Annex II – Core TSOs general measures and action plan to avoid future cross-zonal capacity reductions

Q2 2023

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# Introduction

According to Articles 20(14)(b) and 20(15) of the DA CCM, Core TSOs have the obligation to provide general measures and/or action plans in order to avoid cross-zonal capacity reductions in the future, as follows:

* As per Article 20(14)(b): *General measures to avoid cross-zonal capacity reductions in the future*
* As per Article 20(15): *When a given Core TSO reduces capacity for its CNECs in more than 1% of DA CC MTUs of the analysed quarter, the concerned TSO shall provide to the CCC a detailed report and action plan describing how such deviations are expected to be alleviated and solved in the future.*

This annex contains the required information described above for each Core TSO that has applied capacity reductions for at least 1 DA CC MTU of the analysed quarter.

# CEPS

**1.1 General measures to avoid cross-zonal capacity reductions in the future, as per Art. 20(14)(b) of DA CCM**

ČEPS has implemented the following measures to avoid cross-zonal capacity reduction. Firstly, in its individual validation, only technically feasible scenarios (set of Core NPs) are tested. These scenarios include know-how about max/min generation capabilities of BZs, and popular flow directions. As a result, the tested MCP (NPs vector) is not only an extreme utilization of the domain (vertex) but also a realistic grid situation. This leads to highly efficient IVA applications. Secondly, a wide variety of remedial actions are considered in the ČEPS optimization algorithm. This helps ČEPS to efficiently eliminate majority of the operational security threats without cross-zonal capacity reduction. Finally, by applying IVA directly for the over-congested element, the minimal value of IVA required is guaranteed.

**1.2 Detailed report and action plan describing how such deviations are expected to be alleviated and solved in the future**

ČEPS reduced capacity for its CNECs in less than 1 % of DA CC MTUs of the analysed quarter, detailed report and action plan are not provided hence.

# DAVinCy TSOs

## APG

In order to provide a better understanding of the results and the processes applied among DAVinCy TSOs, following are some introductory explanations:

* APG, Tennet NL and the German TSOs (DAVinCy TSOs) use a common tool for individual validation called DAVinCy (**D**ay **A**head **V**al**i**datio**n** of **C**apacit**y**). In case an overload cannot be solved with the available remedial actions, DAVinCy determines the necessary Individual Validation Adjustments (IVAs) on relevant CNECs with the objective to minimise the overall capacity reduction among the six DAVinCy TSOs. This can lead to situations where an overload occurs in one control area of TSO A whereas the IVA(s) is/are applied within other control areas, e.g., of TSOs B and C.
* The application of an IVA prevents a network element from being overloaded and does not necessarily lead to a deviation from the minimum cross-zonal capacity according to Article 16(8) of regulation (EU) 2019/943 on the internal market of electricity. Deviations from the minimum cross-zonal capacity according to the Austrian action plan, will be reported and reflected accordingly in the Austrian action plan report submitted to the Austrian NRA E-Control.

In Q2/2023, the following could be observed:

* In 52 hours or 2.38 % of the MTUs an IVA was applied within the DAVinCy area.
* Compared to the whole Core region, DAVinCy TSOs applied IVAs infrequently.

In 8 of those 52 hours (or 0.37 % of MTUs), IVAs were applied on Austrian CNECs to prevent potential overloads in the Austrian control area. In 5 of those 52 hours (or 0.23 % of the MTUs), IVAs were applied on AT CNECs in order to prevent potential overloads in other control areas. In another 17 of those 52 hours (or 0.78 % of the MTUs), IVAs were applied as common DAVinCy-fallback on AT CNECs. Therefore, next to the proposed national measures, APG also depends on measures to reduce congestions in other control areas of the DAVinCy consortium, as well as on common improvements to prevent DAVinCy-fallbacks, to further reduce the hours with IVA application on Austrian CNECs.

APG wants to highlight that it fully supports the innovative functioning of DAVinCy since it increases the overall benefit of the Core region compared to a purely national individual validation and could be used as blueprint for an effective coordinated validation approach among all Core TSOs.

In the opinion of the DAVinCy TSOs, the cooperation of six TSOs within the DAVinCy consortium leads to a very effective result when relieving potential overloads within the grid in order to secure operational security. This is caused by the fact that remedial actions within six control areas can be used. Moreover, IVAs having a minimal impact on cross-zonal capacities offered to the market can be applied to solve congestions. Furthermore, the DAVinCy TSOs acknowledge, that this report has to be based on the amount of capacity reductions, i.e. IVAs applied by DAVinCy. Nevertheless, it should be noted, that measures to reduce the application of IVAs need to address the cause of IVAs, respectively the reduction of congestions and fallbacks.

