

Handbook of the Business Processes for the Long Term Capacity Calculation of the Southeast Europe Region



June 2026

Version 2.0

Glossary of Terms

<i>Acronym</i>	<i>Definition</i>
BM	Business Month
BY	Business Year
CGM	Common Grid Model
CNE	Critical Network Element
CNEC	Critical Network Element Contingency
EIC	Equipment Identification Code
GLSK	Generation and Load Shift Key
GSK	Generation Shift Key
LT CCC	Long term Coordinated Capacity Calculation
LT CCM	Long term capacity calculation methodology
LT OPC	Long term Outage Planning Coordination
MA	Month ahead
MRID	Master Record Identification Number
NMFT	Network Models & Forecast Tools
NTC	Net Transfer Capacity
RA	Remedial Action
RAL	Remedial Action List
RCC	Regional Coordination Center
SA	Security Analysis
SEE	South-East Europe
SG	Swiss Grid
TH	Time horizon
TL	Tie Line
TS	Timestamp
TSO	Transmission System Operator
UAP	Unavailability Plans

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2 Document History and Status

This section provides an overview of the Long Term Capacity Calculation handbook history and status. Document history is reflected in Table 1.

Note that this handbook is updated by SEleNe CC every time transmission system operators (TSOs) and/or the SEleNe CC decide to update/modify/enhance the existing procedures.

Table 1. Document History

Version	Date	Notes
1.0	September 2022	Initial Public Version of LT CCM handbook.
2.0	June 2026	Updated Public version of LT CCM handbook.

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3 Introduction

The main scope of this handbook is to provide all necessary details concerning the business processes that should be implemented by all South-East Europe (SEE) Transmission System Operators (TSOs), namely ESO, IPTO, and TEL, as well as the Southeast Electricity Network Coordination Center (SEleNe CC) in order to calculate the Long term Capacity in the SEE.

4 Provision of Required Inputs

The LT CCM process is foreseen in the LT CCM module of the SEleNe CC tool. The LT CCM module of the SEleNe CC tool uses multiple inputs, which must be all available prior to the start of the process. More specifically, for LTCC the following inputs are required in the following steps:

- LT CGM:
 - ✓ Reference IGMs (if needed) for peak and off-peak for the relevant month for the MA TH and for each season for YA TH.
 - ✓ Market document (if needed).
- LT OPC:
 - ✓ Reference CGM for peak and off-peak of the month for the MA TH and for each season for YA TH.
 - ✓ CNEC files for LT OPC of the month for MA TH and for each season for YA TH.
 - ✓ UAP will be the yearly for YA TH and the last updated for the MA TH.
 - ✓ Element list should be the last updated version.
 - ✓ RALs for MA and YA TH.
- LT CCC:
 - ✓ Long term NTC for each border and direction for MA and YA TH.
 - ✓ GLSK files
 - ✓ CNEC files for LT CCC of the month for MA TH and for each season for YA TH
 - ✓ Splitting factors and the Reliability margin

For the LT OPC the mandatory inputs are as next:

- the peak and off-peak Reference CGMs (which were created by NMFT WG) or the CGM output of the LT CGM step,
- the CNEC files,
- the UAP,
- the Element List and the RALs

For the LT CCC the mandatory inputs are as next:

- the peak and off peak CGMs which are output from the LT OPC and includes the RAs (in order to obtain a free congestion CGM),
- the CNEC files,
- the GLSK files,
- the Long Term NTC,
- the splitting factors and the Reliability margin

In case the Reference CGMs are not available or at least one TSO requests the CGM creation, through the LT CGM process, the SEE and the CE IGMs become mandatory.

In case there are no CNEC and/or GSK files for a month ahead or for a year ahead TH, then the last available ones should be considered. Moreover, the last available UAP, Element list and RA list could be used.

4.1 CGM

The Reference CGMs are used for the LT OPC. For the MA TH there is a reference CGM for peak and off-peak for the relevant month (in case there is no off-peak CGM then the process is executed only for the peak CGM). In the YA TH, for each season of the year, a peak and an off-peak CGM is used (in case there is no off-peak CGM then the process is executed only for the peak CGM). The CGM used in the LT CCC is the output of the LT OPC and it is free of congestion. The reference CGM will be uploaded on the SEleNe CC tool by SEleNe. In case there is not a valid CGM (e.g. issues with the load flow convergence), then the IGM files from CE and SEE area will be used to try to create a valid one. The relevant CGMs and IGMs that will be used in the LT OPC will contain latest available information as regards the generation pattern and topology from SEE TSOs. The Reference CGMs are provided by NMFT WG, but the updated version of Reference CGMs from OPC WG can be used also.

