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Report on methodologies and projects that shall provide a long-term solution to the operational security risks which the derogation granted to TenneT TSO B.V. seeks to address

in accordance with 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

Table of Contents

1. Introduction	3
2. Grounds for the derogation	4
3. Methodologies and projects	7
4. Conclusions	9

1. Introduction

Article 16(8) of the Regulation (EU) 2019/943, prescribes that TSOs 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. TSOs are considered compliant with this requirement if a minimum level of 70% of available capacity for cross-zonal trade is reached. For borders using a flow-based approach, this level is set to 70% of the capacity respecting operational security limits of internal and cross-zonal critical network elements taking into account contingencies (hereinafter referred to as "CNECs"). Transitory measures, such as action plans pursuant to Article 15 of the Regulation 2019/943 or derogations pursuant to Article 16(9) of the same regulation, allow a step-wise approach for reaching this minimum capacity, ultimately by 31 December 2025.

In December 2019, the Ministry of Economic Affairs and Climate Policy of the Netherlands has established an action plan¹ pursuant to Article 15 of Regulation 2019/943. In accordance with Article 15(2) of Regulation 2019/943, the action plan has established a linear trajectory for the minimum capacity available for cross-zonal trade to be compliant with Article 16(8) of Regulation 2019/943 (hereinafter referred to as "linear trajectory").

Article 16(9) of Regulation 2019/943 prescribes that upon request of transmission system operators in a capacity calculation region (hereinafter "CCR"), the relevant regulatory authorities may grant a derogation from Article 16(8) of Regulation 2019/943 on foreseeable grounds where necessary for maintaining operational security. The derogation shall be granted for no more than one year at a time, or, provided that the extent of the derogation decreases significantly after the first year, up to a maximum of two years. The extent of such a derogation shall be strictly limited to what is necessary to maintain operational security and shall avoid discrimination between internal and cross-zonal exchanges.

In October 2019, TenneT TSO B.V. (hereinafter referred to as "TenneT") applied for two derogations in accordance with article 16(9) of Regulation 2019/943. In anticipation of a decision of the Ministry of Economic Affairs and Climate Policy of the Netherlands to establish an action plan pursuant to Article 15 of Regulation 2019/943, TenneT retracted one of the two applications for derogation on 18 December 2020. The other application for a derogation was approved by the Dutch national regulatory Authority for Consumers and Markets (hereinafter "the ACM") on 20 December 2020, for the duration of 1 year from 1 January 2020 until 31 December 2020.

In July 2020, TenneT applied for another derogation in accordance with article 16(9) of Regulation 2019/943, this time for the period from 1 January 2021 until 31 December 2021 (hereinafter referred to as "the

¹Action plan of the Netherlands published by the Ministry of Economic Affairs and Climate Policy:
<https://www.rijksoverheid.nl/ministeries/ministerie-van-economische-zaken-en-klimaat/documenten/publicaties/2019/12/20/actieplan-verhoging-beschikbaarheid-zone-overschrijdende-transportcapaciteit-elektriciteitshandel>

derogation"). Apart from the removal of the request for performing a parallel run for the purpose of developing, testing and executing new processes and tools, this derogation for the year 2021 was largely similar to the derogation for the year 2020, This application was approved by the ACM on 16 November 2020.²

As a condition for its approval, the ACM requires that TenneT reports at the latest on June 30th 2021 on the methodologies and projects that shall provide a long-term solution to the issues that the derogation seeks to address and that TenneT needs to develop pursuant to article 16(9). By means of submitting this report to the ACM, TenneT complies with this requirement.

In the following sections the grounds for the derogation are shortly discussed, the methodologies and projects and their current status are discussed and finally a conclusion is given on how these methodologies and projects will help to provide a long-term solution for the grounds of the derogation.

2. Grounds for the derogation

TenneT has submitted a request for a derogation from the requirement of article 16(8) of Regulation 2019/943 on the basis of the following two foreseeable grounds:

1. Loop flows on Dutch CNECs cannot be contained to an acceptable level, as they are not under the control of TenneT
2. There is a foreseeable lack of redispatching potential when the grid is in an outage situation

Both foreseeable grounds are further explained below.