The DAVinCy TSOs plan to apply the following measures in order to minimize the application of IVAs and, as required by art 20(14)(b) and 20(15) DA CCM, avoid as far as possible cross-zonal capacity reductions in the future:

* Methodological improvements based on increasing experience with the operational Core DA Capacity Calculation to finetune the trade-off between operational security and offered capacities. This concerns, among other things, the selection of possible market outcomes that are being analysed. Moreover, an update for IVA application on CNECs, which have a high sensitivity on anticipated congestions has been implemented in Q2/2023.
* Based on experience gained since Core DA Go-Live, the DAVinCy TSOs have decided to, for the time being, cap IVA such that a floor level of RAM ≥ 20%\*Fmax is maintained on their CNECs. This shall specifically avoid that external data issues lead to unfortunate results. DAVinCy TSOs reserve the right to change or abolish the floor level in the light of future operational experience. The floor level has been implemented in Q3/2023.
* Further improvement of process robustness through the use of redundant IT systems, plausibility checks and replacement strategies for input data, separate systems for test and productive environment and implementation of security management.

In addition to improvements of the individual validation process and DAVinCy itself, APG plans to implement further measures according to the Austrian Action Plan. Those measures include, but are not limited to:

* Network reinforcement and optimisation, e.g. dynamic line rating to relieve grid elements with overloads in the future.
* Network expansion and planned infrastructure projects according to the Network Development Plan.

## German TSOs

In order to provide a better understanding of the results and the processes applied among DAVinCy TSOs, following are some introductory explanations:

* APG, Tennet NL and the German TSOs (DAVinCy TSOs) use a common tool for individual validation called DAVinCy (**D**ay **A**head **V**al**i**datio**n** of **C**apacit**y**). In case an overload cannot be solved with the available remedial actions, DAVinCy determines the necessary Individual Validation Adjustments (IVAs) on relevant CNECs with the objective to minimise the overall capacity reduction among the six DAVinCy TSOs. This can lead to situations where an overload occurs in one control area of TSO A whereas the IVA(s) is/are applied within other control areas, e.g., of TSOs B and C.
* The application of an IVA prevents a network element from being overloaded and does not necessarily lead to a deviation from the minimum cross-zonal capacity according to Article 16(8) of regulation (EU) 2019/943 on the internal market of electricity.

In the opinion of the DAVinCy TSOs, the cooperation of six TSOs within the DAVinCy consortium leads to a very effective result when relieving potential overloads within the grid in order to secure operational security. This is caused by the fact that remedial actions within six control areas can be used. Moreover, IVAs having a minimal impact on cross-zonal capacities offered to the market can be applied to solve congestions. Furthermore, the DAVinCy TSOs acknowledge, that this report has to be based on the amount of capacity reductions, i.e. IVAs applied by DAVinCy. Nevertheless, it should be noted, that measures to reduce the application of IVAs need to address the cause of IVAs, respectively the reduction of congestions and fallbacks.

The DAVinCy TSOs plan to apply the following measures in order to minimize the application of IVAs and, as required by Article 20(14)(b) and Article 20(15) DA CCM, avoid cross-zonal capacity reductions in the future:

* Methodological improvements based on increasing experience with the operational Core DA Capacity Calculation to finetune the trade-off between operational security and offered capacities. This concerns, among other things, the selection of possible market outcomes that are being analysed. Moreover, an update for IVA application on CNECs, which have a high sensitivity on anticipated congestions has been implemented in Q2/2023.
* Based on experience gained since Core DA Go-Live, the DAVinCy TSOs have decided to, for the time being, cap IVA such that a floor level of RAM ≥ 20%\*Fmax is maintained on their CNECs. This shall specifically avoid that external data issues lead to unfortunate results. DAVinCy TSOs reserve the right to change or abolish the floor level in the light of future operational experience. The floor level has been implemented in Q3/2023.
* Further improvement of process robustness through the use of redundant IT systems, plausibility checks and replacement strategies for input data, separate systems for test and productive environment and implementation of security management.

