MEMORANDUM

TO	Market participants CWE	**CLASSIFICATION**	C1 - Public Information
		DATE	May 7, 2020
		REFERENCE	

FOR INFORMATION ■

FOR DECISION-MAKING ☐

1. Context

In the CWE Consultative Group of 30-3-2016 it was agreed that TSOs would perform a Standard Procedure for Assessing the Impact of Changes (SPAIC) for a commonly agreed list of relevant changes, including the commissioning of new assets. A SPAIC analysis consists of a comparison of flow-based domains and the resulting market outcomes for a set of typical “reference” days, commonly predefined by CWE TSOs, in order to estimate the impact of a change in grid topology and/or flow-based parameters.

This SPAIC concerns a change in grid topology in the southwestern Netherlands: the 380 kV line Borssele – Geertruidenberg will be looped into the Rilland (RLL) substation.

2. Description of the change

After the 380 kV substation Rilland was added to the grid, with the old lines Borssele – Zandvliet and Zandvliet – Geertruidenberg looped into it (see SPAIC published 28-10-2019), the next step and subject of this SPAIC is to also loop in the Borssele – Geertruidenberg line. See Figures 1 and 2, below, for a comparison of the current and future grid topology.

In grid model terms, this means one circuit is removed and two new ones take its place, as follows:

	Publication name	**EIC**
Removed	[NL-NL] Borssele – Geertruidenberg 380 Zwart	49T000000000005E
Added	[NL-NL] Borssele – Rilland 380 Zwart	49T000000000059S
Added	[NL-NL] Rilland – Geertruidenberg 380 Zwart	49T0000000000606

The corresponding CBCOs that will be added to the CBCO list can be found in Dataset 6. All CBCOs in which BSL-GT380 Z was a CB or CO will of course be removed from the list; also, the CB BSL-RLL380 G will only be monitored in the direction from Borssele to Rilland (not from Rilland to Borssele anymore) in the new configuration.

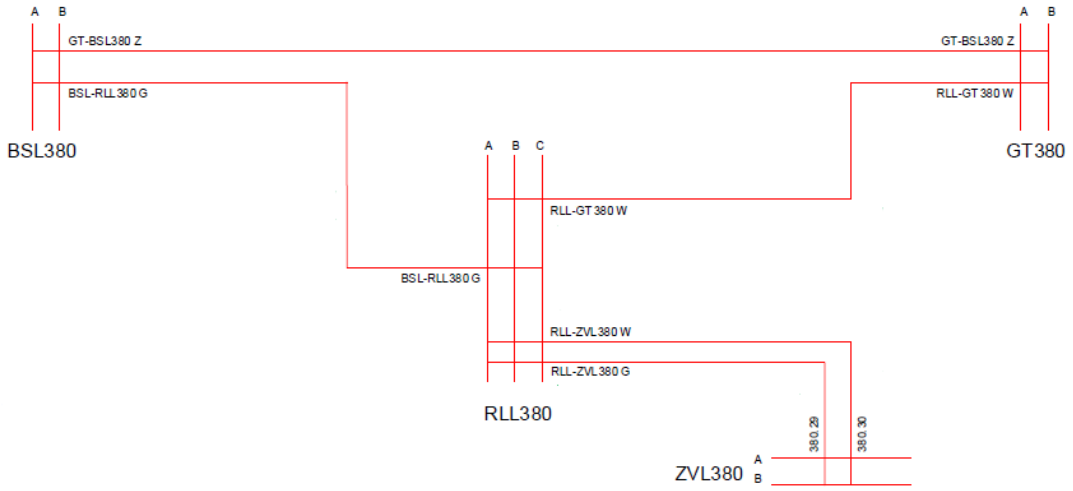

Figure 1: Existing 380 kV grid topology around Rilland

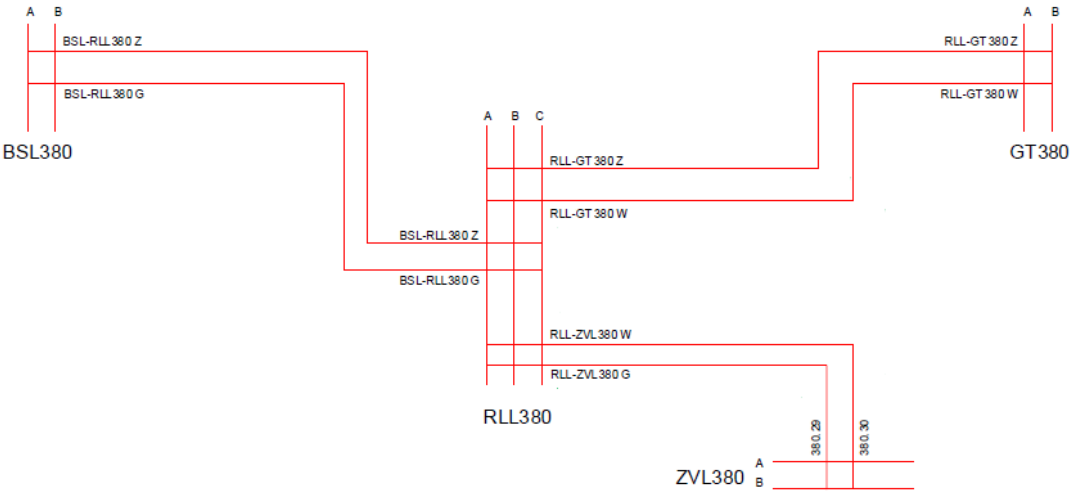

Figure 2: Future 380 kV grid topology around Rilland

3. Methodology behind the SPAIC

This SPAIC analysis consists of a comparison of flow-based domains for 12 typical “reference” days commonly defined by CWE TSOs using a clustering algorithm, in order to estimate the impact of a change in the grid topology or flow-based parameters. These 12 reference days are mapped for winter, interseason and summer from 1-10-2018 to 30-9-2019.

