European Network of
Transmission System Operators
for Electricity

# CACM LIST OF INFORMATION TO ACER

# IMPLEMENTATION GUIDE

2020-09-16

APPROVED DOCUMENT
VERSION 1.1

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

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

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# 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.<br>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.<br>Capacity Coordinator role was updated to Coordinated Capacity Calculator in order to align the IG with the last version of the HRM.<br><br>Approved by MC. |
| | | | | |

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# 1 Scope

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

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

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

# 2 References

## 2.1 Normative references

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

- IEC 62325-351:2016, Framework for energy market communications – Part 351: CIM European market model exchange profile.
- IEC 62325-450:2013, Framework for energy market communications – Part 450: Profile and context modelling rules.
- IEC 62325-451-1:2017, Framework for energy market communications – Part 451-1: Acknowledgement business process and contextual model for CIM European market.
- IEC 62325-451-3:2014+AMD1:2017 CSV, Framework for energy market communications – Part 451-3: ENTSO-E Capacity Allocation and Nomination business process and contextual model for CIM European market.
- IEC 62325-451-6:2018 Framework for energy market communications - Part 451-6: Publication of information on market, contextual and assembly models for European-style markets
- IEC TS 61970-600-1:2017 Energy management system application program interface (EMS-API) - Part 600-1: Common Grid Model Exchange Specification (CGMES) - Structure and rules
- IEC TS 61970-600-2:2017 Energy management system application program interface (EMS-API) - Part 600-2: Common Grid Model Exchange Specification (CGMES) - Exchange profiles specification

## 2.2 Other references

- Articles 82(4) and (5) of the CACM Guideline (Commission Regulation (EU) N° 1222/2015 of 24 July 2015 establishing a guideline on capacity allocation and congestion management)
- Article 8(9) of Regulation 714/2009
- Critical Network Element Document UML Model and Schema
- Coding Schemes Mapping Implementation Guide
- The Harmonised Electricity Market Role Model

150 • Detailed Data Descriptions for the purpose of the ACER CACM list of information

151 • Business Requirements Specification for ACER CACM

# 3 Terms and definitions

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

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

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

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

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

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

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

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

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

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

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

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

**Capacity calculation timeframes:**

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

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

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

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

**CGMES:** Common Grid Model Exchange Specification

**CGMES v2.4.15:** means the Edition 1 of the IEC Technical Specifications of CGMES: IEC TS 61970-600-1:2017 and IEC TS 61970-600-2:2017.

**Compensation/reimbursement:** means the amount of money paid by TSO(s) for each individual curtailment, expressed in €.

**Critical Network Element & Contingency (CNEC):** means a critical network element limiting the cross-zonal exchanges, potentially associated to a contingency which is defined as the tripping of one single or several network elements.

**Cross-Zonal Capacity (MW), Article 29(8)(e) CACM:** means maximum admissible power flow between two bidding zones calculated in accordance with Article 29(8)(c) CACM taking into account reliability margin, previously allocated cross-zonal capacity and rules for efficiently sharing the power flow capabilities of critical network elements among different bidding zone borders.

**Curtailment:** means the cancellation or reduction of already allocated cross-border transmission rights before or after their nomination.

**DACF:** Day Ahead Congestion Forecast.

**DEP:** Data Exchange Processes.

**End date and time:** means the last day and exact time including the market time unit of the curtailment.

**EQ:** Equipment.

**Flow-based approach, Article 2(9) CACM:** means a capacity calculation method in which energy exchanges between bidding zones are limited by power transfer distribution factors and available margins on critical network elements.

**Flow from previously allocated capacity (MW), Article 29(7)(c) CACM:** cross-zonal capacity allocated in previous timeframes in a form of long term transmission rights per bidding zone border for each market time unit.

**IGM:** Individual Grid Model.

**Maximum Flow (MW), Article 29(7)(a) CACM:** means the maximum admissible power flow when considering the operational security limits e.g. permanent admissible transmission loading (PATL) as defined in the capacity calculation methodology of the concerned CCR.

**MIA:** Market Information Aggregator.

**Power Transfer Distribution Factors (PTDF):** indicates the incremental change in real power that occurs on transmission lines due to real power transfers between two regions.

**Previously allocated cross zonal capacity (MW), Article 29(8)(e) CACM:** means the cross-zonal capacity allocated in previous timeframes in a form of long-term transmission rights per bidding zone border for each market time unit.

