

PUBLIC

Annual Performance Assurance Report

2016/17

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MESSAGE FROM THE PERFORMANCE ASSURANCE BOARD (PAB) CHAIR

The amount of Industry Change shows no sign of slowing down. As a consequence we are continuing to see many challenges for ELEXON and its customers.

The migration of Profile Class 5-8 customers to trade in the half hourly market, under Modification P272, came to a conclusion on 1 April 2017. While the headline statistic of 97.5% completion is seen as a success there still remains around 26,000 Meters that have not migrated as they were exempted due to Supply Licence Condition, SLC12. Over the coming months we hope to see these Meters being migrated.

The Performance Assurance Board (PAB), OFGEM and ELEXON have worked together during 2016/17 to monitor Supplier's migration plans and to encourage compliance with Modification P272 obligations. As a consequence during the latter part of the year the PAB held meetings over two consecutive days in order to deal with the issues arising from the P272 migrations. I would like to take this opportunity to thank all those involved for their efforts and commitment.

We continue to see the non-half hourly and half hourly market performance fall short of the industry targets of 97% and 99% respectively. The PAB has seen an increase in the number of Parties escalated (6 compared with 4 in 2015/16) during 2016/17 for missing agreed milestones in their plans to achieve the 97% NHH target. An observation I have made is that the level of detailed understanding of both NHH and HH market processes is falling as those who experienced the introduction of the Performance Assurance Framework in 1998 are leaving the industry.

The BSC Auditor gave an unqualified opinion again in 2016/17. However, the materiality of the errors found was 0.97TWh compared to 1.07TWh in 2015/16 (materiality threshold of 1.3 TWh). We are continuing to work with Parties to deliver actions required to address the risk to Settlement.

Thank you for all your efforts over the last 12 months.

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OVERVIEW

The Performance Assurance Board (PAB) is required, by [Balancing and Settlement Code \(BSC\) Section Z 8.1](#), to prepare an Annual Performance Assurance Report (APAR), which includes:

- Results from risk evaluation and risk assurance procedures focussing on the outcome of deployment of Performance Assurance Techniques (PAT);
- The actual costs associated in delivering the Performance Assurance Framework (PAF) compared with the estimated costs set out in the Risk Operating Plan; and
- Recommendations for modifying the PATs.

Risk evaluation and performance

We strive to deliver a transparent risk based PAF, focusing on the key Settlement Risks affecting BSC Parties. We employ a collaborative approach with our customers to monitor their performance against BSC obligations. This has resulted in good performance during 2016/17 with BSC Parties and Party Agents achieving the following:

Successes

- Suppliers completed 97.5% of the migration of Profile Class 5-8 Non Half Hourly (NHH) Meters to the Half Hourly (HH) market for Settlement by the 1 April 2017 deadline¹;
- NHH Gross error volumes remained below (24.5GWh) the agreed acceptable level (165 GWh) across the year; and
- Meter Technical Detail² (MTD) related non-compliances, as reported by the Technical Assurance Agent remained below the 10% standard (6.45%);
-

Other issues progressed within period

- We identified root causes for Advanced Meter interoperability as Auxiliary MTDs not being sent and Outstation passwords not being provided to Parties. We continue to work with Parties to resolve underlying issues;
- A new flow is being created to address issues of re-sending HH MTD flows for some Meter types to include additional details which did not fit on the current flow. We are working with Parties to devise appropriate work arounds until the flow is implemented; and
- We improved the way we monitor for the quality of MTDs. We now consider the number of re-submitted MTDs and the data from the TAA related to MTD non-compliances to provide a wider view of performance.

Needs further work

We are working with Parties to improve the following issues:

¹ [P272 Mandatory Half Hourly Settlement for Profile Classes 5-8](#)

² Errors in MTDs indicate an increased risk to the quality of metered consumption.

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- Performance in relation to settling energy on actual reads did not meet the required standards during 2016/17 (HH settling on 98.59% actual reads compared to the standard of 99% and NHH settling on 96.62% actual reads compared to the standard of 97%);
- Re-submission of HH MTDs was greater than the compliance threshold (2.98% re-submitted instead of less than 1%);
- Around 60% of Commissioning records were identified as missing on inspection by the TAA;
- The TAA and BSC Audit raised concerns about the increasing number of Metering Faults not being resolved; and
- Missing HH and NHH MTDs and ensuring the assessment for considering Parties for Error and Failure Resolution is fit for purpose.

Cost of delivery

The annual cost of delivering assurance in 2016/17 was £3,254,781, which is £177,662 less than estimated in the Risk Operating Plan 2016/17. This is due to lower demand led expenditure.

Modifying PATs

We are undertaking a review of the PAF which may result in significant changes to PATs in the future. We are also reviewing the BSC Audit scope to ensure the focus remains on areas of risk with the greatest potential for significant material impact on Settlement.

RESULTS FROM RISK EVALUATION AND RISK ASSURANCE PROCEDURES

In order to assess risk to Settlement, ELEXON analyses data made available via assurance techniques such as Performance Monitoring and Reporting³, Material Error Monitoring⁴ and the Technical Assurance Agent⁵. ELEXON assigns a Business Unit Settlement Risk Rating (BUSRR) to the relevant participant to determine the extent to which their performance impacts Settlement. ELEXON presents its findings to the Performance Assurance Board (PAB) on a monthly basis. The PAB deploys Performance Assurance Techniques (PATs) such as Balancing and Settlement Code (BSC) Audit, Error and Failure Resolution (EFR), Technical Assurance of Performance Assurance Parties (TAPAP) and Technical Assurance of Metering Systems (TAM) to mitigate identified risk to Settlement. For a full description of the PATs please refer to the [PAT Guiding Principles](#) document.

In this section we report on:

- The key areas monitored to detect risk to Settlement in 2016/17,
- Performance at industry level in relation to standards established to mitigate risk to Settlement; and
- The outcome of the deployment of PATs to mitigate risk to Settlement.

³ Performance Assurance Reporting and Monitoring System (PARMS) data is used primarily to support the Performance Monitoring and Reporting technique, which is part of ELEXON's Performance Assurance Framework. PARMS is a database that contains information about how Suppliers and their Supplier Hubs are performing.

⁴ The provision of quantitative data designed to quantify the contribution made by Performance Assurance Parties to error and the impact of such errors on Performance Assurance Parties.

⁵ The Technical Assurance Agent service consists of a combination of sampled and targeted visits to sites with HH Metering Systems and is designed to monitor the compliance of these Metering Systems with respect to the requirements stated in the BSC and its Subsidiary Documents. This provides a level of assurance that the metered values being passed into Settlement are representative of actual consumption.

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1. Gross error

SR0072: The risk that Non Half Hourly Data Collectors (NHHDCs) process incorrect Meter readings, resulting in erroneous data being entered into Settlement.

Monitoring

We monitor performance for each Non Half Hourly (NHH) Supplier against this risk.

We obtain information from Non Half Hourly Data Aggregators (NHHDCs) that shows us where consumption is higher or lower than expected for a particular customer type. ELEXON sends this out as an 'instance report' to the Supplier who is given an opportunity to inform us if the instances are genuine or not. ELEXON calculates the level of error reported against a Supplier and applies a threshold to determine a Supplier's contribution to the level of risk to Settlement. The threshold of acceptable error in the market is 165GWh.

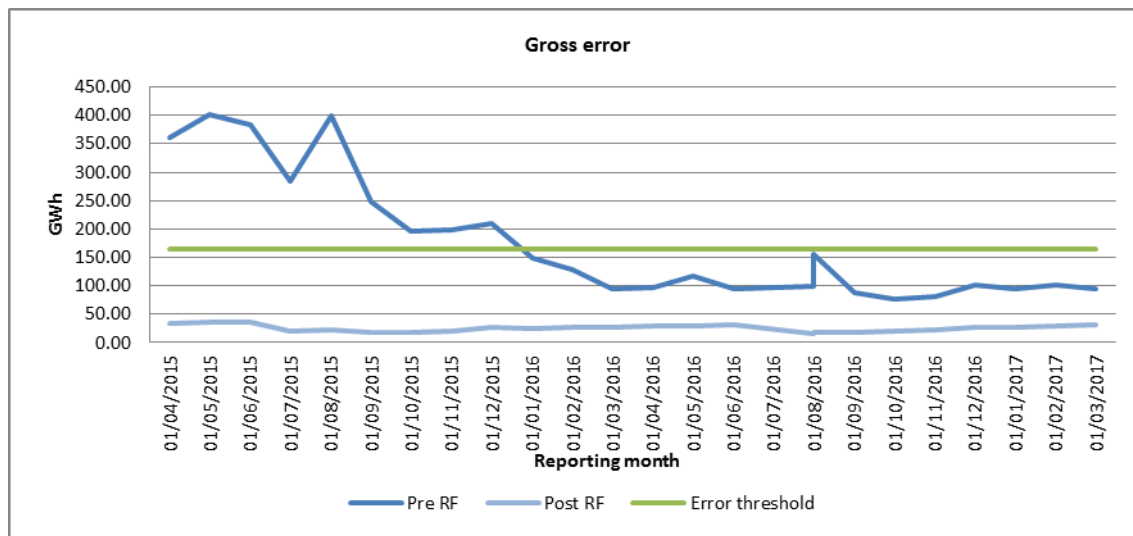


Chart 1: Gross error

Performance

Error volumes below the green line in Chart 1 are considered acceptable. During 2016/17 the volume of gross error across industry remained below the 165 GWh threshold. The average gross error volume in the post Final Settlement Run (RF) was 24.5 GWh.