4.2 IGMs

The IGMs will be used in the LT CGM process to create the peak and/or off-peak CGMs. For yearly and/or monthly THs, if it will be necessary or requested by at least one SEE TSO, peak and off-peak CGMs will be created, using non-SEE and SEE TSOs seasonal IGMs or new IGMs of the SEE TSO, that requests the change of it. The seasonal IGMs for CE will be uploaded on the tool by the SEleNe CC. The provision of IGMs will be done only in case a CGM through the LT CGM process is needed to be created through the CGM processor, or in case some amendment needs to be reflected accordingly. The relevant IGMs that will be used in the LT CGM will contain latest available information as regards the generation pattern and topology from SEE TSOs. The new CGM created will be used in the LT OPC step of the process.

4.3 CNEC file

The file contains the single- and multi-contingencies that shall be examined during the SA of LT OPC and during the calculation of LT CCC. There is one for each process and all TSOs have to provide it. It contains the CNEs that each TSO defines and the associated contingencies. The CNEC file is provided by the TSOs.

4.4 GLSK file

The purpose of the GLSK file is the definition of the generators or loads which will be used for generation and load shifting. The system supports two methods for shifting that can be specified in GLSK file:

- Proportional shifting according to actual base case generation in the model (**PROP**): The system will proportionally distribute the total amount of shifting to the listed equipment respecting the maximum generation capacity of the generation nodes. Base case is the generation pattern of the CGM which is input to the CC process. For the generation nodes, if the imbalance exceeds the available generation capacity (Pmax), the remainder will be distributed proportionally to positive loads. For the load nodes only the

PROP method is used. The shift in defined generation/load nodes is proportional to the base case generation/load within an area.

- Proportional shifting based on remaining available generation margin (**PRAG**): The system distributes the total amount of shifting to the listed equipment proportionally to remaining available generation margin. This method is applicable only for generation nodes (GSK). The margin is calculated as the difference between the base case generation and the maximum capacity (Pmax), defined in the CGM. Base case is the generation pattern of the input CGM. If the imbalance exceeds the available generation capacity, the remainder will be distributed proportionally to positive loads.

4.5 RA List

This list contains possible RAs which can be used to solve security violations for the LT OPC. There are different lists for M-1 process and Y-1 process. If there is no RAL defined for a TH, then the LT OPC cannot be initiated. The RAL is used only for the LT OPC and not for the LT CCC and is used to provide as input to the LT CCC a congestion free CGM.

4.6 Splitting Factors & RM

For the MA TH, GSK splitting factors, NTC splitting factors and Reliability Margins are defined by the involved SEE TSOs for every week of the year. However, they can be different during the weeks of the year if the TSOs want to update them. For the YA TH, GSK splitting factors, NTC splitting factors and Reliability Margins are defined by the involved SEE TSOs for every month of the year.

4.7 UAP and Element List

The UAP contains planned outages from all European TSOs and the OPC Element list contains a mapping of element mrid/EIC to UCTE element naming convention. The yearly UAP will be used for YA TH. For MA TH the monthly UAP is used, which is generated after each MA merge every month (usually at the 28th of each month). The MA merge is performed for the period from 1st day of the following month until the end of the year.

4.8 Long Term NTC

Long Term NTC values are specified for all borders and directions and are used as a fallback solution in the Long Term Capacity Validation procedure. The validated NTC values from the Long Term YA process are used as Long Term NTC values to the MA TH and to the next YA TH.

5 LT CGM

SEleNe CC checks that all inputs required for the LT CGM, are available in the SEleNe CC tool, namely all the IGM files both for CE and SEE region. If an issue with the SEE IGMs is observed, then the SEleNe CC contacts the corresponding TSO via phone to report the issue. In case the SEE TSOs need to create a new CGM different than the reference CGM from the NMFT and in which they will use their modified IGMs

then for the CE region all the IGMs that were used to create the relevant reference CGM are going to be used for the merging. In case a seasonal IGM from the CE region is not valid (e.g. issues with the load flow convergence) then the seasonal IGMs either from the previous or from the next season will be used. Two CGMs will be generated using these seasonal IGMs of different seasons and the TSOs will decide which one is the appropriate to be used in the LT OPC process. For the MA TH the LT CGM is triggered for peak and if needed for off-peak for each month and for the YA the LT CGM is triggered for peak and if needed for off-peak for each season. The generated CGM from this process may be used for the LT OPC.