2.1 Loop flows above an acceptable level

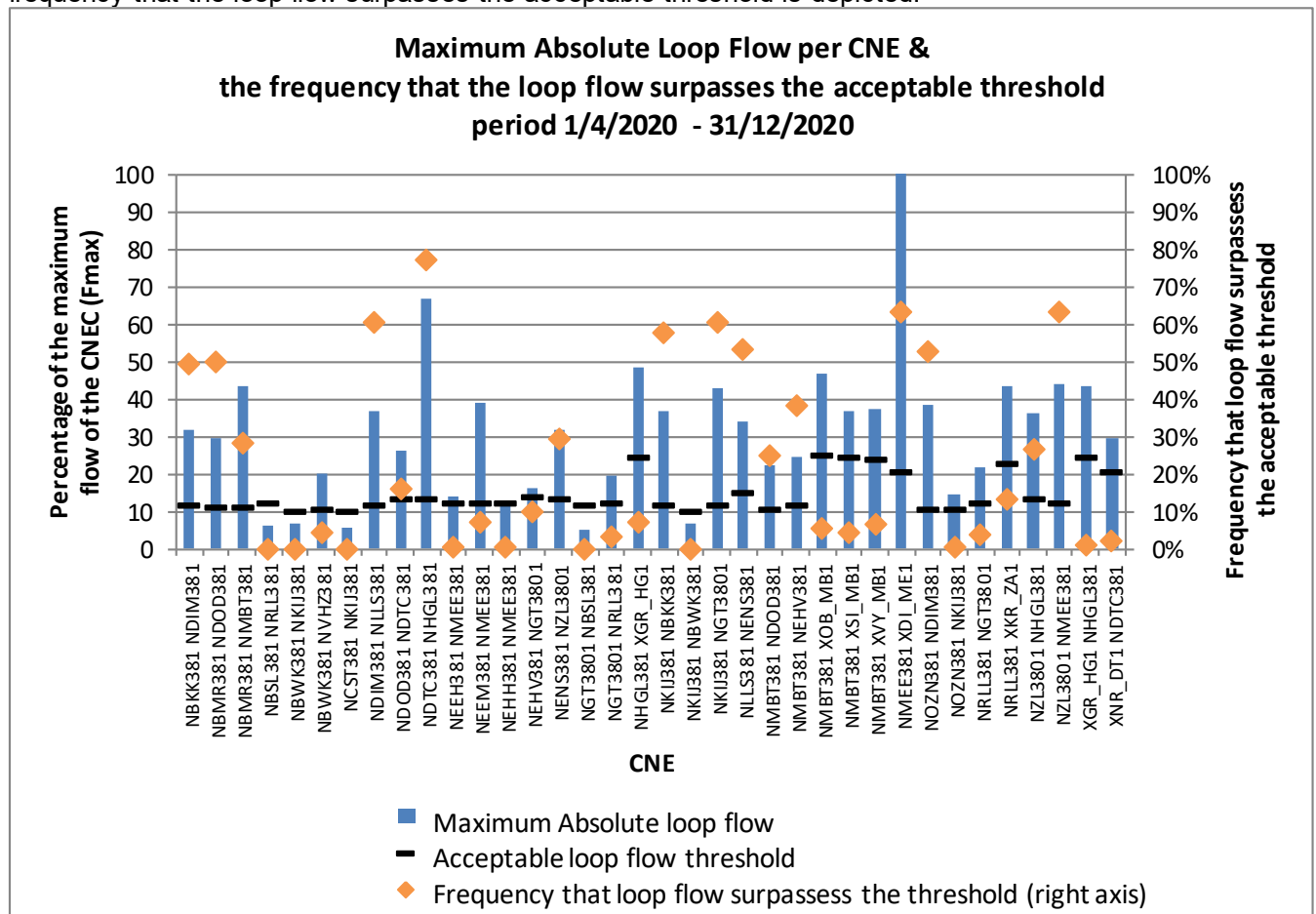
The first foreseeable ground for the requested derogation is that loop flows on Dutch CNECs cannot be contained to an acceptable level, as they are not under the control of TenneT. This contributes to creating an operational security risk if the minimum capacity provided for in Article 16(8) of Regulation (EU) 2019/943 or the action plan of The Netherlands would be applied. Loop flows created in neighbouring bidding zones are a consequence of the grid topology in that bidding zone in combination with a sub-optimal generation and load distribution. Phase Shifting Transformers located at the North Eastern border of the Netherlands can help to reduce loop flows, yet an optimised utilisation of these transformers is not expected to be sufficient to constrain the level of loop flows to acceptable levels. Given the fact that several Member States implemented an action plan in accordance with Article 15 of Regulation (EU) 2019/943, including Germany, TenneT expects that structural congestion in neighbouring bidding zones will remain on the short term and loop flows will remain above an acceptable level.