Mitigation techniques

Parties that record error above the threshold for three consecutive months qualify for EFR. Whilst in EFR they are required to demonstrate understanding of the identified performance issues and have robust plans in place to correct them in a timely manner.

Outcome of PATs

No new EFR plans were requested in 2016/17. However, five EFR plans were ongoing from 2015/16. Two were closed during 2016/17 and three remained open at the end of the period. One of these Parties has since had their EFR plan closed (the other two are both under threshold now and awaiting three months of compliance before exiting EFR).

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2. Energy settled on actual Meter reads

SR0081: The risk that Half Hourly Data Collectors (HHDCs) do not process valid HH readings resulting in estimated data being entered into Settlement

SR0074: The risk that NHHDCs do not collect and / or enter valid Meter readings resulting in old/default data entering Settlement.

Monitoring

We monitor performance against this risk focusing on the percentage of energy settled on actual reads to ensure that the data entering Settlement is accurate.

Half Hourly (HH) performance is considered optimal if a Supplier settles 99% of energy on actual reads by the Initial Reconciliation Settlement Run (SF).

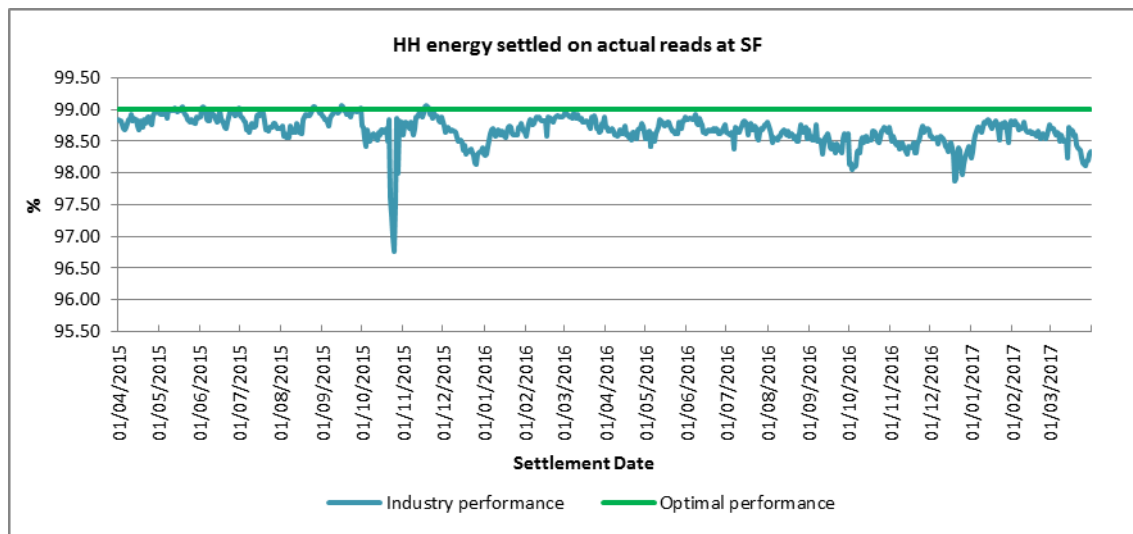
Non Half Hourly (NHH) performance is considered optimal if a Supplier settles 97% of energy on actual reads by the Final Reconciliation Run (RF).

Performance

Volumes of energy settled on actuals above the green line in chart 2 and 3 below are acceptable. During 2016/17 industry did not achieve acceptable volumes of HH and NHH energy settled on actual reads.

On average, industry settled 98.59% (instead of 99%) of HH energy on actual Meter reads at SF compared with 98.76% in 2015/16.

Industry settled 96.62% (instead of 97%) of NHH energy on actual Meter reads at RF compared with 96.59% in 2015/16.



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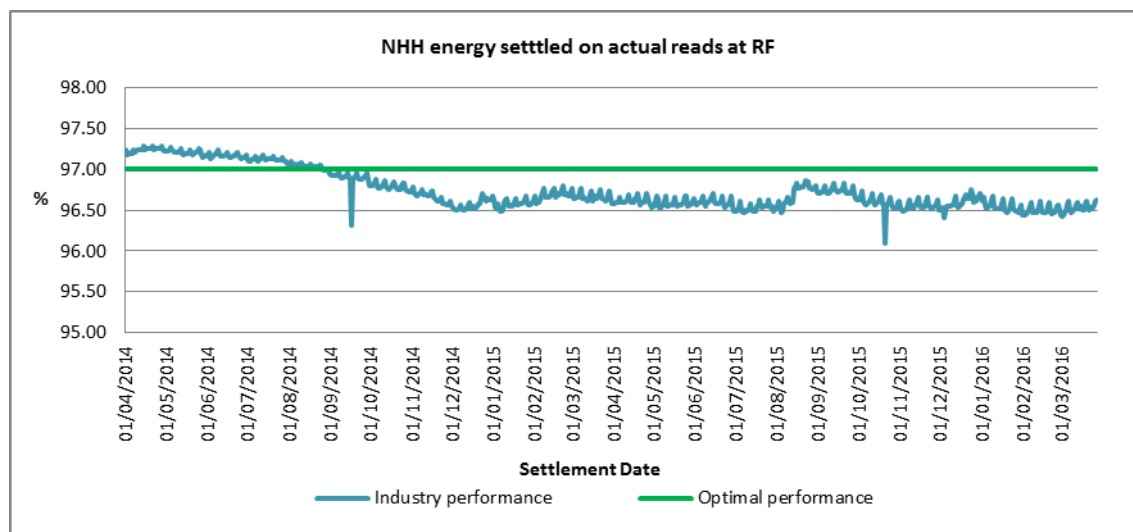


Chart 2 and 3: HH/NHH energy settled on actual reads

Mitigation techniques

Parties that record volumes of actual reads below the threshold for three consecutive months and exceed the 500MWh threshold of estimated energy settled are considered for EFR.

During 2016/17 three HH Suppliers were required to put EFR plans in place for not meeting the standard for optimal performance. Nine plans were in place prior to 2016/17.

Nine NHH Suppliers were required to put EFR plans in place for not meeting the standard. Twelve plans were pre-existing.

Root causes

Issues related to HH performance include Meter faults at very large customer sites and issues collecting hand held data at sites where communications with the Meter are not in place.

The decline in NHH overall performance, initially seen in August 2014, was due to a single Party experiencing system errors caused by a migration to a new IT system. Whilst this Party's performance has improved significantly during 2016/17, issues impacting Settlement remain in the NHH market. Parties contributing to NHH poor performance in 2016/17 site issues such as difficulty obtaining reads through pedestrian site visits, difficulty obtaining customer own reads or automated collections and errors or problems that occur when the reads are processed. Some Suppliers highlighted shorter contract periods with customers as an obstacle to obtaining and processing actual reads.

Outcome of PATs

During 2016/17 one new and two existing plans for HH performance were closed for improved performance in 2016/17. Five pre-existing plans for NHH performance were closed for improved performance in 2016/17.

We continue to work with Parties to meet performance standards through EFR. We have escalated some Parties to the Performance Assurance Board (PAB) for the length of time taken to resolve problems.

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3. Meter Technical Details (MTDs)

MTDs are all technical details of a Metering System required to enable metered data to be collected and correctly interpreted from that Metering System.

Re-submission of HH MTDs⁶

SR0022: The risk that Half Hourly Meter Operator Agents (HHMOAs) do not provide correct MTDs to the HHDCs resulting in Meter readings being misinterpreted or not collected.

