

## **Annex V – Methodological description of the CSAM-based modelling analysis conducted by ACER**

This modelling analysis was developed by ACER following ENTSO-E's claim that two methodologies are relevant to assess the interdependency in terms of flows: the calculation of remedial action influence factors (RAIFs), in line with the methodology for coordinating operational security analysis (CSAm)<sup>1</sup>, and the calculation of zone-to zone power transfer distribution factors (PTDFs).

- (1) RAIF means a flow deviation on a cross-border relevant network element with contingency (XNEC) resulting from the application of a remedial action, normalised by the permanent admissible loading on the associated cross-border relevant network element (XNE). In this analysis, redispatching actions between pairs of generating nodes are considered as remedial actions for the calculation of RAIFs.
- (2) The modelling analysis carried out by ACER consists of the calculation of RAIFs between SWE CCR and Italy North CCR in line with the CSAm, based on the following information on the calculations of RAIFs performed by ENTSO-E:
  - i. Common grid models (CGMs) used for ENTSO-E's analysis;
  - ii. Node name (in UCTE format as included in the CGMs) of the French and Spanish nodes used to perform redispatching between France and Spain;
  - iii. Node name (in UCTE format as included in the CGMs) of the XNECs considered for RAIFs;
  - iv. RAIFs obtained when calculating the redispatching action of bullet ii. on the XNECs of bullet iii. above.
- (3) In order to replicate ENTSO-E's analysis and conduct ACER's own analysis according to the CSAm, ACER requested ENTSO-E to provide a mapping of each French node included in the considered CGMs to its corresponding CCR (SWE, Core, Italy North) with regard to a possible implementation of the CSAm. ENTSO-E replied that this information was not available. Instead, ENTSO-E provided two separate files, containing the following information:

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<sup>1</sup> Methodology for coordinating operational security analysis in accordance with Article 75 of Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation. See [https://extranet.acer.europa.eu//Official\\_documents/Acts\\_of\\_the\\_Agency/Individual%20decisions/ACER%20Decision%2007-2021%20on%20the%20Amendment%20of%20the%20Methodology%20for%20Coordinating%20Operational%20Security%20Analysis.pdf](https://extranet.acer.europa.eu//Official_documents/Acts_of_the_Agency/Individual%20decisions/ACER%20Decision%2007-2021%20on%20the%20Amendment%20of%20the%20Methodology%20for%20Coordinating%20Operational%20Security%20Analysis.pdf)

- a. The mapping of each French generating node included in the considered CGMs to its native CCR;
  - b. The list of critical network elements (CNEs) considered in each CCR.
- (4) ACER based its assessment on Article 15 and Article 27 of the CSAm. The calculation process followed by ACER consisted of the following steps:
- i. Identification of Spanish and French nodes in SWE CCR with a redispatching potential larger than or equal to 500 MW;
  - ii. Calculation of node-to-node PTDFs on relevant French critical network elements with contingency (CNECs) located in Italy North CCR;
  - iii. Calculation of RAIFs, assuming a redispatching amount of 500 MW;
  - iv. Calculation of the sum of all RAIFs larger than or equal to 1% pursuant to paragraphs (c) and (d) of Article 27(4) of the CSAm;
  - v. Extraction of CNECs for which the sum of RAIFs is larger than or equal to 5% pursuant to paragraph (e) of Article 27(4) of the CSAm;
  - vi. Identification of overlapping CNEs and overlapping cross-border relevant remedial actions (XRAs) pursuant to paragraphs (e) and (f) of Article 27(4) of the CSAm.
- (5) The results obtained by ACER showed that 157 French CNECs, made of three CNEs located in Italy North CCR, met the 5% RAIF threshold specified in point v. above. Hence, pursuant to Article 27(4)(e) and (f) of the CSAm, these three CNEs were found to be overlapping CNEs and the redispatching actions between Spanish generators and French generators located in SWE CCR used to identify them were defined as overlapping XRAs.
- (6) Following the concern expressed by ENTSO-E that the results obtained by ACER were strongly impacted by an assumption that each generating node is simultaneously contributing to several individual XRAs, ACER updated its analysis. In the updated analysis, each node considered for redispatching was set to participate to only one individual XRA; for each node and for each considered CNEC, only the most impactful remedial action, i.e. the one with the largest RAIF, was retained.
- (7) The updated results obtained by ACER showed that the outcome of the initial assessment was only slightly affected, as now 154 French CNECs, made of two CNEs located in Italy North CCR, were still found to meet the 5% total RAIF threshold. This corresponds to about 10% ( $10.5\% = 2/19$ ) of the 19 CNEs located in the Italy North CCR provided by ENTSO-E. For the two identified overlapping CNEs, the number of overlapping XRAs ranged between 8 and 10 and the total RAIF per CNE amounted to between 17% and 20%.
- (8) The application of a consistent redispatching amount of 500 MW for all generating nodes was used for exemplificative purposes. As for a significant share of the identified

XRAs individual RAIFs are found to be above 2%, the same set of overlapping CNEs and overlapping XRAs would have been obtained with (individually set) lower values (e.g., a redispatching amount of 250 MW) allowing to meet the 1% individual RAIF threshold.

- (9) Furthermore, as Article 15 of the CSAm requires XNEs (instead of only CNEs) to be considered in the analysis, the number of overlapping network elements is very likely to increase significantly once the list of XNEs of each CCR would be defined in the Italy North CCR during the implementation of the CSAm.