Explanatory Note of the Coordinated NTC methodology for SEE CCR

Version January 2018

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1. Introduction

This technical document sets out the main principles for the common capacity calculation methodology for the day-ahead (DA) and intraday market (ID) time-frames (hereafter SEE DA and ID CCM) applied in the SEE CCR. It contains a description of both the methodology and the calculation process in compliance with the Capacity Allocation and Congestion Management guideline (hereafter CACM).

The participating TSOs for the calculations are ADMIE (GR), ESO EAD (BG) and Transelectrica (RO), the following borders are considered Greece-Bulgaria-Romania.

2. Coordinated NTC calculation methodology

2.1. Inputs

In order to allow the Coordinated Capacity Calculator (CCC) to perform the relevant Capacity Calculation (CC) processes, each TSO for the SEE region shall provide the following relevant input data:

- Operational security limits, contingencies and allocation constraints;
- Reliability Margins;
- Base Case – Individual Grid Models;
- Generation shift keys;
- Remedial actions.

In this chapter details about the previous data are described.

2.1.1. Operational security limits, contingencies and allocation constraints

2.1.1.1. Critical network elements and contingencies

A Critical Network Element (CNE) is a network element either within a bidding zone or between bidding zones impacted by SEE cross-border trades and monitored during the CC process under certain operational conditions. The CNEC (Critical Network Element and Contingency) is a CNE limiting the amount of power that can be exchanged, potentially associated to a contingency. They are determined by each SEE TSO according to agreed rules, described below.

The CNECs are defined by:

- A CNE: a line or a transformer that is significantly impacted by cross-border exchanges;
- An "operational situation": base case (N) or contingency cases (N-1, N-2, busbar faults, depending on the TSO risk policies).

A contingency is defined as the trip of one single or several network elements. A scheduled outage is not a contingency. A contingency can be a trip of:

- a line, DC link or transformer (including phase shifter transformer);
- a generating unit;

- distributed generation of a relevant size like a clustered wind farm, cogeneration, etc…
- a (significant) load;
- large voltage compensation installation;
- a set of the aforementioned contingencies.

2.1.1.2. Maximum flow and current on a critical network element

The maximum permanent admissible current/power limit means the maximum loading that can be sustained on a transmission line, cable or transformer for an unlimited duration without risk to the equipment, determined by each TSO in line with its operational security policy.

The temporary current/power limit means the maximum loading that can be sustained for a limited duration without risk to the equipment (e.g. 120% of permanent physical limit can be accepted during 20 minutes).

Each individual TSO is responsible for deciding, in line with their operational security policy, if temporary limit should be used.

As thermal limits and protection settings can vary in function of weather conditions, different values are calculated and set for the different seasons within a year. These values can be also adapted by the concerned TSO if a specific weather condition is forecasted to highly deviate from the seasonal values.

The maximum admissible limit is not reduced by any security margin, as all uncertainties in capacity calculations are covered by reliability margin.

2.1.1.3. Maximum/ minimum voltage on a network node

If the voltage on a node is significantly impacted by cross-border exchanges, the voltage on this element shall be monitored in the CC process.

Each TSO shall specify the voltage limits for each node of its transmission system and/or the maximum acceptable deviation.

2.1.1.4. Allocation constraints

Besides active power flow limits on CNEs, other specific limitations may be necessary to maintain the transmission system within operational security limits. Since such specific limitations cannot be efficiently transformed into maximum flows on individual CNEs, they are expressed as allocation constraints.

2.1.2. Reliability Margin (RM)

Disclaimer: The Reliability calculation methodology is still under development within the SEE CCR.
The calculation depicted below is the current status of the methodology foreseen but might not reflect the final implementation.

The methodology for the CC is based on forecast models of the transmission system. The inputs are created two days before the delivery day with the best available forecast. Therefore the outcomes are subject to inaccuracies and uncertainties. The aim of the reliability margin is to cover these inaccuracies and uncertainties induced by those forecast errors.

2.1.2.1 The unintended deviation (UD)

For control-related reasons, deviations occur between the scheduled values and the actual values during the exchange of energy between neighboring control areas. This implies that at any moment the exchange between two control areas can be significantly higher than the scheduled exchanged, endangering the security of supply.

2.1.2.2 The uncertainties (UN)

The coordinated NTC calculation methodology is based on different inputs provided by TSOs, they are based on best available forecast at the time of the capacity calculation for RES, consumption, production plans or available network elements and those could differ from the real-time situation.

