

Derogation request of APG
from the obligation under Article 16(8) pursuant to
Article 16(9) of Regulation (EU) 2019/943 of the
European Parliament and of the Council of 5 June
2019 on the internal market for electricity for the
Capacity Calculation Region Core

Introduction

- (1) In accordance with Article 16(8) of the Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity (“Regulation 2019/943”) transmission system operators shall not limit the volume of interconnection capacity to be made available to market participants as a means of solving congestion inside their own bidding zone or as a means of managing flows resulting from transactions internal to bidding zones. The minimum levels of available capacity for cross-zonal trade are reached:
 - for borders using a coordinated net transmission capacity approach, the minimum capacity shall be 70% of the transmission capacity respecting operational security limits after deduction of contingencies. This is determined in accordance with the capacity allocation and congestion management guideline adopted on the basis of Article 18(5) of the Regulation 2009/714 (EC) of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation (“Regulation 2009/714”).
 - for borders using a flow-based approach, the minimum capacity shall be a margin set in the capacity calculation process available for flows induced by cross-zonal exchange. The margin shall be 70% of the capacity respecting operational security limits of internal and cross-zonal critical network elements, taking into account contingencies, as determined in accordance with the capacity allocation and congestion management guideline adopted on the basis of Article 18(5) of the Regulation 2009/714.
- (2) However, in case a transmission system operator cannot comply with the minimum capacity of 70% to be made available to market participants due to operational security risks on foreseeable grounds, such transmission system operator may request from the relevant regulatory authorities a derogation from Article 16(8) of the Regulation 2019/943. The extent of such derogations shall be strictly limited to what is necessary to maintain operational security and they shall avoid discrimination between internal and cross-zonal exchanges. Before granting a derogation, the relevant regulatory authority shall consult the regulatory authorities of other Member States forming part of the affected capacity calculation regions. In absence of an unanimous decision by the regulatory authorities such decision is incumbent upon ACER.
- (3) ACER issued a Recommendation (No. 01/2019), published on 9 August 2019, describing a unified way on how to monitor the capacities made available to the market in relation to the 70% target for all considered timeframes and all coordination areas.
- (4) In accordance with the Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on Capacity Allocation and Congestion Management (“CACM Regulation”) and the Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (“SOGL”), TSOs are required to develop and deliver the proposals on the methodologies in which the essential elements related to the coordinated capacity calculation and coordinated usage of non-costly and costly remedial actions are to be defined. The following methodologies have to be submitted by TSOs from the same Capacity Calculation Region (“CCR”):
 - a. The Capacity Calculation Methodologies for the Core CCR as referred to in Article 21 of the CACM Regulation (“Core CCM”).
 - b. The Coordinated Redispatching and Countertrading Methodology for the Core CCR as referred to in Article 35 of the CACM Regulation (“CACM 35”).
 - c. The Redispatching and Countertrading Cost-Sharing Methodology for the Core CCR as referred to in Article 74 of the CACM Regulation (“CACM 74”).

- d. The operational security coordination methodology for the Core CCR as referred to in Article 76 of the SOGL Regulation (“SOGL 76”).
- (5) Austrian Power Grid AG (hereinafter referred to as “APG”) is operating the Austrian transmission system for electricity and therefore ensuring the trans-regional national exchange of electricity as well as the exchange with neighbouring countries between generators and consumers. APG has been certified as Independent Transmission Operator on 12 March 2012.
Essentially, the present request refers to the obligation deriving from Article 16(8) of the Regulation 2019/943, which applies to APG in its role as transmission system operator from 01 January 2020.
- (6) As operational security would have been endangered, pursuant to Article 16 (9) of the Regulation 2019/943, APG filed a request for the grant of a derogation from the obligations laid down under Article 16 (8) of the Regulation 2019/943 in relation to the bidding zone borders AT/DE, AT/CZ, AT/HU and AT/SI for the year 2020.
- (7) This derogation request was approved by the Austrian national Regulatory Authority, E-Control, on 17 December 2019. The positive decision is linked to requirements regarding transparency and implementation the measures and projects to be implemented to mitigate the foreseeable grounds of the derogation request. The derogation is valid until the end of 31 December 2020, provided that the solutions and projects do not enable the requirements of Article 16 (8) of the Regulation 2019/943 to be achieved at an earlier point in time.
- (8) With regard to the current status, APG is making efforts and has taken concrete measures to mitigate derogation grounds of the derogation according to point (7). Some processes have already been implemented and others are in an advanced implementation phase. In addition to the expansion of cross-border redispatch contracts, major developments are currently being made in capacity calculation and validation tools. According to current status, the mitigation of those reasons for derogation, which can only be remedied through international cooperation, will not be ready by the end of 2020 as key methodologies from CACM Regulation and SOGL Regulation (see point 4 above) will not be implemented until 31 December 2020 and APG therefore cannot rely on these methodologies per 1 January 2021.
- (9) Against this background and pursuant to Article 16 (9) of the Regulation 2019/943, APG files the present request for the grant of a derogation from the obligations laid down under Article 16 (8) of the Regulation 2019/943 in relation to the bidding zone borders AT/DE, AT/CZ, AT/HU and AT/SI for the year 2021. This derogation is applied on the basis of two foreseeable grounds justified in the Article 3.
- (10) The national regulatory authorities (hereinafter referred to as “NRAs”) adopted on 29th June 2020 a common note, which gives a guidance for the TSOs on the necessary content of derogation requests in line with Article 16(9) of the Regulation 2019/943 as well as the assessment criteria. This request for derogation prepared by APG takes into account the requirements of the common NRAs’ note.