The application of an IVA prevents a network element from being overloaded and does not necessarily lead to a deviation from the minimum cross-zonal capacity according to Article 16(8) of regulation (EU) 2019/943 on the internal market of electricity. In case of a deviation from the minimum cross-zonal capacity, the compliance with the minimum cross-zonal capacity targets of the German action plan according to the monitoring methodology approved by the German NRA Bundesnetzagentur is subject to the regulatory scrutiny. This is done by an approval of the report of German TSOs on available cross-zonal capacity for the year 2023 that will presumably be finished in mid-2024[[1]](https://word-edit.officeapps.live.com/we/wordeditorframe.aspx?ui=de&rs=de&wopisrc=https://officedocs.projectplace.com/wopi/files/1496076749&IsLicensedUser=1#_ftn1).

Please note, that Amprion and TransnetBW exceeded the 1-%-IVA threshold in Q2 2023 and are thus obligated to provide more details in this annex.

In Q2/2023, the following could be observed:

* In 52 hours or 2,38 % of the MTUs an IVA was applied within the DAVinCy area. In 38 hours or 1,74 % of the MTUs an IVA was applied on a network element of a German TSO
* In 27 hours or 1,24 % of the MTU an IVA was applied on a network element of Amprion. In 20 of those MTUs the DAVinCy fallback procedures had to be applied. In none of those MTUs an overloaded network element in the Amprion control area led to the IVA application during the DAVinCy process.

In 26 or 1,19 % of the MTU an IVA was applied on a network element of TransnetBW. In 25 of those MTUs the DAVinCy fallback procedures had to be applied due to issues with data quality or tool issues. Only in one single hour or 0,05 % of the MTUs an overload within the TransnetBW control area led to an IVA application during the ordinary DAVinCy process.The low number for MTUs with an overloaded network element in the TransnetBW control area indicates that IVAs applied on TransnetBW’s CNECs were solving overloads in other control areas most of the times. In the Amprion control area there are actually no MTUs with an overloaded network element which indicates that all IVAs applied on Amprion’s CNECs were solving overloads in other control areas.

The above mentioned measures applied by the DAVinCy TSOs already decreased the amount of IVAs applied on Amprion and TransnetBWs CNECs. For any further reductions Amprion and TransnetBW depend on measures to reduce congestions in other control areas of the DAVinCy consortium or cross border and improvements to prevent DAVinCy fallbacks. German TSOs want to highlight that they fully support the innovative functioning of DAVinCy since it increases the overall benefit of the Core region compared to a purely national individual validation and could be used as blueprint for an effective coordinated validation approach among all Core TSOs.

In addition to the measures mentioned above in the general section for all DAVinCy TSOs, the planned grid enforcements within the control areas of the German TSOs will relieve grid elements with overloads in the future (cf. Action Plan of Germany[1] and Network Development plan[[2]](https://word-edit.officeapps.live.com/we/wordeditorframe.aspx?ui=de&rs=de&wopisrc=https://officedocs.projectplace.com/wopi/files/1496076749&IsLicensedUser=1#_ftn2)) will minimize the application of IVAs and, as required by Article 20(14)(b) and Article 20(15) DA CCM, avoid cross-zonal capacity reductions in the future.

[[1]](https://word-edit.officeapps.live.com/we/wordeditorframe.aspx?ui=de&rs=de&wopisrc=https://officedocs.projectplace.com/wopi/files/1496076749&IsLicensedUser=1#_ftnref2) Federal Ministry for Economic Affairs and Climate Action (2020): Action Plan Bidding Zone; URL: https://www.bmwk.de/Redaktion/EN/Downloads/a/action-plan-bidding-zone.html[[2]](https://word-edit.officeapps.live.com/we/wordeditorframe.aspx?ui=de&rs=de&wopisrc=https://officedocs.projectplace.com/wopi/files/1496076749&IsLicensedUser=1#_ftnref2) 50Hertz Transmission GmbH, Amprion GmbH, Tennet TSO GmbH, TransnetBW GmbH (2023): Grid Development Plan Electricity 20237/2045 – 2nd Draft; URL: <https://www.netzentwicklungsplan.de/en/front>

## TENNET TSO BV

In order to provide a better understanding of the results and the processes applied among DAVinCy TSOs, following are some introductory explanations:

* APG, Tennet NL and the German TSOs (DAVinCy TSOs) use a common tool for individual validation called DAVinCy (**D**ay **A**head **V**al**i**datio**n** of **C**apacit**y**). In case an overload cannot be solved with the available remedial actions, DAVinCy determines the necessary Individual Validation Adjustments (IVAs) on relevant CNECs with the objective to minimise the overall capacity reduction among the six DAVinCy TSOs. This can lead to situations where an overload occurs in one control area of TSO A whereas the IVA(s) is/are applied within other control areas, e.g., of TSOs B and C.
* The application of an IVA prevents a network element from being overloaded and does not necessarily lead to a deviation from the minimum cross-zonal capacity according to Article 16(8) of regulation (EU) 2019/943 on the internal market of electricity.