2.1.2.3 Current target methodology

RM can be modeled as a probability distribution function taking into account:

- Unintended deviation on the north Greek borders and the Bulgaria-Romania interconnections

- Uncertainties of the forecast between D-2 calculation studies and real time

The RM probability distribution function can be obtained corresponding to the previously described parameters associated with variables for each case. The obtained values can be different depending on the border.

2.1.2.4 Temporary values to be used

South Romania countries (Bulgaria and Serbia) - Romania

RM is calculated as the maximum of the two following values:

UD is defined with a fix value of 200 MW.

UN is defined at 20% of the TTC in south borders.

These thresholds are explained by the specificities of the south Romania interconnections:

-The most common limiting CNECs are after N-1 or N-2 contingencies, that is why the UD part is quite low.

-The huge amount of RES production in Romania and Bulgaria makes the forecast sensible to changes which give a high value for the UN threshold.

North Greek countries-Greece

RM is calculated as the maximum of the two following values:

UD is defined with a fix value of 500 MW.

UN is defined at 10 % of the TTC in all north borders

These thresholds are explained by the specificities of the north Greek interconnections

-There are recurring CNECs in neighboring grids in the north of Greece associated with the flows on north Greek borders.

-There is no significant RES production in Greek north borders with effect on the flows on the interconnections

Bulgaria-Greece border

The RM for this border is calculated as the maximum of the three following values:

a ratio of the total RM that is applied for the total north Greek borders;

UD is defined with a fix value of 100MW;

UN is defined at 10% of the TTC at this border.

These thresholds are explained by the specificities of the Bulgaria-Greece interconnection

-There are recurring CNECs in neighboring grids in the south of Bulgaria associated with the flows on south Bulgaria borders.

-There is no significant RES production in Bulgarian south borders with effect on the flows on the interconnections.

Bulgaria-Romania border

Bulgaria-Romania border

The RM for this border is calculated as the maximum of the three following values:

a ratio of the total RM that is applied for the total south Romania borders;

UD is defined with a fix value of 200MW;

UN is defined at 20% of the TTC at this border.

These thresholds are explained by the specificities of the Bulgaria-Romania interconnections:

-Several recurring CNECs limiting in N situation on the border can explain a higher UD value.

-The huge amount of RES production in Romania and Bulgaria makes the forecast sensible to changes which give a high value for the UN threshold.

Transitory period for temporary values of RM will be 1 year after the beginning of testing of the methodology.

2.1.3. Base Case - Individual Grid Model (BC-IGM)

2.1.3.1. BC-IGM preparation

Basis for the Individual Grid Model (IGM), adopted in the CC process, is a scenario assumed to be representative of the expected conditions for the market time unit under assessment.

The scenarios contain structural data, topology and forecast (obtaining the so called “Base Case – Individual Grid Model”) of:

- Grid topology: outages of grid elements is adapted according to the approved outages plans;
- Load conditions: most recently updated load forecast is implemented;
- Conventional generation sheet:
  - for the D-1 CC process, the best available forecast is adopted,
  - for the ID CC process, the last available market results are adopted;

- Renewable generation infeed: the best available forecasts are adopted;
- Net positions and initial cross-border exchanges, accordingly to the approach described in the following paragraph.

The BC-IGM prepared by the SEE TSOs will then be merged into a Common Grid Model by the Coordinated Capacity Calculator.

2.1.3.2. Coordination of the net positions and initial cross-border exchanges

Day-Ahead timeframe

Forecasting of the net positions two days before the delivery day in SEE CCR is based on a common process established in ENTSO-E: the Common Grid Model Alignment (CGMA). This centrally operated process ensures the grid balance of the models used for the CC across Europe. The process is described in the Common Grid Model Alignment Methodology (CGMAM), which was approved by all TSOs in ENTSO-E.

Main concept of the CGMAM is presented in Figure 1 below:

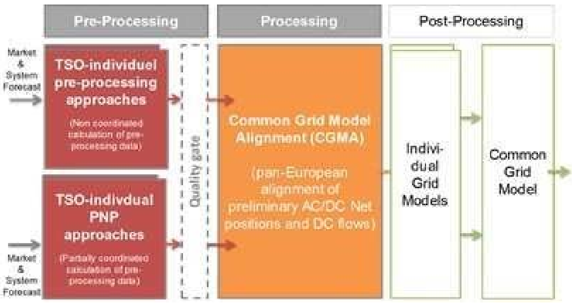

Figure 1: Main concept of the CGMAM

The CGMAM input data are created in the pre-processing phase, which shall be based on the best available forecast of the market behavior and Renewable Energy Source (RES) generation.

