

# All TSOs' of the IU Capacity Calculation Region proposal for common provisions for regional operational security coordination in accordance with Article 76 of Commission Regulation (EU) 2017/1485 of 2 August 2017

## “IU CSAm”

Version for Public Consultation

11 October 2019

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## WHEREAS

1. Commission Regulation (EU) 2017/1485 establishes a guideline on electricity transmission system operation (hereafter referred to as “SO GL”), which entered into force on 2 August 2017.
2. This document is the common methodology of all transmission system operators (hereafter referred to as “IU TSOs”) of the IU Capacity Calculation Region (hereafter referred to as “IU CCR”), and defines the methodology for regional operational security coordination within CCR IU (hereafter referred to as “IU CSAM” or “Methodology”) in accordance with Article 76 and 77 of SO GL.
3. This Methodology takes into account the general principles and goals set in SO GL as well as Commission Regulation (EC) 2015/1222 establishing a guideline on capacity allocation and congestion management (hereafter referred to as “CACM”).
4. Articles 76 and 77 of SO GL constitute the legal basis for this Methodology and define several requirements that it should include at least: (a) conditions and frequency of intraday coordination of operational security analysis and updates to the common grid model by the regional security coordinator; (b) the methodology for the preparation of remedial actions managed in a coordinated way, considering their cross-border relevance as determined in accordance with Article 35 of CACM, taking into account the requirements in Articles 20 to 23 of SO GL and determining at least: (i) the procedure for exchanging the information of the available remedial actions between relevant TSOs and the regional security coordinator; (ii) the classification of constraints and the remedial actions in accordance with Article 22 of SO GL; (iii) the identification of the most effective and economically efficient remedial actions in case of operational security violations referred to in Article 22 of SO GL; (iv) the preparation and activation of remedial actions in accordance with Article 23(2) of SO GL; (v) the sharing of the costs of remedial actions referred to in Article 22 of SO GL, complementing, where necessary, the common methodology developed in accordance with Article 74 of CACM.
5. This Methodology contributes to and does not in any way hinder the achievement of the objectives of Article 4 of SO GL.
6. This Methodology defines how regional operational security assessment shall be applied in a coordinated manner in day-ahead and intraday within IU CCR of regional operational security coordination within IU CCR.
7. This Methodology considers and where necessary complements the methodology for coordinating operational security analysis in accordance with Article 75 of SO GL (hereafter referred to as “CSA Methodology”).
8. This Methodology considers and, where necessary, complements the IU methodology for coordinated Redispatching and Countertrading (hereafter referred to as “IU RD and CT Methodology”) in accordance with Article 35 of CACM.
9. This Methodology considers and, where necessary, complements the common IU methodology for coordinated redispatch and countertrading cost sharing (hereafter referred to as IU Cost Sharing Methodology”) in accordance with Article 74 of CACM.
10. According to Article 6(6) of SO GL this Methodology includes a timescale for its implementation and a description of its expected impact on the objectives of the SO GL.
11. In conclusion, this Methodology shall contribute to the general objectives of the SO GL to the benefit of all TSOs, the Agency, regulatory authorities and market participants.

## TITLE 1 GENERAL PROVISIONS

### Article 1 Subject matter and scope

1. This Methodology for regional operational security coordination shall be considered as the methodology of IU TSOs pursuant to Article 76 of SO GL and for organisation of regional operational security coordination in accordance with Article 77 of SO GL.
2. This Methodology shall cover the day-ahead and intraday regional operational security coordination within IU CCR. This Methodology shall apply to all TSOs and the RSC within CCR IU.
3. This Methodology is subject to NRA approval in accordance with Article 6(3)(b) of SO GL.

### Article 2 Definitions and interpretation

1. In this IU CSAM, the following acronyms are used:
  - a. “CGM” means the “common grid model”;
  - b. “CGMm” means the methodology regarding articles 67 and 70 of SO guideline
  - c. “IGM” means the “individual grid model”;
  - d. “PTDF” means “power transfer distribution factor”
  - e. “RA” means “remedial action”.
  - f. “RD and CT” means “redispatching and countertrading”
  - g. ‘ANORA’ means the list of agreed not ordered remedial actions
  - h. CROSA’ means ‘Coordinated Regional Operational Security Assessment’,
  - i. ‘CSA’ means ‘Coordinated Security Analysis’;
  - j. ‘ROSC’ means ‘Regional Operational Security Coordination’;
  - k. ‘RSA’ means ‘Regional Security Analysis’.
2. For the purposes of the IU CSAM Methodology, the terms used shall have the meaning of the definitions included in article 3 of the SO Regulation, article 2 of CACM Regulation, article 2 of Commission Regulation (EU) No 543/2013 of 14 June 2013 on submission and publication of data in electricity markets and article 2 of CSAM. In addition, the following definitions shall apply:
  - a) “Ordered RA” is the subset of the Agreed RA that is bindingly ordered by the RA Requesting TSO and RA Connecting TSO.
  - b) "RA Connecting TSO" means the TSO responsible for the operation of the control area where the Redispatching resources are located and activated, and/or the countertrading resources are activated;
  - c) “RA Requesting TSO” means the TSO responsible for the operation of the control area where the physical congestion is detected. In case of a physical congestion on a cross-border transmission line, both TSOs responsible for the operation of that line are considered to be RA Requesting TSOs;
  - d) ‘Agreed RA’ means a RA which TSOs in CCRs have agreed to implement;
  - e) 'Activated RA' means the ordered RA which the resource provider has agreed to implement and is activated by the Requesting and Connecting and Transiting TSO and is implemented in the CGM;
  - f) 'Shared RA' means a RA available for the global optimisation to relieve operational security limit violations;
  - g) 'Conditionally shared RA' means a shared RA whose applicability depends on conditions provided by the RA Connecting TSO;

