MEMORANDUM

TO	Market Participants	**CLASSIFICATION**	C1: Public Information
		DATE	November 22, 2019
		REFERENCE	

SUBJECT Impact assessment of Planned Outage LLS-ENS in 2020Q1

1. Context

In the CWE Consultative Group of 30/03/2016 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. This SPAIC presents an impact assessment of planned outage on Lelystad – Ens 380 Zwart (EIC code: 49T000000000023C). During this outage the conductor will be changed to increase the maximum capacity of the line to 4kA.

2. Specific changes in CWE FB CC related to the planned outage

The planned outage of Lelystad-Ens380 Zwart is currently scheduled from begin January 2020 till mid March; the latest planning of this and other outages due to planned maintenance in the Extra high voltage network of TenneT TSO B.V. is published at: https://www.tennet.eu/electricity-market/transparency-pages/urgent-market-messages-planned-maintenance-nl/.

3. Methodology behind the SPAIC

A temporary outage is one of the triggers for the 'light' SPAIC approach. This SPAIC deviates from this recently developed and communicated approach. To take into account the changes in the Dutch grid, we decided to continue with the 'full' SPAIC approach as also used for the previous SPAIC "Rilland+Randstad 380" and take this as the updated historical benchmark. Also the additional CBCOs which are included in CWW FB CC per BD 15/11/2019 are included in this SPAIC.

This SPAIC analysis consists of a comparison of flow-based domains for eight typical “reference” days commonly defined by CWE TSOs using a clustering algorithm, in order to estimate the impact of a change in grid topology or flow-based parameters. These eight reference days are mapped to the winter and interseason part of the year. Although at this point in time also cluster days for the summer season of 2019 are available, TenneT decided to continue with using the eight reference days as used before in its previous SPAICs and not include reference days for the summer season, because the outage under consideration in this SPAIC takes place during the winter/interseason part of the year and thus an analysis of the impact in summer is not relevant.

For this SPAIC, the eight '2018/2019 reference days' for the period 1/10/2018 to 15/5/2019 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 the file "Dataset 5 – SPAIC LLS-ENS VNB 2019Q4 – Typical Day Description".

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:
    1. The historical Flow-Based Domains and CBCOs ("Historical benchmark")
    2. Updated Flow Based Domains and CBCOs, taking into account significant changes which have taken place or will take place in the methodology between October 2018 till the moment of the planned outage. 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 integration of Rilland+Randstad including update of CBCO-list
    3. 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 222 days for all above three scenarios of Flow Based Domains and CBCOs.
    - From the 227 days in the period, 4 days were in total not simulated because of the following reasons:
        - 2 Days with clock change day (28/10/2018, 31/3/2019)
        - 2 days because of unavailability of some historical results in the Euphemia Simulation Facility at the time when the SPAIC was conducted (14/2/2019, 28/2/2019)

      Therefore in total, data of 222 days is published.
    - All market coupling results of the SPAIC days are performed with the Market Coupling Algorithm Euphemia 10.3 (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

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

The table below summarizes the standard outputs of a SPAIC analysis that were agreed upon, including a reference to the joined datasets indicating where the corresponding information can be found.

#	Output	Description	Dataset
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 8 typical days • A list of CBCOs which are added to the CWE	• Qualitative description of foreseen change: Cover note • Description of the typical days: Dataset 5 • Overview of temporary additional CBCOs added to CWE FB MC for the duration of the change: Dataset 6.
2a	Capacity calculation indicators Dataset historical benchmark • 24 PTDF matrixes + 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
2b	Capacity calculation indicators Dataset updated historical benchmark • 24 PTDF matrixes + 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” • FB Domain Volume: Dataset 3
2c	Capacity calculation indicators Dataset including change • 24 PTDF matrixes + 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” • FB Domain Volume: Dataset 3

#	Output	Description	Dataset
3a	Market simulation indicators for the dataset historical data	After the capacity calculation is performed, also Market Coupling simulations have been performed to get insight in impact on the following market indicators for the CWE Bidding Zones: • Net positions (MRC Net Position and balanced CWE Net Position) • Market prices • Market Spreads and Price Convergence • Market clearing volumes (executed Supply and Demand) • Social Welfare indicators (consumer surplus, producer surplus, congestion income, total social welfare) • PRBs indicators • Number of Euphemia solutions found	All information can be found in Dataset 4. Column A indicates whether the data refers to scenario #3a, 3b or 3c: • MRC Net Position, CWE Net Position and Market price – Sheet "MRC NP, CWE NP, P" • Price spreads and Price Convergence – Sheet "MarketSpread, convergence" • Market clearing volumes (max executed Supply and Demand) – Sheet "Market Volumes" • Total CWE Social Welfare, MRC Social Welfare, PRB indicators (number of PRBs, maximum of DeltaP[1], sum of DeltaP, PRB Utility Loss), Euphemia Solutions found – Sheet "CWE SW, MRC SW, PRBs, EuphemiaS" • Consumer Surplus, Producer Surplus, CWE Congestion Income – Sheet "Social Welfare"
3b	Market simulation indicators for the dataset for the updated historical benchmark		
3c	Market simulation indicators for the dataset including changes		

[1] Value in EUR indicating the 'in-the-moneyness' of an (individual) block order