Pre-Processing Data (PPD) of CGMA are based on either an individually or regionally coordinated forecast. Basically the coordinated approach shall yield a better indicator about the final net position than an individual forecast. Therefore, TSOs in SEE CCR agreed to prepare the PPD in a coordinated way.

The main concept of the coordinated approach intends to use statistical data as well as linear relationships between forecasted NP and input variables. The data shall represent the market characteristic and the grid conditions in the given time horizon. The coefficients of the linear model will be tuned by archive data.

The result of the process is the “Balanced Net Position” (BNP) for each control area and for each market time unit.

The TSOs of the SEE region will adopt the net position of their control area as the result of the CGMA process, based on which the net positions on each relevant border can be defined and used at the relevant IGM models.

Intra-Day timeframe

The net position of each bidding zone of the SEE region and the cross-border exchanges on each border are defined according to the latest available market results.

2.1.4. Generation Load Shift Key (GLSK)

GLSKs are needed to transform any change in the balance of one bidding zone into a change of injections in the nodes of that bidding zone. GLSKs are elaborated on the basis of the forecast information about the generating units and, if necessary, the loads.

GLSK file is defined for each:

- control area: GLSK is computed for each relevant network node in the same control area;
- and time interval: GLSK is dedicated to individual market time unit in order to model differences between different system conditions.

In order to avoid newly formed unrealistic congestions caused by the process of generation shift, TSOs should be able to define generation shift key (GSK) and, if necessary, load shift key (LSK):

- Generation shift: GSK constitute a list specifying those generators that shall contribute to the shift;
- Load shift: LSK constitute a list specifying those load that shall contribute to the shift in order to take into account the contribution of generators connected to lower voltage levels.

If GSK and LSK are defined, a participation factor is also given:

- G(a) Participation factor for generation nodes;
- L(a) Participation factor for load nodes.

The sum of G(a) and L(a) for each area has to be to 1 (i.e. 100%).

For the application of the methodology, SEE TSOs may define:

a) Generation shift keys based proportional to the remaining available capacity on generation;
b) Generation shift keys based proportional to the actual generation in the D-2 CGM for each market time unit;
c) Generation shift keys with fixed values based on the D-2 CGM for each peak and off-peak situations;
d) Generation shift keys based on participation factors;
e) Generation shift keys based on merit order list.

2.1.5. Remedial Action (RA)

During coordinated NTC calculation, SEE TSOs will take into account Remedial Actions (RAs), that refers to any measure applied in due time by a TSO in order to respect security principles under maximum allowed cross border exchanges of the transmission power system regarding power flows and voltage constraints.

The general purpose of the application of RAs is to maintain the transmission system within the operational security limits during the CC process, where maximum power exchanges are reached. The application of proper RAs in the context of the capacity calculation can allow an increase of NTC values released to the markets, with subsequent benefits for the system.

RAs can be classified in the following two categories:

- Preventive Remedial Actions (PRAs) are those launched to anticipate a need that may occur, due to the lack of certainty to cope efficiently and in due time with the resulting constraints once they have occurred;
- Curative Remedial Actions (CRAs) are those needed to cope with and to relieve rapidly constraints with an implementation delay of time for full effectiveness compatible with the Temporary Admissible Transmission Loading. They are implemented after the occurrence of the contingencies.

The possible types of RAs considered in the CC process are the following:

- Changing the tap position of a phase shifting transformer (PST);
- Topological measure: opening or closing of one or more line(s), cable(s), transformer(s), bus bar coupler(s)or switching of one or more network element(s) from one bus bar to another;
- Change the voltage on a node by activating/deactivating reactance(s) or capacitor(s).

All explicit RAs applied for NTC calculation must be coordinated in line with article 25 of Regulation (EU) 2015/1222 (CACM). Prior to each calculation process, the TSOs of a bidding zone border shall agree on the list of remedial actions that can be shared between both in the capacity calculation. This means that a shared remedial action of one TSO is used to solve the contingency in the grid of another TSO.