² Reference ACM/20/040967

Observations from 2020

For TenneT's report on margins available for cross-zonal trade in 2020,³ TenneT created a dataset with single values per CNE per MTU per direction (see step 3 of section 5.3.1.). This dataset also contains information on the level of loop flows that have been determined for each CNE.

In the next figure, the maximum absolute loop flow that has been observed per CNE in the period 1/4/2020 – 31/12/2020 is shown, as well as the threshold value of 'acceptable' loop flows on each CNE. Also, the frequency that the loop flow surpasses the acceptable threshold is depicted.



From this figure it becomes clear that there is a need for a derogation to deal with loop flows, because:

- For the majority of CNEs, maximum levels of loop flows are observed which significantly surpass the threshold level of acceptable loop flows
- For 14 CNEs loop flows surpass the threshold at least 20% of the time

³ 2020 Assessment of available cross-zonal capacity for the Netherlands, published by the ACM on 15-04-2021: <https://www.acm.nl/sites/default/files/documents/nl-maczt-assessment-2020.pdf>

2.2 Foreseeable lack of redispatching potential when the grid is in an outage situation

The second ground for the requested derogation is the foreseeable possible lack of redispatching potential to allow TenneT to comply with the minimum capacity provided for in Article 16(8) of Regulation (EU) 2019/943 or the action plan, without endangering operational security when the grid is in an outage situation. As indicated in the action plan of the Netherlands and the TenneT investment plan⁴, TenneT is and will be upgrading the capacity of several corridors of the extra high voltage grid in the Netherlands. Upgrades are performed to keep the grid fit for purpose considering the future energy mix and the ability to comply with the various obligations on the minimum capacity to be made available for cross-zonal trade.

For construction of these projects, situations of long duration outages are expected to occur. For the duration of such an outage, the grid capacity is temporarily reduced and internal flows on the remaining critical network elements increase compared to the grid situation where the outage is not present. Therefore it can occur that the available internal redispatching potential is insufficient to meet the 70% requirement.

Especially in situations with (locally) limited domestic redispatching potential, cross-border remedial actions can provide efficient measures to maintain operational security while complying to the required minimum margins available for cross-zonal trade. However, existing bilateral redispatching contracts do not enable a structural use due to the manual procedures involved and the limited visibility on the future availability of redispatching potential. The implementation of methodologies for coordinated redispatch is required to efficiently make use of cross-border remedial actions for this purpose.

Observations from 2020

As indicated in the TenneT's report on margins available for cross-zonal trade in 2020,³ TenneT had to reduce the capacity on the interconnector cables on the borders DK1->NL and NO2->NL below the target levels of 70% in order to guarantee operational security. Throughout 2020 several planned outages took place in the northern part of the Netherlands to perform grid investments. For the vast majority of times the reductions that were applied were related to the combination of these planned outages in combination with an unplanned outage of a Critical Network Element (CNE) in the area. In that case the available transport capacity of the internal network elements was reduced and transport capacity was insufficient to meet all available installed generation capacity (including the capacity of the interconnectors). In order to maintain sufficient redispatch potential in the area, part of the discrepancy between installed generation capacity and available transport capacity had to be solved by applying a reduction on the interconnectors to ensure operational security.

⁴ Investeringsplan Net op land 2020-2029, available at: <https://www.tennet.eu/nl/bedrijf/publicaties/investeringsplannen/>

3. Methodologies and projects

TenneT is working on several methodologies and projects that should alleviate the foreseeable grounds for the derogation. The methodologies and projects are explained below, after which an overview of the status of the methodologies and projects can be found.

3.1 Methodologies

Article 16(4) of Regulation (EU) 2019/943 prescribes that TSOs should use countertrading and redispatch, including cross-border redispatch, to maximise available capacities to reach the minimum capacity provided for in paragraph 8 of the same article, or the minimum capacities as provided for by the action plan. To do this in a coordinated way, in accordance with Regulation (EU) 2015/1222 (hereafter: CACM Regulation) and Regulation (EU) 2017/1485 (Hereafter: SOGL Regulation), TSOs are required to deliver several aligned methodologies that are key to manage the flows in the grid via a coordinated capacity calculation and coordinated application of remedial actions. These key methodologies are:

- a) The Day-Ahead Capacity Calculation Methodology for the Core Capacity Calculation Region as referred to in Article 21 of the CACM Regulation ("**Core DA CCM**"). This methodology will improve the estimation of loop flows and optimize the effective use of capacities on internal and cross-zonal CNECs by implementing a harmonised approach across the Core region: TSO will be able to individually define the initial setting of its own non-costly and costly remedial actions, based on the best forecast of their application and with the aim to reduce the loop flows on its cross-zonal CNECs below a loop flow threshold that avoids undue discrimination.
- b) The operational security coordination methodology as referred to in Article 76 of the SOGL Regulation ("**SOGL 76 methodology**"). This methodology will improve amongst others the coordination between TSOs based on the coordinated security analysis as well as outage coordination by the regional coordination centres (RCCs). The methodology considers and where necessary complements the CACM 35 methodology.
- c) The coordinated redispatching and countertrading methodology as referred to in Article 35 of the CACM Regulation ("**CACM 35 methodology**"). By improving coordination of remedial actions and redispatching measures across the Core region, cross-border redispatching possibilities will be created which can help to reduce loop flows and make it easier to increase available capacities for cross-zonal exchange without endangering security of supply.
- d) The redispatching and countertrading cost sharing methodology as referred to in Article 74 of the CACM Regulation ("**CACM 74 methodology**"). This cost sharing methodology will ensure that financial settlement between TSOs after providing redispatch and countertrading using the above mentioned methodology will be dealt with accordingly.

3.2 Projects

Next to methodologies, TenneT is also working on a number of projects to alleviate the grounds for the derogation.

The major driver for increasing capacity available for cross-zonal trade is doing **grid investments**. Relevant grid investments are detailed in the aforementioned investment plan and, particularly relevant in this context, in the action plan of the Netherlands. Investments in the Dutch grid as such do not constrain the amount of loop flows, but do reduce the relative share of capacity that is used by loop flows.

TenneT is also actively participating in the ongoing **Bidding Zone Review process** that is taking place in accordance with Article 14 of (EU) Regulation 2019/943. As a basic principle, bidding zones shall not contain long-term, structural congestions and bidding zone borders shall be based on structural congestions rather than national borders. The purpose of the Bidding Zone Review is to investigate whether alternative bidding zone configurations would increase the economic efficiency and cross-border trade opportunities, while maintaining the operational security of the electricity grid. Alternative bidding zone configurations could significantly reduce the level of loop flows, in particular if bidding zones that are causing loop flows are split in smaller zones. In such a situation, the flows could still remain in the system but the flows would become cross-zonal flows instead of loop flows. However, such a bidding zone reconfiguration potentially also has a huge impact on the market (e.g. less liquidity in the market/ higher prizes) and electricity prices for generators and consumers, and therefore needs to be thoroughly investigated before decided upon by the relevant Member States.

Next to TenneT's effort in order to enable coordinated cross-zonal remedial action optimization via the previously mentioned methodologies, TenneT is also working on improving the redispatching market on a national level. A local project for this purpose is the "*Grid Operators Platform for Congestion Solutions*" (**GOPACS**), a platform in which the TSO and DSOs cooperate to both increase the redispatching potential by unlocking more market participants and to better coordinate the use of congestion alleviation measures in the TSO and DSO grid. These efforts contribute to having enough redispatching potential available in the future.

3.3 Status overview

The table below summarises the latest available information regarding the implementation of the methodologies and projects.

	Status	Currently foreseen implementation date
Methodology		
Core DA CCM	Implementation ongoing	February 2022
SOGL 76	ACER adopted a decision in December 2020. A detailed implementation plan has been submitted to ACER in April 2021	April 2024
CACM 35	ACER adopted a decision in December 2020. A detailed implementation plan has been submitted to ACER in April 2021.	April 2024
CACM 74	ACER adopted a decision in December 2020. A detailed implementation plan has been submitted to ACER in April 2021	April 2024
Project		
Grid investments	Grid reinforcements are performed according to the action plan	Grid reinforcements until 2025 are detailed in the investment plan ⁴ and action plan ¹
Bidding Zone Review	The methodology for the review has been approved by ACER and the modelling chain is being prepared accordingly. Configurations to be studied are expected to be decided upon by ACER early 2022	Results are expected in 2023, after which Member States will have to take a decision on the future Bidding Zone configuration.
GOPACS	GOPACS has been introduced as a portal for electricity producers and users to offer flexibility for resolving congestions to TenneT and Dutch DSOs.	The efforts to increase the redispatch potential in the Netherlands is an ongoing process

4. Conclusions

For the purpose of this derogation, TenneT is developing in cooperation with others TSOs several methodologies and in addition is working on several projects. As the expected methodologies are not yet in place, this prevents TenneT to structurally rely on cross-border remedial actions. The need for a derogation in outage situations is expected to become less relevant in the future as both investments are being completed and the implementation of the methodologies listed in the previous paragraph is expected to provide more structural redispatching possibilities. For the year 2022 TenneT believes that a derogation remains necessary.