ELEXON

Update on Central System and Industry Testing for Targeted Charging Review impact on MDD and LLFs

Supplier Volume Allocation Group (SVG)

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Summary   **This paper provides an update to the SVG from the Central System and Industry Testing carried out for the significant increase in the volume of data needed to be published in Market Domain Data and Line Loss Factor data sets.**

1. Background

1.1 The Targeted Charging Review (TCR): Significant Code Review (SCR) is an Ofgem led project that assessed how residual network charges should be set and recovered in Great Britain by Licensed Distribution System Operators (Distributor Network Operator's (DNO's) and Independent Distribution Network Operators (IDNOs)) and the National Electricity Transmission System Operator (NETSO).

1.2 The unprecedented growth in the size of the Market Domain Data (MDD) and Line Loss Factor (LLF) datasets presents challenges for Elexon's Central Systems. In the first instance, the new Line Loss Factor Classes (LLFCs) and valid set combinations simply need to be added to MDD and the LLF dataset, and communicated to Parties and Party Agents; Central Systems and participants' systems must then receive, process and send larger data flows and datasets caused by the growth in LLFCs and valid set combinations.

1.3 In the December SVG Meeting (SVG238), the committee approved the Distributor Network Operator's (DNO's) TCR Change Request's (CR's) to be published in January 2021.

1.4 The SVG and the BSC Panel decided not to progress any further Change Requests for TCR until testing had been carried out to mitigate the risk that Central Systems and Participant's systems cannot handle the growth in LLFCs and valid set combinations. This also poses a risk to industry processes, e.g. Imbalance Settlement, to fail.

2. Phase 1 - Industry Testing

2.1 Industry Testing was carried out between 10 and 23 February 2021 to provide assurance to Elexon, the SVG, the BSC Panel and Participants that Industry are able to process MDD and LLF data files with increased data without any detrimental impact business operations.

2.2 17 Industry Participants took part in the Testing. There was balanced mix of participants (Suppliers and Data Aggregators – HHDAs and NHHDAs), either active as participant for realistic testing or validation of the test MDD and LLF files, that helped meet the initial objective set in terms of coverage through industry participation.

2.3 The scope of the testing was focused on the D0269/D0270 (complete and incremental MDD) and D0265 (Line Loss Factor data file). CGI generated D0269 and D0270 for the year 2020/21, by raising the number of LLFC ids to 35,000 based on the number of LLFCs projected to be needed by IDNOs for the TCR project) and creating the associated LLFC combination data. The D0265 then covered the increased LLFCs.

2.4   Elexon shared D0030 files for MPID PENL as requested by one of the industry participant. Elexon also shared Valid_MTC_LLFC_SSC_PC_Combination_307.csv file as requested by industry participants.

2.5   Elexon held Drop in Sessions throughout the Testing period and had good engagement from Testers. Elexon have also raised awareness of the testing and the potential impact of the TCR through the publication of Release Circular and FAQ Document in Elexon newsletter Newscast highlighting 'downstream' impact of TCR that Participants need to impact assess.

2.6   The full list of Participant responses are listed in Appendix 1. Industry Testing finished on time with no defects reported and some observations or positive feedback from Participants that took part in the testing that this was a useful exercise to carry out.

2.7   Based on the responses from Participants Elexon are satisfied that Phase 1 – Industry Testing has met the objective of providing assurance that Participants' systems can cope with the increased volume of data in the LLD and MDD data files.

3.   Phase 2 - Central System Testing

3.1   For the Phase 2 Central System testing involved volume testing of the central system applications at two levels:

- Phase 2 Cycle 1 – c35,000 LLFCs and associated data combinations (this was based on the initial IDNO projections of the number of LLFCs needed to implement the TCR)

- Phase 2 Cycle 2 – c54,000 LLFCs and associated data combinations

3.2   In addition, prior to executing the volume tests a benchmark test processing c22,000 LLFCs and associated data combinations was executed.

3.3   High level summary of the two cycles:

- Cycle 1: 37,378 LLFCs & 461,671 data combinations. Tests completed with some temporary workarounds added to overcome significant issues with the capacity and the design of the systems.

