Data Management Status Report

December 2021

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Foreword

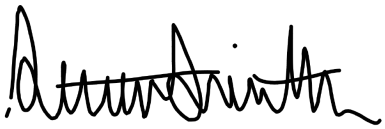
Maintaining and providing accurate data to the non-household retail market is essential for efficient market operations, positive customer experiences and reduced frictions for market participants. Poor data quality is an industry-wide concern and there is considerable focus from both Ofwat and MOSL on the need to improve data quality across the market.[1]

In that context we have committed to publish a report providing an overview of our progress and challenges, our data management processes, and our approach. We review our current performance, outline our improvement roadmap and how we are addressing a range of specific market data issues. This report will be updated annually so you can follow our progress in the key areas we identify. Our aims are to reduce friction in the market and improve the quality of our services for customers and retailers. We hope the report will be a focal point and catalyst for conversations with customers and stakeholders to further drive improvements.

We acknowledge that aspects of our historic data performance have been below our high standards and Ofwat's recent investigation further underlined this.[2] In particular, the accuracy of some of the data that we introduced into the market when it opened in 2017 should have been better. We have now rectified these issues and have embarked on a journey to achieve a step change in performance. We believe that by sharing this journey and our learnings along the way we will be able to help both MOSL and the industry achieve shared data quality aims.

There are some positive signs of progress and performance reflected in improvements in some key metrics which are explored in detail in section 3. We recognise that we have much further to go but are pleased that these metrics indicate we are moving in the right direction. However, there remain issues and areas of underperformance that we must focus on.

We will continue to seek feedback from our customers, retailers and MOSL about how we can improve data quality through our operational channels, ongoing engagement and industry discussions. We look forward to continuing to work with all market participants to drive improvements in customer and operational data to support the healthy functioning of the non-household (NHH) market.



Stuart Smith
Director of Wholesale Services

[1] The poor quality of data has been highlighted as being one of the main sources of market friction by both Ofwat and MOSL.
Ofwat (August 2020), State of the market 2019-20: Review of the third year of the business retail water market - Ofwat
[2] Ofwat (December 2021),
Notice_Ofwats_Decision_Financial_Penalty_Thames_Water_Utilities_Limited.pdf

Introduction

This report is the first of a series of annual reports that will provide an overview of our approach to non-household (NHH) data health, our current performance, and our plans to improve data quality performance.

This report is broken down into the following sections:

- Section 1 summarises our Data Management Framework. It then discusses how we handle more specific data issues and our prioritisation criteria which is brought to life through our 'Data Issue lifecycle'.
- Section 2 discusses recent improvements made to strengthen our Data Management Framework and to improve performance of specific data issues.
- Section 3 summarises and comments on our current performance. This section looks at data from a range of sources including MOSL's Data Quality Dashboad, Market Performance Standard (MPS) SLAs, the data quality component of the Retailer Measure of Experience (R-MeX) survey, complaints and escalations and our internal measures.
- Section 4 sets out our planned improvements to our Data Management Framework and specific data issues.
- Section 5 provides concluding remarks and contact details for any reader who wishes to engage around data issues.

1. Our approach to Data Management

Addressing market data issues and opportunities is a core part of our service performance and service quality approach. Data issues are an intrinsic and embedded part of our property and metering related processes and services supporting the registration of eligible premises in CMOS.[3] We won't achieve lasting improvements without seeking to constantly improve the day-to-day management and performance of their delivery.

This section outlines our approach to data management, comprising six 'pillars' of our Data Management Framework illustrated in figure 1 below. Ultimately, we need to succeed in each of these pillars to continue to manage our data effectively. In this section we briefly describe the elements of our quality and service delivery approach with reference to these six pillars. Underpinning and driving this framework, is a focus on continuous improvement, as we recognise that we must always strive to be a more effective provider and partner to our customers, retailers and other market participants.

Figure 1: Thames Water's Data Management Framework

[3] CMOS stands for the Central Market Operating System and is the core IT system for the non-household market. CMOS holds data about all the business customers in the business retail market and is used to enable switching between retailers and for the calculation of the financial settlement between wholesalers and their retailers.