In the opinion of the DAVinCy TSOs, the cooperation of six TSOs within the DAVinCy consortium leads to a very effective result when relieving potential overloads within the grid in order to secure operational security. This is caused by the fact that remedial actions within six control areas can be used. Moreover, IVAs having a minimal impact on cross-zonal capacities offered to the market can be applied to solve congestions. Furthermore, the DAVinCy TSOs acknowledge, that this report has to be based on the amount of capacity reductions, i.e. IVAs applied by DAVinCy. Nevertheless, it should be noted, that measures to reduce the application of IVAs need to address the cause of IVAs, respectively the reduction of congestions and fallbacks.

The DAVinCy TSOs plan to apply the following measures in order to minimize the application of IVAs and, as required by Article 20(14)(b) and Article 20(15) DA CCM, avoid cross-zonal capacity reductions in the future:

* Methodological improvements based on increasing experience with the operational Core DA Capacity Calculation to finetune the trade-off between operational security and offered capacities. This concerns, among other things, the selection of possible market outcomes that are being analysed. Moreover, an update for IVA application on CNECs, which have a high sensitivity on anticipated congestions has been implemented in Q2/2023.
* Based on experience gained since Core DA Go-Live, the DAVinCy TSOs have decided to, for the time being, cap IVA such that a floor level of RAM ≥ 20%\*Fmax is maintained on their CNECs. This shall specifically avoid that external data issues lead to unfortunate results. DAVinCy TSOs reserve the right to change or abolish the floor level in the light of future operational experience. The floor level has been implemented in Q3/2023.
* Further improvement of process robustness through the use of redundant IT systems, plausibility checks and replacement strategies for input data, separate systems for test and productive environment and implementation of security management.

# ELES

**General measures to avoid cross-zonal capacity reductions in the future, as per Art. 20(14)(b) of DA CCM**

1. Improvement in congestion management – we will continue to improve the quality of our inputs for CORE DA CC in order to avoid unnecessary IVA application in case of errors in inputs files.
2. Network development and optimisation

**Detailed report and action plan describing how such deviations are expected to be alleviated and solved in the future**

In the second quarter of 2023, ELES applied reduction for more that 1% of MTU. There are three main reasons for this:

1. Presence of two CCR: The main reason for reduction at ELES is the fact, that we are in the cross-road of two CCR, which both aim to maximise capacities in order to fulfil 70% criteria. Often, maximisation of the capacities in Italy North CCR have negative effect on the RAM of Slovenian elements in CORE CCR. This is mostly due to the fact, that we have a PST on the Slovenian – Italian border, that is used to maximise Italy North NTC values.
2. Network weaknesses – there are some weaknesses on our network, most critical are the lines Podlog – Obersielach (SI-AT) and Divaca – Pehlin (SI - HR) - for both, the most reductions were applied.

Our plan to improve the situation consists of the following:

1. Additional training of operators and improvement of the local validation tool in order to improve the process and improve stability and reliability of the tool
2. Analysis will be performed on accuracy of validation tool (e.g. comparing the flows considered during the validation and realised flows). Based on the result of the analysis, the validation tool reliability margin will be adjusted in order to decrease the level of IVA application.
3. Network development and optimisation - For the Podlog – Obersielach line, we are in the process to obtain and install a static serous synchronous compensator (SSSC) in order to be able ro relieve the flow on the element. For the Divaca – Pehlin line, we are still investigation different possibilities to increase capacities (SSSC or high temperature lines).

# ELIA

General measures to avoid cross-zonal capacity reductions in the future, as per Art. 20(14)(b) of DA CCM include, but are not limited to:

**Robustness and CGM quality**

* A daily follow up plus short-term mitigations and long-term local validation of the tool has been set up to improve the tool aiming to:
  + reduce the number of occurrences of fallbacks,
  + reduce the number of occurrences of spanning by switching to DCLF when no ACLF converges.
  + reduce the number of occurrences of excessive IVA application due to failure in the derogation step.
* Congestion management through the shifting of overloads from the congested element to other CNECs via PST optimization to reduce the overall overloads, this action is already in place.
* Common Core action ongoing to correct the DC imbalance corrected and the CGM used in the FB DA CC process to make the flowbased calculations more correct.

