

Common explanatory note from Elia, Rte and TenneT on exceptional TSO collaboration measures being currently agreed upon between the CWE-TSO's for the winter period 2014-2015

Introduction

In the course of 2014 Belgium has been confronted with forced outages of several nuclear production facilities (Doel 3 (1006MW) and Tihange 2 (1008MW) in March; Doel 4 (1047MW) in August), representing an unforeseen loss of more or less 1/3rd of the installed generation capacity in Belgium compared to the winter 2013-2014. This exceptional generation shortage in Belgium will impact the CWE-region for the next winter period.

The Belgian electricity grid is highly interconnected and relies as such significantly on imports from neighbouring countries. In order to identify the possible impact on the CWE-region, several studies regarding the upcoming winter have been performed together with the TSO's and coordination centres of the CWE region.

These studies confirm that a situation without wind in the CWE-region and with very high load (representing a cold wave on the region) leads to the highest risk in terms of security and reliability of the electricity supply system.

In such case, North to South flows put a high burden on the NL-BE border. To keep the resulting physical flows to an acceptable level and to avoid an outage with potential cascading effect in Europe, usual remedial actions from the TSO's will not be sufficient to allow usual levels of capacities ("Net Transfer Capacity" (NTCs)). The NTCs resulting from the classical CWE NTC coordination could lead to two different cases :

- The set of NTCs obtained would not allow sufficient import to BE to avoid adequacy issue (high probability of load shedding in BE);
- The set of NTCs would lead to violation of N-k policy in likely market directions (risk of cascading effect);

In order to secure the situation, the flows from the North to the South in the region have to be reduced by a coordinated adjustment of the NTC's in the Central West European region. Indeed, reducing NTC's only on Belgian borders,

or on each CWE border through the usual CWE coordinated verification process ("red flag"), would lead to likely probability of load shedding as less energy would then be available to be imported in Belgium.

These measures have been determined by ELIA, Rte and TenneT in coordination with other CWE TSOs.

Exceptional measures agreed for next winter

Managing adequacy issues is a new challenge for the TSO's, requiring more than ever regional coordination, especially on capacity calculation. Besides classical actions which have already been taken, such as grid and generation maintenance optimization and critical investments projects (Dynamic Line Rating on several border lines), additional exceptional measures are necessary for the coming winter period to minimize adequacy issues in Belgium.

These measures have been translated into agreed operational principles between TSO's in order to avoid to a maximum possible the need to resort to the load-shedding plan (considered as the ultimate solution). **These measures shall only be exceptionally applied in case adequacy risks are detected in Belgium between 4th of December 2014 and 31st of March 2015**, under the condition that, where required, regulatory approval has been satisfied.

Indeed, the actions have undoubtedly a temporary character related to the exceptional adequacy risks that can be detected during the winter 2014-2015. The agreed regional coordination measures ranging over different timeframes are built to provide actions proportionate to the desired effect and intervening in the right order. The combination of these measures provides more (several) possibilities to intervene in the process, taking the best advantage of the information available at each point in time. This allows intervening only when there is evidence on the need to do so, and avoids unnecessary (i.e. over-dimensioned) interventions since other opportunities will be given in the next stages of the process in subsequent timeframes, when more precise information is available. Before triggering this exceptional coordination procedure, Elia will always take into account all measures and local topological actions available in Belgium. The strategic reserve is one of these measures available in Belgium

that will be activated before the coordination of exceptional measures between CWE TSOs are applied.

The agreed coordination is coherent during the different capacity calculation stages until real-time and is detailed below.

In **Month Ahead**, a preventive reduction of monthly capacities can be considered on an "ad hoc" basis for each border to warrant electricity transfer to Belgium, in order to keep maximum flexibility for managing congestions during the D-2 stage.

In **Week Ahead**, the main focus is to create sufficient awareness of the adequacy situation by performing a continuous monitoring, exchanging information and escalating when appropriate. A continuous monitoring of the adequacy situation in Belgium will be performed by Elia. In case of scarcity risk, Elia will inform the Belgian government according to national procedures related to scarcity and will raise a "week ahead adequacy flag" to inform CWE TSOs and coordinating entities. This "adequacy flag" will also mention the assumptions used by Elia to detect the "adequacy issues". Market parties and general public will be informed of the risk of scarcity through different channels put in place in Belgium (dedicated website, smartphone apps, announcement during weather forecast...).