Article 1 Subject Matter and Scope

1.1 APG requests a derogation from the implementation of the minimum margin available for cross-zonal trade as established in Article 16(8) and in accordance with Article 16(9) of the Regulation 2019/943 for a period of the year 2021 with regard to its Core bidding zone borders AT/DE, AT/CZ, AT/HU as well as AT/SI.

1.2 This request for derogation is based on 2 different foreseeable grounds for deviating from the 70% capacity criterion as established in Article 16(8) of Regulation 2019/943 respectively from the target capacity value according to an action plan as further described in Article 3, justifying the approval of a derogation. Both foreseeable grounds would impact the operational security in case of non consideration while a minimum target capacity is to be achieved.

Article 2 Definitions and abbreviations

AMR	Adjustment for minRAM
CC	Capacity Calculation
CCR	Capacity Calculation Region
CEP	Clean Energy Package
CGM	Common Grid Model
CNE(C)	Critical Network Element (with Contingency)
CWE	Central Western Europe
D-2	Two-Days Ahead
FB	Flow Based
FBCE	Flow Based Common Environment
FRM	Flow Reliability Margin
INB	Italian North Border
MACZT	Margin Available for Cross-Zonal Trade
MACZTmin	Relevant target capacity
minRAM	Minimum Remaining Available Margin
MNCC	Margin from Non-Coordinated Capacity Calculation
MCCC	Margin from Coordinated Capacity Calculation
MTU	Market Time Unit
NP	Net Position
NTC	Net Transfer Capacity
PFC	Power Flow Colouring
PST	Phase-Shifting Transformer
RAM	Remaining Available Margin
TRM	Transmission Reliability Margin
TTC	Total Transfer Capacity

Article 3 Foreseeable grounds impacting operational security

Acknowledging that key methodologies from the CACM and SOGL Regulations mentioned in the

Introduction are still not implemented in the CCRs in which APG is actively involved as a member TSO, APG cannot count on them in relation to the assessment and fulfilment of the *70% capacity criterion, respectively a lower target capacity according to an national action plan as of 1 January 2021* (hereinafter „relevant target capacity“ or “ $MACZT_{min}$ ”).

Based on this, the application of the minimum capacity in accordance with Article 16(8) of the Regulation 2019/943 respectively the target capacity according to the national action plan (for borders using a coordinated net transmission capacity and for borders using a flow-based approach) from 01 January 2021 on, **endangers the operational security due to the 2 foreseeable grounds stated in Table 1**, which are further elaborated in this Article. These foreseeable grounds are relevant for all Austrian borders of the Core CCR (AT/CZ, AT/HU, AT/SI and AT/DE) if not explicitly specified otherwise.

TABLE 1. LIST OF FORESEEABLE GROUNDS THAT ENDANGER THE OPERATIONAL SECURITY

No.	Description
3.1	Lack of concepts and IT-tools <ul style="list-style-type: none"> • Insufficient concepts and IT-tools for capacity calculation and • capacity validation (in line with the Regulation 2019/943) in the different capacity calculation areas.)
3.2	Systemic issues <ul style="list-style-type: none"> • Usage of CNEC capacity > threshold by loop flows and PST flows (lack of cross-CCR coordination), • margin for uncoordinated transits and • absence of consideration of 3rd country flows in the capacity calculation.

As further elaborated in this Article all these arguments related to the request for derogation pursuant to Art 16(9) of the Regulation 2019/943 are foreseeable, they directly impact APG’s operational processes and are of major importance for maintaining the operational security.

3.1 Lack of concepts and IT-tools

Referring to Point (4) of the Introduction key methodologies concerning a capacity calculation and validation broadly coordinated in the Core region for the day ahead and intraday timeframe according to the CACM Regulation will not be implemented until the January 1st 2021. APG cannot count on them in relation to the fulfilment of the target capacity criterion, starting as of 1st January 2021.