1.1 Leadership and Governance

To achieve sustained success on our data improvement journey we need senior sponsorship and engagement backed up by effective governance. This will ensure sufficient oversight when making key decisions and will provide a focus on data concerns when prioritising our investments, operations and project portfolio.

In pursuit of improvements during 2021 we have taken steps to:

- Further clarify senior management and Executive accountability for data issues and improve visibility and authority for the identification and resolution of issues via the recruitment of a new role: 'Head of Data Insights'. This role will be the senior accountable individual for identifying and driving household and non-household property and meter data improvements. This has been supported by further clarification at the Executive level where our retail director has accountability for the accuracy of Customer, Meter and Property data.
- Review our existing performance management frameworks to identify opportunities to further embed data discussions and measures into cornerstone NHH meetings such as the monthly Market Performance meeting which reviews Operational Performance Standards (OPS) and Market Performance Standards (MPS) with accountable deliverers. Standing agendas and Terms of Reference have been updated and new data meetings have been proposed to drive enhanced data focus and visibility, bringing data measures alongside other business performance metrics.
- Continue to learn from the issues highlighted by Ofwat at Retail market opening. As one example, we have established an external review of how we deliver large business change projects (scheduled to conclude in December 2021) which we expect to identify recommendations to strengthen data governance and controls in relation to major data migration projects.

1.2 Operating Model

We have organised ourselves in a way that ensures that data quality can become an increasingly critical focus of day-to-day operational service delivery, while also ensuring that we have dedicated data management expertise focused on identifying data challenges and opportunities across our business to drive the continuous improvement of our processes.

Our service teams, for example our metering team, deliver services on a day-to-day basis and have a manager that is accountable for delivering this service effectively and efficiently through their operational processes. Being accountable for delivering a service specifically includes being accountable for the processes and the data they generate/require for effective service outcomes. To embed this accountability further, we continue to develop data quality metrics around individual services, against which our delivery teams will be held to account. This is discussed further in section 4 which looks at our planned improvement roadmap.

Operational service delivery teams are supported by:

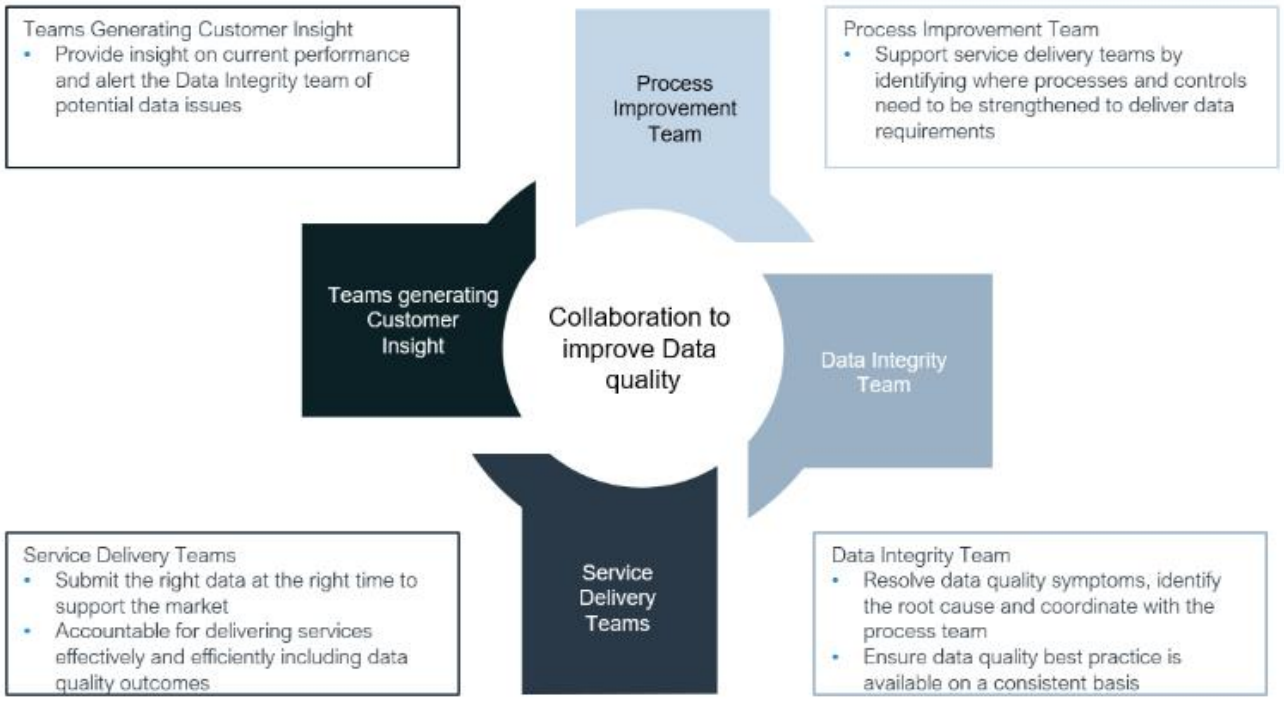
- Data Integrity and Process Improvement teams who work to strengthen our processes and ensure that we have the appropriate controls in place to deliver data and broader service requirements. Our specialist Data Integrity team also acts as a data management centre-of-excellence for the business – driving improved understanding of market data requirements and linking in with MOSL's data improvement initiatives. They take the lead on resolution of