In order to get an indication of the quality of the HH MTDs sent, we monitor how many times the HHMOA re-sends HH MTDs with the same Effective from Date (EFD) where there has been a change in a key field of the MTD. The key fields are those fields in the MTDs that could most impact Settlement if incorrect.

Monitoring

Resubmissions of HH MTDs, with changes to key fields, indicate that the HHMOA may not have robust processes in place to input, validate and send its MTDs. Parties performance is considered acceptable when they achieve >99% accuracy in the sending of MTDs.

Performance

Actual performance above the green line in chart 4 is considered optimal. During the period 2016/17 industry performance did not meet the required level of accuracy (< 1% of HH MTDs re-submitted). On average 2.98% of HH MTDs were re-sent, compared with 1.97 % in 2015/16.

The Technical Assurance Agent (TAA) identified five Category 1.01⁷ non-compliances linked to issues with incorrect HH MTDs, compared with three the previous year, indicating that HHDC back office processes for managing MTDs may be lacking.

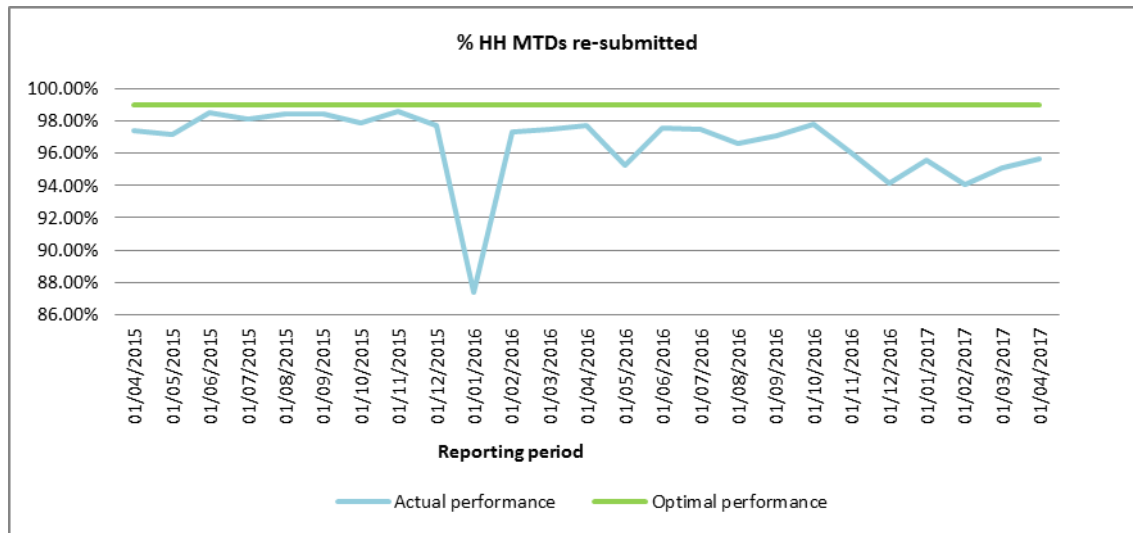


Chart 4: % HH MTDs re-submitted

⁶ Related to SR22 The risk that HHMOAs do not provide correct Meter Technical Details to the HHDCs resulting in Meter readings being misinterpreted or not collected.

⁷ Incorrect Standing Data held by DC (MTDs).

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Root causes

Upon investigation by ELEXON, the increased levels of HH MTD re-submissions during 2016/17 were found to be related to a particular Meter type⁸ (large numbers being moved to mandatory HH Settlement) which has additional information that does not fit on the existing HH MTD data flow. As a result, MOAs have been sending two MTD flows to contain the full information for these Metres and therefore inflating the figures seen since January 2017.

The TAA noted that many HHDCs do not have one overarching IT system that holds MTDs and relevant data is stored in a number of systems. It was not possible to tell from the data recorded whether HHDCs were issued incorrect information from HHMOAs or the HHDCs provided incorrect details when providing information in advance of the HH Metering System inspections.

Mitigation techniques

Parties whose accuracy score is below 95% for three consecutive months are considered by the PAB for EFR.

Parties identified as re-submitting high levels of HH MTDs for EDM I Meter issues were not placed in EFR during 2016/17. This was because the Parties were able to provide evidence that the MTDs were not resent as a result of issues with quality but as part of a controlled process to ensure that DCs received all the required MTDs.

The Master Registration Agreement Service Company (which is responsible for making changes to flows sent over the Data Transfer Network) has received a proposal to amend the HH MTDs data flow⁹ to accommodate the additional information through their governance process. This will ensure that full MTDs can be sent in one data flow.

ELEXON will conduct investigations into the Category 1 non-compliances raised by the TAA. Further investigation should highlight where the weakness is in the process. Following this, ELEXON will consider performing a TAPAP check to monitor the compliance of Meter Operator Agents (MOAs) and HHDCs and check whether there is a market issue.

Outcome of PATs

During 2016/17 the PAB approved changes to the way we monitor performance in relation to the provision of quality MTDs. The existing method of looking at re-submissions alone was not considered effective because it only allows us to see the volume of amended MTDs. However, these resubmissions are undertaken to improve data quality. Therefore by deploying EFR against any Party which is attempting to improve data quality is counterintuitive.

The new performance standard combines the number of MTD re-submissions with the data from the TAA showing the number of non-compliances related to incorrect MTD across a rolling 12-month period. It was felt that by using the two data sets together the monitoring would provide a wider picture of Supplier and HHMOA performance concerning data quality. Full details of the new standards which were implemented in April 2017 are in version 6.0 of the [Business Unit Settlement Risk Ratings Guidance](#), SR3019 performance.

Missing MTDs

SR0025: The risk that HHMOAs do not provide MTDs to the correct HHDCs resulting in Meter readings not being collected.

SR0024: The risk that NHHMOAs do not provide MTDs to the correct NHHDCs resulting in Meter readings not being collected.

⁸ EDM I Meters.

⁹ MIF229 - Changes to D0268 to rectify interoperability issues in the HH market post-P272

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Monitoring

We monitor the transfer of MTDs from MOAs following a Change of Agent and Change of Supplier with a concurrent Change of Agent. MTDs are considered missing when a 'Notification of Meter Operator or Data Collector Appointment' and 'Terms or Notification of Change to Other Parties' flow has been received but no associated MTDs have been received.

HH standards

A two-step approach is used to determine acceptable HH performance. Performance is deemed optimal when Parties meet both of the following criteria:

- Criteria 1 - % missing MTDs before R1 to after RF' is less than 0.5%; and
- Criteria 2 - Of that 0.5% missing, none is missing 'before R3 to after RF'.

HH Performance

Party performance is considered acceptable if the overall % of missing MTDs is below the light green line (0.5%) in Chart 5. During 2016/17 the total number of missing HH MTDs across industry was between 0.77% and 1.25. This compares with 0.46% to 0.85% in 2015/16.

The percentage of missing before R3 to RF is acceptable if below the dark green line (0%) in Chart 5. Industry did not meet the second criteria during 2016/17 (on average 54.38 % (instead of none) of the 0.5% missing HH MTDs were still missing 'before R3¹⁰ to after RF' compared with 62.85% in 2015/16).

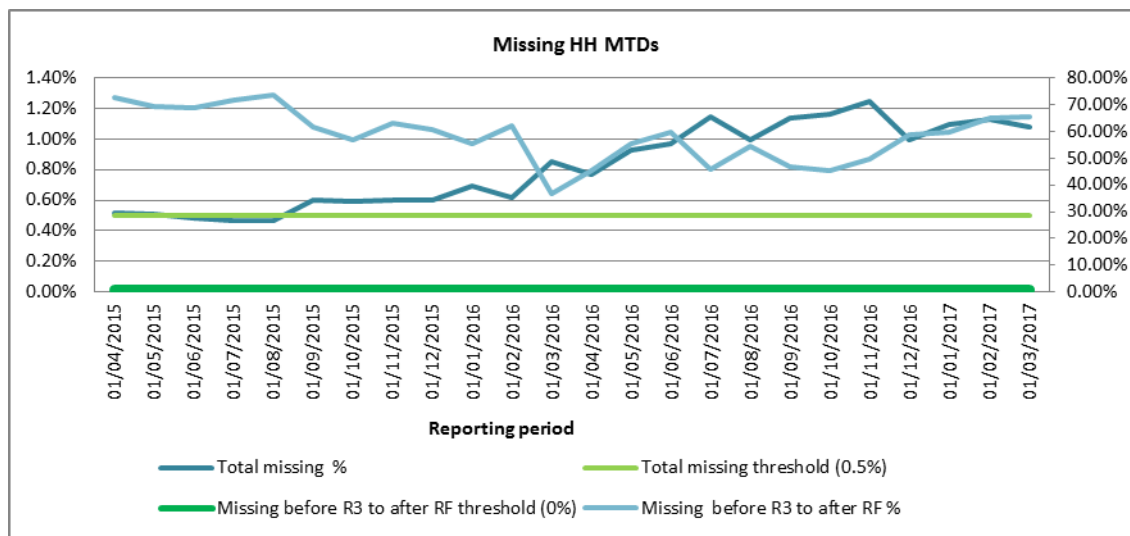


Chart 5: Missing HH MTDs

NHH standards

A two-step approach is used to determine NHH performance. Performance is deemed optimal when they meet both of the following criteria:

- Criteria 1 - Total number of missing MTDs is less than 0.5%; and
- Criteria 2 - Of that 0.5% missing, less than 25% are missing 'before R3 to after RF'.