- h) 'Non-Shared RA' means a RA used to relieve specific operational security limits violations and not available for the global optimisation;
  - i) 'Redispatching' means a measure performed by one or several TSOs by altering specific generation and/or load patterns in order to change physical flows in the transmission system and relieve physical congestions. The location of the units considered for Redispatching are known and the parameters of the resource are known;
  - j) 'Countertrading' means a measure performed by one or several TSOs in one or several bidding zones in order to relieve physical congestions where the location of activated resources within the bidding zone is not known.
  - k) "Cross-border impacting RA" means a RA, considered to be activated by a TSO and whose activation has a significant influence on at least one TSO that is not involved in its activation
  - l) "Preventive RA" - means a RA that is the result of an operational planning process and needs to be activated prior to the investigated timeframe for compliance with the (N-1) criterion
  - m) "Curative RA" - means a RA that is the result of an operational planning process and is activated straight subsequent to the occurrence of the respective contingency for compliance with the (N-1) criterion
  - n) "Set of RA" - means a combination of RA that are to be applied as a whole to maintain operational security and categorized as in the Article 22 of SO guideline.
  - o) "grid element" means any component of a transmission system, including interconnectors, or of a distribution system, including a closed distribution system, such as a single line, a single circuit, a single HVDC system, a single transformer, a single phase-shifting transformer, or a voltage compensation installation
  - p) "cross regional operational security analysis" or CROSA is the entire process of regional security analysis applied in the IU region as defined in Articles 22 to 36 of this methodology
  - q) "all island" means Ireland and Northern Ireland
  - r) "LPA" means local preliminary assessment executed by the SONI and EirGrid TSOs in accordance with Article 15
  - s) TATL means temporary admissible transmission loading
  - t) PATL means permanent admissible transmission loading
3. The following types of constraints are considered in this methodology:
- a. Constraints in line with SO GL means a situation in which there is a need to prepare and activate a RA in order to respect operational security limits. The consideration of these constraints within IU CSAM is further defined in Article 19. The constraints consist of the following:
    - i. Power flows and voltages exceeding operational security limits;
    - ii. Violations of stability limits of the transmission system identified in accordance with article 38 (2) and article 38 (6) of SO GL;
    - iii. Violations of short-circuit current limits of the transmission system.
  - b. Constraints related to all aspects required to be taken into account when using RAs and classified as following:
    - i. Technical constraints are all the rules related to the technical limitations for resources for redispatching in accordance with article 5 of CT and RD methodology or network elements;

- ii. Operational constraints are all the operational conditions and usage rules taking into account the timings to operate the grid and avoid a premature ageing of the network elements;
    - iii. Procedural constraints are all the timing constraints due to local or regional processes;
    - iv. Legal constraints are the legal requirements stated in national laws regarding the priority of activation of RAs.
  - c. System constraints are all the optimisation constraints added by IU On-shore TSOs, expressed as flow limitation on one or a set of Secured and Scanned Elements and necessary to respect stability limits or operational security limits other than power flow limits. These are further detailed in Article 17.
4. In this IU CSAM, unless the context requires otherwise:
- a. The singular indicates the plural and vice versa;
  - b. Headings are inserted for convenience only and do not affect the interpretation of this IU CSAM;
  - c. Any reference to legislation, regulations, directives, orders, instruments, codes or any other enactment shall include any modification, extension or re-enactment of it when in force.

### **Article 3 Application of SO GL 76 methodology**

1. This Methodology defines how the day-ahead and intraday regional operational security coordination shall be applied within IU CCR.
2. This Methodology shall apply to all TSOs and RSC within CCR IU.
3. Application of this methodology requires all TSOs and the RSC within CCR IU to coordinate with the adjacent CCRs for inter-CCR and inter-RSC coordination.
4. The implementation timetable is set out in Article 41.

## **TITLE 2 REGIONAL OPERATIONAL SECURITY COORDINATION**

### **Article 4 General provisions for day-ahead and intraday regional operational security coordination process**

1. IU TSOs in coordination with IU's RSC shall identify and validate in day-ahead and intraday the Agreed Remedial Actions for the IU CCR for each hour of the target day following the regional operational security coordination process as defined in this methodology.
2. The day-ahead and each intraday regional operational security coordination process shall consist of three main stages:
  - a) the creation of regional operational security coordination inputs for the CROSA by the IU TSOs as described in Articles 14 – 20;
  - b) the regional operational security coordination, including the validation and logging of the remedial actions by the RSC as described in Articles 21 to 34;
  - c) Implementation of the Remedial Actions by the IU TSOs in coordination with the RSC as described in Articles 35 and 36

3. Intraday CROSA shall be performed at least three times in intraday timeframe in accordance with article 24 of CSAM.
4. Not less than six months before the establishment of the CROSA processes contained within articles 21 to 34 , the IU TSOs shall jointly define the timeline of each step of the day-ahead and intraday regional operational security coordination, in line with the article 24 of the CSAm and publish them on their website.
5. Each IU TSO shall implement the Agreed Remedial Action in all subsequent IGMs and shall activate the Ordered Remedial Actions following the prescriptions as described in Article 35.
6. Each IU TSO has the right to modify an Ordered remedial action or to activate a new remedial action in accordance with the Fast Activation process as described in Article 37.