Capacity Calculation for NTC borders: As the Regulation 2019/943 entered into force on 4 July 2019 and the relevant ACER Recommendation (No 1/2019) was published on 9 August 2019, there was a too short time period left for TSOs to adapt current processes related to capacity calculation (evaluation, development, specification, tender, implementation, testing, training) and be ready to fulfil requirements stemming from Article 16(8), from the 1 January 2020 onwards. This also applies for the 1 January 2021, as development of a tool capable of this calculations is still ongoing and will not be finished by the beginning of next year, but rather in Q2/2021. The currently applied NTC methods (at AT/CZ, AT/HU, AT/SI) have been designed in such a way that they follow the ENTSO-E methodology which is based on the calculation of TTC (Total Transfer Capacity) and TRM (Transmission Reliability Margin). The NTC methodology assumes bilateral stepwise increase/decrease of power generation per country and monitoring of the n-1 security criteria relevant for a certain border. By that process the total values of cross-zonal capacity are calculated per border (and not per CNEC). That currently applied method, which is not compliant with the coordinated NTC approach according to the CACM Regulation, has neither been designed to

calculate the margins available for cross-zonal trade per CNEC nor to evaluate the influence of commercial trades from the other non-coordinated areas on the elements of the coordinated area or to distinguish between different flow types.

Capacity Calculation for Flow Based (CWE) border (DE/AT): As the Regulation 2019/943 entered into force on 4 July 2019, there was a very short time period left for TSOs to adapt current processes related to flow-based capacity calculation and be ready to fulfil obligations from Article 16(8), starting from the 1 January 2020. While the necessary IT change to include the possibility to set the minRAM value per CNEC individually is already in place, there is still a necessity to have a local calculation of MNCC and loop flow values, leading to Article 16(8) conform minRAM values per CNEC. As this will be integrated in the above mentioned tool (due to the identified synergy), the calculation of NTCs and minRAMs with respect to article 16 (8), cannot be deployed by 1 January 2021.

Capacity Validation at NTC and Flow Based (CWE) border (DE/AT): The new methods and processes of capacity calculation in line with the requirements of the Regulation 2019/943 (see Capacity Calculation paragraphs above and Article 4) and according to ACER's Recommendation (No. 01/2019) are expected to lead to significantly more volatile MCCC values, which due to the basic principles of the methodology according to the Recommendation can go way beyond the security limits, as first evaluations show. Therefore an additional process step for operational security validation of the calculated capacities is of paramount importance to ensure secure operational conditions. The concepts, methods and IT-tools for this process step are currently not yet available.

Due to the location in the centre of the continent, APG is highly exposed to the effects of diverse developments on the electricity sector in many European countries. In this context for APG it is even more critical that the capacity calculation and forecast methods are not yet harmonized and properly coordinated (see Introduction (4)). Hence, such a validation process is of high complexity and has to consider all relevant uncertainties that come along with the current status. It needs to be newly developed and tested thoroughly, to ensure that the capacities calculated under consideration of minimum targets according to the Regulation 2019/943 can be secured in each and every MTU with the remedial actions available.

Without a reliable validation process, along with the new respectively enhanced capacity calculation concepts considering the cross-zonal capacity minimum target, there is no possibility to evaluate if the available remedial actions and especially the redispatch potential after the closure of day-ahead energy market are sufficient to solve potential overloads and to ensure physical firmness of the transmission capacities offered on D-2 level. **This could lead to situations, where higher capacities are given to the market with the goal to fulfil the relevant target capacity criterion, but the redispatch potential to ensure these capacities is not available though. This would impose an unbearable risk for operational security and endanger security of supply.** At the moment such a process is not in place yet. A reliable validation process including the relevant concepts and IT-tools is currently under development according to the steps provided in Article 4 of this derogation request. As this is the most critical aspect of the future capacity calculation, a lot of emphasis on a safe concept and implementation was needed to ensure secure grid operation. Due to the short time to specify, tender, develop, implement and test the tool, with very high requirements at the same time, safe commissioning as of January 1, 2021 cannot take place without security risks. According to the current plan, the go-live is foreseen in Q2/2021.

Due to the aforementioned reasons, APG is not able to calculate from 1 January 2021 the volume of NTC transmission capacity on its Eastern and South-Eastern borders (AT/CZ, AT/HU, AT/SI) that would comply with the minimum capacity criteria, respectively the target capacity according to an action plan, on at least one limiting CNEC. Concerning the CNECs relevant for the CWE region, the minRAM values to be determined in line with ACER Recommendation (No. 01/2019), that

consider exchanges outside of CWE region (MNCC values), can as well not be calculated as of 1 January 2021. Moreover, without a reliable validation processes, it is not feasible to evaluate if the available remedial actions are sufficient to solve potential overloads and to ensure physical firmness of the transmission capacities offered on D-2 level.