6 Iterations of the LT OPC

Each iteration of the LT OPC consists of three main tasks, namely the SA, the assessment of the corresponding results and the RA proposals in order to obtain a congestion free model after planned outages implementation. During the assessment of the SA results, participating TSOs can propose RAs to solve congestion and voltage violation issues and finally obtain a congestion free model.

6.1 Security analysis

For MA or YA TH the first run (first iteration) of the LT OPC is initiated. All involved TSOs check the mapping of planned outages and the data quality validations. The data quality validations consist of checks of the CNEs and COs in the CNEC files, as well as the RA lists, all against the reference CGM.

Once the LT OPC is triggered for the OPI assessment, the RCC tool conducts the SA by evaluating all possible N-1 scenarios. The examined contingencies are those defined in CNEC files of all the involved TSOs. Permissible limits for the CNE are considered those defined in the CNEC file.

6.2 Assessment of the SA Results

TSO users directly evaluate them via the RCC tool screen. The TSO users can approve the current solution or, in case they identify the need to apply RAs, they shall propose RAs that should be applied for the next iteration of the LT OPC and then reject the results. All TSOs and SEleNe CC must approve or reject all TSs in order to start a new iteration of the LT OPC.

6.3 Handling of RAs

Each one of the involved TSOs shall propose RAs to solve efficiently the congestion and voltage issues identified in its power system. Note that each TSO can propose RAs using only elements/equipment belonging to its jurisdiction. Elements/components belonging to third parties (other TSOs) cannot be used/declared as RAs.

Proposal of RAs is on the full responsibility of the involved TSOs. This actually implies the following:

1. Each one of the involved TSOs shall actively participate in the procedure in order to propose the most suitable RAs.
2. The SEleNe CC **cannot** propose RAs. On the contrary, the SEleNe CC can only accept or reject RAs already proposed by the TSOs. In case of

rejection, justification (concerning the reasons for rejection) shall be provided to the relevant TSO.

Concerning (2), the following exceptions apply:

- a) SEleNe CC can propose RAs for third parties (neighboring TSOs that belong to SEE observability area but do not belong in the SEE CCR). These RAs shall be requested from one of the involved TSOs (ESO, IPTO, TEL) and aim to reflect the actual status of the neighboring power system, including cases where TL RAs with third TSOs are required after completion of the LT OPC iterations. The following steps are foreseen for these cases:
 - I. One of the involved TSOs (referred to hereafter as reporting TSO) identifies an issue in the CGM, that belongs to its observability area but different than the SEE TSOs (IPTO, ESO, TEL). This identification may take place after the N-th iteration of the LT OPC procedure, following assessment of the results by the reporting TSO.
 - II. The reporting TSO shall inform SEleNe CC accordingly by providing all relevant proof (e.g. maintenance schedules, e-mail correspondence, etc.) and shall request the creation of a new RA. For this purpose, the reporting TSO shall provide to the SEleNe CC all relevant information required to correctly declare this RA (e.g., the status in case of a line, etc.). In cases where the affected equipment (e.g. a Tie-Line) is jointly owned and the other owner is a third (non-SEE) TSO, the reporting TSO submits a request to SEleNe CC to create the TL RA for the corresponding part of the line and have it applied on behalf of the third TSO.
 - III. The SEleNe CC shall declare this RA within the RAL of the reporting TSO.
 - IV. The reporting TSO shall wait for the SEleNe CC to create and set the RA before rejecting the respective timestamps.
- b) SEleNe CC can declare RAs in case a TSO does not have temporary access to the SEleNe CC tool. Nevertheless, these RAs shall be proposed and communicated by the relevant TSO.

6.3.1 Handling of RAs that Include Tie-Lines

Some RAs include the use of Tie-Lines (TLs). These RAs are more demanding, requiring further coordination among all relevant parties. Therefore, the procedure of Figure 1 is proposed.