¹⁰ Third Reconciliation Settlement Run.

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NHH Performance

The percentage of total missing MTDs is acceptable if it is below the light green line (0.5%) in Chart 6. Industry volumes met the criteria for the % of missing MTDs overall (ranging between 0.12% to 0.25% in 2016/17). This compares with a 0.12% to 0.34% in 2015/16.

The percentage of missing before R3 to after RF is acceptable if it is below the dark green line (25%) in Chart 6. Industry did not meet the second criteria throughout the year averaging 56.07% compared to 57.9% in 2015/16. However in March 2017 it fell to near acceptable levels of 29%.

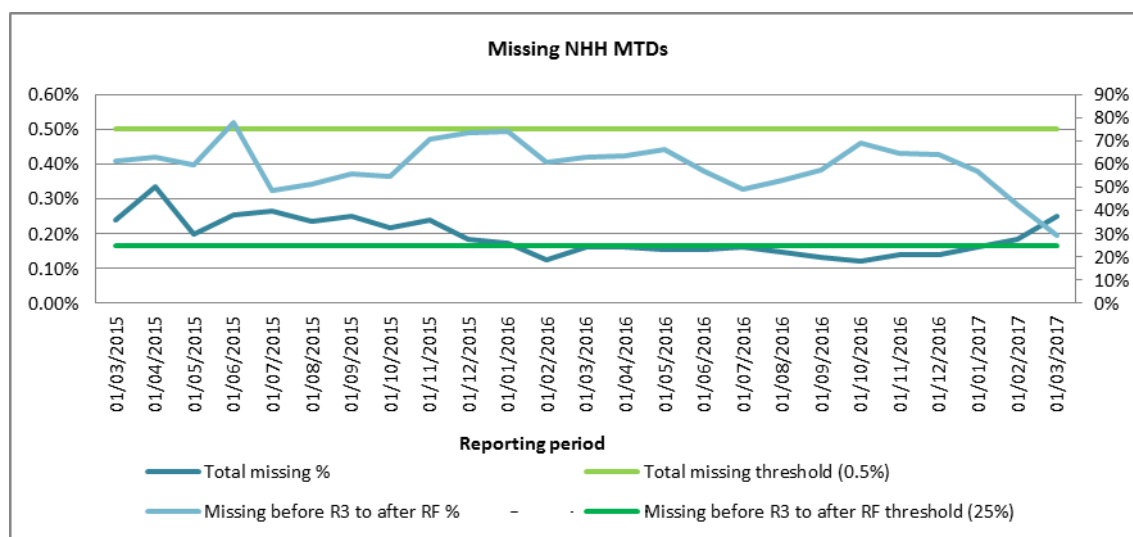


Chart 6: Missing NHH MTDs

Mitigation techniques

Parties that fail to meet both sets of criteria for three consecutive months are considered for EFR.

No Parties were required to put an EFR plan in place during 2016/17 for missing MTDs.

One HH Party had a pre-existing EFR plan in place but exited EFR with improved performance soon after the 2016/17 period closed.

Three NHH Parties had pre-existing plans in place. All remained open during 2016/17 but have since been closed.

Root causes – HH and NHH

There have been a number of concerns about the effectiveness of the monitoring and assessment that takes place in relation to missing MTDs. Parties have raised concerns with ELEXON around misreporting and inclusion in reporting of issues that are non-settlement impacting and expressed frustration that time and resource is being spent on investigations that are not causing genuine Settlement issues.

Analysis undertaken by ELEXON showed that the process of the DC receiving MTDs breaks down prior to a newly registered MOA receiving them which indicates that investigations on the root causes of missing MTDs should be directed at the transfer of MTDs from one MOA rather than MOA to DC. Full details of this analysis is in the PAB paper [PAB197/14](#).

Outcome of PATs

The PAB has acknowledged there are limitations in terms of the current assessment process, investigating cases for EFR and working with Parties on EFR plans to rectify missing MTDs. ELEXON has agreed with the PAB to undertake a series of targeted (TAPAP) checks to determine the impact Parties are having on Settlement and to determine whether EFR is required.

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MTDs following a change to a HH Metering System

SR0028: The risk that HHMOAs make changes to the Metering System and do not inform the HHDCs resulting in Meter readings being misinterpreted or not collected.

Monitoring

We monitor HHMOAs sending MTDs following a change to a Metering System using data provided by the TAA on MTD non-compliances.

Performance is considered optimal if at 10% or less audit visits the TAA identify MTD related non-compliances.

Performance

During 2016/17, MTD related non-compliances were identified at 6.45% of TAA audit visits, compared with 5.84% in 2015/16.

| Non-compliances | 2015/16 | 2015/16 | 2016/17 | 2016/17 |
|---|------------------------|------------------|------------------------|------------------|
| | No. of non-compliances | % per site visit | No. of non-compliances | % per site visit |
| Cat 1.01 Incorrect Standing Data held by DC (MTDs) | 3 | 0.22% | 5 | 0.37% |
| Cat 2.01 Incorrect Standing Data held by MOA (MTDs) | 14 | 1.05% | 11 | 0.81% |
| Cat 2.02 Non-Key Field MTDs do not match DC | 24 | 1.80% | 38 | 2.79% |
| Cat 2.03 MTDs not provided | 37 | 2.77% | 34 | 2.49% |
| Total non-compliances as % of site visits | 78 | 5.84% | 88 | 6.45% |
| No. site visits | 1336 | | 1364 | |

Table 1: MTD related TAA non-compliances

Mitigation techniques

No Parties were required to put an EFR plan in place during 2016/17.

Outcome of PATs

As mentioned in the commentary on re-submission of MTDs, we will no longer be looking at this data in isolation to determine whether Parties should be placed in EFR. The new performance standard for the provision of quality MTDs combines the number of MTD re-submissions with the data from the TAA showing the number non-compliances related to incorrect MTD across a rolling 12-month period. This provides a wider picture of Supplier and HHMOA performance concerning data quality. Full details of the new standards are in version 6.0 of the [Business Unit Settlement Risk Ratings Guidance](#), SR3019 performance.

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4. Migration of Profile Class (PC) 5-8 to mandatory HH Settlement

With effect from 6 April 2014, any Profile Class (PC) 5-8 is mandated to have an Advance Meter fitted. These Meters should be capable of being remotely read and have HH read capability.

In order to make Settlement as accurate as possible a change to the Code was made to mandate HH Settlement for all Metering Systems within PCs 5-8 (where capable metering has been installed) by 1 April 2017¹¹.

Monitoring

In order to manage the migration of PC 5-8 Meters from NHH to HH Settlement, Supplier Migration Plans (SMPs) were added to the Code obligations. These plans provided PAB the ability to plot the progress of Suppliers over the course of the migration.

To this end, Suppliers were required to submit monthly updates, detailing progress against their approved SMP as they migrate Advanced Meters in PC 5-8 to HH Settlement between 5 November 2015 and 1 April 2017. In addition plans need to be revised if Suppliers become aware that their approved SMP no longer reflects their migration pattern.

Performance

In November 2015, there were a total of 126,013 PC 5-8 Advanced Meter sites across the industry which fell under the obligation to migrate to HH Settlement. As of 1 April 2017 industry had migrated 97.56% of Meters to HH Settlement. A total of 150,529 Meters have now undergone the Change of Measurement Class (CoMC) process and are being Settled HH (19.46% more than envisaged). The extra volume was made up of Meters that were exchanged for Advanced Meters during the course of the migration.

The BSC Auditor noted that compliance with CoMC processes has seen improvements compared to 2015/16 particularly in relation to the severity of the issues. The BSC Auditor reported no medium or high audit issues with the CoMC process.

