidding zone	Mandatory
pTDF_Quantity.quantity	PTDF value	Used to provide the PTDF factor for the Bidding zone	Mandatory
pTDF_Quantity.quality	Not used	The PTDF factor value associated to the bidding zone for the critical network element.	Optional

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Table 29 - RemedialAction_Series, RemedialAction_RegisteredResource, AdditionalConstraint_Series, AdditionalConstraint_RegisteredResource and Shared_Domain CriticalNetworkElement Document dependency table

Remedial Action Series, Registered Resource and Shared Domain			
Attributes	Business View Values	Description	XSD Requirements
Not used	Not used		Not used

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