As shown in Figure 1, when the N-th iteration is finished, TSOs assess the results and evaluate the need of TL RAs for specific TSs. In case a TSO (for instance TSO_A) wants to implement a TL RA, then TSO_A shall determine the affected TSO (TSO_B), i.e., the TSO that owns the other half of the TL, and inform accordingly. Communication can be done by any means, e.g., phone, emails, etc. using internal TSO procedures.

During the communication phase both TSOs shall unanimously decide if the TL RA shall be applied or not. If they agree not to apply the TL RA, then the TL RA coordination procedure is finished. In case they decide to apply the TL RA, then the following cases are considered:

- a. If TSO_B has not yet accepted or rejected the affected TSs, then the TL RA shall be applied for these TSs during the next iteration ($N+1$) by both parties. **At this point TSO_A shall notify SELeNe CC about the application of this TL RA.**
- b. If TSO_B has already accepted or rejected the affected TSs, then there is no option to proceed with this TL RA for the next iteration ($N+1$ iteration). Therefore, TSO_A shall reject the TSs for which the TL RA is agreed to be applied. After iteration $N+1$ is finished, between iteration $N+1$ and $N+2$, both TSO_A and TSO_B shall apply the TL RA. **At this point TSO_A shall notify SELeNe CC about the application of this TL RA.**

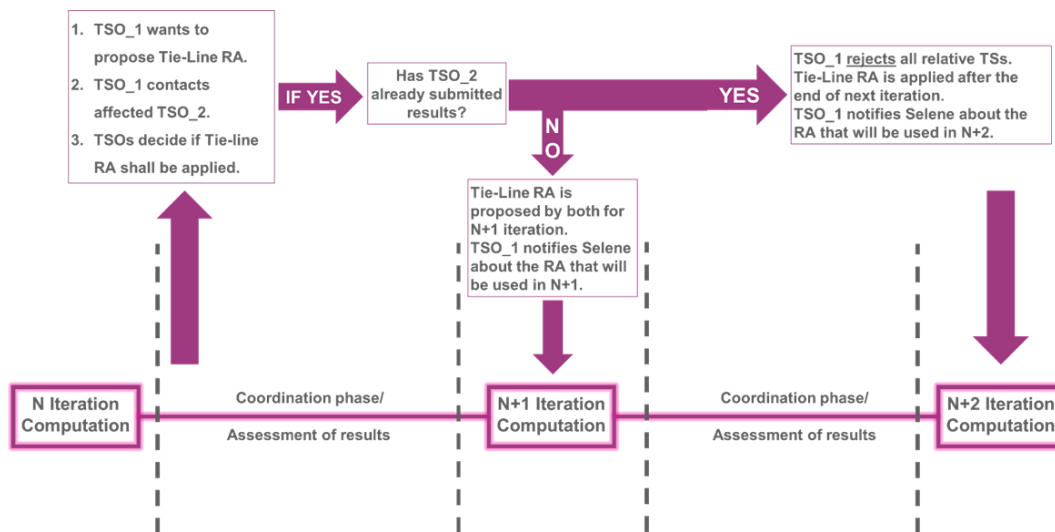


Figure 1. Procedure for the coordination of TL RAs.

6.4 Handling of Outages

Each one of the involved TSOs shall activate or deactivate an Outage to provide a secure and reliable network solving efficiently the congestion and voltage issues identified in its power system with the aim of obtaining a free congestion CGM. Note that each TSO can activate or deactivate Outages only belonging to its jurisdiction. Outages belonging to third parties (other TSOs) can be activated/deactivated only by the SELeNe CC operator.

Activation/deactivation of Outages is on the full responsibility of the involved TSOs and all the involved SEE TSOs, shall actively participate in the procedure. This actually implies the following:

- Each one of the involved SEE TSOs shall actively participate in the procedure in order to activate/deactivate the most suitable Outages.
- The SELeNe CC **can** activate/deactivate Outages from non-SEE TSOs and from SEE TSOs after explicit communication and the respective permission/authorization with them. On the contrary, the SELeNe CC can only accept or reject Outages already activated/deactivated by the TSOs. In case of rejection, justification (concerning the reasons for rejection) shall be provided to the relevant TSO. In case the SEE TSOs want to deactivate

some Outages of the neighboring non-SEE TSOs (TSOs of the observability area) then they shall inform the SEleNe CC by providing all relevant proofs. In case there is no AC load flow convergence of the base case (before the application of contingencies) of the created CGM then the SEleNe CC will deactivate the most suitable Outages and will inform SEE TSOs about the deactivated Outages. If the SEE TSOs do not agree with the deactivation of the Outages, then SEleNe CC will be notified about the reasons for rejection.