## TITLE 3 DEFINITION AND DETERMINATION OF IU XNES, XRA'S, CONSTRAINTS AND CONTINGENCIES

### Article 5 Definition of Secured Elements

1. Secured elements represent a set of grid elements of IU TSOs of voltage level  $\geq 132\text{kV}$  subject to the CROSA, on which operational security limits violations need to be managed in a coordinated way.
2. The secured elements are elements identified as cross-border relevant network elements (XNEs) in accordance with CSAM within the IU CCR.
3. TSOs of IU CCR shall have a right to exclude any element from the secured elements set, except mandatory elements defined in §2, that fulfils one of the following criteria:
  - a. Element is a power plant line
  - b. Element is a radial line
  - c. Element is connected to DSO grid
  - d. Element is a transformer with secondary voltage side  $< 132\text{ kV}$
4. TSOs of IU CCR shall have a right at any time to exclude any element from the secured elements set, except mandatory elements defined in §2, if there is common agreement between TSOs of IU CCR that this element can be excluded.
5. TSOs of IU CCR, which are part of more than one CCR, shall have a right to exclude any element from secured elements set which is subject to CROSA of other CCRs.
6. The list of excluded elements from the secured elements set shall be shared with the respective RSC and among IU TSOs.
7. Each TSO of IU CCR shall have a right at any time to include any element of voltage level  $\geq 110\text{kV}$  in secured elements set.

### Article 6 Definition of Scanned Elements

1. Scanned elements represent set of elements on which CROSA shall not create new operational security limits violations or worsen any existing violation. Each IU TSO may, for CROSA purposes only, deviate from this by setting individual thresholds for the scanned elements of its IGM.
2. TSOs of IU CCR shall have a right at any time to include any element excluded from secured elements set in scanned elements set.

3. Each TSO of IU CCR shall have a right at any time to include any element of voltage level < 110kV in scanned elements set, which is modelled in its IGM, and shall provide justification for its inclusion.

### **Article 7 List of secured and scanned elements**

1. By 3 months after approval of this methodology, TSOs of IU CCR with support from IU's RSC, shall define lists of secured and scanned elements.
2. If a new element of voltage level  $\geq 110\text{kV}$  is commissioned, it can be included in the secured element list as per Article 6.7
3. Each IU TSO shall have the right at any time to move any element of voltage level  $\geq 110\text{ kV}$  of its control area from the scanned element list to secured element list.

### **Article 8 Cross-border relevant network elements**

1. The cross border network elements (XNEs as defined under the pan-EU CSAm Article 15.1) shall be the list of secured elements identified in accordance with article 5.

### **Article 9 Classification of remedial actions**

1. Each IU TSO shall classify their remedial actions in accordance with Article 22 of SO GL.

### **Article 10 Cross-border relevance of remedial actions**

1. Within one month after secured elements set (IU XNEs) have been defined in accordance to article 5, TSOs of IU CCR shall share with IU's RSC all potential remedial actions designed according to article 14 of CSAm.
2. TSOs of IU CCR, in coordination with the IU's RSC, shall jointly assess the relevance of potential remedial actions shared by the IU TSOs in accordance to §1.
3. TSOs of IU CCR shall aim at agreeing on a qualitative approach according to Article 11 to determine remedial actions that are deemed cross-border relevant and corresponding TSOs affected by those remedial actions.
4. If the TSOs of IU CCR cannot agree on a qualitative approach, according to Article 11, for a certain remedial action, a quantitative approach according to Article 12 shall be used for these remedial actions.
5. TSOs of IU CCR will jointly define and share with the RSC the list of remedial actions that are deemed cross-border relevant.
6. Reassessment of the list of cross-border relevant remedial actions RAs shall be done on a yearly basis.
7. If a new remedial action is designed in day-ahead or intraday operation planning period, each TSO of IU CCR shall assess its relevance using the quantitative approach as specified in Article 15(5) of CSAm.
8. Remedial action influence factor computation for remedial actions described in §7 shall be performed on last available common grid model for CROSA.

9. If new remedial action is designed between two mandatory assessments and prior to day-ahead planning period, each TSO of IU CCR shall assess its relevance according to Article 11. If agreement cannot be reached, then the quantitative approach as described in Article 12 shall be used.
10. TSOs of IU CCR can delegate the task described in §7 to the IU's RSC.
11. If a new remedial action or set of remedial actions is designed during real time operation and if the system is in alert state, the connecting TSO of IU CCR shall use quantitative assessment in order to identify if this remedial action is cross-border-impacting. When doing this, connecting TSO shall check that activation of such remedial action does not lead to violations of operational security limits on elements of its observability area using either last available common grid model or its state estimator. If such analysis shows that activation of remedial action may cause violations on elements of its observability area, its activation has to be coordinated with affected TSOs.
12. In an emergency state IUTSO shall apply the provision of article 16.4 of CSAm.
13. Between two mandatory assessments of remedial actions, each TSO of IU CCR shall have right to request additional assessment of a remedial action providing justification for such a request to RA connecting TSO and relevant RSC.
14. During Fast Activation Process, when an IU TSO proposes an XRA in accordance with paragraphs 3 and 4 of article 17 of the CSAm and when this TSO is the Connecting TSO as well as the only XRA affected TSO, the activation of this XRA shall not be subject to further coordination.

### **Article 11 Qualitative assessment of XRAs**

1. TSOs of IU CCR, with support of RSC, shall jointly establish a list of remedial actions provided by IU TSOs to the RSC in accordance with Art. 78.(1) of SO Regulation.
2. For each remedial action included in the list defined in §1 :
  - a. Each TSO of IU CCR shall individually assess the cross-border relevance of the remedial action on its grid;
  - b. RA connecting TSO shall assess the cross-border relevance of the remedial action on other TSOs grid and also on its grid;
  - c. If a remedial action is quantifiable such as redispatching, countertrading, change of set point on HVDC systems or change of taps on phase-shifting transformers, the quantity above which this remedial action is deemed cross-border impacting on another TSO's grid or its own grid shall be specified as required under CSAM Article 15 (7).
3. TSOs of IU CCR can delegate the tasks described in §2 to the IU's RSC.
4. Each TSO of IU CCR shall propose remedial actions which it deems to be cross border relevant and shall provide a justification for their selection to RA connecting TSOs and the IU's RSC.
5. If a common agreement among TSOs of IU CCR is reached, then the remedial action is defined as cross-border relevant and all XRA affected TSOs are identified.
6. If a remedial action or set of remedial actions is not proposed as cross-border relevant by any TSO of IU CCR, it is considered as non-cross-border relevant.
7. If a remedial action is identified as cross border relevant only by XRA connecting TSO, this TSO shall be considered as the only XRA affected TSO.