- Cycle 2: 57,550 LLFCs & 708,046 data combinations. This stressed the system further causing unacceptable levels of file loading performance despite applying temporary workarounds. These tests were stopped as the poor performance levels prohibited us from completing testing and discovering anything new about the behaviour.

- Overall Finding: Central systems will need some combination of increased processing resources/code changes/configuration changes in order to handle the expected increased data volumes successfully.

Central System	Observations	Recommendations
MDD & Legacy SVAA	High disk space usage. Disk space utilisation reached its maximum limit resulting in D0265 failing to load files into SVAA DB.	1. Increase disk space available for MDD & SVAA file system and tablespaces in Production and test environments.
Legacy SVAA	Insufficient system memory. D0030 processing ran out of memory as a result of which the D0314 files were not produced.	1. Implement a new module with optimised code for D0030 file processing to generate the D0314. 2. Increase system memory available
	D0030 Supplier and distributor reports (IRPDUS & IRPDU2) generation time increased substantially	1. Code changes and DB performance tuning.
	D0041 The duration of the NHH D0041 increased substantially and the throughput of the loader was reduced.	1. The increase in duration could indicate a performance problem and should be investigated to check if the performance can be improved.

Pool Application	Weekly report P0214001 generation time increased substantially.	1. Code changes and DB performance tuning.
	Monthly report P0145002 generation time increased by about 45% which added about 1.75 hours to the duration.	1. The increase in duration could indicate a performance problem and should be investigated to check if the performance can be improved.
DCP	Insufficient system memory and CPU for DCP Microservices. DCP D0265 file loading completed after increasing system resources allocation and manual intervention to progress testing however processing time increased substantially.	1. Increase system resource allocation for DCP processes. 2. Configuration change to reduce the number of files processed simultaneously. 3. Code change (data loader & Web API) to attempt to improve processing times.

4. Conclusions and Next Steps

4.1 The Phase 2 Central System tests demonstrated that the relevant current BSC Central Systems applications solutions will not be able to handle the increase in Market Domain Data (MDD) and Line Loss Factor Classes (LLFCs) expected following the Ofgem Targeted Charging Review (TCR). Some combination of increased processing resources (system memory & CPU), code changes and configuration changes will be required in order to handle the expected increased data volumes successfully.

4.2 The required changes will need to tested and implemented before the IDNO Change Requests will be recommended to the SVG for approval. The initial estimate to carry out this work is 17 weeks, Elexon is working closely with our service providers to schedule and prioritise these updates to the Central Systems.

4.3 Elexon continue to engage with Ofgem and the Electricity Network Association (ENA) and the IDNOs regarding the timescales and impacts on the overall TCR project.

5. Recommendations

5.1 We invite the SVG to:

a) **NOTE** the update.

Appendices

Appendix 1 – Phase 1 Industry Testing anonymised results table

For more information, please contact:

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Appendix 1 – Phase 1 Industry Testing anonymised results table

Participant number	BSC Role	Objective for participation in Industry Testing	Test Results / Feedback / Observation received from participant
01	HHDC,DA; NHHDC,DA	We require the D0269 file with version 002	'Our testing appears to have gone successfully. Below is a summary of our findings during testing. ●D0269 O We loaded both 002 and 004 versions successfully using their respective Microsoft Access MDD Loader Utility provided by Elexon. O Data from the Access databases were loaded into our systems successfully. ● D0265 O We usually download the SPF file format from the Portal, this was not included in the testing files · Instead we used the PFF file, as they appeared to have the same format. **Observation:** O We loaded the largest D0265 file, which was approx. 1GB in size. O The file loaded successfully into our system O The only downside we noted was the length of time this file took to load – due to the size, this was expected. · During the annual refresh during March/April, due to the size and volume of files, we may need to change our loading procedures to load them outside of working hours – this is not a huge concern.'
02	Supplier	We require the D0269 files for validation	'x only loads the D0269: I tested that last week and it loaded without issue as far as I am aware. I should say that although the complete data set is loaded into staging tables very little is loaded into the contract management system. The key components for x are the LLFCs – the MDD must be loaded before the D0265s can be loaded. I downloaded three D0265s, three of the biggest DNO's files. The first one loaded without issue and I have yet to be updated about the other two. I have a meeting with the third party system provider tomorrow lunchtime. We will discuss it then. In the meantime, I will send an