legacy issues and current data symptoms while holding service delivery managers to account for poor data quality in day-to-day processes; and

- Customer insight functions – for example our account management and complaints teams help us understand what our customers tell us is working and, more importantly, what is not. We seek to engage with our customers to address specific data issues as well as to understand their broader priorities and the impacts of poor data on their organisations.

In this way our teams support each other to continuously improve the quality of our data and related processes and services, as illustrated in figure 2 below.

Figure 2: Collaboration Model to improve data quality



1.3 Culture and Capability

We are establishing a data focused culture that promotes a focus on data quality and service improvement, whilst upskilling our workforce to continuously enhance our data management performance. We are doing this by recruiting the right talent with the appropriate expertise in data management into clearly defined roles, building internal capability to ensure effective data quality compliance, and having effective engagement around data issues across our teams.

Since 2017, we have insourced and expanded the Data Integrity team to ensure that we have the appropriate internal capability and subject matter expertise. This has been coupled with the recruitment of specialist data architecture roles (in business change and digital teams) to better support the design and delivery of changes to market data flows. Finally, the organisational opportunities created by the recruitment of the Head of Data Insights role in November 2021 will bring together expertise from a range of teams to provide greater insight and drive for improvements.

Generating engagement and building understanding so individuals are focused on data quality and their role in impacting it will be a continuous focus for our business. There is more to be done in each of these areas, but we are confident that through implementing our initiatives in our roadmap detailed in section 4, and by equipping our teams with the right information, skills and support, we are on our way to establishing an improved and sustained data quality culture.

1.4 Processes & Controls

Continuously improving our processes and controls for effective data management is an ongoing priority. As well as managing the risks of poor quality data our control framework can help deliver efficiency, improved data correction service level performance and better customer outcomes.

The three key elements for ensuring that our processes & controls will deliver our data improvement outcomes are:

- understanding and managing the risks that follow from incorrect data outputs for each of our key processes leading to updated CMOS property and meter data
- ensuring accountability and responsibility is appropriately allocated and agreed for all processes (including any aspects that relate to data)
- having understood the risks - to establish any new or improved controls to:
    - establish new performance metrics (and business owners for those metrics)
    - agree management sign offs for high-risk data quality transactions
    - identify process automation opportunities to reduce manual handling errors
    - increase the intensity and effectiveness of routine quality monitoring
    - drive increased efficiency and customer service from getting data right first time and keeping it up to date

Our improvement plans in section 4 addresses each of these three elements. For example, one of our planned activities for 2022 is to document and review the risks and controls for key market data updates.