**Detailed report and action plan describing how such deviations are expected to be alleviated and solved in the future**

**Integration of coordinated validation**

* The incoming of XB RD in the future evolution of Core DA CCM will help by adding new re-dispatch potential on some congested axis.

**Situation linked to short outages:**

* There are no extra investments foreseen to cover N-2 situations like for temporary short outages.

**ROSC + Cost Sharing**

* Elia uses 50% of the PSTs range to reduce the loopflows in D-2. Our optimizer achieves a LF reduction of up to 16% of Fmax on the grid element experiencing the highest relative LF. In doing so, the optimizer uses ~70% of time the available range on the North Border PSTs (Zandvliet side) into its full extent. Thus 70% of the time the derogation is needed to adapt the CEP target. The derogation set a threshold for LF and if there is excessive LF, the target, 70%, is reduced. This derogation will stop when the methodologies of ROSC and Cost-sharing are implemented.

In Q2 for one business day, the 19th of April, too high IVAs were applied resulting in RAM values that went exceptionally under the 20% of FMax. In the meantime, mitigation measures have been taken by Core TSOs with, among other actions, algorithmic improvements and change of internal methodologies for internal validation process.

# HOPS

1. General measures to avoid cross-zonal capacity reductions in the future, as per Art. 20(14)(b) of DA CCM

General measures include, but are not limited to:

* Network development and optimisation

The goal is to increase the transmission capacity and reduce grid congestion. The measures to achieve these goals include strengthening the optimising the existing network and the development of new infrastructure.

* Improvements concerning congestion management

Core CCR coordinated improvements based on shared forecasts and aligned assumptions in capacity calculations with coordinated actions to increase cross-zonal capacities and reduce uncertainties (CGM improvements, Coordinated validation, etc.). Also, inclusion of third countries could open further opportunities for HOPS (with planning process and implementation of remedial measures). Unscheduled allocated flows coming from commercial exchanges outside the Core CCR (Fuaf) has a strong impact on HOPS grid.

1. Detailed report and action plan describing how such deviations are expected to be alleviated and solved in the future

In the analysed quarter (Q2 2023), HOPS applied reduction in less than 2% MTUs. For most MTUs, the reductions are applied to:

* TL 400kV Ernestinovo – Pecs 1 or 2 (0,64% MTUs, or around 38% of times of all applied reductions) with an associated contingency case between one of them
* TL 400kV Žerjavinec – Tumbri (0,59% MTUs, or around 35% of times of all applied reductions) with no contingency.
* TL 400kV Žerjavinec – Tumbri (0,13% MTUs, or around 8% of times of all applied reductions) with an associated contingency case TL 220 kV Mraclin - Žerjavinec.
* TL 220kV Žerjavinec - Podlog (0,13% MTUs, or around 8% of times of all applied reductions) with the associated contingency case TL 400kV Tumbri – Krško 1 or 2.

Applied reductions on network element are mostly low (less than 5% of Fmax), while for several MTUs during mid-June (BD20230616) higher values are applied on TL 400kV Žerjavinec – Tumbri due to several outages in the surrounding area.

Such reductions are planned to be solved by developing and optimising the transmission network.

# MAVIR

1. **Explanation for the reductions applied by MAVIR in Q2, 2023**

MAVIR performs the individual validation with the basic principle of determining CBCOs that can be potentially overloaded by a realistic market outcome. In case a CBCO which cannot be solved by available remedial actions from contingency analysis but selected to be potentially overloaded is identified, IVA with the objective of minimizing the loss of the flow-based domain volume is optimized and calculated in order to relieve the potential overload. In Q2, there were 3 business days with some amount of IVA applied to CBCOs by MAVIR due to a pattern of significant power flows in the grid which can be counted as singular cases for which there is no other solution but IVA application. There were 9 distinct hours (or 0.4% of the MTUs) with IVA application to only 2 different CBCOs. In addition, of the 9 distinct hours, each hour had a single CBCO with IVA. In total, 8 of the 9 distinct hours, the CBCOs with IVAs were a domain limiting constraint, but only in a single hour the CBCO became active constraint for the market with a shadow price equal to 49.5 EUR/MW. There were zero distinct hours which did not fulfil the 20% minimum RAM requirement.