Due to those reasons, APG is not able to determine with any appropriate accuracy the cross-zonal capacities respectively the target capacities according to an action plan respectively, to be offered to the market, and in the consecutive step, cannot validate their feasibility by ensuring the network security.

A raise of cross border capacities currently cannot be assessed by APG at operational capacity calculation stage neither regarding the effect on specific minimum capacity targets nor on the impact related to operational conditions. This will only be possible after the implementation of both, the capacity calculation and the capacity validation tool. Offering the capacities to the market before the operational go-live of these tools would impose an unbearable risk for operational security and seriously endanger security of supply.

3.2 Systemic issues

According to the Regulation 2019/943, the total amount of 30 % of capacity on each CNE can be used for the reliability margins, loop flows and internal flows.

- Margin for uncoordinated transits (unreliable forecast)

For the determination of the capacities to be offered for the cross-zonal trade according to ACERs Recommendation (No. 1/2019), netting of flows outside of the coordination area (MNCCs) is envisaged. These MNCCs are to be calculated based on non-coordinated and non-harmonized forecasts. As the coordination areas nowadays are relatively small (especially for NTC based borders), and as there is no common, harmonized and reliable net-position or exchange forecast yet implemented in Europe, the application of such a methodology will inevitably lead to large uncertainties, which cannot be covered by a low reliability margin contained along with loop flows and internal flows within 30% of capacity on each CNE. **Neglecting these evident and foreseeable uncertainties can lead to high overloads and potentially to operational situations where the available remedial action portfolio (incl. redispatch) is insufficient. This would endanger the operational security severely.**

- Usage of CNECs capacity > threshold by loop or PST flows (lack of cross-CCR coordination)

Based on the calculations performed with historical data, the volume of loop flows and PST flows is sometimes very high on some CNECs. **This inevitably leads to the fact that minimal margin available for cross-zonal trade cannot be fully given to the market without endangering network security, as a large amount of capacity is blocked by loop flows and PST flows.** The reason for this can be found in the not yet implemented coordinated capacity calculation methods according to the CACM Regulation in the different CCRs (calculation of loop flows and its limitation is foreseen in the Core CCM), the pending implementation of proper methods for operational security coordination and the non-existence of adequate cross-CCR coordination, as for example between Core and Italy North CCR.

- Absence of consideration of 3rd country flows in the capacity calculation

According to the guidance given by EC in its letter from 16 July 2019, the consideration of the non-EU country flows in the capacity calculation and counting these flows towards the relevant target capacities should be possible on the condition that an agreement has been concluded by all TSOs of a CCR with TSO of the third country, approved by the respective NRAs. This agreement should be fully in line with EU capacity calculation principles and rules, and should cover at least:

- Consideration of internal third country constraints for intra-EU capacity calculation
- Consideration of EU internal constraints for capacity calculation on the border with third countries, and
- Cost-sharing of remedial actions

However, the physical flows caused by the 3rd countries are present on the CNECs and cannot be artificially neglected in the calculation process. It also needs to be pointed out that non-consideration of third country flows leads to a different treatment of the EU Members States TSOs with the regard to fulfilment of a relevant target capacity requirement, with a significant disadvantage for those with higher exposition to flows of 3rd countries.

As the cross-zonal capacities of APG are significantly influenced by the import/export of Switzerland, the consideration of these flows has significantly influences on secure grid operation. With a focus on Switzerland, the methodological specifics and the governance for the inclusion are currently being investigated within the Core CCR in close coordination with the European Commission, ACER and the NRAs including the Swiss parties . Depending on the resulting solution a contractual framework is planned to be established. Nevertheless the timeline to fulfil all the preconditions related to the inclusion of third countries into the determination of MACZT stated above is very tight. Under consideration of the status and the remaining open issues, it is rather unlikely and not in the sphere of APG that an appropriate contractual framework can be concluded before 1 January 2021. In order to fulfil the relevant target capacity requirement without considering CH, APG would need to artificially increase available capacity/RAM on some CNECs. **Based on analysis performed with historical data, some CNECs are highly influenced by third country flows. A further artificial increase of capacity/RAM would increase the risk for operational security risk and endanger the network security.**

Both foreseeable grounds stated in Article 3.1 and Article 3.2 clearly justify the necessity of the derogation from the implementation of the minimum margin available for cross-zonal trade as established in Article 16(8) and in accordance with Article 16(9) of the Regulation 2019/943 for maintaining security of supply.

Meanwhile and besides the demanding developments within Core, APG has made huge efforts and in advancing and implementing the mitigation measures from the approved derogation 2020. The processes and methods for mitigating the foreseeable grounds were published based on the decision of the national Regulatory Authority, E-Control and APG is making best efforts for their implementation. Besides that, progress reports were and will be provided to E-Control to ensure transparency on the progress of the developments.