Mitigation techniques

Parties that failed to meet the requirements for their approved migration plan qualified for EFR.

During 2016/17 nine Suppliers were required to put EFR plans in place to improve their migration performance. One other Supplier was already in EFR from 2015/16.

EFR was turned on/re-purposed for a total of 17 Suppliers in June 2017 to address the outstanding CoMCs required. We continue to monitor these Parties and work with them to complete the migration.

Root causes

The root causes identified by Parties in EFR have been varied and include:

- HH MOAs not being able to support a number of meter types;
 - MTDs not provided by the de-appointed NHH MOA, or no/incorrect password details provided on the Auxiliary MTDs;
 - Resource issues that meant no availability of appointment dates;
 - Issues with service providers; and
 - General processing issues.
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¹¹ P272 Mandatory Half Hourly Settlement for Profile Classes 5-8

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Outcome of PATs

The migration process including the monitoring and resolution of issues by Parties through EFR has resulted in qualitative successes such as the increased level of communication and co-operation from Parties during and post migration. Parties have also demonstrated a better understanding of the complexities of the Change of Measurement Class process.

5. Interoperability of Advanced Meters

During 2016/17 Parties noted issues relating to the interoperability of Advanced Meters on a change of Supplier and/or agent event. In particular they reported that gaining agents were unable to access the remote read functionality.

Monitoring

ELEXON conducted analysis on communications between Parties for Advanced Meters. This confirmed issues with the transfer and content of details required to operate Advanced Meters remotely, specifically related to the Auxiliary MTD flow. The results showed that ~20% of Auxiliary MTDs were missing upon an Advanced Meter Change of MOA and 23% of Auxiliary MTDs had passwords that were hidden.

Mitigation techniques

The PAB approved a targeted TAPAP check on six MOAs based on their degree of compliance displayed; three Suppliers who hold ultimate responsible for maintaining complete and accurate MTDs; and three DCs to assess any impact on Settlement as a result of the issues noted.

The results were presented to PAB in September 2016, resulting in a PAB recommendation to check a further six MOAs.

Following completion of the TAPAP checks the PAB initiated the EFR technique for all 12 MOA participants audited.

Root causes

- System defects resulting in Auxiliary MTDs not being produced and sent upon de-appointment;
- Design of Advanced Metering Systems processes not adhering to Code requirements; and
- Failures to backfill Advanced Meter details for Metering Systems impacted by the implementation of the Auxiliary MTD flow.

Outcome of PATs

Two MOA EFR plans were closed during 2016/17. Exit checks identified weaknesses in some plans which required new plans to address. Ten MOAs remained in EFR at the end of the period.

ELEXON and industry have worked together to agree a solution to the Advanced Meter issues and address retrospective missing MTDs. We facilitated a Supplier Agent workgroup to discuss legacy AMR interoperability issues. The workgroup agreed a process for updating and backfilling retrospective missing Auxiliary MTDs and level 3 passwords. Further industry workshops are scheduled to evaluate the need for guidance and/or obligations on the adoption of secure passwords.

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6. Commissioning

In November 2014 a change to the Code¹² was made which required the relevant systems operator to commission and provide commissioning records for measurement transformers as well as calibration certificates.

Monitoring

In May 2016 ELEXON completed the last in a series of TAPAP checks on the implementation of changes to the Commissioning process to identify any breakdown in the process. The checks revealed widespread issues including:

- Lack of Commissioning or long delays in performing Commissioning by System Operators and MOAs;
- Continued difficulties in communication between System Operators, MOAs and Suppliers;
- A clear need for timescales for the process; and
- Missing calibration certificates for measurement transformers still an issue.

The TAA also reported during their audit, that 60% of checked Metering Systems that should have been commissioned after the implementation of the Code changes still had missing or incomplete Commissioning records. In addition calibration certificates for measurement transformers are no longer readily available to the TAA auditor due to the age of many HH Metering System installations.

Testing of the Commissioning process was added to the Balancing and Settlement Code (BSC) Audit scope as of the 2016/17 audit for HHMOA and Systems Operators agents. However, Settlement impacting non-compliances were still evident in a third of the HHMOAs and close to half of the Systems Operators tested.

Mitigation techniques

Parties that are found to be non-compliant against Code obligations during the TAPAP checks and the BSC Audit may be considered for EFR.

Eight EFR plans were required during 2016/17 following the TAPAP checks. There were 13 pre-existing plans in place from TAPAP checks performed in the previous year.

Root causes

Parties audited by the TAA cited being unable to locate original records which have been lost/destroyed or cannot be provided by the System Operator/HHMOA as the reason for non-compliances. However, for newly commissioned Metering Systems that will have certificates, the TAA reported that there was little evidence to show that Parties have robust commissioning processes in place.

HHMOAs told the BSC Auditor of challenges meeting the new timeframes for commissioning where it cannot be performed on installation, whereas System Operators said they have faced difficulties getting hold of measurement transformer calibration certificates.

Outcome of PATs

The BSC Auditor noted that following the inclusion of timescales to the Commissioning process in November 2016, efforts have been made to meet the new obligations.

Two Parties with pre-existing EFR plans exited EFR in 2016/17. However, exit checks completed by ELEXON with some other Parties identified weaknesses in the processes that have been put in place and new EFR plans were required to refine these processes.

¹² [P283 Reinforcing the Commissioning of Metering Equipment Processes](#)

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In order to make the process more consistent and effective ELEXON are working to introduce a set of new data flows to facilitate the communication of Commissioning information between MOA, System Operator & Supplier businesses.

Members of the Technical Assurance of Metering Experts Group (TAMEG) are looking at the issue of missing measurement transformer calibration certificates and ways of gaining assurance.

ELEXON has continued to provide support to industry on the Commissioning obligations with ad-hoc training sessions and are planning another education day during 2018/2019 BSC following a proposed introduction of a set of data flows for the communication obligations in the commissioning process.

7. Metering System faults not resolved

Monitoring

The TAA audit noted a significant increase in the number of Category 1 non-compliances raised due to HH Metering System failures, 14 in 2016/17 compared to 5 in 2015/16. Analysis of Trading Disputes showed all the non-compliances related to HH Metering System failure had been present for more than 100 days prior to the inspection date; some a great deal longer.

The BSC Auditor identified issues in more market participants surrounding the actioning of Metering System faults (Settlement impacting issues detected in 14 different market participants in 2016/17 compared to 11 in the previous period).

Mitigation techniques

ELEXON will consider performing a TAPAP check to monitor the compliance of Suppliers, HHMOAs and HHDCs if following investigation weaknesses are identified in the fault investigation process.

Parties against which medium or high rated Audit Issues are raised during the BSC Audit 2016/17 will be considered for EFR in 2017/18.

If a TAPAP check is forthcoming, non-compliant Parties will be considered for EFR.

Root causes

As yet nothing has been confirmed. The TAA expressed concern over whether market participants have appropriate controls in place to ensure that checking and actioning of alerts for material changes in metered volumes (either increase or decrease) takes place. ELEXON will conduct investigations into the issues raised by the TAA and BSC Auditor.

Outcome of PATs

The increased use of Data Transfer Network data by the BSC Auditor around the faults process has provided a more detailed view of the issues relating to Metering system faults. This has resulted in more audit issues detected in 2016/17.

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COST OF DELIVERING THE PERFORMANCE ASSURANCE TECHNIQUES (PATs)

The Code obliges ELEXON to compare the actual costs of implementing the Performance Assurance Techniques (PATs) with the estimated costs set out in the [Risk Operating Plan](#) for the same period. We include the previous year's actual and forecast costs for information.

| | Operational | Contractual | Total |
|-----------------------------|-------------|-------------|------------|
| ROP 2015/16 Forecast | £878,800 | £2,005,634 | £2,884,434 |
| 2015/16 Actual | £982,956 | £2,015,589 | £2,998,545 |
| ROP 2016/17 Forecast | £1,007,530 | £2,424,913 | £3,432,443 |
| 2016/17 Actual | £985,816 | £2,268,965 | £3,254,781 |

Table 2: Costs of delivering PATs

8. Total Costs

Total actual spend in 2016/17 was £177,662 lower than estimated for the Risk Operating Plan (ROP) 2016/17. We provide further details below.

9. Operational Costs

Operational costs cover the provision of ELEXON staff to deliver the PATs.

The actual operational costs were £21,714 less than the ROP 2016/17 estimate. This is due to minor changes in staff numbers and grades of staff performing Performance Assurance Framework related activities.