These shared remedial actions can only be activated with prior consent of the neighboring TSO since their activation has a significant impact on its control area.

2.2. Capacity calculation approach

SEE TSOs will use coordinated NTC approach to determine the cross border capacities for each border of the SEE CCR.

2.2.1. CNEC Selection

The following approach will be used to determine the CNECs that will be used for capacity calculation.

At first, each TSO will define a list of CNEs and contingencies which need to be monitored during the coordinated NTC calculation process based on each TSO needs and operational experience. The result of this process will be an initial pool of CNEs and contingencies which can be updated periodically (e.g with commissioning of new grid elements). This selection is responsibility of each SEE TSOs. From the CNECs list defined by the TSOs, a sensitivity study for a set of scenarios will be carried out by the TSOs to determine the CNECs which have cross border relevance. The sensitivity of an element will be determined by the amount of additional transit that will go though it when the cross border exchanges increase by 100 MW, for several initial cross border exchange values. A similar analysis could be carried out (if it is considered necessary) in order to determine the nodes whose voltage level is significantly impacted by cross border exchanges. We will call X% the sensitivity factor to be applied. All CNECs/nodes with sensitivity equal or higher than this threshold will be monitored during the capacity calculation.

TSOs will keep the possibility to maintain additional CNECs that can be sensible to cross border exchanges.

Each TSO of the SEE region shall monitor the Critical network elements and contingencies in order to assess the relevance of the threshold over time.

If out of the studied scenarios, real time constraints occur due to cross border exchanges, the TSOs have the possibility to add new CNECs and contingencies that they consider relevant. These additional CNECs and contingencies shall meet the requirement of sensitivity as defined above.

2.2.2. Remedial actions coordination

Regarding the remedial actions, TSOs can do a pre-selection of remedial actions that will help to find the best combinations (especially when a complex set of RAs is necessary to solve some particular constraints) and reduce time in order to obtain remedial actions coordination.

Remedial actions coordination can deal with many different actions, such as but not limited to:

- PSTs tap modification;
- Topological remedial actions;
- Voltage regulation.

2.2.3. CNTC approach

SEE TSOs will use coordinated NTC approach to determine the cross-border capacities for each border of the SEE CCR.

During the DA and the ID CC processes, the Total Transfer Capacity (TTC) for the south RO borders, BG-RO border, the north Greek borders and the BG-GR border shall be assessed in both border directions:

- Using Alternate Current (AC) load-flow algorithm in order to assess network security of the relevant CNECs, taking also into consideration the beneficial effects of coordinated remedial actions;
- Based on:
    - merged two-days ahead CGMs (D2CF merged models) for DA CC process;
    - merged day ahead or intraday CGMs (DACF or IDCF merged models) for ID CC process;
- Applying modification of cross border-zonal exchanges according to GLSK files.

Disclaimer: For starting process a day is divided into two periods for the daily capacity calculation (hours in Continental Europe Time):
• peak: from 7:00 until 23:00;
• off peak: from 00:00 until 7:00 & from 23:00 until 24:00.
For each period, a single timestamp is used to represent the whole period: for peak period it is 10:30, for off peak period it is 03:30.
The target solution is to increase the number of timestamps up to 24.

3. Coordinated NTC calculation process

3.1. Creation of a common grid model (CGM)

3.1.1. Individual Grid Model (IGM)

All TSOs develop scenarios for each market time unit and establish the IGM. This means that SEE TSOs will create:

- hourly IGMs for each delivery day (D) in D-2. These models shall be used in the DA CC process for the creation of the D-2 Common Grid Models;
- hourly IGMs for each delivery day (D) in D-1. These models shall be used in the ID CC process for the creation of the D-1 Common Grid Models.

These IGMs shall include all the relevant data described in paragraph 2.1.3.

The detailed structure of the model, as well as the content is described in the Common Grid Model Methodology (CGMM), which is common for entire ENTSO-E area.

3.1.2. IGM replacement for CGM creation

If a TSO cannot ensure that its D2CF IGM for a given market time unit is available by the deadline, or if the D2CF IGM is rejected due to poor or invalid data quality and cannot be replaced with data of sufficient quality by the deadline, the merging agent will apply all methodological & process steps for IGM replacement as defined in the CGMM (Common Grid Model Methodology).

3.1.3. Common Grid models

SEE TSOs shall provide the SEE Coordinated Capacity Calculator with an IGM for each market time unit.

