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RFC DE/AT-split
Performance impact

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Context of the RFC for the DE/AT-split

- PCR was requested to support the change request for the DE/AT split with a go-live date on October 1st 2018.
- German and Austrian NRAs agreed to implement a capacity management mechanism on the German-Austrian border, starting October 1st, 2018. Impact: DE bidding zone (BZ) will now split into 2 BZs (DE and AT) with limited interconnection capacity (under Flow Based PTDF constraints)
- The go-live of the split of the German-Austian Bidding Zones on 1 October 2018 was a decision made by the 2 involved NRAs and thus enforced by regulatory authority.
- The DE/AT-split is going life on the same day as the EIRGID/SEMO PX go-live, another regulatory enforced RFC.
- PCR is running in production at this moment with the release Euphema E10.2_fix 1 and this release will also support the go-live of the DE-AT split. Shortly after these 2 go-lives, we expect the go-live of the new MNA-compatible release E10.3. Although not needed for the go-live of these RFCs, they shall be included in the test data with the new E10.3 release to check the resulting future DA system performance.
- In order to judge the feasibility of the DE/AT-split, PCR has performed the regular RFC acceptance test program with the production release Euphema 10.2_fix 1 whereby the DE/AT-split and the SEMO PX-RFC are simulated together, inluding also recent RFCs for BSP and Cropex

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PCR acceptance criteria for RfCs

- **Historical batch**

  One year of most recent historical MRC data with alterations reflecting accepted RfCs and DE/AT split RfC (base batch: S19Y17M3_EIR_BSP)

- **Projected batch**

  One year of historical MRC data with alterations reflecting two years of market growth (increase of the order book volumes), accepted RfCs and DE/AT split RfC. This batch is classified as “extreme” (base batch: F7Y17_EIR_BSP).

Batch	Over all sessions, Euphemia should find a 1st solution…
Historical	… ≤ 3,5 minutes on average
	… 97% of sessions ≤ 5 minutes
	… 99% of sessions ≤ 8 minutes
	… 100% of sessions ≤ 10 minutes
Projected	… 97% of sessions ≤ 8 minutes
	… 100% of sessions ≤ 18 minutes

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Disclaimer on FB data delivered by TSOs

- PCR needs at least a full year of historical data to perform a RFC acceptance test. The DE/AT- border was never modeled in Flow Based before. TSOs thus had to reconstruct a Flow Based PTDF dataset

- PCR would like to raise attention to following 2 issues/risks with the TSO test data used for the test results shown hereafter:

  - **Amount of constraints:** TSOs have submitted a test dataset for the DE/AT- border containing more than 4000 PTDF constraints on a given day, whereas the number of Flow Based PTFD constraints for the entire CWE region amounts only up to around 600 constraints per day so far. PCR has questioned the TSOs about this unproportionately high number of constraints, however the concerned TSOs have made clear they do not intend to reassess the situation and expect PCR to deal with it. This suggests that for future switches of regions from ATC to Flow based, the number of PTDF constraints may explode, which could provoke a performance problem for the coupling if not timely anticipated
  - **Quality of the FB data:** TSOs consider it an uneasonably high workload to reconstruct a full year of historical test data in Flow Based PTDFs, because this border was never modeled in FB before. As a proxi, TSOs have now modelled data according to the method described hereafter.

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Disclaimer on FB data delivered by TSOs

- **SPAIC methodology:**
  - TSOs selected 12 typical days in the period **Sep.2016-Aug.2017** (SPAIC period)
  - TSOs generated **"production like"** FB data for those typical days
  - SPAIC period was split into 12 clusters, each cluster linked to the FB data of one typical day (1 cluster ⇔ FB data of 1 typical day).
  - All the days of a given cluster will is mapped with the FB data of the associated typical day → one year of FB data
  - The creation of FB data for 12 typical days and the clustering of the SPAIC Period takes several weeks
  - Robust and proven methodology to create "realistic" FB input data on a large period