### **Article 12 Quantitative assessment of XRAs**

1. TSOs of IU CCR shall use the common grid models established according to Article 67 of the SO Regulation when computing remedial action influence factor.
2. Each TSO of IU CCR shall provide a list of elements on which the influence of the remedial action shall be assessed. The assessment shall be done at least on the XNEC elements as required by CSAM Article 15(4).
3. Remedial action influence factor shall be calculated according to Article 15 (4) and Article 15 (5) of CSAM for remedial actions for which agreement on using qualitative approach in accordance to Article 12 could not be reached.
4. Where a remedial action consists of a combination of actions, its cross-border relevance shall be assessed for the effect of the combination.
5. TSOs of IU CCR can delegate the task of performing calculations of remedial action influence factor to IU's RSC.
6. All remedial actions which have an influence factor greater than a threshold set in accordance with CSAM Articles 15(4) and 15(5) will be deemed as cross-border- relevant otherwise remedial actions will be considered as non-cross-border relevant
7. All TSOs of IU CCR that have at least one affected XNEC for which the remedial action influence factor is greater than the threshold are considered as XRA affected TSOs as required by CSAM Article 15(8).

### **Article 13 Contingency list**

1. Each TSO of IU CCR shall establish the list of contingencies to be simulated in operational security analysis in accordance with articles 6 and 10 of the CSAM (hereafter referred to as "Contingency List").
2. Each TSO of IU CCR shall provide the respective RSC(s) with the contingency list to be used in IU CROSA process and shall inform the RSC about any update of this list in accordance with article 11 of CSAM.
3. IU's RSC shall use the latest Contingency Lists shared by the TSOs.

## **TITLE 4 PROCESS DESCRIPTION COORDINATION OPERATIONAL SECURITY ANALYSIS PROCESS**

### **CHAPTER 1 PREPARATION**

#### **Article 14 Provision of the regional operational security inputs**

1. Each IU TSO shall provide the following input data to IU's RSC:
  - a. Individual Grid Model according to Article 15, including the operational security limits for each secured and scanned network element according to Articles 5 and 6
  - b. Available remedial actions within his control area according to Article 16;
  - c. When relevant, Additional System Constraints according to Article 17;
  - d. Secured network elements according to Article 5, scanned network elements according to Article 6, and contingencies according to Article 18.

2. The input data shall cover all remaining hours for a relevant business day.
3. IU TSOs shall deliver or update when required the input data before the commonly agreed process deadlines.

### **Article 15 Preparation and updates of individual grid models by TSOs**

1. Each IU TSO shall prepare and deliver day-ahead and intraday individual grid models for day-ahead and intraday coordinated regional operational security assessments as defined in the methodology pursuant to article 75(1) SO guideline and the methodology pursuant to article 70(1) SO guideline.
2. IU TSOs shall have the right to perform local preliminary assessments. When preparing IGMs, each IU TSO shall have the right to include RAs resulting from these local preliminary assessments in accordance with article 21 (3) of CSAM which were performed by IU TSOs before the first day-ahead CROSA.
3. When preparing IGMs, IU TSOs shall have the right to include non-cross-border relevant remedial actions in accordance with article 21 (4) of CSAM resulting from local preliminary assessments performed by IU TSOs at any time.
4. If the result of the optimisation contains agreed RAs for the respective control area each IU TSO shall provide to the IU's RSCs updated IGM between two coordination runs in accordance with CSAM article 33 (1)(c) and CGMm articles 3 and 4.
5. In addition, SONI and EirGrid will jointly carry out local preliminary assessment (LPA) in accordance with the provisions of CSAm Article 21.3 and 21.4 and will relieve operational security limit violations within the all island synchronous area on:
  - a. All XNE's where the operational security limits are expected to be relieved during a subsequent CROSA using remedial actions which involve remedial actions wholly within the all island synchronous area
  - b. All other network elements where the operational security violation is likely to be solved by non-cross border remedial actions.
  - c. All other network elements where the operational security limit violations are likely to be relieved by a subsequent CROSA
6. Where redispatch is applied during the LPA the location and volume of any injections and withdrawals shall be advised to the RSC when the input data is provided for the CROSA process.

### **Article 16 Preparation and update of remedial actions by TSOs**

1. Each IU TSO shall prepare and deliver remedial actions to the IU's RSC for day-ahead and intraday coordinated regional operational security assessments as defined in the methodology pursuant to article 75(1) SO GL.
2. When identifying the remedial actions that are made available, the following principles will be taken into consideration by the IU TSOs:
  - a. The remedial actions will comply with the provisions of SOGL article 22 and article 8 of the IU RD and CT methodology
  - b. Cross-border impacting remedial actions defined according to Article 11 of this methodology.
  - c. Status of non cross-border impacting remedial actions which have a relevant impact on any of the secured network elements of its control area