Article 4 Mitigation measures

In order to be able to fulfil the capacity requirements of Art 16(8) of the Regulation 2019/943, respectively the target capacities according to an action plan, and to conclude with a reasonable certainty whether the cross-zonal capacities could meet those requirements, APG is developing the necessary methods and concepts, as well as the IT-tools as an interim step until the relevant key methodologies according to the CACM Regulation and the SOGL are implemented (see Introduction (4)).

This article lists concrete steps and projects to mitigate the foreseeable grounds for derogation as presented in Article 3.

4.1 Mitigation of the lack of concepts and IT-tools

4.1.1 Mitigation measures for insufficient concepts and IT-tools for capacity calculation

- As the monitoring concept introduced by ACER with its Recommendation No. 01/2019 is based on CNECs, changes in the current NTC capacity calculation methodology are necessary towards the introduction of a CNEC based calculation. Until the implementation of the Core CCM, for three NTC borders (AT/CZ, AT/HU, AT/SI), an enhanced CNEC based NTC calculation methodology, which considers mutual interdependencies of all three borders is needed. A new capacity calculation concept and software was therefore specified from scratch during the first four months of 2020. In contrast to the necessary local developments for the flow-based calculation of minimum capacities in the CWE area, the development of a tool for the NTC borders is much more challenging and complex. The new concept will enable APG to calculate simultaneously feasible border capacities for AT/CZ, AT/HU and AT/SI, limited by at least one CNEC and under consideration of relevant minimum target capacities. The calculation of the NTC values will therewith consider all relevant parameters, which are amongst others, MNCC values (with and without 3rd country flows), loop- and PST-flows caused by the different zones (flow decomposition module) as well as margins related to uncertainties of not yet well-coordinated net position forecasts. Considering its vitality for secure grid and market operation, this complex tool has to be properly designed and maintained to ensure reliability and a high level of availability for the operational process. The development was outsourced to an external IT-development company, specialized in this field of operation. The tender phase was completed at the beginning of July 2020 and the development phase was initiated then immediately. The development of the new capacity calculation software for the simultaneous NTC calculation for the three borders AT/CZ, AT/HU and AT/SI, taking into account minimum capacities, is planned to be completed end Q1 2021. This will be followed by testing and calibration of the tool and training of the operators. The go-live readiness of the tool is expected for end Q2 2021.
- Even with the high amount of resources allocated to this project, the whole development process will take a bit more time than originally planned. The calculation tool will enable APG to calculate in a more coordinated manner across the three borders the highest possible NTCs with respect to the relevant target capacity and under consideration of reliably maintaining operational security.
- This new capacity calculation tool will also be capable to calculate the needed minRAM values to fulfil a certain $MAZCT_{min}$ criterion and the still valid 20% Fmax criterion (within CWE) for Flow Based relevant CNECs (CNECs currently related to CWE; in future Core CNECs). APG is currently operating a local prototype for the calculation of MNCCs and resulting AMRs on its CWE CNECs for the purpose of testing and analysis. This local prototype is used in the CWE CEP parallel run, in which APG participates on a voluntary

basis in order to gain further experience and information for the operational implementation.

- As the testing, operator-training and secure go-live of the new capacity calculation tool is of a substantial relevance for the network security in Austria and Europe, APG will not put this at risk due to an earlier go-live date of the new capacity calculation with respect to Art 16(8) of the Regulation 2019/943. This justifies the expected go live of the new calculation tool in Q2 2021, few months later than the planned completion (Q1 2021).
- In parallel, APG is actively working together with the other Core TSOs to implement the Core capacity calculation methodology (Core CCM) in line with the Regulation 2019/943. This methodology is expected to be a major step towards an adequately coordinated capacity calculation in the highly meshed system of Continental Europe.

4.1.2 Mitigation measures for insufficient concepts and IT-tools for capacity validation

- For the validation in the timespan until the implementation of Core CCM, a new methodology to validate the outcomes of the capacity calculation tool (Article 4.1.1) was specified and respective IT-tools will be developed till end Q1 2021, followed by the tests, implementation and operators training. In coordination with the capacity calculation tool, the go-live readiness is envisaged for end Q2 2021.
- All aspects mentioned in Article 4.1.1 regarding the complexity of the concept and tool, it's importance for operational security and the necessary requirements considering proper development, maintenance and operation apply as well – if not even more – to the validation tooling.
- In parallel, APG is actively working with the other Core TSOs to implement capacity validation requirements in line with Core CCM and in line with the Regulation 2019/943.