For this SPAIC, the twelve reference days for the period 1-10-2018 to 30-9-2019 have been mapped to the market days in this period on the basis of the season, type of day and how close the historical domain was to the domain of a reference day. For all these days, Market Coupling Simulations have taken place, to average out impact of specific order books for the "reference days" selected by the CWE TSOs. By averaging the

results per cluster over multiple market days, the average impact of the different flow-based domains can be assessed. An overview of the mapping of the typical days to the market days is given in Dataset 5.

4. Published datasets

The following results have been simulated and are published:

1. Flow-based domains and CBCOs for three different scenarios for all reference days:
    a. The historical flow-based domains and CBCOs ("Historical benchmark")
    b. Updated flow-based domains and CBCOs, taking into account significant changes to the grid or the flow-based methodology which have taken place or will take place between October 2018 and the moment the new configuration becomes operational. For all reference days, the following changes were included:
        i. The DE-AT Split;
        ii. The commissioning of NEMOlink;,
        iii. The commissioning of COBRAcable;
        iv. The integration of the second circuit of Doetinchem – Niederrhein;
        v. The looping-in of Borssele – Zandvliet and Zandvliet – Geertruidenberg to Rilland 380 kV (see chapter 2);
        vi. The completion of the Randstad Noordring project (Bleiswijk – Vijfhuizen – Beverwijk);
        vii. The upgrade in thermal rating of both circuits of Lelystad – Ens[1];
        viii. The application of separate summer and winter values for the thermal capacity of Dutch CBs (see market message published 29-10-2019).
    c. The new pre-solved flow-based domains and CBCOs, corresponding with the most probable grid topology (when writing this document) applied to all reference days ("dataset including change").
2. The market coupling results for 363 days for all above three scenarios of flow-based domains and CBCOs.From the 365 days in the period, 2 days in total (i.e. 28-10-2018 and 31-03-2019) were not simulated because of clock changes. All market coupling results for the SPAIC days were performed with the Market Coupling Algorithm Euphemia 10.3 running for 12 minutes (the version currently in operation for Market Coupling).
3. Overview of the typical days and the mapping of the typical days to the individual days of the period
4. Overview of additional CBCOs added to the CWE FB MC.

The data of the simulation results are attached in separate datasets. The contents of the datasets are explained below.

[1] Strictly speaking, only one of the circuits of Lelystad – Ens will have been upgraded when the new configuration around Rilland becomes operational. However, since the other circuit is already out of service for the upgrade and will have its new capacity when it returns to service, the decision was made to include it with its new capacity.

#	Output	Description	Datasets
1	Description change and features of the typical days	A qualitative description of the foreseen change, period and expected high-level impact resulting from this. A description of the main quantitative features of the 12 typical days	• Qualitative description of foreseen change: Cover Note • Description of the typical days: Dataset 5
2A	Capacity calculation indicators Dataset *historical benchmark* • 24 PTDF matrices + RAM for each typical day and for all fixed labels • Min/max Net positions • Volume	This is the dataset that is used as a reference for the change that is subject of the change	• PTDF matrices + RAM: Dataset 1 – Sheet "Historical Benchmark 2A" • Min/Max NP: Dataset 2 – Sheet "Historical Benchmark 2A" • Volume: Dataset 3 – Sheet "Historical Benchmark 2A"
2B	Capacity calculation indicators Dataset *updated historical benchmark* • 24 PTDF matrices + RAM for each typical day and for all fixed labels • Min/max Net positions • Volume	This is the dataset that is updated, including all methodological changes that are known at the time of the study	• PTDF matrices + RAM: Dataset 1 – Sheet "Updated Historical Benchmark 2B" • Min/Max NP: Dataset 2 – Sheet "Updated Historical Benchmark 2B" • Volume: Dataset 3 – Sheet "Updated Historical Benchmark 2B"
2C	Capacity calculation indicators Dataset *including change* • 24 PTDF matrices + RAM for each typical day and for all fixed labels • Min/max Net positions • Volume	This is the dataset that includes the change that is subject of the impact assessment	• PTDF matrices + RAM: Dataset 1 – Sheet "SPAIC 2C" • Min/Max NP: Dataset 2 – Sheet "SPAIC 2C" • Volume: Dataset 3 – Sheet "SPAIC 2C"

#	Output	Description	Datasets
3A	Realized market indicators for the historical dataset	After the capacity calculation is performed, market coupling simulations have been performed to get insight the impact on the following market indicators for the CWE Bidding Zones : • Net positions (MRC Net Positions and balanced CWE Net Position) • Market Prices, market price spreads and price convergence • Market Clearing volumes (executed Supply and Demand) • Social Welfare indicators (Consumer Surplus, Producer Surplus, Congestion Income, Total Social Welfare) • Euphemia performance and solution indicators	All information can be found in Dataset 4. Column A indicates whether the data refers to scenario 3A, 3B or 3C: • Net positions (“MRC NP, CWE NP, P” sheet) • Market Prices, market price spreads and price convergence (“MRC NP, CWE NP, P” sheet) • Market Clearing volumes (“Market Volumes” sheet) • Social Welfare indicators (“Social Welfare” sheet) • Total CWE Social Welfare, MRC Social Welfare, and Euphemia performance indicators (“CWE SW, MRC SW, PRBs, EuphemiaS” sheet)
3B	Market simulation indicators for the updated historical dataset		
3C	Market simulation indicators for the dataset including changes		