# PSE

General measures to avoid cross-zonal capacity reductions in the future, as per Art. 20(14)(b) of DA CCM:

* PSE is taken under consideration: long-, medium- and short-term measures to prevent capacity reduction.
* Generally, the main source of improvements will be grid developments, as prescribed in the Action Plan and as foreseen in the Grid Development Plan.
* In medium PSE is investigating dynamic monitoring of the lines, which increase the line rating.
* As the short-term measures, PSE implemented parametrization of the validation tool, which potentially leading to avoiding application of low IVA values (so that IVAs will be less frequent). Additional propose was to include in individual validation topological remedial actions.
* In some cases the IVA was implemented in specific maintenance situation, this will be only temporary and additional investigation are not foreseen,

2.

Detailed report and action plan describing how such deviations are expected to be alleviated and solved in the future.

1. In the analysed quarter (Q2 2023), PSE applied reduction of ~4% MTUs = 83 distinct MTUs with applied reductions. In total it was 18864MW of IVA,
2. In Q2 2023 PSE had no reductions applied as fallback,
3. In the analysed quarter (Q2 2023), for most MTUs, the reductions are applied to:
   1. CNE PSTs in Mikulowa and to Mikulowa-Hagenwerder tieline PSE applied 5634MW of IVA, mainly due influence of planned outages on second circuit Mikulowa-Hagenwerder tieline.
   2. CNE Krajnik-Vierraden c.2 PSE applied 4744MW of IVA, mainly due influence of planned outages on Mikulowa-Hagenwerder tieline. Increase of ampacity on Krajnik-Vierraden c.2 line was done in the end of June 2023.
   3. Polaniec-Tarnow, Polaniec-Rzeszow and Polaniec-AT2 PSE applied 4410MW of IVA. In order to avoid applying the reduction to Polaniec-AT2, a new topo measure was used during analysed quarter.

Action plan:

1. The parametrisation of tool for individual validation might reduce frequency of IVA. Additional analysis and test will be needed to finally conclude on this, following by a decision on PSE side and necessary operators training. Upgrading of the tool is in progress and expected in some of upgrading will be available in Q3 2023.
2. Including additional remedial actions: e.g. topological remedial action close to congested area. Additional analysis and test will be needed to finally conclude on this.
3. Reinforcement of the grid is included in grid development plan. For example: maintenances to increase ampacity of Krosno Iskrzynia – Rzeszów line planned in 2024.
4. Monitoring of CGM quality in case of F0\_Core. This is a very important element, for which unfortunately PSE is not able to do much, since CGM quality results from modelling issues from power systems outside of PSE.
5. Special situation on the market influences redispatching potentials. Therefore, improvements of the fuel availability for the conventional power plant will increase redispatching potentials and in consequence value and frequency of the IVA implementation. This however depends of the market situation and lies outside of PSE competences and authority.

# RTE

RTE is developing the integration of a NRAO in order to improve the inclusion of topological remedial actions in the validation step. This tool integration is expected to be ready by the end of 2023.

# SEPS

1. General measures to avoid cross-zonal capacity reductions in the future, as per Art. 20(14)(b) of DA CCM

[SK-SK] V.Dur - Levice 2 [DIR] + N-1 V.Dur - Levice 1 SK\_CBCO\_00079

[SK-SK] V.Dur - Levice 1 [DIR] + N-1 V.Dur - Levice 2 SK\_CBCO\_00070

[SK-HU] Levice - God [DIR] [SK] + N-1 R.Sobota – Sajoivanka SK\_CBCO\_00018

[CZ-SK] Nosovice - Varin [DIR] [SK] + N-1 Lemesany - Krosno Iskrz 1 SK\_CBCO\_00111

The significant amount of the IVA application can be assigned to the planned outages in vicinity of the above-mentioned CNECs.

The general measures that can be potentially improved in order to decrease the number of reductions are:

1. Improvement of the outage planning
2. Infrastructural improvements
3. Introduction of new topological measures that can alleviate congestions
4. Improvements planned in the validation tool which should help to select more accurate scenario that is evaluated during validation
5. Detailed report and action plan describing how such deviations are expected to be alleviated and solved in the future

The main portion of the IVA application was done on the CNEC [SK-SK] V.Dur - Levice 2 [DIR] + N-1 V.Dur - Levice 1 SK\_CBCO\_00079 on which significant volume of the virtual margin was assigned. There are two solutions that are planned:

1. Short-term solution: Introduction of new topological measure in that are that should help to relieve the congestion and therefore allows to reduce the number of IVA application.
2. Long-term solution: There is a plan to change configuration of the critical elements in the substation V. Dur, which should significantly decrease the flows on CNEC NEC [SK-SK] V.Dur - Levice 2 [DIR] + N-1 V.Dur - Levice. The current estimation is that this shall be accomplished in Q2 2028.