The individual TSOs' IGMs are merged to obtain a CGM according to the CGMM. The process of CGM creation is performed by the Coordinated Capacity Calculator and comprises the following services:

- Check the consistency of the IGMs (quality monitoring);
- Merge D-2 IGMs and create a CGM per market time unit;
- Make the resulting CGM available to all TSOs.

The merging process is standardized across Europe as described in European Merging Function (EMF) requirements. As a part of this process the Coordinated Capacity Calculator checks the quality of the data and requests, if necessary, the triggering of backup (substitution) procedures.

Merging process can be performed using common Entso-e tools and methods.

3.2. Quality check

The Coordinate Capacity Calculator gives a feedback to the TSOs of SEE Region about the correctness of their input files used for CC process. This check concerns the following input files:

- IGMs provided by TSO of SEE region

- GLSK provided by TSO of SEE region
- CGM (merged of IGM files)

The quality has to be done for each file provided by TSOs of SEE region and for the merged CGM file. The optimal solution in an automatized process is where the uploading TSO of SEE region gets a feedback when files are uploaded to a common system and the quality check starts immediately.

Quality checks can be performed using common Entso-e tools and methods.

3.3. Regional calculation of cross-zonal capacity

3.3.1. The capacity calculation process

For each relevant market time unit, the DA and the ID CC processes designed in the SEE CCR are respectively represented in figure 2 and in figure 3. The blue boxes represent tasks that TSOs are responsible of. The green ones are tasks that the coordinated capacity calculator is responsible of. Today in the SEE CCR, the TSOs send the capacities to the market. In the CACM methodology it is written that the CCC is responsible of. To limit the complexity, SEE TSOs will continue as a starting point to perform this action on behalf of the CCC.

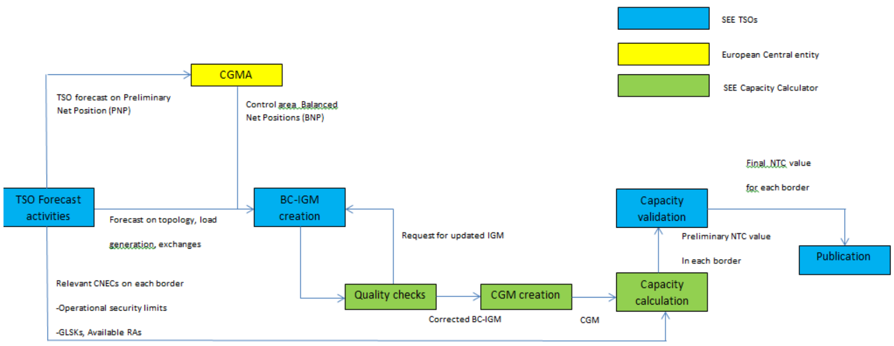

Figure 2: CNTC DA CC process

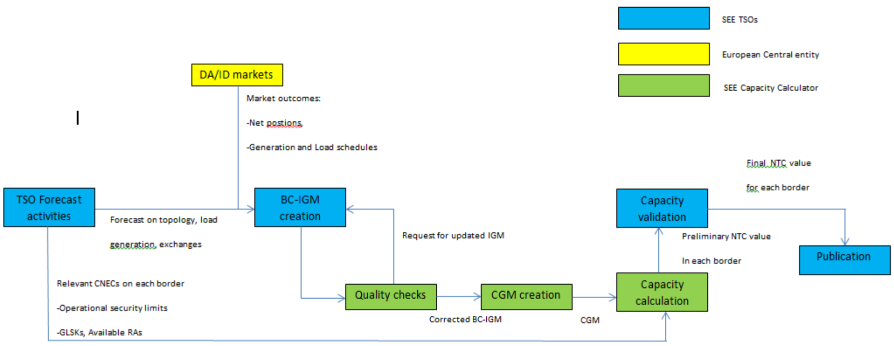

Figure 3: CNTC ID CC process

3.3.2. The TTC calculation

The Coordinated Capacity Calculator will determine the Total Transfer Capacity (TTC) available on the south RO borders, RO-BG (ratio of the TTC on the south Romania countries – Romania border), on the total Greek north borders and on the BG-GR border (ratio of the TTC on the Greek north borders).

The TTC calculation is based on:

- Alternate Current (AC) load flow algorithm, considering reactive power limit;
- Merged CGM file;
- Modifications of exchanges has to be realized according the merged GSK file;
- Respect of network security for CNEC with Remedial Action provided.