			email to the technical team to see if there is any news. Should there be any issues I will let you know.'
03	NHHDA	We require the D0269 files for validation	'I have completed testing for NHHDA x and loaded the D0269's successfully.'
04	Supplier	We want to validate new MDD and LLF test files.	'We have finished the testing process and the new files load without any problems into our systems.'
05	Data User HHDC HHDA	Internal processing timescales and whether this will fit into our existing timetable.	'We haven't completed our test phase yet, however have not encountered any issues. This aligns with our expectations and test objective in which the only impact we foresaw was around internal processing performance, for which we already have some solutions in mind if this is identified.'
06	BSC Party	Validate D0269/D0270 in relation to loading it into MPRS (particularly performance)	'The D0269 and D0270 flows (both structure versions) were successfully loaded in a test MPRS environment with performance reflective of the additional rows being loaded. Although each SMRS has its own MPRS environment the tests indicate that there should be no performance implications loading the enlarged MDD file.'
07	Supplier	We require the D0269 and D0265 files for validation	'I have had a successful attempt. I have attached details and screen prints on new tabs of the observations spreadsheet.'
08	Supplier	We want to better understand the changes in the data and how it will work with our CRM	'Our CRM isn't in a place where we're able to test these files at the moment – we are still waiting for the release to include TCR changes at end of March.'
09	Supplier	Download the new files, giving us an opportunity to review the scale of the change, ideally I would like to apply the test data to our own test environments and review the processing of the additional LLF records and associated top line combinations.	'Initially we registered our interest to understand the scope of testing etc. and access to the data. I previously messaged out to confirm that we cannot provide any resources to this testing due to resource constraints.'

10	Supplier	Our main aim is to understand the impact of the LLF Class data volumes changes on our systems and processing time. In particular, our focus will be on the impacts on a., the MDD uploads and b. the D0265 data flows.	'I firstly wanted to offer our thanks for providing industry data test files and giving us the opportunity to prepare our systems for the significant increase in LLF Class volumes. Whilst we have not been able to complete all our testing by the feedback deadline of 23/02 our main feedback so far would be: *future change suggestion provided and being reviewed Elexon.*'
11	Supplier	The specific objective that we want to achieve from the testing is to make sure that our pricing and quoting system has the bandwidth to deal with the increased volumes of Market Domain Data and that it can load them successfully in real time.	'When we started looking in more detail at our systems, we realised that the only system into which these files were directly loaded was a third party provided system and that none of our own systems actually loaded these flows directly. Therefore, we did not undertake any loading of the test files.'
12	BSC Party	We require the D0269 and D0265 files for validation	'Sorry, it feels like I missed a step, heading to the Elexon portal and clicking the bookmark for MDD Industry testing I can see downloads for D0265 but nothing else.

In particular, I was hoping to download a D0030.'
Elexon have shared D0030 files with participant. |
| 13 | Supplier | We require the D0269 and D0265 files for validation | 'I have nothing to report as those files are not processed as part of industry flows by the IT systems I support.' |
| 14 | Supplier | Download the new files, giving us an opportunity to review the scale of the change, ideally I would like to apply the test data to our own test environments and review | Did not share any feedback until 24-February after test window finished. |

		the processing of the additional LLF records and associated top line combinations.	
15	Supplier	We're interesting in testing the new data for a few reasons: • We think there may be gaps in the current combinations of PC/SSC/MTC/LLFC as we are enrolling domestic export (both HH and NHH) and some DNOs recognise the combinations we're using and some don't. • We'd like to run it against some of our portfolio to see how we can use the data to validate industry data and to provide tools for selecting correct combinations based on the customers set up and auto healing on CoS • Our forecasting/procurement team want to load the data into their models to understand how it affects them (Individual's objective but not Elexon's).	Did not share any feedback until 24-February after test window finished.

16	HHDA	To get a view of how big the D0265 files are going to get	Did not share any feedback until 24-February after test window finished.
17	Supplier	… are aware that the D0269/D0270 & D0265 data files will increase in size due to Ofgem's TCR, we wish to take this opportunity to verify that our systems are able to process these increased data files without any detrimental impact on our operations.	Did not share any feedback until 24-February after test window finished.