10. Contracted Costs

The contracted costs cover outsourced provision of the following:

- Annual Balancing and Settlement Code (BSC) Audit;
- Delivery of the Technical Assurance of Metering (TAM) by the Technical Assurance Agent (TAA);
- The Qualification Service;
- Support and maintenance for the risk database (ATLAS); and
- Support and maintenance of the Performance Assurance Reporting and Monitoring System software.

The difference between ROP forecasted contractual spend for 2016/17 and actual contractual spend is £155,948k lower due to the following:

- The actual spend for the BSC Operational Audit was £26,872 less than forecast. This is largely due to variances in expenditure against the contingency, additional time for site visits and a TAPAP check undertaken;
- The actual spend for the TAM was £141,475 less than forecast. This is largely due to the multi-circuit testing being delayed, reporting contingency and ad hoc visits/meetings less than expected;
- The actual spend for Qualification and Re-Qualification was £15,660 more than forecast. This is demand led expenditure and reflects more Parties going through Qualification than anticipated and no re-Qualifications required; and

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- PAB and Trading Disputes Committee meeting expenditure was £3,262 less than expected due to variations in expenses submitted.

FUTURE CONSIDERATIONS

11. PAF review

The current approach to the Performance Assurance Framework (PAF) was introduced in 2007 under [Modification P207](#). In 2016/17 the BSC Panel agreed to a formal review of the PAF to ensure it continues to meet the challenges of a rapidly changing market and provide value to its stakeholders. Following engagement with a broad spectrum of stakeholders the following key themes are to be considered/addressed through the PAF review:

- Lack of risk focus;
- Lack of understanding of PAF effectiveness;
- Poor industry engagement;
- Neglect of Central Volume Allocation (CVA) risk;
- Issues with some key Performance Assurance Techniques (PATs);
- Data provision; and
- Smart Metering

Work on data provision and the identification, evaluation and mitigation of the potential risks associated with the rollout of Smart Metering has already commenced. Progression of this work stream can be found under [Issue 69](#) on the BSC website. ELEXON and PAF stakeholders are working together to understand industry concerns and identify possible solutions to issues raised. Where changes to the BSC are required to implement an improvement, we will raise these at the earliest opportunity.

To encourage engagement and improve understanding of the PAF processes we will provide regular updates through Newscast. A dedicated web page on the BSC website is due to be launched end of September. We are holding a Supplier Volume Allocation (SVA) Assurance Forum in late Autumn 2017. The day will include presentations on performance assurance activities with opportunities to discuss Parties and stakeholders ideas on future SVA-related changes.

12. Provision of HH MTDs

At the February 2017 Performance Assurance Board (PAB) meeting, ELEXON highlighted issues with the current process for reporting on missing Meter Technical Details (MTDs) and assessing whether Error and Failure Resolution (EFR) is required.

ELEXON noted that there were limitations in the current assessment process. Investigating deployment of EFR and working with Parties on EFR plans for these risks is not straightforward. This is largely down to the limitations from using Performance Assurance Reporting and Monitoring System data. As a consequence, obtaining a true and reliable picture of the data and the issues takes considerable time for both ELEXON and impacted Parties. Parties have raised concerns with ELEXON around misreporting and inclusion of non-Settlement impacting scenarios within reporting, and time and resource being spent on investigations that are not causing genuine Settlement issues.

To assess compliance with the transfer of MTDs following a Change of Agent, ELEXON undertook independent analysis from its database of data flow communications. This analysis highlighted a subset of participants who display a greater proportion of failures to provide MTDs. ELEXON subsequently agreed to undertake a series of targeted Technical Assurance of Performance Assurance Parties (TAPAP) checks on this subset of participants to determine the root causes of missing MTDs and to determine whether EFR is required. The first tranche of checks would take place during Quarter 4 2017.

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Following the TAPAP check, ELEXON will:

- Review the Settlement Risk ratings;
- Review existing performance standards;
- Consider if and when future TAPAP checks to address missing MTDs are required;
- Review the BSC Audit market/audit issues and findings of the TAPAP check to ensure the Performance Assurance Techniques are aligned; and
- Review the ratings provided by the BSC Auditor if required.

Further details of the review can be found in PAB paper [PAB197/14](#).

13. Proving tests in CVA market

The BSC Auditor raised concerns that proving tests in the Central Volume Allocation (CVA) market are not being undertaken in all instances. Some CVA MOAs suggested there was some ambiguity with respect to certain proving test scenarios and when documents need to be sent in.

ELEXON has raised a change to BSCP502¹³ (Change Proposal (CP)1491 'Lack of clarification surrounding the timeliness of proving tests and documentation for CVA MOA'). This should help clarify when a proving test needs to be completed.

Once CP1491 has been implemented (expected February 2018) ELEXON will consider the undertaking a TAPAP check to evaluate CVA MOAs performance in undertaking proving tests in all required scenarios.

14. Measurement Transformer Calibration Certificates

Each Code of Practice (CoP) requires measurement transformers calibration certificates be made available to the TAA for review at a TAA inspection where the HH Metering System is not an Low Voltage installation, installed with class 0.5 Current Transformers or better. Calibration certificates may be necessary to compensate the Settlement Meter to account for equipment errors to achieve or improve Metering System overall accuracy.

During 2016/17 the TAA recorded 665 non-compliances related to calibration certificates not provided or incorrect. This compares with 516 in 2015/16. Root causes cited by the TAA were:

- Historical certificates cannot be sourced. i.e. they are no longer physically available and it is impossible to regenerate them; and
- For newly commissioned Meters robust processes are not being employed to ensure that certificates are retained and accessible for the full period they are required in the CoPs.

The commissioning TAPAP checks also identified issues with calibration certificates. Some Parties in EFR against the commissioning TAPAP check will be addressing any issues regarding the provision of calibration certificates.

A Workgroup was created in July 2017 to find alternatives to the certificates that provide the same level of assurance as the calibration certificates. The Workgroup will provide updates to the PAB as they become available.

¹³ Non-Half Hourly Data Aggregation for SVA Metering Systems Registered in SMRS.

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15. Review of the Balancing and Settlement (BSC) Audit scope

ELEXON has proposed that a revised audit scope be implemented as an interim measure, ahead of the outcomes of the Performance Assurance Framework (PAF) Review in relation to the BSC Audit. The revised document will focus only on key risk areas with the greatest potential for significant material impact on Settlement.

The aim of the review is to assess the BSC Audit Scope and the assurance provided by the BSC Auditor in its current format. It is intended that the reviewed scope will bridge the gap between the end of the 2017/18 audit and the full re-procurement exercise to be undertaken post PAF Review. The BSC Audit Scope and BSC Audit assurance arrangements have been fairly static since the BSC Audit's initial implementation. ELEXON will take this review as an opportunity to consider whether the current arrangements are still entirely appropriate and to ensure that the BSC Audit is responsive to changes in the BSC risk landscape.

Any changes proposed will be subject to industry engagement and will be presented again to the PAB and Panel for endorsement and approval respectively ahead of implementation.

FURTHER INFORMATION

[Balancing and Settlement Code Audit Annual Report](#)

[ELEXON's response to the BSC Audit](#)

[Technical Assurance Agent Annual Report](#)

[ELEXON's response to the TAA Annual Report](#)

If you have any questions or require further information on the Annual Performance Assurance Report, please contact:

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APPENDIX – SUPPLEMENTARY INFORMATION ON THE PERFORMANCE ASSURANCE TECHNIQUES

Performance Assurance Techniques (PATs) deployed in 2016/17

Sixteen PATs are at the disposal of the Performance Assurance Board to use to identify and/or mitigate risk. Full details on all the PATs can be found in the document [Performance Assurance Framework Techniques Guiding Principles](#).

In this reporting year we deployed the following techniques to detect risk to Settlement:

- Performance Monitoring and Reporting – Applied monthly, monitoring performance at key points in the Settlement process to provide assurance that Parties and Party Agents are meeting Balancing and Settlement Code (BSC) requirements.
- Material Error Monitoring – Applied on a monthly basis, monitoring data to quantify the contribution made by Parties and Party Agents to error and the impact of such error.
- BSC Audit – Applied annually, reviewing systems and business processes of Parties and Party Agents as well as the central Settlement systems to provide assurance that actions have been performed in accordance with the BSC and its subsidiary documents.
- Technical Assurance of Performance Assurance Parties – Applied annually and ad hoc, routine and targeted visits to ensure Parties and Party Agents continue to meet BSC requirements.
- Technical Assurance of Metering Systems – Applied annually, sampled and targeted visit by The Technical Assurance Agent (TAA) to sites with Half Hourly (HH) Metering Systems to monitor the compliance of the systems with the BSC requirements.