**Resource Description Framework (RDF):** Is a data model for objects ("resources") and relations between them, provides a simple semantics for this data model, and these data models can be represented in an XML syntax.

**Resource Description Framework Schema (RDFS):** Is a vocabulary for describing properties and classes of RDF resources, with a semantics for generalization-hierarchies of such properties and classes.

**Reduction in cross-zonal capacity:** means the value of reduction of the cross zonal capacity for each market time unit between begin and end time expressed in MW.

**Reliability margin (MW), Article 22(5) CACM:** means the transmission reliability margin calculated and applied for each bidding zone border in accordance with the capacity calculation.

242 **RSC:** Regional Security Coordinator.

243 **Shadow price of critical branches (€/MW)**: means the marginal increase of market surplus
244 when the constraint of the critical branches is marginally relaxed.

245 **SSH:** Steady State Hypothesis.

246 **SV:** State Variables.

247 **TP:** Topology.

248 **TSO:** Transmission System Operator.

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# 4 The ACER list of information Business Process

## 4.1 Overview

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

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

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

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

- Monitoring the efficiency of bidding zones.
  To monitor the efficiency between bidding zones, it is necessary to provide the curtailments on a border during a certain time interval. It is also mandatory to provide the DACF CGM in CGMES format. The DACF process is executed every calendar day, whereby the RSCs get the individual grid models as input and merge them into a common grid models.

- Information on Capacity Calculation Process and result

  - Critical network elements and contingencies and results
    This information consists on data extracted from the capacity calculation process such as contingencies, monitored elements and remedial actions. Additionally, maximum flows studied by the load flow calculation per border and interconnectors will be provided. For flow-based approach, PTDF factors and shadow price of the critical elements are also included in the data submission.

  - Results of capacity calculation
    It is mandatory to provide also the results of the capacity calculation like the allocated capacities or reliability margins.

- Incremental social welfare
  Finally, it is mandatory to send the loss factors on the interconnectors, and the actual losses per market time unit period.