This computation is performed separately for each relevant market time unit and for each border and direction starting from the relevant CGM.

In particular, for computing the TTC from the bidding zone A to the bidding zone B, starting from the relevant CGM, the flow from A to B is stepwise increased or decreased until an unsecure/secure TTC situation is detected.

The TTC at the BG-GR border is a ratio of the total TTC value ($TTC_{BG\text{-}GR} = k*TTC_{TOTAL\ NORTH}$) that is calculated for the sum of north Greek interconnections, where k is a splitting factor. The above splitting factor will be given to the CCC by the relevant TSOs. In order to evaluate the TTC at the Greek north interconnections, one bidding zone is considered the Greek system and the other bidding zone the north Greek neighboring systems (systems of Albania, FYROM, Bulgaria and Turkey). The same splitting factor is used to determine the NTC of the BG-GR border in relation to the NTC for the sum of the north Greek borders ($NTC_{BG\text{-}GR} = k*NTC_{TOTAL\ NORTH}$) as well as to determine the TRM of the BG-GR border in relation to the TRM for the sum of the north Greek borders ($TRM_{BG\text{-}GR} = k*TRM_{TOTAL\ NORTH}$). The splitting factor can be different for imports and for exports.

The TTC at the RO-BG border is a ratio of the total TTC value that is calculated for south RO interconnections. In order to evaluate the TTC for South Romania - Romania interconnections one bidding zone is considered the Romania system and the other one the South Romania systems (systems of Serbia and Bulgaria). Similarly to the TTC calculation, the NTC values for the RO-BG border are a ratio of the NTC values for the South Romania (Bulgaria and Serbia) - Romania borders. The ratio will be provided to the CCC by the relevant TSOs.

The TTC calculation sub-process is described in figure 4.

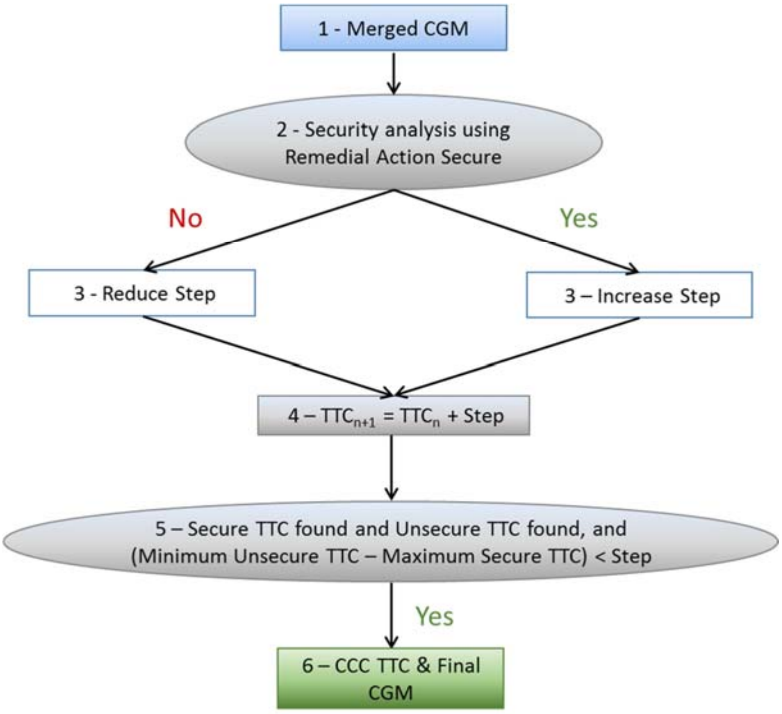

Figure 4: TTC calculation sub-process

1. The network used for the TTC calculation of the SEE Region and direction is the merged CGM.
2. This step aims at identifying a **combination of remedial actions which guarantees the respect of security constraints as well as the maximization of cross border capacities** declared as input in paragraph 2.1.5 Such a combination may not exist, in which case the level of TTC is considered as unsecure, otherwise it is considered as secure.
3. It is up to the Coordinated Capacity Calculator to choose the most suitable method to determine the step of each loop.
4. For each step, the CGM is modified in order to reach the target TTC using the GLSK shift

method, described in figure 5.