During 2021, we have taken steps to strengthen and document our approach to data investigations and reviewed the governance of decisions to implement data fixes. We have implemented a new documented and change controlled methodology which provides greater assurance and rigor for any data investigation and better enables our compliance with the requirements of CSD105 governing updates of data errors to CMOS. In particular, SLA requirements to update CMOS following our determination or assurance of the correct data to upload and/or our agreement to make changes with other trading parties. Compliance is being demonstrated by the introduction of more formal gateways to confirm valid data for update and appropriate consultation.

1.5 Insight

We gather, analyse and compare both internal and external data sources to build a comprehensive picture of our current data performance and specific data issues. These datapoints include the following sources:

- MOSL Data Quality Dashboard
- Market Performance Standards (MPS) SLAs

- Retailer Measure of Experience (R-MeX) Data Scores and Qualitative feedback
- Internal Measures e.g. Meter asset benchmarks and feedback from field teams
- Complaints and Escalations data
- Market transaction rejections and exceptions generated by end-to-end performance and system interdependency monitoring
- External data sources and products to enhance our property data such as Address Base Premium an Ordnance Survey product which provides property data validation and property lifecycle information.

These data points act as triggers to initiate data investigations via our 'Data Issue Lifecycle'. This approach helps us to identify and resolve data issues in a consistent and controlled manner. A data issue is often a symptom of a deeper-rooted issue within a business process or evidence of a gap within current processes. The steps within our 'Data Issue Lifecycle' help us to see beyond data symptoms to root causes so that we can resolve, or establish, these underlying processes to deliver sustainable improvements. More information on the 'Data Issue Lifecycle' and how it helps us move from insight to action can be found in figure 3 at the end of this section.

These datapoints are discussed further in section 3 where we provide an overview of our current performance.

1.6 Technology and Systems

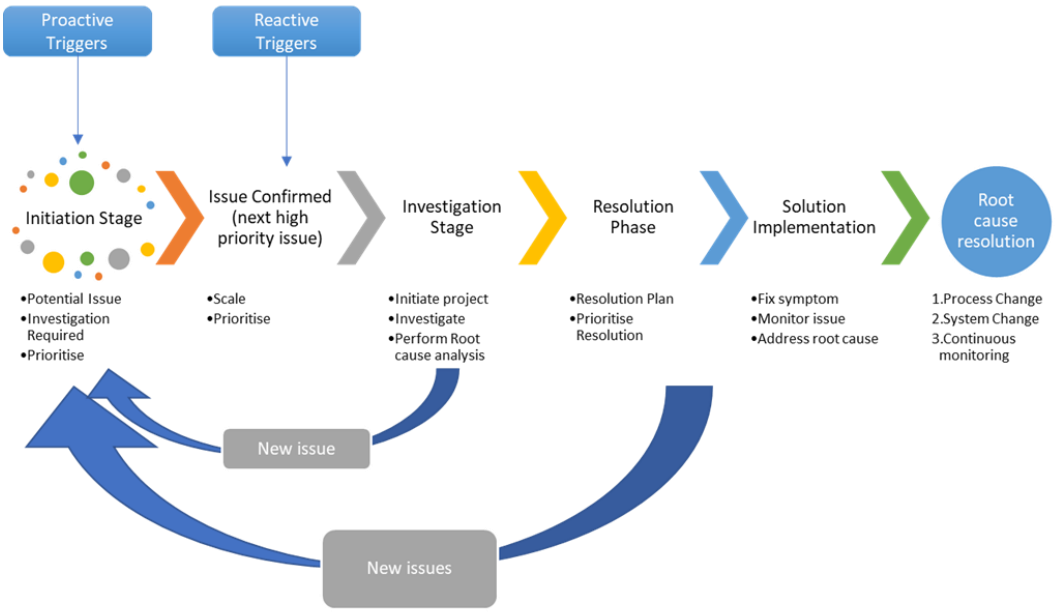
A central part of our approach involves deploying systems and tools that optimise our capability to gather and maintain accurate data, whilst being sufficiently configurable to allow us to respond quickly to market feedback.

During 2021 we replaced a legacy property and meter master data system holding all our NHH property and meter data with a new system that offers improved functionality to automatically validate our data. This will increase the efficiency of our day-to-day processes but also improves our accuracy by minimising the chance of human error. For example, from greater use of preventative controls in our systems when inputting data through drop-down box fields to limit user inputs to a list of simple correct options and exception/error reporting at source data input level.