4.2 Mitigation of systemic issues

In the course of establishing the methodologies and projects that will provide an interim solution to the issues that the request for derogation addresses, APG specified and currently develops methods and tools for calculation of cross-zonal capacities on CNEC level. Those methodologies are based on the concepts introduced with the ACER Recommendation No. 01/2019, and aim to fulfil the following equation in the capacity calculation phase:

$$MCCC (MTU) + MNCC (MTU) \geq MAZCT_{min} (MTU)$$

Where:

$MAZCT_{min}$ is the minimum MACZT target level for a CNEC and MTU considering the relevant target capacity

$MCCC$ is the margin from coordinated capacity calculation

$MNCC$ is the margin from non-coordinated capacity calculation

This method takes the CGMs as basis for calculation and applies the general principles as follows:

- a) A margin to deal with the uncertainties related to the insufficiently coordinated forecast of transit flows is calculated and applied for the Austrian CNECs as described in 4.2.1
- b) After the initial load flow and power flow decomposition calculation, the loop flows are calculated and $MACZT_{min}$ is applied for the Austrian CNECs as described in 4.2.2. For the avoidance of doubt, if the loop flows are below the acceptable level defined in paragraph f) of 4.2.2, the $MACZT_{min}$ will not be reduced due loop flows.
- c) During the validation phase (to be in place once the mitigation measures described in 4.2 are successfully applied), operational security limits are assessed. This implies the detection of congested grid elements and their relieving through the application of non-costly and costly remedial actions.
- d) As long as operational security limits of the transmission grid can be respected, the calculated $MACZT_{min}$ (respectively NTCs, which are based on $MACZT_{min}$) is provided to the day-ahead market. If operational security limits of the transmission system cannot be kept, the available cross-zonal capacity will be reduced to a level that respects these operational limits.
- e) The minimum capacity available for cross-zonal trade shall in any case respect the minimum values as defined in Article 6.

The approach used in this derogation request defines capacity calculation rules and includes, where needed, mathematical equations.

4.2.1 Determination of margin for forecast error related to the non-coordinated transit flows calculation

- The application of a capacity calculation process in line with Article 16(8) of the Regulation 2019/943 on a relatively small coordination areas leads to large uncertainties which cannot be covered with the low reliability margins.
- Due to the central location of APG's transmission system and the rather small coordination areas, high MNCC values are the consequence and also high uncertainties in the determination of MNCC for the Austrian CNECs. These uncertainties are expected to decrease once the Core CCM including the respectively coordinated and more reliable net-position or exchange forecast processes are implemented, constituting a large coordinated area encompassing as well four of the six Austrian borders. Due to the high uncertainties and resulting forecast errors of non-coordinated transits, it is necessary to apply a dedicated margin for MNCC forecasting errors in order to ensure operational security. **Neglecting these evident and foreseeable uncertainties can lead to high overloads and potentially to operational situations where the available remedial action portfolio (incl. redispatch) is insufficient. This would endanger the operational security severely.** This MNCC margin, which is to be considered as a part of the MNCC, shall be included in the capacity calculation methodology. By taking this into account, MNCC shall be calculated as follows:

$$MNCC = MNCC_{CGM} + MNCC_{margin}$$

Where:

MNCC is the margin from non-coordinated capacity calculation

$MNCC_{CGM}$ is the forecasted non-coordinated transit flow induced by cross-zonal exchanges outside of respective coordination area(s). The flow is calculated using the best available forecast of the bidding zones net positions and by including exchanges between 3rd countries and EU countries, respectively between 3rd countries only (see Article 4.2.3).

$MNCC_{margin}$ is the margin necessary to cover the uncertainties related to the forecasted non-coordinated transit flows induced by cross-zonal exchanges outside of the coordination area(s). The margin is given per CNEC and calculated using the probability distribution of deviations between the forecasted non-coordinated transit flows at the time of the capacity calculation and the realised non-coordinated transit flows. In the second step, the 90th percentiles of the probability distributions of all CNECs shall be calculated¹. This means that APG applies a risk level of 10% and thereby the margin values cover 90% of the historical forecast errors within the observation period.

- A re-assessment if the $MNCC_{margin}$ is sufficient to guarantee secure grid operation will be performed by APG during the implementation of new capacity calculation and validation tools (Article 4.1), in coordination with the national regulatory authority E-Control.

4.2.2 Determination of acceptable level of loop flows

- a) This foreseeable ground for derogation cannot be solved solely by APG as the loop flows originate from external sources for which the volume over the Austrian CNECs cannot be influenced by APG. Furthermore, as the network of APG is located on the edge of two regions, the mutual influence of the different CCRs is especially visible on APG's CNECs and this requires close coordination and clear rules for network operation. This counts especially for the application of remedial actions (e.g. control of PSTs), where such rules are currently not in place but are foreseen with the implementation of Articles 21 and 35 of the CACM Regulation as well as Articles 75 and 76 SOGL.
- b) Article 16(8) of the Regulation 2019/943 stipulates that 30% of Fmax of CNE under consideration of contingencies (CNEC) is to be used to accommodate loop flows, internal flows and transmission reliability margin. Due to the reasons stated in Article 3.2, it is necessary to establish an approach to calculate an acceptable level of loop flows.
- c) Loop flows are to be estimated during the capacity calculation process by using the CGM. In absence of the coordinated capacity calculation process in the Core CCR, a CGM has to be prepared by APG based on best available information in the moment of its creation. In order to obtain the level of expected loop flows per CNEC, net positions of the different bidding zones in the CGM will be shifted to zero-balance:

$$F_{0,all} = F_{ref} - PTDF_{all} \overline{NP}_{ref,all}$$

Where:

$F_{0,all}$ is the total flow per CNEC in situation without any commercial exchange between bidding zones

F_{ref} is the flow per CNEC in CGM (with commercial exchanges)

$PTDF_{all}$ is the power transfer distribution factor matrix which contains all bidding zones and all CNECs

¹ In line with the flow reliability margin methodology prescribed in Article 8 of the Core CCM.

$\overline{NP}_{ref,all}$ is the total net positions per bidding zone included in the CGM

This approach for the determination of the total loop flow, which represents a situation without any commercial exchange between bidding zones, is in line with the Article 17.3 of Core CCM.

- d) In order to derive the loop flows per CNEC, the following decomposition methodology will be applied:
- a) Cross zonal CNECs: As there are no internal flows over a tie-line, there is no need to decompose flows any further as $F_{0,all}$ defines directly loop flows;
 - b) Internal CNECs: a flow decomposition method is required to distinguish the internal flows from loop flows. The Power Flow Colouring (PFC) decomposition method², which is based on a perfect-mixer principle and is consistent with the European zonal market model, will be used to allow for a complete partitioning of the power flow on each CNEC.
- e) For a given CNEC, LF_{calc} [%] is equal to the loop flow computed following paragraph d) of this Article divided by F_{max} , which is the maximum admissible power.
- f) The values determined according to point e) of this Article shall be compared with the threshold of acceptable level of the loop flows ($LF_{accepted}$ [%]), which is defined for the different types of network elements as follows:
- a) Cross zonal CNECs: The acceptable level of the loop flows is equal to the difference between 30% of the capacity of a CNEC respecting their operational security limits and the corresponding FRM (Flow Reliability Margin) of these CNECs;
 - b) Internal CNECs: the maximal level of loop flows must be determined under the consideration of internal flows. Since internal lines are predominantly to be used for carrying internal flows, the maximal level of acceptable loop flows shall therefore be 30% of the difference between 30% of the capacity of a CNEC respecting their operational security limits and the corresponding FRM of these CNECs.

As the loop flows constitute a part of 30% Fmax margin of each CNEC, loop flows exceeding the $LF_{accepted}$ shall influence the $MAZCT_{min}$ value per MTU as follows:

$$MAZCT_{min} = MAZCT_{min} (before\ calculation\ of\ loop\ flows) - \max(0; LF_{calc} - LF_{accepted})$$

4.2.3 Consideration of flows of 3rd countries in the capacity calculation

- In order to properly consider the flows originating from 3rd countries, APG is actively involved in the Core CCR investigations and discussions on how to integrate 3rd countries in the relevant methodologies.
- With a focus on Switzerland these investigations and developments are currently done in close coordination with the European Commission, ACER and the NRAs.

² Dusan Vlaisavljevic et al, "Power Flow Colouring: A Novel Power Flow Tracing Methodology Tailored for the European Zonal Electricity Market Design", Proceedings of IEEE ISGT Conference (Bucharest, October 2019)

- The governance and contractual framework is as well in concrete development in close coordination with the European Commission, ACER and the NRAs and planned to be concluded 2021.
- Until then, the exchanges between 3rd countries and EU countries, respectively between 3rd countries only will be included in MNCC calculation (see Article 4.2.1).

Article 5 Extent and duration of the Derogation

- (1) APG requests the derogation for one year (starting from 1st of January 2021).
- (2) The extent of actual request for derogation is decreased in relation to derogation granted for year 2020 as APG has managed to set some efficient mitigations measures, one being an additional redispatch potential secured over the signed bilateral TSO contracts. The derogation extend will further decrease, latest end Q2/2021, once the IT-tools for capacity calculation and validation are put into operation (in accordance with article 4.1). Afterwards, the extent of the derogation will be reduced to the systemic issues only (in accordance with article 4.2), which are not under the control of APG (loop flows, third country flows and security margin related to unscheduled transits), and as such, cannot be solely mitigated by APG.
- (3) This request is applicable for all the APG CNECs used in day ahead capacity calculation in CWE (respecting the applicable PTFD threshold) and all NTC borders within the Core CCR. After the go-live of Core day-ahead calculation, this request will be applicable for all the APG CNECs in Core.
- (4) In case that the technical grounds described in Article 3 of this derogation request cannot be fully tackled (either by APG or jointly within the Core CCR), before the expiry of the derogation period, APG might have to request a renewal of the derogation. If such a case should occur, APG will provide a detailed justification for a renewal of the derogation.