For the tie-line Nosovice – Varin there is also planned reinforcement that shall increase Imax from 1740A to 2000A in 2026. We assume that this step should lead to decrease of the IVA volume on this element.

# Transelectrica

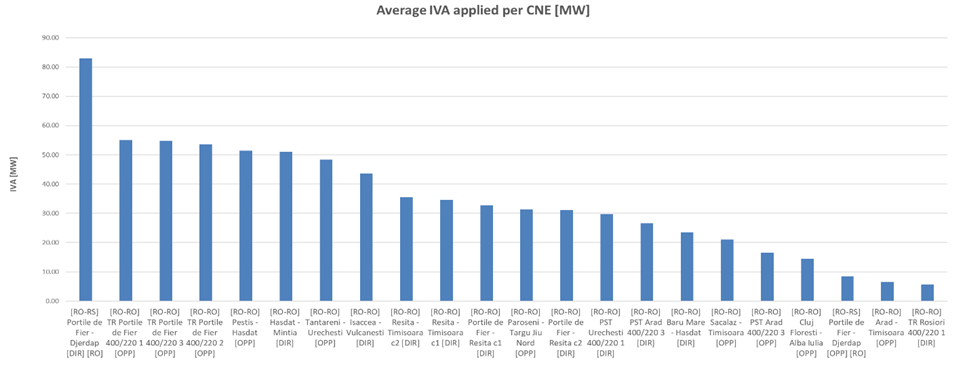
In 2021, the Romanian Government decided to adopt an Action Plan pursuant to Article 15 of the Regulation (EU) 2019/943, including a linear trajectory for the yearly increase of the minimum capacity made available for cross-zonal trade until 31 December 2025.

For year 2023 the minimum capacity made available for cross-zonal trade on Romania – Hungary border (part of Core CCR) has been 48% from the transmission capacity) according to the Action Plan. For this year though, Transelectrica was granted a derogation on foreseeable grounds for maintaining operational security, thus the minimum capacity for cross-border trade remains at 33% from the transmission capacity, the same target provided in the Action Plan for the year of 2021.

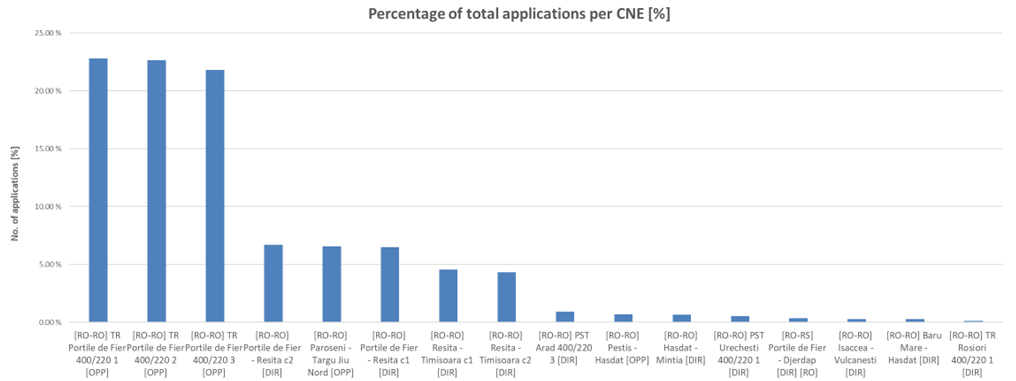
In addition to being part of the Core CCR, Transelectrica is also part of SEE CCR with RO – BG border having operational processes for Day-ahead capacity calculation since June 2021 and first Intraday capacity calculation since October 2021. Moreover, there are three non-EU borders for which there is no coordinated capacity calculation.

Regarding the capacity calculation process, the Core DA CCM allows TSOs to correct cross-zonal capacity for reasons of operational security during the validation process individually and in a coordinated way according to Article 20 (1). Article 20(5) states that *“each Core TSO shall validate and have the right to decrease the RAM for reasons of operational security during the individual validation. The adjustment due to individual validation is called ‘individual validation adjustment’ (IVA) and it shall have a positive value, i.e. it may only reduce the RAM. IVA may reduce the RAM only to the minimum degree that is needed to ensure operational security considering all expected available costly and non-costly RAs”.*

* For the period 20230401 – 20230630, Transelectrica applied an Individual Validation Adjustment (IVA) on the CNEs mentioned in Figure 1. In this graph the average IVA per CNE is represented for the timestamps where reductions were applied for more than 1% of the total reductions.