- d. Status of the remedial actions which were available for the previously performed coordinated regional operational security assessments or capacity calculation of the same hour and the previously agreed and not ordered remedial actions,
  - e. Remedial actions which are technically not available following:
    - i. an unforeseen event, or
    - ii. an unplanned outage, or
    - iii. a declaration of unavailability status done by a third party owning the remedial action
  - f. a list of all remedial actions provided to IU's RSC which are also offered to RSCs of adjacent CCRs.
  - g. Identify whether a RA is shared, non-shared or conditionally shared.
3. IU TSOs shall provide relevant information for each RA for the purpose of day-ahead and intraday regional operational security coordination process that will reflect the technical, operational or procedural constraints of the RA according to paragraph 2
4. If necessary, each IU TSO shall provide to the IU's RSC updated list of remedial actions during the coordination stage of regional operational security assessments, considering
- a. The agreed outcome of the last coordination run for the XRAs in accordance with Article 31 and 32;
  - b. The outcome of the TSO local security assessment for the non cross-border impacting remedial actions deemed necessary to solve congestion on any other network element of its control area or to solve violation of voltage, short-circuit power or stability operational limits in its control area following local security assessment performed by the TSO
  - c. any unplanned or forced outages or changes of outage schedules of relevant assets;
  - d. Latest updates on exchange schedules and schedules of load and generation pursuant to the SO GLS Art 75(1) methodology.

### **Article 17 Preparation and update of Additional System Constraints by TSOs**

1. Each IU TSO shall have the right to make available to IU's RSC system constraints in accordance with Article 2 for the purpose of dynamic stability, voltage operational security limits in the N-situation and after occurrence of a contingency from the contingency list described in article 13
2. The system constraints, for the purpose of dynamic stability, shall be defined based on the criteria on dynamic system stability in accordance with article 38 and article 39 SO guideline.
3. When applying such additional system constraints, the concerned TSO shall provide to other IU TSOs and IU's RSC the justification for these system constraints in a transparent manner.
4. If relevant, each IU TSO shall provide to the IU's RSC updated system constraints, at the end of any coordination run of the coordination stage of DA or ID regional operational security assessments (CROSA).

### **Article 18 Preparation of contingencies and secured/scanned elements**

1. Each IU TSO shall prepare and deliver the list of contingencies for its control area to the IU RCSs for day-ahead and intraday coordinated regional operational security assessments pursuant to the principles defined in article 13 developed in line with the methodology pursuant to article 75(1) SO GL.
2. Each IU TSO shall prepare and deliver the list of secured and scanned elements for its control area to the IU RCSs for day-ahead and intraday coordinated regional operational security assessments pursuant to the principles defined in article 7 developed in line with the methodology pursuant to article 75(1) SO GL.

### **Article 19 Preparation and update of the list of remedial actions**

1. Each IU TSO shall prepare and deliver to the IU RCS the list of agreed remedial action within its control area for day-ahead and intraday coordinated regional operational security assessments pursuant to the principles defined in article 16 developed in line with the methodology pursuant to article 75(1) SO guideline

### **Article 20 Consistency and quality check of the input data**

1. The IU's RSC shall assess the quality of each input data file provided by each IU TSO for each hour of the business target day.
2. The IU's RSC shall assess the consistency of each input data provided by each IU TSO for each hour of the business target day between the different input files and the IGMs, and shall monitor the inclusion of agreed remedial actions in the submitted IGMs.
3. The IU's RSC and IU TSOs shall inform the concerned IU TSOs on the identified issues in accordance with paragraphs 1 and 2 in an appropriate timeframe before starting the remedial action optimisation to give IU TSOs the opportunity to correct these errors or inconsistencies and provide an updated IGM.

## **CHAPTER 2 COORDINATION**

### **Article 21 General provisions of coordination process**

1. IU TSOs with the support of IU's RSC shall perform the CROSA in accordance with articles 23, 24,33,34 of CSAm.
2. At Day Ahead stage, the CROSA will include two coordination runs and at the intraday stage the CROSA will include at least one coordination run. Each coordination run will consist of the following steps:
  - a. Building of the CGM by the IU's RSC as described in CGM methodology;
  - b. Running load flow and security analysis as described in article 22 of this methodology;
  - c. Remedial action optimization as described in articles 23 to 32 of this methodology;
  - d. Remedial Actions Coordination as described in article 32 of this methodology

- e. Inter-CCR coordination as described in article 33 of this methodology
3. Each IU TSO shall update the input data for the 2<sup>nd</sup> coordination run in the Day Ahead stage, and when necessary in any 2<sup>nd</sup> coordination run of the intraday process in accordance with the provisions defined in Articles 14 - 20 of this methodology.
  4. In the Intraday CROSA, IU TSOs and IU's RSC shall reassess the ANORAs in accordance with Article 36 and that were agreed in the day-ahead CROSA or previous Intraday CROSA for the period until the results of the following Intraday CROSA are available.
  5. Information about Ordered RAs and ANORAs during day-ahead and Intraday CROSA shall be logged by IU's RSC

### **Article 22 – Running load flow and security analysis**

1. IU's RSC shall perform the power flow and security analysis by using the CGM built in accordance with the methodology pursuant to Article 70(1) of the SO Regulation. The security analysis will be performed using the latest list of contingencies as well as the latest list of secured and scanned elements provided by the IU TSOs.
2. IU's RSC shall provide to all IU TSOs the power flow and operational security analysis results.
3. IU TSOs should validate the power flow and operational security analysis results. This validation will identify any material errors in the study input which would make the outcome of the operational security analysis non-realistic.