6.4.1 Handling of Outages that Include Tie-Lines

Some Outages include Tie-Lines (TLs). These Outages are more demanding, requiring further coordination among all relevant parties. Therefore, the following procedure is proposed. When the N -th iteration is finished, TSOs assess the results and evaluate the need for activation/deactivation of TL Outages for specific TSs. In case a TSO (for instance TSO_A) wants to activate/deactivate a TL Outage, then TSO_A shall determine the affected TSO (TSO_B), i.e., the TSO that owns the other half of the TL, and inform accordingly.

During the communication phase both TSOs shall unanimously decide if the TL Outage shall be activated/deactivated or not. If they agree not to activate/deactivate the TL Outage, then the TL Outage coordination procedure is finished. In case they decide to activate/deactivate the TL Outage, then the following cases are considered:

- c. If TSO_B has not yet accepted or rejected the affected TSs, then the TL RA shall be activated/deactivated for these TSs during the next iteration ($N+1$ iteration) by both parties. At this point TSO_A shall notify Selene about the activation/deactivation of this TL Outage.
- d. If TSO_B has already accepted or rejected the affected TSs, then there is no option to proceed with this TL Outage for the next iteration ($N+1$ iteration). Therefore, TSO_A shall reject the TSs for which the TL Outage is agreed to be activated/deactivated. After iteration $N+1$ is finished, during the evaluation window between iterations $N+1$ and $N+2$, both TSO_A and TSO_B shall activate/deactivate the TL Outage. At this point TSO_A shall notify SEleNe CC about the activation/deactivation of this TL Outage.

7 LT CCC

The SEleNe CC checks that all inputs required for the LT CCC, are available. If an issue is observed, then the SEleNe CC contacts the corresponding TSO to report the issue. The SEleNe CC shall notify all involved TSOs to verify the correct mapping of the CNEs and contingencies from the CNEC file, as well as the GLSK files, to the CGM to be used for the LT CCC. Each TSO will respond in order to proceed with the capacity calculation.

For MA and YA TH the calculation of the capacity is triggered for all borders and directions and for peak and off peak (if the CGMs exist), choosing the CGMs for each week of the month for the relevant month, in case of the MA TH, and for each month of the relevant season in YA TH. No RAs are applied in the LT CCC as the CGMs used as input to the process are free of congestion as they are outputs of the LT OPC process where RAs were applied.

Until the NTC Validation window closure, all involved TSOs shall validate the NTC results. When the NTC Validation is complete on each TSO part, the TSO shall mandatory notify the SEleNe CC.

After all involved TSOs have finished the NTC Validation, the SEleNe CC closes the NTC Validation Window and generates the validated LT CCC reports for all borders and directions. The Overview reports and the NTC export files are downloaded for the relevant Time horizon (M-1 or Y-1), Business Month or Business Year.

SEleNe CC operator shall also publish the validated results on SEleNe CC website, for all borders and directions, including the following reports:

- Detailed Reports
- Overview Reports produced **after** NTC Validation
- Forecast Report
- Results Summary Reports

Finally, SEleNe CC shall transfer the validated LT NTC values to the Short-Term TH.

8 Coordination Phase of LT OPC and LT CCC

The coordination phase may include several iterations of the LT OPC procedure. Indeed, the coordination phase starts with the second iteration of the LT OPC and proceeds to subsequent iterations until all security issues are resolved.

Before the coordination phase the LT OPC process is initially executed and the SEleNe CC informs all involved TSOs that the first iteration has been finished. The coordination phase consists of six main steps. More details concerning the required steps are provided below:

Step-1: At this step, the SEleNe CC operator triggers the second iteration of the LT OPC. RAs, proposed during the first iteration of the LT OPC, constitute the inputs of the second iteration.

Step-2: The SA is executed by the SEleNe CC tool. When the SA is finished, all involved TSOs assess the solution and approve or reject the relevant TSs by proposing their RAs.

Step-3: All TSOs provide their feedback (i.e., approval of TSs or rejection and proposal of new RAs). If at least one TSO rejects at least one TS, then the SEleNe CC triggers the next iteration of the LT OPC. The already proposed and accepted RAs are inputs for the next LT OPC iteration. The TSOs and SEleNe CC can also activate or deactivate outages from the UAP file.