## 4.2 Use Cases

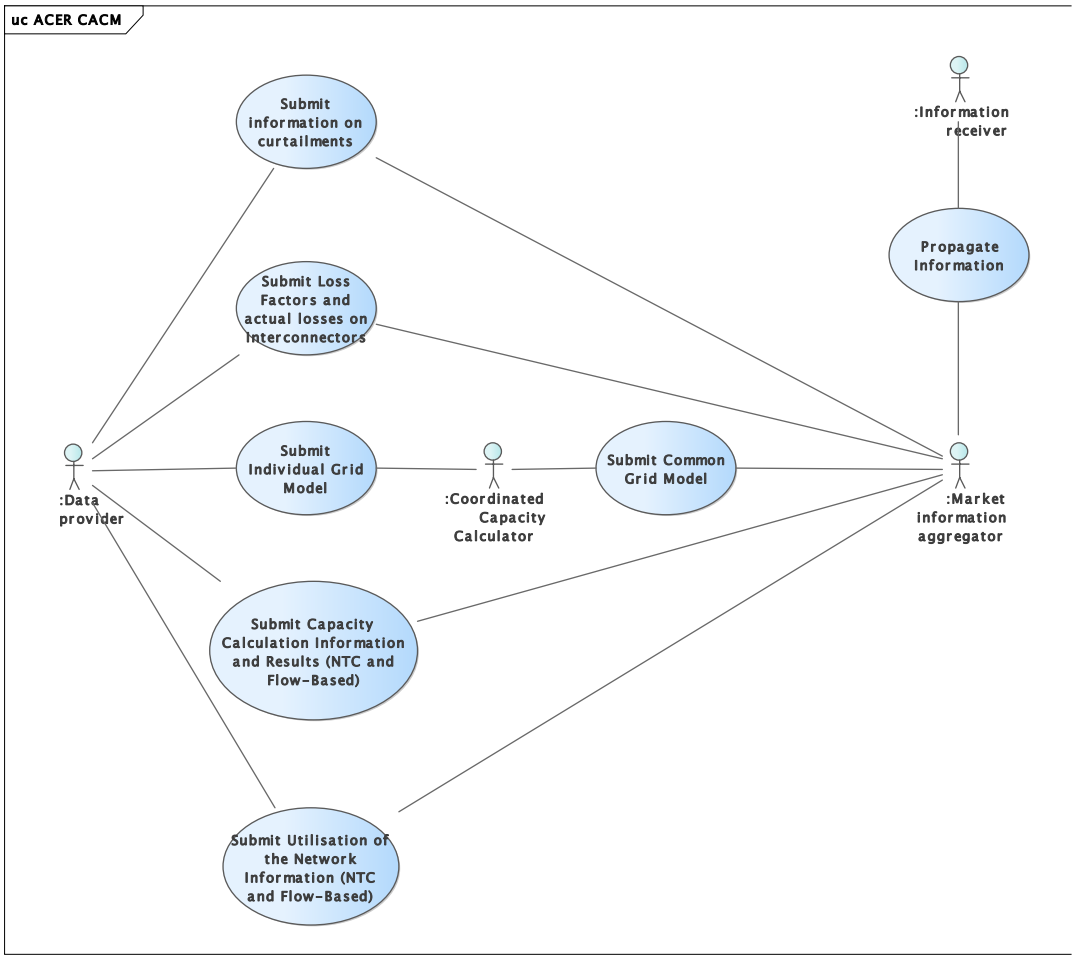


**Figure 1 - Use Cases**

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. |

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.<br>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.<br>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.<br>For flow-based approach, PTDF factors are also provided with the information previously described.<br>For both methodologies contingencies and critical network elements have to be included.<br>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.<br>In flow base methodology the shadow price of critical network elements has to be included.<br>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.<br>Information receiver acknowledges the received information. |

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## 4.3 Document exchange processes

### 4.3.1 Overview

The use cases are supported by the following document exchanges:

- Submit information on curtailments - Publication_MarketDocument
- Submit actual losses - Outage_MarketDocument
- Submit loss factors – Configuration_MarketDocument (Out of Scope)
- Submit IGM and CGM - CGMES v2.4.15
- Submit EIC-CGM mapping – ResourceMapping_MarketDocument (Out of scope)
- Submit network information on capacity calculation and utilisation (NTC or flow-based) - CriticalNetworkElement_MarketDocument
- Submit results information on capacity calculation and utilisation (NTC only) - Publication_MarketDocument
- Reply Acknowledgement_MarketDocument