To help Parties resolve issues impacting Settlement we deployed:

- Error and Failure Resolution – Applied to Parties and Party Agents failing to meet performance standards, providing structured and managed framework for the rectification of Party and Party Agents issues against obligations and standards prescribed in the BSC/and or identified by PATs.
- Change Mechanism – Applied ad hoc, making changes to the BSC to correct areas of weakness or defect.
- Supplier Charges – Applied monthly, charges to Suppliers for failing to meet performance standards set out in the BSC which are then paid to compensate impacted Parties.
- Trading Disputes – Applied ad hoc to correct identified Settlement errors.

To help prevent Parties from posing risks to Settlement we deployed:

- Education – Applied to new entrants and on an ad hoc basis, providing guidance on common market issues and providing support and guidance regarding the BSC arrangements.
- Qualification – Applied to Parties and Party Agents wishing to participate in the electrify market, provides assurance that new organisations entering the market have developed their systems and processes to an appropriate standard to meet their obligations under the BSC.

To incentivise Parties to meet their Code obligations we deployed:

- Breach and Default – Applied ad hoc to Parties for persistent or material breach of the BSC. May result in suspending the right of the Party to participate in energy trading or expelling the Party from the BSC.
- Peer Comparison – Applied monthly, the publication of named peer comparison data to Trading Parties and on the BSC website.

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BSC Audit

The 2016/17 BSC Audit was unqualified. This means that the level of error detected was below the 1.3TWh threshold. Key issues raised include:

- Proving tests not being performed and/or communicated;
- Incomplete or delayed provision of Meter reads and meter technical Details (MTDs);
- Metering System faults not resolved;
- Backlogs of HH/Non Half Hourly (NHH) Data Aggregation Exception Reports;
- Volumes of large Estimated Annual Consumption/Annualised Advances;
- Long Term Vacant process; and
- NHH Standing Data flow and Meter reading backlogs.

The BSC Auditor closed two existing market issues (Quality of HH MTDs and lack of clarification over proving tests in the Supplier Volume Allocation market) and raised two new market issues (Supplier hub interaction with other BSC Agents and Outstation passwords not communicated).

ELEXON's full response to the BSC Audit opinion is in the PAB paper [PAB198/07](#).

Breach and Default

During 2016/17 three Parties were in breach of the BSC for non-payment of BSC charges. Two were expelled from the BSC for non-payment and one rectified payment and cleared the Default process.

Education

During 2016/17, we provided the following performance assurance related training/educational days:

- 2 Technical Assurance of Metering educational sessions;
- 5 Performance Assurance Framework educational sessions;
- 15 Performance Assurance Reporting and Monitoring System educational sessions; and
- 1 Trading Disputes educational session.

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Error and Failure Resolution (EFR)

The total number of EFR plans in place during 2016/17 was 106. 31 plans were closed during the period and 75 remain ongoing after the period ended. The total number of new plans put in place during 2016/17 was 63.

| SR0022¹⁴ Quality of MTDS | Number of plans | Number closed during period | Number ongoing after the period ended. |
|--|------------------------|------------------------------------|---|
| EFR turned on before APAR period and open during the period | 1 | 0 | 1 |
| EFR turned on during the APAR period | 0 | 0 | 0 |
| Total: | 1 | 0 | 1 |
| SR0024¹⁵ Missing NHH MTDS | Number of plans | Number closed during period | Number ongoing after the period ended. |
| EFR turned on before APAR period and open during the period | 3 | 0 | 3 |
| EFR turned on during the APAR period | 0 | 0 | 0 |
| Total: | 3 | 0 | 3 |
| SR0025¹⁶ Missing HH MTDS | Number of plans | Number closed during period | Number ongoing after the period ended. |
| EFR turned on before APAR period and open during the period | 1 | 0 | 0 |
| EFR turned on during the APAR period | 0 | 0 | 0 |
| Total: | 1 | 0 | 0 |
| SR0028¹⁷ Sending HH MTDS on changes to Metering System | Number of plans | Number closed during period | Number ongoing after the period ended. |

¹⁴ The risk that HHMOAs do not provide the correct Meter Technical Details to the HHDCs resulting in Meter readings being misinterpreted or not collected.

¹⁵ The risk that NHHMOAs do not provide Meter Technical Details to the correct NHHDCs resulting in Meter readings not being collected.

¹⁶ The risk that HHMOAs do not provide Meter Technical Details to the correct HHDCs resulting in Meter readings not being collected.

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| | | | |
|---|------------------------|------------------------------------|---|
| EFR turned on before APAR period and open during the period | 0 | 0 | 0 |
| EFR turned on during the APAR period | 0 | 0 | 0 |
| Total: | 0 | 0 | 0 |
| <u>SR0072</u>¹⁸ <u>Level of gross error</u> | Number of plans | Number closed during period | Number ongoing after the period ended. |
| EFR turned on before APAR period and open during the period | 5 | 2 | 3 |
| EFR turned on during the APAR period | 0 | 0 | 0 |
| Total: | 5 | 2 | 3 |
| <u>SR0074</u>¹⁹ <u>NHH energy settled on actual Meter reads</u> | Number of plans | Number closed during period | Number ongoing after the period ended. |
| EFR turned on before APAR period and open during the period | 12 | 5 | 7 |
| EFR turned on during the APAR period | 9 | 0 | 9 |
| Total: | 21 | 5 | 16 |
| <u>SR0081</u>²⁰ <u>HH energy settled on actual Meter reads</u> | Number of plans | Number closed during period | Number ongoing after the period ended. |
| EFR turned on before APAR period and open during the period | 7 | 2 | 5 |
| EFR turned on during the APAR period | 3 | 1 | 2 |

¹⁷ The risk that HHMOAs make changes to the Metering System and do not inform the HHDCs resulting in Meter readings being misinterpreted or not collected.

¹⁸ The risk that NHHDCs process incorrect Meter readings, resulting in erroneous data being entered into Settlement.

¹⁹ The risk that NHHDCs do not collect and / or enter valid Meter readings resulting in old/default data entering Settlement.

²⁰ The risk that HHDCs do not process valid HH readings resulting in estimated data being entered into Settlement.

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| | | | |
|---|------------------------|------------------------------------|---|
| Total: | 10 | 3 | 7 |
| Commissioning non-compliances detected through TAPAP²¹ | Number of plans | Number closed during period | Number ongoing after the period ended. |
| EFR turned on before APAR period and open during the period | 13 | 2 | 11 |
| EFR turned on during the APAR period | 8 | 0 | 8 |
| Total: | 21 | 2 | 19 |
| Non Compliances Identified through Supplier Migration monitoring | Number of plans | Number closed during period | Number ongoing after the period ended. |
| EFR turned on before APAR period and open during the period | 1 | 0 | 1 |
| EFR turned on during the APAR period | 9 | 1 | 9 |
| Total: | 10 | 1 | 9 |
| Missing auxiliary MTD flows or missing passwords following TAPAP checks. | Number of plans | Number closed during period | Number ongoing after the period ended. |
| Total: | 12 | 2 | 10 |
| BSC Audit issues | Number of plans | Number closed during period | Number ongoing after the period ended. |
| Total: | 22 | 16 | 6 |

Table 3: EFR plans

²¹ Technical Assurance of Performance Assurance Parties.

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Qualification

During 2016/17, the PAB considered and approved 97 role-specific applications. The majority of Suppliers (70) were brought through by consultancies as 'off the shelf' Suppliers. There were no applications for re-Qualification and no Removal of Qualification events in 2016/17.

| Roles | Qual 2015/2016 | re-Qual 2015/2016 | Qual 2016/2017 | re-Qual 2016/2017 |
|---|----------------|-------------------|----------------|-------------------|
| Supplier Meter Registration Agent (SMRA) | 1 | 0 | 2 | 0 |
| Unmetered Supplies Operator (UMSO) | 1 | 0 | 2 | 0 |
| Half Hourly Data Collector (HHDC) | 0 | 1 | 0 | 0 |
| Non Half Hourly Data Collector (NHHDC) | 0 | 0 | 0 | 0 |
| Half Hourly Data Aggregator (HHDA) | 0 | 1 | 0 | 0 |
| Non Half Hourly Data Aggregator (NHHDA) | 0 | 0 | 0 | 0 |
| Half Hourly Meter Operator Agent (HHMOA) | 9 | 0 | 6 | 0 |
| Non Half Hourly Meter Operator Agent (NHHMOA) | 8 | 0 | 14 | 0 |
| Central Volume Allocation Meter Operator Agent (CVAMOA) | 0 | 0 | 0 | 0 |
| Supplier (NHH/HH) | 62 | 0 | 73 | 0 |
| Meter Administrator (MA) | 0 | 0 | 0 | 0 |
| Total | 81 | 2 | 97 | 0 |

Table 4: Qualifications and Re-Qualifications

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Supplier Charges

The total value of uncapped Supplier Charges in 2016/17 was £21,686,907 compared with £13,529,894 in 2015/16. We provide a breakdown of these charges below.