- **Extrapolated FB data Sep.2017-Feb.2018:**
  - TSOs mapped Sep.2017-Feb.2018 period using the 12 clusters defined over 2016-2017
  - **Hence only limited accuracy** of the FB data for this period

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The RFC acceptance test progam for DE/AT-split

Data used

Scenario	Description
DE/AT Split	• Historical DE orders have been distributed among DE and AT (based on orderbook information) • Flow-based model is implemented in CWE now including AT • Accurate PTDF data have been provided by TSOs for the period from 01/01/2017 to 01/09/2017 and "extrapolated" PTDF data for the period from 02/09/2017 to 28/02/2018

Note: This RfC was tested with several datasets on top of:

- Recently adopted BSP RFC
- Recently adopted Cropex Coupling/Block RFC
- Upcoming Eirgrid/SEMO-PX go-live RFC

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The RFC acceptance test progam for DE/AT-split

E10.2_fix 1– current production release

- Tests were run for one year of day-ahead auctions (FB data only accurate for part of the year) (without daylight saving time days):
  - historical batch: 01/03/2017 to 27/02/2018
  - Euphemia version: 10.2_fix1 (MRC setup)

Scenario	Criterion	Test result S19Y17M3_EIR_BSP_CRO_DEAT
Historical	Average time shall be less than 3.5 min	3,9
	97% shall be found in less than 5 min	80,9%
	99% shall be found in less than 8 min	98,9%
	100% shall be found in less than 10 min	99,7%*

- Also considering alternate configurations, one session could not be found in 10 minutes on both batches
- Note that projected data senarios were not tested as the MNA release is supposeo to go-live soon after the DE/AT-split RFC

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Combined RFCs test results

PCR RfC Acceptance Criteria				
simulation	avg. TTFS < 3.5 min	97% TTFS <= 5 min	99% TTFS <= 8 min	100% TTFS <= 10 min
S19Y17M3_EIR_BSP	3,19	97,0%	99,7%	100,0%
S19Y17M3_EIR_BSP_DEAT	4,11	82,3%	99,4%	99,7%
S19Y17M3_EIR_BSP_CRO_DEAT	3,88	80,9%	98,9%	99,4%

<-- initial simulation results without DE/AT split change

<-- initial simulation results with DE/AT split change

<-- extended simulation results with DE/AT split and Cropex change

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Conclusion PCR SC

- The results show that this RFC for the DE/AT-Split hits the limits of the Euphemia performance, measured according to the applied RFC test criteria.
- This means that it is consuming part of the robustness of the pan-European system
- Given the regulatory nature of this RFC, and despite the test criteria are not all met, PCR SC conditionally accepted the DE/AT split, subject to escalation to MRC, INC and all NRAs in order to assure that the stakeholders together acknowledge and accept the risk it imposes to the coupling.

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Conclusion PCR SC

PCR SC would like to launch at this point some important recommendations for discussion among the stakeholders:

- Deadlines for RFCs, whether by regulatory decision or on request of stakeholders, should in the future timely be consulted with PCR, in order to allow prior testing and upgrade of the system in view of safeguarding its operational robustness up to standards. By deciding unilaterally, a NRA/Party can in fact cause a performance degradation, impacting the coupling results and thus the other stakeholders of the SDAC coupling.

- RFCs with high impact on the SDAC system and /or performance of the system should be given sufficient lead time

- There is a risk of « explosion » of the number of PTDF constraints imposed to the system by TSOs as we envisage several regions to switch to Flow Based. PCR would like to invite the TSOs to provide test datasets with the PTDF constraints for these regions, in order to anticipate timely any necessary SDAC system upgrades

- Together with INC, PCR is currently designing a performance improvement and R&D program for the SDAC solution. This plan will contain short/mid/long term measures to deal with limitations of the system and prepare its future upgrade. It will be important to discuss and anticipate the future scale and complexity of the coupling in order to feed this into the R&D test program in the coming period

- The 10 minute calculation deadline is very limited compared to the increasing complexity of the mathematical problem to solve. PCR would like to revert to the stakeholders to discuss if and how this deadline can be relaxed. With the DE/AT split we have a risk of extended calculation time.

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