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

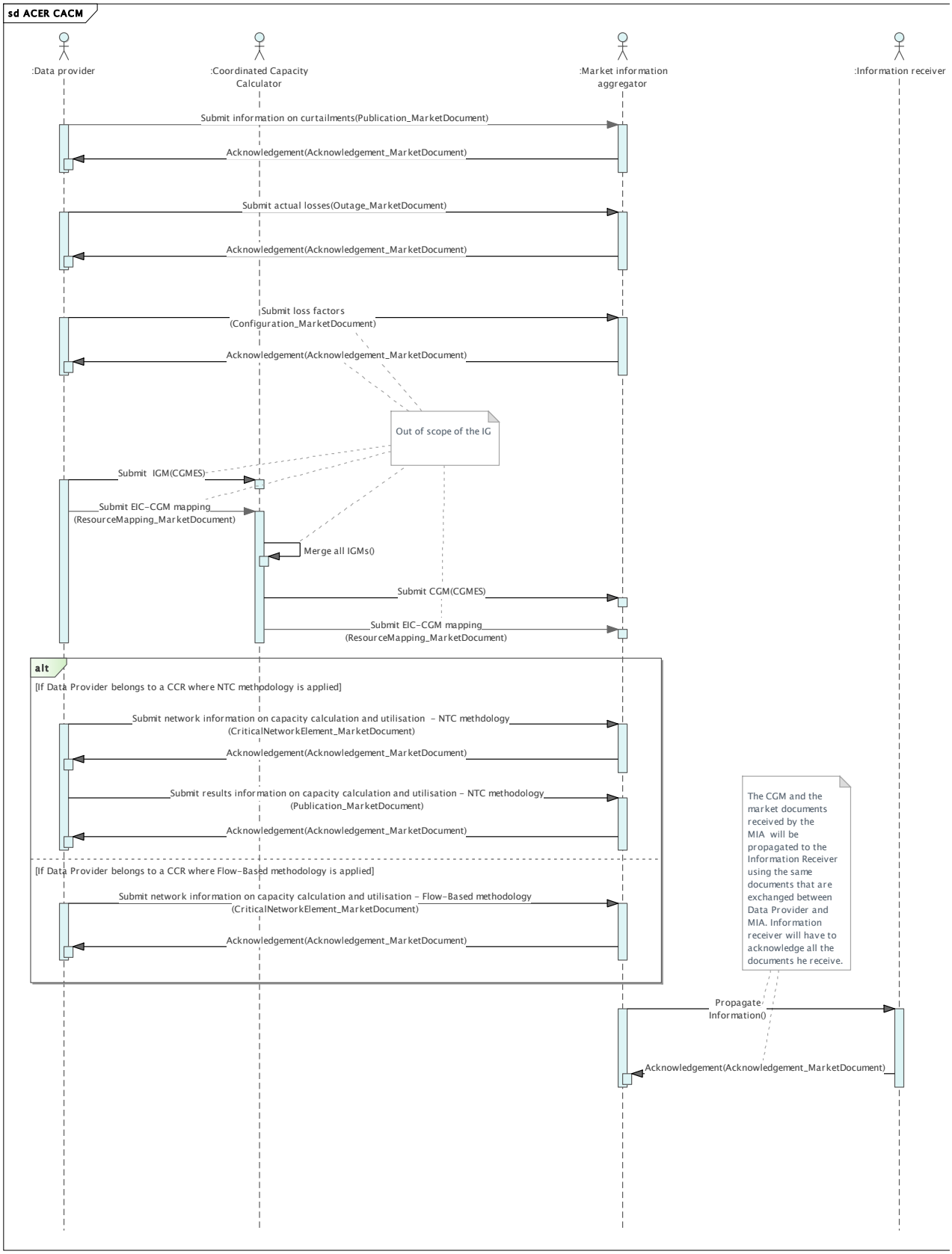


**Figure 2 - Sequence diagram for ACER CACM**

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

### 4.3.2 Submission of information on curtailments Publication_MarketDocument

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

### 4.3.3 Submission of actual losses Outage_MarketDocument

Next information that data providers have to submit to MIA are the actual losses in the interconnectors. Loss factors are static data that rarely change and are therefore to be recorded as master data using the Configuration_MarketDocument. Once MIA receives the document, he has to acknowledge it. If losses contained in the submitted document are rejected by the MIA, he sends a negative acknowledgement (A02 Message fully rejected) to the data provider, which gives a list of rejected losses and reasons for rejection. Else if losses are correct MIA send a positive acknowledgement (A01 fully accepted)
When this document is propagated from MIA to information receiver, the process is the same. In this case information receiver has to acknowledge the reception of the document.

### 4.3.4 Submission of loss factors Configuration_MarketDocument (Out of Scope)

The loss factors on a line, are static values that rarely change. For this reason, it was decided to keep them separately as Master Data. ACER requires to submit the loss factors only for the interconnectors.
For submitting these factors, it is mandatory to use the configuration document. The dependency tables, structure and rules for using this document are available in the Configuration Transparency Process Implementation Guide that is available in the EDI library.

### 4.3.5 Submission of CGM CGMES v2.4.15

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

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

- HTML documents - This is HTML export of all profiles belonging to CGMES.
- HTML Enterprise Architect Export - This is HTML export directly from Enterprise Architect (EA). It has different views in comparison with HTML documents. The HTML export from EA is similar to the view in the EA - i.e. as if directly browsing the UML.
- RDFS of the CGMES profiles - This is RDFS export of the profiles belonging to the CGMES. It is used by vendors for processing the profile information.
- XMI of CGMES - This is the XMI export from EA. This file can be used for transfer of CGMES package from one EA file to another.
- OCL documentation of CGMES - This contains all OCL validation rules included in the CGMES.
- CGMES issue list and change log (09/08/2017) - Quality of CGMES datasets and calculations (18/11/2016)
- Energy management system application program interface (EMS-API) - Part 600-1: Common Grid Model Exchange Specification (CGMES) - Structure and rules
- Energy management system application program interface (EMS-API) - Part 600-2: Common Grid Model Exchange Specification (CGMES) - Exchange profiles specification

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

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

### 4.3.6 Submission of EIC-CGM mapping (Out of Scope)

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

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

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

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

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

### 4.3.8 Submit results information on capacity calculation and utilisation (Only for NTC) Publication_MarketDocument

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

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

Once MIA receives the document, he has to acknowledge it. If capacities contained in the submitted document are rejected by the MIA, he sends a negative acknowledgement (A02

Message fully rejected) to the data provider, which gives a list of rejected issues and reasons for rejection. Else if capacity results are correct MIA send a positive acknowledgement (A01 fully accepted)
When this document is propagated from MIA to information receiver, the process is the same. In this case information receiver has to acknowledge the reception of the document.