- a generation upward shift in all the bidding zones with a positive sensitivity on the flow from A to B and
- a generation downward shift in all the bidding zones with a negative sensitivity on the flow from A to B;

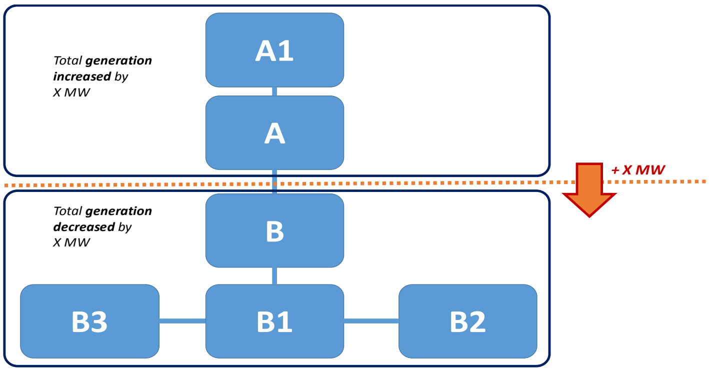

Figure 5: Stepwise flow increase from A to B

5. As a long both a secure (no violation of operational security limit of relevant CNECs) and an unsecure situations have not been found, new iteration is performed.

   As soon as at least one secure and one unsecured situations have been found, if the difference between the *"Maximum Secure TTC"* and the *"Minimum Unsecure TTC"* is higher than the Step $_{\text{Threshold,}}$ a new level of TTC is studied. (This new level of TTC should be between the maximum secure TTC and the minimum Unsecure TTC).

   If the difference between the *"maximum secure TTC"* and the *"minimum Unsecure TTC"* is lower or equal than Step $_{\text{Threshold}}$, the calculation ends.

6. For the ***Maximum TTC*** the security of the network is ensured and remedial actions are used in order to maximize cross-zonal capacity.
7. Allocation constraints could be identified corresponding to operating constraints out of SEE CCR, which might impede keeping the transmission system within agreed security limits.

3.3.3. The voltage validation

<u>Temporary implementation:</u>

The coordinated capacity calculator has also to verify that, after a set of contingencies, the voltage level on some selected grid elements is within a safety range based on the TSO operational rules.

1. If yes, the TTC value obtained from the process described in the previous chapter is confirmed.
2. If no, the coordinated capacity calculator can then apply a list of specific remedial actions defined by the TSOs such as topological actions and activation of reactance(s), capacitor(s).

If the coordinated capacity calculator cannot ensure the transmission system is maintained within the operational security limits with this level of exchange, a backward stepwise approach is applied in order to identify the maximum cross-border exchange that is compatible with the voltage security ranges.

Final implementation:

Power flows and voltage levels will be evaluated within the same sequence of the capacity calculation process.

3.3.4. The final validation

Once the coordinated capacity calculator has calculated the TTC, it provides the concerned TSOs with these values. Each TSO then has the opportunity to validate the TTC value calculated centrally or can reduce the value in case the centralized calculation could not see a particular constraint. Such constraints cannot be monitored by the DA/ID CC process or other centralized processes. Those constraints could be, but not limited to unplanned outage that occurs after the deadline to update the inputs or overloading which couldn't be observed from the CGM.

The TSO requesting a capacity reduction is required to provide a reason for this reduction, its location and the amount of MW to be reduced in accordance with article 26.5 of CACM regulation.

Where the two TSOs of a bidding zone border request a capacity reduction on their common border, the coordinated capacity calculator will select the minimum value provided by the TSOs. The reason associated to this value will be the one taken into account in all report required by relevant legislation.

For each border, direction and time unit, the final available capacity for the DA and ID markets will be defined as the difference between the computed NTC value and the already scheduled/allocated flow in the previous market timeframes. If this difference is negative, no capacity will be made available to the market.

3.4. Backup & Fallback processes

3.4.1. Backups and replacement process

For all inputs related to the capacity calculation, standard backup communication process has to be defined among SEE TSOs and the coordinated capacity calculator. Where inputs are not available for one of the parties at the expected time, back up procedures are applied until a critical deadline is reached, in order to get the associated inputs and carry on with the original process.

Where a critical deadline is reached and the inputs could not be provided to the concerned party on time, then fallbacks are applied, meaning that SEE TSOs and the coordinated capacity calculator could use other inputs to perform their tasks.

As an example, inputs from the day before, since network situations are usually stable from one day to another and could be re-used in order to complete the CC process.