Article 6 Proportionality regarding maintaining the operational security

In light of the foreseeable grounds outlined in Article 3, such as not finally implemented and tested capacity calculation and validation tools by January 2021, high loop flows, uncertainties regarding the forecast of non-coordinated transit flows and related to the consideration of 3rd country flows in the capacity calculation, it is not possible for APG to fulfil the relevant target capacity by 1 January 2021 at all hours, without endangering operational security.

Concerning the requirements of Art 16(8) of the Regulation 2019/943 and under consideration of the ACER Recommendation 01/2019, APG therefore currently develops the necessary methods and IT-tools for calculation and verification of cross-zonal capacities (see Article 4) as an interim step until the relevant key methodologies according to the CACM Regulation and the SOGL are implemented.

Though this interim step will not provide for a solution for all foreseeable grounds according to Article 3, these developments (according to Article 4) are first of all necessary to enable APG to evaluate the $MACZT_{min}$ at the stage of capacity calculation, which is a precondition to draw

conclusions with reasonable certainty whether the cross-zonal capacities meet the requirements of Art 16(8) of the Regulation 2019/943 under the respective framework conditions (e.g. MNCC uncertainties, level of loop and PST flows, 3rd country flows). On the other hand, reliable validation methods and tools are vital to ensure operational security while aiming at the transition towards fulfilment of the $MACZT_{min}$ criterion.

Until the go-live of the respective methods and tools mentioned above (see Article 4), APG has to continue to apply the current methodologies and practices for capacity calculation, in order to maintain operational security, while APG shall make its best efforts to offer the following cross-zonal capacities:

- For NTC borders (AT/CZ, AT/HU and AT/SI)
 - Until the go-live of the respective methodologies and tools mentioned in article 4.1: Per border and direction the NTC values that are at least on the same level (on average per border and per direction) as in the last three years.
 - After the go-live of the respective methodologies and tools mentioned in article 4.1: Per border and direction the NTC values that are determined according to the methodological approach for derogation (see article 4.2) by fulfilling at least $MACZT_{min}$ (relevant target capacity) over a limiting CNEC and MTU.
- For the FB border (AT/DE):
 - Until the go-live of the respective methodologies and tools mentioned in article 4.1: 20% of Fmax per CNEC for cross-zonal trades within the CWE region and the currently applied process of the long-term capacity inclusion.
 - After the go-live of the respective methodologies and tools mentioned in article 4.1: Per CNEC, a calculated minRAM necessary to fulfil the $MACZT_{min}$ criterion as described in Article 4.2. A minimum value of 20% of Fmax for cross-zonal trades within the CWE region and the currently applied process of the long-term capacity inclusion will be taken into account.

With the go-live of the new capacity calculation methodologies and respective IT-tools (according to Article 4), APG will report the achieved $MACZT_{min}$ to E-Control along with any deviation from the equations in this derogation and a justification why the deviation was required in order to respect operational security limits. With the go-live of the validation tools APG will assess in coordination with E-Control the possibilities to increase cross-zonal capacities considering the $MACZT_{min}$ criterion, while ensuring operational security.

The scope of the derogation therefore does not go beyond what is necessary to maintain operational security, as set out in Article 3 and does not relate to curtailment of capacities already allocated (Article 8).

Article 7 Non-Discrimination

The proposed derogation aims at the transition from the status quo to the $MACZT_{min}$ criterion in a non-discriminatory manner. Any currently applicable methodologies with respect to calculating the NTC values or FB capacities or any future methodologies which still need to be developed do and will not contain any measures resulting in a discrimination between internal and cross-zonal exchanges.

The new methodological approaches and related IT-tools to be developed during the derogation period as described in Article 6, aim at an increased transparency that undue discrimination between internal and cross-zonal exchanges is avoided and the relevant target capacities can be met as long as loop flows remain below an acceptable level (defined by threshold $LF_{accepted}$) and operational security can be guaranteed.

Article 8 No curtailment procedures of capacities already allocated pursuant to Art 16 Abs 2

The proposed derogation shall apply solely to the determination of capacities on all Core CCR borders of APG, which will be made available for cross-zonal exchanges. The derogation does not provide any grounds for the curtailment of any already allocated capacities. Curtailments of already allocated capacities remain subject to respective Network Codes/Guidelines.

Article 9 Request

For all the above mentioned reasons, and as previously mentioned in Article 1, APG, in accordance with Article 16 (9) of Regulation 2019/943 seeks to be granted a request for derogation from the obligations under Article 16 (8) of Regulation (EC) No 2019/943 with regard to the bidding zone borders AT/DE, AT/CZ, AT/HU and AT/SI for a period of one year (2021).