### 4.3.9 Propagate Information

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

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

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

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

# 5 General rules for document exchange

## 5.1 Overview

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

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

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

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

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

- PMD: Publication_MarketDocument
- OMD: Outage_MarketDocument
- CGMES: Common Grid Model Exchange Specification
- CNE: CriticalNetworkElement_MarketDocument
- ACK: Acknowledgement_MarketDocument

**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 portal (QAS). | Done through OPDE and quality portal (QAS). |
| 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 |

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## 5.2 Publication_MarketDocument dependency table for Curtailments

The dependency table below only apply to the curtailments

**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<br><br>Coding Scheme: A01 | The identification of the sender. | Mandatory |
| sender_MarketParticipant.marketRole.type | A32: Market Information Aggregator<br><br>A39: Data Provider | The role of the sender. | Mandatory |
| receiver_MarketParticipant.mRID | EIC-X code of the receiver<br><br>Coding Scheme: A01 | The identification of the receiver. | Optional |
| receiver_MarketParticipant.marketRole.type | A32: Market Information Aggregator<br><br>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><br><br><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:<br><br>A13: Withdrawn | The identification of the condition or position of the document with regard to its standing. | Optional |

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493 **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<br><br>Coding Scheme: A01 | Import bidding zone code | Mandatory |
| out_Domain | EIC-Y code of the exporter bidding zone<br><br>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<br><br>InstanceComponent.position | Not used | A sequential value representing a relative sequence number. Used only for auctions. | Optional |
| participantNumber_Attribute<br><br>InstanceComponent.position | Not used | A sequential value representing a relative sequence number. Used only for auctions. | Optional |
| winnerParticipantNumber_Attribute<br><br>InstanceComponent.position | Not used | A sequential value representing a relative sequence number. Used only for auctions. | Optional |
| curveType | A01: Sequential fixed size block<br><br>A03: Variable sized Block | The identification of the coded representation of the type of curve being described. | Optional |
| Reason.code | A97: Force majeure curtailment<br><br>A98: Network security curtailment<br><br>B26: Emergency Situation Curtailment | Indicates the reason of the curtailment.<br><br>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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496 **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><br><br><end>2018-03-16T00:30Z</end> | Time interval covered by elements of Point class.<br><br>It must be included within header Time_Period.timeInterval. | Mandatory |
| resolution | PT15M<br><br>PT30M<br><br>PT60M | Resolution used in the Point class. | Mandatory |

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498 **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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## 5.3 Outage_MarketDocument dependency table

**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.<br><br>Coding Scheme: A01 | The identification of the sender. | Mandatory |
| sender_MarketParticipant.marketRole.type | A32: Market Information Aggregator<br><br>A39: Data Provider | The role of the sender. | Mandatory |
| receiver_MarketParticipant.mRID | EIC-X code of the receiver.<br><br>Coding Scheme: A01 | The identification of the receiver. | Mandatory |
| receiver_MarketParticipant.marketRole.type | A32: Market Information Aggregator<br><br>A33: Information Receiver | The role of the receiver. | Mandatory |

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

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506 **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.sssZ", 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.sssZ", 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<br><br>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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508 **Table 10 - Asset Outage Document dependency table**

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

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511 **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><br><br><end>2018-03-16T00:30Z</end> | Time interval covered by elements of Point class.<br><br>It must be included within header unavailability_Time_Period.timeInterval. | Mandatory |
| resolution | PT15M<br><br>PT30M<br><br>PT60M | Resolution used in the Point class. | Mandatory |

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513 **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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516 **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 |

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## 5.4 Publication_MarketDocument dependency table for the Capacity Results