3.4.2. Fallback NTC values

If the SEE TSOs and the coordinated capacity calculator could not complete a CC process within the agreed time for calculation, the last coordinated cross border capacity calculated within the long term timeframe is then used as an input for validation.

The coordinated capacity calculator uses this capacity as an input of the validation process. The TSOs have then the opportunity to adjust these values following the rules of this process.

4. Transparency

SEE TSOs shall:

- fulfill the obligations from the Transparency regulation 543/2013;
- publish daily, NTC values computed in the DA CC process;
- publish daily, NTC values computed in the ID CC process.

SEE TSOs shall provide the relevant NRAs with a yearly report on the results of the DA CC process:

- Cross-border capacities made available to the market during the previous year;
- Reliability margins applied;
- Limiting CNECs.

SEE TSOs shall provide the relevant NRAs with a yearly report on the results of the ID CC process:

- Cross-border capacities made available to the market during the previous year;
- Reliability margins applied;
- Limiting CNECs;

The limiting CNECs will be provided to SEE NRAs upon request. SEE TSOs will participate in the elaboration of the ENTSO-E biennial report on capacity calculation and allocation, which will be provided each two years and updated under request of the relevant authorities, according to Article 31 of CACM GL. For SEE region, this report will contain the capacity calculation approach used, statistical indicators on reliability margins, statistical indicators of cross-zonal capacity, quality indicators for the information used for the capacity calculation and, if appropriate, proposed measures to improve capacity calculation.

The Agency shall decide whether to publish all or part of this report.

5. Timescale for the CCM implementation

Article 9(9) of the CACM Regulation requires that:

"The proposal for terms and conditions or methodologies shall include a proposed timescale for their implementation and a description of their expected impact on the objectives of this Regulation."

The deadline for implementing a harmonized CCM within a Capacity Calculation Region is defined in article 21(4):

"*All TSOs in each capacity calculation region shall, as far as possible, use harmonized capacity calculation inputs. By 31 December 2020, all regions shall use a harmonized capacity calculation methodology which shall in particular provide for a harmonized capacity calculation methodology for the flow-based and for the coordinated net transmission capacity approach*."

The following section provides the description of the planned implementation timeline for the SEE capacity calculation methodology.

5.1. Prerequisites

When the new Capacity Calculation (CC) goes live, the calculation will be performed by the coordinated capacity calculator based on input provided by the TSOs, and finally validated by the TSOs. Two crucial elements in this process are the Common Grid Model (CGM) and the Industrialized Capacity Calculation Tool.

The CGM is being developed by a coordinated project of all EU TSOs, and the industrialized capacity calculation tool is being developed by the coordinated capacity calculator. Both shall be implemented before the "go-live" of the CCM.

5.2. Timeline for implementation of the CCM

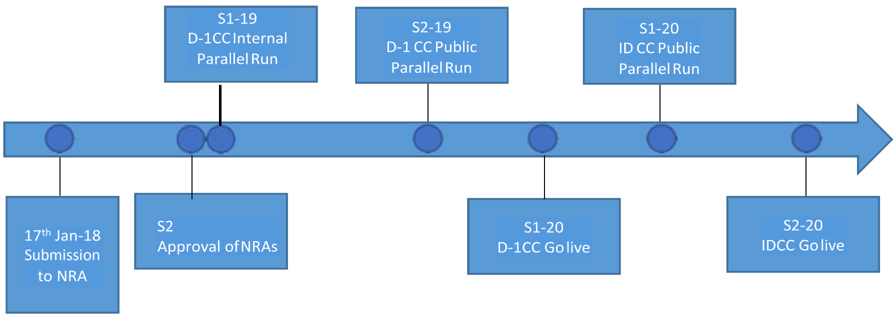

Figure 6: Timeline

Main dates:

- 17th of January 2018: Submission of the methodology for approval
- S2 2018: Approval of the methodology by the SEE NRAs
- S1 2019: Start of Internal parallel run
- S2 2019: Start of the Capacity Calculation for the day-ahead market timeframe External parallel run
- 1st January 2020: Go-Live criteria of the Capacity Calculation for the day-ahead market timeframe are met
- S1 2020: Start of Capacity Calculation for the intraday market timeframe parallel run
- 1st July 2020: Go-Live criteria of the Capacity Calculation for the intraday market timeframe are met