### **Article 23 Optimisation of remedial actions**

1. IU TSOs and IU's RSC shall optimise the remedial actions in order to identify the most effective and economically efficient remedial actions based on the following principles:
  - a. The optimization of remedial actions shall be performed in a coordinated way considering all available remedial actions;
  - b. The optimization time-coupled and in accordance with article 24 of this methodology;
  - c. The optimization of remedial actions shall aim at removing operational security limit violations on secured network elements as described in Article 25;
  - d. The optimization shall avoid additional security limits violation on scanned Network Elements as described in Article 26;
  - e. The optimization shall aim at minimizing direct costs as described in article 27;
  - f. The optimisation shall consider constraints on the remedial actions described in article 2(3)
  - g. The optimization shall propose a balanced set of RA as described in article 28
  - h. The optimisation shall ensure the effectiveness of the remedial action in accordance with Article 29.
  - i. The optimization shall ensure that the resulting set of RAs is robust to changes of forecast and market activities as described in article 30.

### **Article 24 Time coupled optimization**

1. The optimisation of remedial actions for identification of the most effective and economical efficient set of remedial actions shall be time-coupled
2. In the optimisation for day ahead all hours of that day shall be optimised.
3. For Intraday all remaining hours until the end of the day shall be optimised.
4. In the optimisation for both Day Ahead and Intraday, any constraints in accordance with article 23 of agreed remedial actions from previous hours shall be taken into account.

### **Article 25: Relieving operational security limit violations**

1. When performing day-ahead and intraday regional CROSA, IU TSOs and RSC shall detect if power flows violate operational security limits.
2. In Intraday CROSA the detection of power flows violations in accordance with paragraph 1 shall be performed on CGM after removal of ANORAs.
3. For the detection of other constraints, such as voltage violations, violations of short-circuit thresholds or violations of stability limits, each IU TSO should perform local assessment and long-term operational security analyses in accordance with article 31, 38 and 73 of the SO guideline.
4. Other constraints than current limits may be reflected into system constraints in accordance with article 17 of this methodology
5. The optimization process shall aim at identifying RAs from a list of non-costly and costly remedial actions made available by IU TSOs according to Article 16 to relieve operational security limit violation(s), detected in accordance with paragraph 1, on Secured Networks Elements as defined in Article 18
6. Curative RAs shall be used for relieving operational security limit violation(s) in contingency case on a Secured Network Element as long as the temporarily limit (TATL) of the element is not exceeded. Under consideration of all recommended preventive and curative RAs, the permanent limits (PATL) of the Secured Network elements shall be respected.
7. The TATL of a secured network element may be exceeded if the connecting TSO has provided an instantaneous acting curative remedial action which restores the flow on the secured element to the PATL for the relevant contingency.

### **Article 26: Avoid additional security limits violation on Scanned Elements**

1. After application of RAs identified to remove overload on secured and scanned network elements identified in accordance with article 6:
  - a. There shall be no new operational security limits violations created on secured and scanned network elements
  - b. There shall be no worsening of existing operational security limit violations on secured and scanned network elements

### **Article 27: Minimize direct costs**

1. The optimization shall aim at minimizing the direct costs incurred when implementing costly RAs.
2. The minimization of costs shall be based on the costs of remedial actions provided by the IU TSO's under Article 16 and the effectiveness of the remedial actions in accordance with article 29.

### **Article 28: Balance of RA**

1. In order to guarantee the balance of the system after application of remedial actions, the optimization shall ensure that the identified RAs are balanced and can be activated in a balanced way in each timeframe.

### **Article 29: Economic Effectiveness of Remedial Actions**

1. The optimization shall compute the flow sensitivity of RAs.
2. The flow sensitivity of the RA reflects the variations power flow or current on secured and scanned elements as a function of their nominal power flow.
3. The flow sensitivity of the RA shall be balanced with their direct costs in order to ensure the selection of the most economic efficient and technical effective RAs.
4. The optimization shall localize the remaining overloads and flows if not all congestions can be relieved.
5. Costly RAs shall only be chosen to relieve congestions in the grid and not for the purpose of increasing market welfare.

### **Article 30: Robustness of the solution**

1. Taking into account all the principles introduced in articles 1 to 13, the optimization shall ensure that the identified RAs for relieving operational security limit violation(s) on the secured elements are robust to variations of forecasts in consumption, RES production, and market activities and allow IU TSOs to operate their grid without violation of operational security limits.
2. In case of exceptional situations (such as but not limited to unpredictable exact arrival of a wind front, snowfall on PV modules) where the accuracy of one or more of the forecasts variables included in the individual grid models is insufficient to allow the correct identification of operational security limit violations, TSOs of IU CCR shall therefore have right to vary the thermal limits of their XNEs in regional day-ahead or intraday processes in accordance with CSAM article 23.4 and CSAM article 24.4.
3. IU TSOs shall inform without undue delay other TSOs of IU CCR and respecting RSC in case of application of paragraph 2 providing at least following information:
  - a. Elements and timestamps which are affected by the application of the paragraph 2,
  - b. Estimate of the time for which application of paragraph 2 is needed.

### Article 31 Validation of remedial actions

1. The IU TSOs will validate the cross border remedial action optimisation when the IU's RSC provides the results of each stage of RSA results during the day ahead and intraday CROSA
2. The validation process will include, but is not restricted to:
  - a. RA or set of RAs is sufficient to clear overloads on secured network elements both in the base case and following the identified contingencies
  - b. The RA or set of RAs remains available
  - c. RA or set of RAs are considered reliable
  - d. The activation of the RA or set of RAs will not lead to any further violation of voltage or dynamic limits on scanned elements.
3. If it is not possible to validate a RA or set of RAs one of the following options is applied depending on the remaining time before the next CROSA run will be performed or the latest possible activation of the involved RAs:
  - a. If remaining time is sufficient, an additional IU optimization run will be performed by RSC. Therefore, TSOs and RSC shall amend IU optimization inputs in such a way that the additional IU optimization run results in acceptable RAs.
  - b. If the remaining time is not sufficient for an additional IU optimization run, the TSOs which are affected by the rejected RA or set of RAs and their respective RSC shall design and prepare a RA or set of RAs to relieve the congestion in a coordinated way.
  - c. If the remaining time is not sufficient for (a) or (b), but the timestamps for which the congestion occurs are still in the scope of the next CROSA run, the congestions will remain in the model. The congestions will be relieved in the next CROSA run, if these are still predicted in the updated model.
  - d. If the remaining time is not sufficient for (a) and (b) and it is not possible to wait for the next CROSA run, the fast activation process shall be used to relieve the congestion.
  - e. The solution implemented to relieve the congestions in real time following the fast activation process shall be modelled as RA's in the next subsequent CROSA process.