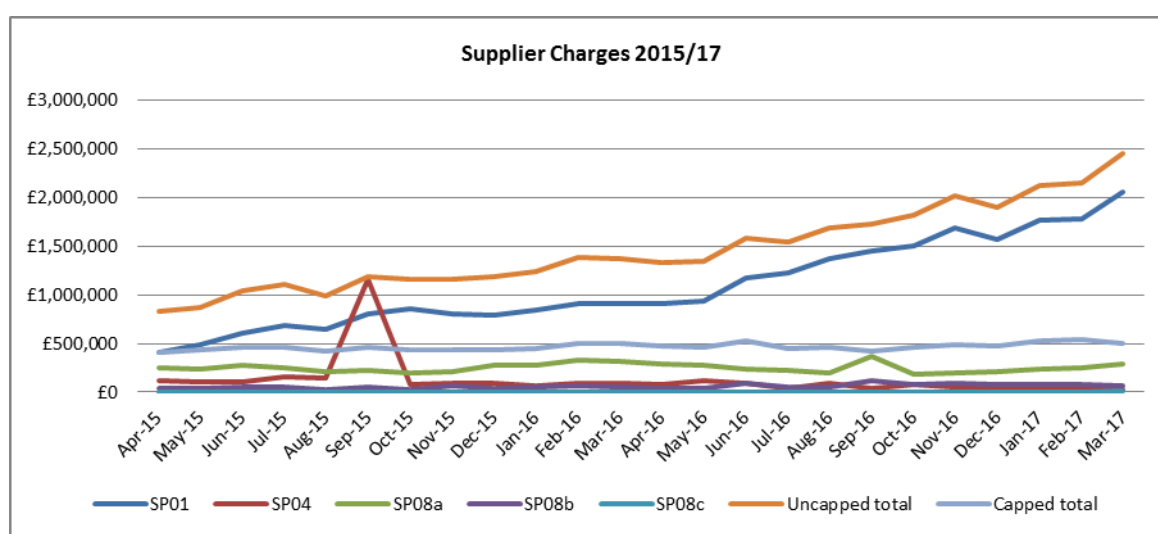
SP01 is related to the non-delivery of routine performance logs or 'Serials'

SP04 is related to the installation of HH Metering

SP08a is related to percentage of energy on Annual Advances and Actual Readings R3 to RF

SP08b is related to percentage of Half Hourly Energy settled on actual Meter readings at SF and R1

SP08c is related to failure to settle specified percentages of energy on Annual Advances and Actual Readings



| Date | SP01 | SP04 | SP08a | SP08b | SP08c | Uncapped | Capped |
|---------|-------------|------------|------------|----------|---------|-------------|------------|
| 2016/17 | £17,443,056 | £736,550 | £2,976,556 | £861,036 | £22,845 | £21,686,907 | £5,785,212 |
| 2015/16 | £8,746,348 | £2,307,619 | £3,063,776 | £561,874 | £2,788 | £13,529,894 | £5,413,403 |

Table 6: Annual Supplier Charges

Technical Assurance of Metering Systems

The TAA audit findings highlighted four issues which are impacting the health of the markets:

- Lack of Commissioning and Commissioning Records
- Measurement Transformer Calibration Certificates
- HH Metering Equipment Failures
- Half Hourly Data Collector (HHDC) Documentation Errors

ELEXON's full response to the TAA Audit findings is in the paper [PAB197/17](#).

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Trading Disputes

Disputes raised

The overall number of Trading Disputes raised during 2016/17 was 48 compared to 38 in 2015/16. Of the 48 Trading Disputes raised, 44 related to Supplier Volume Allocation (SVA) sites and 4 related to Central Volume Allocation (CVA) sites.

Disputes upheld

In 2016/17, Trading Dispute Committee (TDC) upheld 21 Trading Disputes and rejected 1 dispute on the grounds of 'no Settlement error'. ELEXON closed 2 Trading Disputes, both on the grounds that a) there was 'no Settlement error', and b) they did not meet the materiality threshold.

Disputes under investigation

There were 24 Trading Disputes remaining open, under investigation at the end of 2016/17.

Time taken to resolve disputes

The average resolution time for Trading Disputes in 2016/2017 was 3.4 months.

Root causes and materiality

The table below shows the root causes and the level of materiality of the Trading Disputes upheld in 2016/17.

| No. of disputes | Root causes | SVA | CVA | Materiality |
|-----------------|---|-----|-----|--------------------|
| 1 | Incorrect non-zero recording of energy for de-energised Meter | | Y | £23,600,000 |
| 2 | Erroneous submission of data by DA | Y | | £2,152,356 |
| 8 | Incorrect MTDs | Y | | £546,230 |
| 6 | Incorrect programming of Meter causing under/over recording of energy | Y | | £368,238 |
| 2 | Reversed CTs - incorrect recording of import/export energy | Y | | £35,634 |
| 1 | Submission of erroneously large EAC/AA | Y | | £6,200 |
| 1 | Phase failure | Y | | £0 |
| Total 21 | | | | £26,708,657 |

| TD Root causes | No. of disputes | Root causes | SVA | CVA |
|------------------------|-----------------|---|-----|-----|
| Other CT issues | 1 | Closed CT links - incorrect non-zero recording of energy for de-energised Meter | | Y |
| Data aggregation issue | 2 | Erroneous submission of data by DA | Y | |
| Incorrect MTDs | 8 | Incorrect MTDs | Y | |
| CT mismatch | 6 | Incorrect programming of Meter causing under/over recording of energy | Y | |
| Other CT issues | 2 | Reversed CTs - incorrect recording of import/export energy | Y | |
| data estimation issue | 1 | Submission of erroneously large EAC/AA | Y | |
| Phase failure | 1 | Phase failure | Y | |

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| | | | |
|-------|----|--|--|
| Total | 21 | | |
|-------|----|--|--|

Table 7: Trading Disputes root causes

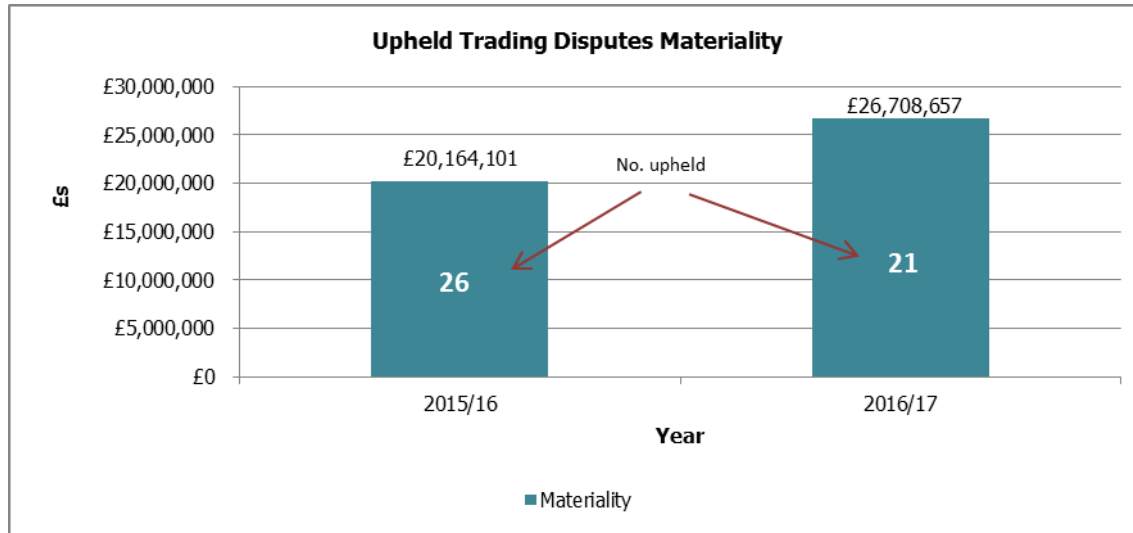


Chart 8: Materiality of Trading Disputes

The chart above shows the level of materiality and number of trading disputes raised in 2015/16 and 2016/17.