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

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

**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.<br><br>Coding Scheme: A01 | The identification of the sender. | Mandatory |
| sender_MarketParticipant.marketRole.type | A32: Market Information Aggregator<br><br>A39: Data Provider | The role of the sender. | Mandatory |
| receiver_MarketParticipant.mRID | EIC-X code of the receiver.<br><br>Coding Scheme: A01 | The identification of the receiver. | Optional |
| receiver_MarketParticipant.marketRole.type | A32: Market Information Aggregator<br><br>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><br><br><end>2018-03-17T00:00Z</end> | Target time interval covered by the document. | Mandatory |
| domain.mRID | EIC code of the capacity calculation region.<br><br>Coding Scheme: A01 | The domain covered within the document. | Optional |
| docStatus | May be used:<br><br>A13: Withdrawn | The identification of the condition or position of the document with regard to its standing. | Optional |

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530 **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 | **NTC**<br><br>A29: Already allocated capacity (AAC)<br><br>B31: Transmission Reliability Margin (TRM)<br><br>A34: Capacity rights | The exact business nature identifying the principal characteristic of time series. | Mandatory (Only for NTC) |
| in_Domain | EIC-Y code of the importer bidding zone.<br><br>Coding Scheme: A01 | Import bidding zone code | Mandatory |
| out_Domain | EIC-Y code of the exporter bidding zone.<br><br>Coding Scheme: A01 | Export bidding zone code | Mandatory |
| contract_MarketAgreement | A01: Daily → Used as day ahead<br><br>A07: Intraday contract → Used as intraday | 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<br><br>(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_Attribute<br><br>InstanceComponent.position | Not used | A sequential value representing a relative sequence number. Used only for auctions. | Optional |
| winnerParticipantNumber_Attribute<br>InstanceComponent.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 |

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532 **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><br><end>2018-03-16T00:30Z</end> | Time interval covered by elements of Point class.<br>It must be included within header Time_Period.timeInterval. | Mandatory |
| resolution | PT15M<br>PT30M<br>PT60M | Resolution used in the Point class. | Mandatory |

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535 **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 | Mandatory |

| | | | |
|---|---|---|---|
| | | relative position within a given time interval. | |
| 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 |

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## 5.5 CriticalNetworkElement_MarketDocument dependency table for the capacity allocation and utilisation of the network information

**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 | **NTC** | **Flow-based** | The identification of the process | Mandatory |
| | A01: Day Ahead<br><br>A40: Intraday process | A43: Flow based domain constraint day-ahead<br><br>A44: The information provided concerns the flow-based process in intraday. | | |
| sender_MarketParticipant.mRID | EIC-X code of the sender.<br><br>Coding Scheme: A01 | | The identification of the sender. | Mandatory |
| sender_MarketParticipant.marketRole.type | A32: Market Information Aggregator<br><br>A39: Data Provider | | The role of the sender. | Mandatory |
| receiver_MarketParticipant.mRID | EIC-X code of the receiver.<br><br>Coding Scheme: A01 | | The identification of the receiver. | Mandatory |

| | | | |
|---|---|---|---|
| receiver_MarketParticipant.marketRole.type | A32: Market Information Aggregator<br><br>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<br><br>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><br><br><end>2018-03-17T00:00Z</end> | Delivery period covered by the document. | Mandatory |
| domain.mRID | EIC code of the capacity calculation region.<br><br>Coding Scheme: A01 | Used as EIC code of the NTC or Flow Based Study Area | Optional |
| Related_MarketDocument.mRID | **Optional only for NTC. Not applicable for flow-based**<br><br>Unique ID (Max 35 characters) | ID of the publication document that contains the capacity results | Optional |
| Related_MarketDocument.RevisionNumber | **Optional only for NTC. Not applicable for flow-based**<br><br>Revision Number | Revision Number of the publication document that contains the capacity results | Optional |

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543 **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 | **NTC** | **Flow-based** | 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 | **Optional for NTC. Not applicable for flow-based.** | The exact business nature identifying the principal characteristic of time series. | Mandatory |
| | C12: Maximum power exchange<br>C13: Maximum power exchange after remedial actions | | |
| In_Domain.mRID | EIC-Y code.<br>Coding Scheme: A01 | Used to identify the inArea of the flow | Optional |
| out_Domain.mRID | EIC-Y code.<br>Coding Scheme: A01 | Used to identify the outArea of the flow | Optional |
| flow_Quantity.quantity | Decimal value (Float) | Used to specifiy the quantity of the specified businessType code | Optional |