*Figure 1. Average IVA applied per CNE during the reported period*



*Figure 2. Percentage of total IVA applications per CNE during the reported period*

1. General measures to avoid cross-zonal capacity reductions in the future, as per Art. 20(14)(b) of DA CCM;
2. Detailed report and action plan describing how such deviations are expected to be alleviated and solved in the future.

* ***Development of the transmission grid***

Most of the cases with IVA applications are related to 220 kV critical network elements located in the southwest part of the country. The following measures are foreseen according to the National Action plan in order to increase the remaining available margin of these elements:

* New 400 kV OHL Porțile de Fier – Reșița planned for 2024;
* OHL 400 kV Reșița – Timișoara – Săcălaz d.c. planned for 2025;
* OHL 400 kV Timișoara – Săcălaz – Arad d.c. planned for 2027;
* Increase the transmission capacity for the OHL in the 220 kV axis Urechești – Târgu Jiu Nord – Paroșeni – Baru Mare – Hășdat planned for 2028;
* New 400 kV Tieline Suceava – Bălți (RO-MD) planned for 2030;
* New 400/220 kV Autotransformer in Roșiori substation planned for 2027.
* ***Increase the quality of the D2CF CGMs at CCR level***

At this moment there is no common D2CF CGMs process to be used for DA CC in all CCRs. Each CCR has its own rules on the IGMs (e.g. D2CF for Core TSOs and DACF for the rest of Continental Europe) and a net position forecast to be used when CGMs are created. As there is no common, harmonized and reliable net position or exchange forecast yet implemented in Europe, the assumptions taken by each CCR will lead to large uncertainties, potentially high overloads and operational situations where the available remedial action potential (including redispatching) is insufficient, thus leading to applying reductions on CNECs. This situation affects the power flow on the 220 kV critical network elements located especially in the southwest part of the country, heavily influenced by the exchanges in the SEE region where DACF files are used for the purpose of D2CF CGMs in Core CCR. A common D2CF CGM process is required for all CCRs in Continental Europe as soon as possible.

* ***Implementation of the coordinated validation in the Core CCR***

Coordinated validation would allow TSOs to use commonly the remedial actions available throughout Core CCR, making use of the most suitable remedial action in order to secure a minimum capacity and reduce the IVA applications.

* ***Implementation of regional coordinated processes for security analysis***

The Articles 16(4) and 16(8) of the Regulation (EU) 2019/943 refers to the implementation of the coordinated capacity calculation and security analysis at regional level to ensure a minimum capacity available for cross-zonal trade. Though the capacity calculation using flow-based method in Core CCR is now an operational process, it is not enough to comply with the minimum available capacity requirements. The results of the day-ahead capacity calculation come with a lot of uncertainties without a coordinated security analysis implemented at a regional level before real-time. Not always the internal measures and remedial actions estimated as available for day-ahead capacity calculation are available and enough to maintain the system security in real-time.

* ***Implementation of redispatching and countertrading processes implemented at regional level pursuant to Article 35 and 74 of Regulation (EU) 2015/1222.***

The Article 16(4) of the Regulation (EU) 2019/943 stated that the redispatching and countertrading shall be used to maximize the available capacity to reach the minimum capacity provided for in Article 16(8) of the Regulation (EU) 2019/943. This process shall be coordinated and follow the implementation of cost-sharing methodology. At Core CCR level these processes are under implementation. Because of this Transelectrica applies an individual redispatching process aimed at achieving the minimum level of cross-zonal capacity as per national Action Plan. This is not always feasible due to the lack of sufficient remedial actions.

* ***Coordination between capacity calculation regions***

Besides Core CCR, Transelectrica SA is also part of SEE CCR with RO – BG border. Furthermore, for the three non-EU borders there is no coordinated capacity calculation. The exchanges on the borders with Bulgaria, Serbia, Ukraine and Republic of Moldova are considered as fixed in coordinated capacity calculation from Core CCR. Any deviation from these values forecasted two days ahead will create a different loading on the critical network element with risks for the operational security of the system. Because of this, lack of cross-CCR coordination becomes critical for Romania in cases with high export from the southeast part of Continental Europe towards the central area. These uncoordinated transits through Romania correlated with high generation in the wind and hydro power plants from the south part of Romania lead to increasing the power flows on the 220 kV network in the southwest part of the country. These transits create (N-1) violations in the transmission grid which cannot be addressed without coordinated remedial actions for redispatching and countertrading.