Until a solution is identified in the real time, the congestions shall remain in the CGM used to carry out the CROSA.

### Article 32: Coordination of remedial actions and rejection provisions

1. In DA and ID CROSA, IU TSOs in coordination with IU's RSC, shall manage in a coordinated way operational security violations on all secured elements considering all XRAs in accordance with article 17 of CSAM. To this end, the RSC shall make recommendations for the implementation of the most effective and economically efficient cross-border relevant remedial actions to the concerned TSOs according to the result of the optimization as described in article 23

2. During each CROSA, Affected TSOs shall decide whether to agree or reject proposed remedial actions in accordance with principles defined in article 78(4) of SO Guideline and further specified in article 17 of CSAM.
3. If any IU TSO(s) reject a RA proposed by IU's RSC, the reasons shall be justified, documented and provided to IU's RSC, as described in article 78(4) pursuant to SO guideline.
4. In case of rejection of recommended RA(s), the concerned IU TSO(s) shall coordinate with the RSC and other IU TSOs to identify and plan alternative RA(s) to relieve the congestion in a coordinated way in accordance with this Methodology and article 17(7) of CSAM.

### **Article 33 Inter-CCR coordination (by RSCs)**

1. TSOs and RSC of the IU CCR will relieve congestions on overlapping XNEs and will coordinate cross-border relevant RA (XRA) impacting these overlapping XNEs in accordance with the proposal for amendment to be developed pursuant to article 27 of CSAM.
2. TSOs and RSC of the IU CCR will perform the coordinated cross-regional operational security assessment in accordance with article 30 of the CSAM.

### **Article 34 Validation session**

1. In the end of the day-ahead CROSA in accordance with article 33 (1)(f) of CSAM, a session shall be hosted by IU's RSC in order to consolidate results of the day-ahead CROSA and for IU TSOs to reach a final agreement and acknowledge RA that have been agreed during the day-ahead CROSA.

## **CHAPTER 3 IMPLEMENTATION OF REMEDIAL ACTIONS**

### **Article 35 Activation of remedial actions**

1. RA connecting TSO shall activate RAs at the latest time compatible with technical, operational and procedural constraints of the resources in accordance with article 19 of CSAM;
2. In case of activating redispatching or countertrading RA, the XRA connecting TSO shall apply the provisions of the IU RD and CT Methodology
3. Each IU TSO has the right to request a reconsideration at any time of Ordered RAs or already activated RAs in cases where the RA(s) is no longer required, or where there have been changes in technical, operational and procedural constraints. RA connecting TSO(s), XRA affected TSO(s) and RA requesting TSO(s) may use either the fast activation process according to Article 36 of this Methodology or initiate an on request ID CROSA according to Article 5 of this Methodology.
4. In subsequent ID CROSA processes, it shall be ensured that any remedial actions optimization does not change the status of Agreed RAs.
5. The TSOs shall update in a coordinated manner the available cross-zonal capacities within the intraday or balancing timeframe to take into account the use of these capacities to facilitate cross-border schedules reflecting the activation of XRAs.

### **Article 36 Consideration of remedial actions in next IGM**

1. All Agreed RAs shall be classified based on a possibility of their reassessment in later CROSA:
  - a) If activation time of an RA prevents waiting for next CROSA for possible reassessment, then the RA shall be classified as Ordered RAs (ORA). Only Fast Activation process can change the status of an ORDERED solution;
  - b) If a reassessment of the RA in next CROSA is a possibility, then the RA shall be classified as Agreed but Not Ordered RA (ANORA).
2. Each IU TSO shall include all RAs agreed during latest CROSA into their day ahead and intraday IGMs according to the provision of CSAM Articles 20 and 21. Information about all RAs agreed during day-ahead and intraday CROSA shall be logged by IU's RSC.
3. IU's RSC shall monitor the inclusion of agreed RAs into IGMs in accordance with Article 28 of CSAM.

### **Article 37 Fast activation process**

1. An IU TSO shall trigger the fast activation process to relieve physical congestion where the detection of the physical congestion occurs:
  - (a) between coordinated security analysis cycles and a fast activation of a XRAs is required because it cannot wait for the next coordinated security analysis; and
  - (b) after the last coordinated security analysis.
2. The fast activation process shall also be considered as a fallback where coordination through the IU's RSC(s) is no longer possible due to insufficient time and the regular process described in Article 35 could not be properly applied (e.g. missing data, tools failure).
3. A TSO shall trigger the fast activation process in the case that an ordered remedial action is not available anymore.
4. During the fast activation process, XRA affected TSOs shall coordinate among each other to identify, plan and activate alternative RAs to relieve the operational security limits violations in a coordinated way while respecting the relevant provisions of article 17 of CSAM.
5. In the fast activation process, the activation of preventive as well as curative XRAs may be applied.
6. In the fast activation process, each IU TSO may activate XRAs in direct coordination with XRA affected TSO(s) in accordance with the principles for coordination of XRAs described in the methodology pursuant to Article 75(1) of the SO Regulation.
7. The IU TSO activating XRAs through fast activation process shall provide the RSC(s) the relevant information on which the decision was based. The RSC(s) shall monitor occurrences of fast activation processes and the information provided by the relevant IU TSOs on those occurrences
8. Remedial actions agreed among affected IU TSOs during the fast activation process shall be considered as coordinated remedial actions and therefore shall be subject to cost sharing in accordance with the principles described in Title 5 of this methodology.
9. IU TSOs will take into account the activated RAs in the next relevant IGMs. New congestions as a result of those RAs should be avoided