**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.

**Table 21 - ConnectingLine_RegisteredResource**

| ConnectingLine_RegisteredResource | | | |
|---|---|---|---|
| **Attributes** | **Business View Values** | **Description** | **XSD Requirements** |

| | | | |
|---|---|---|---|
| mRID | EIC code of the interconnector.<br><br>Coding Scheme: A01 | ID of the monitored element | Mandatory |
| name | Not used.<br><br>(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 OutAggregate Node 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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560 **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**<br>MAW | The unit measurement of the PTDF | Optional |
| shadowPrice_Measurement_Unit.name | **Mandatory if shadow price provided for flow-based. Not used for NTC-based**<br>MAW | Measurement of the marginal relax of the constraint of the critical branches to get the shadow price | Optional |
| currency_Unit.name | **Mandatory if shadow price provided for flow-based. Not used for NTC-based** | Currency of the marginal increase of market | Optional |

| | | | |
|---|---|---|---|
| | EUR | surplus to get the shadow price | |
| 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 |

**Table 23 - Contingency_Series CriticalNetworkElement Document dependency table**

| Contingecy_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 |

**Table 24 - Contingency_RegisteredResource CriticalNetworkElement Document dependency table**

| Contingecy_RegisteredResource | | | |
|---|---|---|---|
| **Attributes** | **Business View Values** | **Description** | **XSD Requirements** |
| mRID | EIC code of the contingency.<br><br>Coding Scheme: A01 | Used as EIC code of the Outage element | Mandatory |
| name | Not used<br><br>(Master Data) | Used as the name of the contingency | Optional |

| | | | |
|---|---|---|---|
| | | network element. | |
| In_Domain.mRID | Not used<br><br>(Master Data) | Used to identify InArea | Optional |
| Out_Domain.mRID | Not used<br><br>(Master Data) | Used to identify OutArea | Optional |

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571 **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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574 **Table 26 - Monitored_RegisteredResource CriticalNetworkElement Document**
575 **dependency table**

| Monitored_RegisteredResource | | | |
|---|---|---|---|
| **Attributes** | **Business View Values** | **Description** | **XSD Requirements** |
| mRID | EIC code of the monitored element.<br><br>Coding Scheme: A01 | ID of the monitored element | Mandatory |
| name | Not used.<br><br>(Master Data) | Used as the name of the monitored element | Optional |
| In_Domain.mRID | Not used.<br><br>(Master Data) | Used to identify InArea | Optional |
| Out_Domain.mRID | Not used.<br><br>(Master Data) | Used to identify OutArea | Optional |
| In_AggregateNode | Not used | Used to identify InAggregateNode for | Optional |

| | | | |
|---|---|---|---|
| | | element orientation | |
| Out_AggregateNode | Not used | Used to identify OutAggregate Node for element orientation | Optional |
| flowBasedStudy_Domain.mRID | **Optional for flow-based. Not used for NTC-based**<br>EIC-Y code.<br>Coding Scheme: A01 | Used as EIC code of the Flow Based Study Area | Optional |
| flowBasedStudy_Domain.flowBasedMargin_Quantity.quantity | **Optional for flow-based. Not used for NTC-based**<br>Decimal value (Float) | 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 | **Optional for flow-based. Not used for NTC-based**<br>Decimal value (Float) | Used when non-zero shadow price. | Optional |

**Table 27 - Analog CriticalNetworkElement Document dependency table**

| **Analog** | | | | |
|---|---|---|---|---|
| **Attributes** | **Business View Values** | | **Description** | **XSD Requirements** |
| measurementType | **Optional for NTC** | **Optional for Flow-base** | Used to identify the monitored measurement<br>A01 = Flow shall normally be provided when non-zero shadow price (flow-based) or when binding | Mandatory |
| | A01: Flow<br>A02: Permanent admissible transmission limit (PATL) | A01: Flow<br>A02: Permanent admissible transmission limit (PATL) | | |

| | | | | |
|---|---|---|---|---|
| | A15: Base Case flow | A03: Flow reliability margin<br><br>A05: Long term allocation margin<br><br>A15: Base Case flow<br><br>A16: Available margin after remedial actions | constraint (NTC) A02: Used for maximum flow<br><br>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 |

**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.<br><br>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 |

**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 |