Two days-ahead, in case of security violation identified during the coordinated verification of CWE NTCs, a reduction of NTCs on all CWE borders according to the normal common ATC process ("red flag") would dramatically increase the risk of load shedding in Belgium as already explained previously.

In order to allow sufficient Belgian imports and to obtain a safe outcome of the day-ahead market coupling, and if the activation of all available measures in Belgium is not sufficient, a specific coordinated optimization of day ahead capacities has to be applied during the D-2 stage and is triggered by Elia with a "D-2 adequacy flag".

In practice, Coreso and SSC will then calculate the most optimal combination of CWE NTC values to provide the maximum import capacity for Belgium which would be adequate to avoid or minimize load shedding in Belgium while respecting the following constraints:

- The network security of the grid should be respected
- Adequacy of France and The Netherlands should not be threatened by doing this specific process
- The adapted NTC will not be below the capacity allocated in Long Term

These calculations are based on the fact that, in extreme cases without wind in the CWE-region and with very high load (cold wave), the likely most limiting elements are located in Belgium, near NL border, due to high north to south physical flows.

As the goal of this procedure is to allow Belgium to import the energy necessary to avoid or minimize load shedding in Belgium while respecting grid and adequacy constraints of other CWE TSOs, the two following actions are foreseen:

- lower NL > BE in order to increase FR > BE
- lower both NL > DE and DE > FR

In other words, these actions on NTCs are intending to force the energy to come from the south of Belgium rather than from the Netherlands or Germany, in order to limit as far as possible the flow on the most constraining grid element and to maximize Belgian imports, taking into account the likely CWE energy sources and sinks.

This combination of reductions will be based on prepared scenario's that will be updated in function of relevant technical parameters. CWE TSOs will either confirm this calculated set or agree on a modified set which would be adequate for avoiding load shedding in the entire CWE region.

If NTC reductions are performed during the D-2 stage and afterwards the situation proves to be better than anticipated then the respective NTC reductions could be undone during the day-ahead and/or intraday stage, depending on the result of analysis. In any case, NTC reductions will be undone before internal measures (including strategic reserve activation) applied by Elia are cancelled.

As of the **day-ahead stage**, intraday cross-border capacities from France and the Netherlands towards Belgium will be re-assessed if there is still a need of additional Belgian import. The objective, in case of "D-1 Adequacy Flag" will be to reduce the risk of load shedding in Belgium, without endangering the Continental European grid security.

The main drivers for allowing increase of **intraday** capacities from France and the Netherlands towards Belgium are the availability of updated and more accurate information related to grid topology, physical flows, availability of remedial actions and dynamic line rating. In order to facilitate this process, an assessment of the intraday ATC's is performed by Coreso. It may be required that some ATC on DE-FR and NL-DE should be set to 0 ("frozen") for the direction loading the limiting grid element. If freezing of intraday exchanges are necessary, these actions will be performed in a coordinated way taking into account the balancing and network constraints of each TSO. Furthermore, Coreso and SSC will later check in intraday if these capacities could be increased.

Despite all previous coordination efforts, it is possible that not all issues have been solved yet. During **real-time** stage exceptional and emergency inter TSO actions will still be used to avoid as much as possible preventive load shedding.

Justification of these actions regarding target models of capacity calculation

The actions described above by TSOs, aiming at modifying the NTCs in CWE, could be questioned regarding the impact on economic welfare of CWE region (as, by avoiding or limiting load shedding, the effect is judged for sure beneficial to Belgium). This assessment can be easily done by comparing these actions with the electricity target model foreseen in the current draft Guideline on Capacity Allocation and Congestion Management. This assessment is performed regarding the impact on the spot price as it is the most relevant market for the physical delivery of electricity.

In D-2, TSOs are anticipating very high prices in Belgium and then a clear preference from the market for that direction, then NTCs on CWE borders are optimized taking into consideration their influence on the most limiting grid elements (to be sure they are both safe and allow required Belgian imports) : in such a way, actions taken by TSOs allow to increase the Day Ahead Market Welfare by providing a set of capacities which are closer to the ones that could be obtained with Flow Based Capacity Calculation.

Conclusion

Due to the unforeseen loss of three nuclear reactors, the Belgium electricity system might encounter significant generation shortages in the coming winter period. Within the powers and possibilities of the CWE TSO's, a set of principles have been agreed among TSOs to apply in exceptional conditions in a limited timeframe and by taking into account Belgium national measures (e.g. strategic reserves and topological measures). These principles aim to contribute to reducing the risk for load shedding and thus impacting the CWE-grid at large.