## TITLE 5 SHARING OF COSTS OF REMEDIAL ACTIONS

### **Article 38 General provisions for cost sharing of remedial actions**

1. Cost sharing of remedial actions shall be applied for cross-border impacting remedial actions
2. Where a remedial action requires coordinated redispatch and countertrading pursuant to Article 74 of EU regulation 2015/1222, cost sharing shall be in accordance with the IU capacity region proposal for the IU RD and CT cost sharing methodology in accordance with Article 74(1) of commission regulation (EU) 2015/1222.
3. Where the affected and implementing TSO are both within the IE synchronous area, and the remedial action does not require redispatch of the flows on any interconnector connecting to the GB synchronous area, the redispatch will be instructed as a balancing action in the I-SEM and costs will be assigned in accordance with the market rules.

## TITLE 6 MONITORING, IMPACT ASSESSMENT AND TIMESCALE FOR IMPLEMENTATION

### **Article 39 Reporting**

1. RAs will be reported by IU TSOs as described in the article 13 (1) of Transparency Regulation (EC) 543/2013 and the regulation for Energy Market Integrity and Transparency 1227/2011.
2. IU's RSC shall record and share all necessary data to enable IU TSOs to fulfil the obligations regarding IU CSAM, IU RD & CT Methodology and article 17 of SO Regulation.

### **Article 40 Impact Assessment**

1. The Proposal generally contributes to and does not in any way hamper the achievement of the objectives of Article 4 of SO guideline. In particular, the Proposal serves the objective established in Article 4 of SO guideline to:
  - a. determining common operational security requirements and principles;
  - b. determining common interconnected system operational planning principles;
  - c. ensuring the conditions for maintaining operational security throughout the Union (and Norway);
  - d. promoting the coordination of system operation and operational planning;
  - e. ensuring and enhancing the transparency and reliability of information on transmission system operation and
  - f. contributing to the efficient operation and development of the electricity transmission system and electricity sector in the Union (and Norway).
2. The Proposal contributes to these objectives by specifying common provisions for regional operational security coordination and the organisation of regional operational security coordination.

## Article 41 Implementation

1. The implementation of the IU CSAM Methodology will consider:
  - a. Regulatory approval of this IU CSAM in accordance with article 6 of SO GL;
  - b. Regulatory approval of IU RD and CT Methodology in accordance with article 9 of CACM Regulation;
  - c. Regulatory approval and implementation of the amendments of CSAM in accordance with article 27 (3), article 21 (6) and article 30 of CSAM;
  - d. Development, testing and implementation of the IT tools, systems and procedures required to support the IU CSAM, CGMES format included and amendments of the CSAM;
2. All IU TSOs, with the support of the IU's RSC, shall aim at regularly identifying the common functions and tools needed in accordance with paragraph 1(e). All relevant IU TSOs, with the support of the IU's RSC, shall:
  - a. Decide on their development;
  - b. Provide for the needed budgets for their tendering, development and maintenance;
  - c. Agree on the rules applicable for the management of the development and maintenance, including evolutions.
3. The provisions of Article 34 will be applied after the amendments of article 27 (3) of CSAM are implemented.
4. During the implementation of IU CSAM, the IU TSOs with the support of IU's RSC shall jointly define the timeline of each step of the day-ahead and intraday regional operational security coordination, in accordance with the article 45 of the CSAM and publish them on their website.

## TITLE 7 ALLOCATION OF TASKS BY RSC

### Article 42 Appointment of RSC and delegation of tasks to RSC

1. IU TSOs appoint CORESO as regional security coordinator that will perform tasks listed in accordance with article 77 (3) of SO GL in the IU CCR.
2. CORESO will perform tasks listed in article 77(3) of SO GL in the IU CCR for all IU TSOs and for technical counterparties of the IU CCR in a transparent and non-discriminatory manner.
3. In accordance with article 77(3) of SO GL all IU TSOs delegate the following tasks to CORESO:
  - a. Regional operational security coordination in accordance with SO GL Article 78 in order to support IU TSOs fulfil their obligations for the year-ahead, day-ahead and intraday timeframes in accordance with articles 34(3), 72 and 74 of SO GL;
  - b. Building of common grid model in accordance with article 79 of SO GL;
  - c. Regional outage coordination in accordance with article 80 of SO GL, in order to support IU TSOs fulfil their obligations in articles 98 and 100 of SO GL;
  - d. Regional adequacy assessment in accordance with article 81 of SO GL in order to support Channel On-shore TSOs fulfil their obligations under article 107 of SO GL.

## TITLE 8 FINAL PROVISIONS

### **Article 43 Publication of this Proposal**

1. Upon approval by the competent regulatory authorities, each TSO shall publish this Methodology on the internet in accordance with Article 8(1) of SO GL

### **Article 44 Language**

1. The reference language for this Methodology shall be English. For the avoidance of doubt, when TSOs need to translate this Methodology into their national language(s), in the event of inconsistencies between the English version published by TSOs in accordance with Article 8(1) of SO GL and any version in another language, the relevant TSOs shall, in accordance with national legislation be obliged to dispel any inconsistencies by providing a revised translation of this Methodology to their relevant national regulatory authorities.