Step-4: In case all TSOs approve all TSs then the LT OPC process terminates. Otherwise, the process returns to **Step-3**.

Step-5: The LT Coordinated Capacity Calculation is started choosing from the “LT Start Capacity Calculation” screen the borders/directions, the CGMs (different CGMs can be used for the calculations) for each week of the month for the MA TH and for each month of the season in the YA TH separately for peak and off peak.

Step-6: When the LT CCC process is finished the TSOs are informed that the process has finished and that they can proceed with the NTC validation.

Important Remarks:

- All involved parties shall actively participate during the coordination phase to assess SA results and to propose RAs.
- There is no exact time concerning the initiation of each iteration of the LT OPC. The first iteration may start at the 28th of M-2 (after the 2nd merge of the OPC Pan European Tool) for the MA process and at the time period 27th October – 7th of November of Y-1 for the YA process. All subsequent iterations are triggered by the SEleNe CC as soon as all TSOs submit their feedback.
- The coordination phase is concluded at the time period 30th of M-2 – 9th of M-1 for the MA process and at the time period 8th – 21st November of Y-1 for the YA process. At that time, if one or more TSs remain unapproved by one or more TSOs, the SEleNe CC approves the results on behalf of them and the whole process is terminated. TSOs may request, on an *ad hoc* basis, the coordination phase to be prolonged via telco in order to solve potential network issues.

9 Timeline

9.1 Month ahead (MA)

For **Business Month M** the relevant dates and processes are presented.

Dates	Processes
20 th – 27 th of M-2	Initial data preparation (IGM if needed, GSK, CNEC files) – TSOs
	- CGM merging and scaling if needed – Selene CC
	- Data quality check – Selene CC
28 th of M-2 - 29 th of M-2 according to OPC monthly merging of outages schedule)	Second data preparation in case of inconsistencies resulting from the data quality check – TSOs
	- Data quality check for OPC
	- Mapping of planned outages and quality check of outages – Selene CC
30 th of M-2 - 9 th of M-1	- Congestion check (security analysis of the base case) – Selene CC
	Additionally iterative RAs application for N-1 fulfilment for the base case and second congestion

	check (security analysis of the base case) – TSOs, Selene CC
	Data quality check of the contingencies/CNEs and Capacity calculation – Selene CC
	Local validation – TSOs
	Recalculation and final validation – Selene CC, TSOs
	Publication of the NTC values: Selene CC and TSOs
	NTC values for Market operator – TSOs

9.2 Year ahead (YA)

For **Business Year Y** the relevant dates and processes are presented.

Dates	Processes
27 th of October – 3 rd of November of Y-1	Initial data preparation (IGM only if topology changes, GSK, CNEC files) – TSOs
	- CGM merging and scaling if needed – Selene CC
	- Data quality check – Selene CC
4 th - 7 th of November (according to OPC yearly merging of outages schedule)	Second data preparation in case of inconsistencies resulting from the data quality check – TSOs
	- Data quality check for OPC
	- Mapping of planned outages and quality check of outages – Selene CC
8 th - 21 st of November of Y-1	- Congestion check (security analysis of the base case) – Selene CC
	Additionally iterative RAs application for N-1 fulfilment for the base case and second congestion check (security analysis of the base case) – TSOs, Selene CC
	Data quality check of the contingencies/CNEs and Capacity calculation – TSOs, Selene CC
	Local validation – TSOs
	Recalculation and final validation – Selene CC, TSOs
	Publication of the NTC values: Selene CC and TSOs

- **Quality check of Outages and Inputs:** Before starting the LT OPC Assessment process the LT OPC is executed and finished without the Assessment Process and the OPC reports contain the Outages for each examined TS for peak and off-peak scenario are generated and examined by the TSOs. Additionally, the correct mapping of the contingencies and CNEs of the CNEC file and the RA lists of the

tool in the reference CGM is checked through the automatically generated Data Quality Report.

- **Data quality check of the contingencies:** In order to check the correct mapping of the contingencies and CNEs of the CNEC file and the generators of the GLSK file in the CGM, that was produced from the LT OPC process and will be used for the LT CCC, the Input Data Quality process of the LT CCC is executed.