During 2022 we plan to replace our current workflow applications with a new system further enhancing automation opportunities and the reduction of manual handling errors.

Figure 3: Data Issue Lifecycle

Our Data Integrity team manages identified data issues to resolution through our Data Issue Lifecycle approach. The key steps and activities are illustrated below:



Potential data issues are identified from two different sources:

- Reactive triggers – these are primarily external and come from complaints, direct queries from retailers, and insights from MOSL Data Quality dashboards
- Proactive triggers – these triggers are primarily internal such as our meter asset data reconciliations, market transaction monitoring and quality checks

Once an issue is identified it is prioritised for action according to the criteria or principles summarised in the table below. More details behind these principles are discussed in Section 2.2.

Criterion	Higher Weighting	Lower Weighting
Charge Impact	Overcharge	No Charging/Undercharge
Compliance	Risk of compliance issue	No compliance issue
Scale	Growing due to issue in BAU processes	Fixed in size/One-off
Complaints	Complaint raised	No complaints identified

As an issue moves through the various stages its prioritisation is repeatedly reviewed. This is because a single issue can reveal multiple issues and/or require multiple solutions each requiring their own prioritisation.

Our approach seeks to resolve the root cause of data issues not just the symptoms. In solution implementation, we address the symptom frequently through data updates. As root cause solutions often take longer to implement, this stage also includes implementing a process to monitor an issue until a permanent fix to the root cause is established.

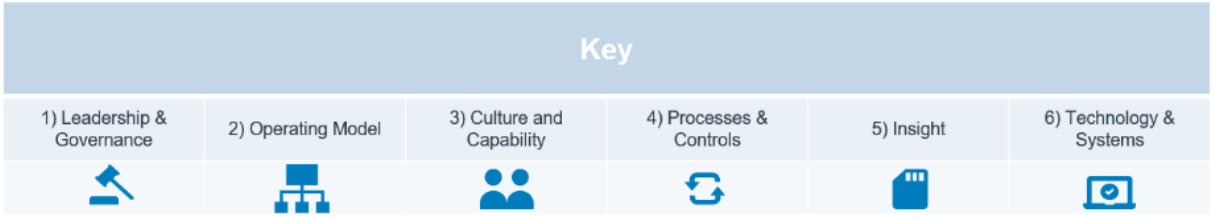
2. Overview of recent improvements

This section provides an overview of a range of recent performance improvements we have recently implemented. In Section 2.1 we summarise changes which have strengthened our grip on overall data management performance. In section 2.2 we summarise changes made to specific data items and the principles or criteria we currently adopt to prioritise resolutions.

2.1. Recent improvements to our overall data management approach

Details of the initiatives and their benefits are articulated in table 1 below:

Table 1 – Completed Improvement Initiatives



Initiative	Description	Reason for focus	Framework Pillar
Recruitment of new 'Head of Data Insights' role and clarification of Exec responsibility for property and meter data	A new 'Head of Data Insights' role has been recruited as part of the Wholesale Services Directorate to oversee both household and non-household property and meter data.	The recruitment of this role and clarification that the Director of Retail is responsible for Thames' property and meter data strengthens our focus on data and provides a focal point and increased authority for driving improvements.	
Developed and implemented a standard investigation methodology for non-household data quality complaints and issues	This methodology details the minimum standard for all non-household market data investigations. It standardises our approach whenever a data issue is investigated, including in response to a customer or retailer's complaint, to ensure a rigorous and consistent approach is undertaken. The methodology details respective roles and responsibilities and governance over decisions to implement data fixes.	The methodology ensures that each investigation is consistent and has sufficient rigour focusing on understanding the root cause of data issues rather than merely the symptom. It enables a greater focus on meeting governance and service level obligations in CSD105 by establishing internal gateways to confirm investigations are complete and data solutions uploaded to the market are of assured quality and have been subject to appropriate consultation.	

Initiative	Description	Reason for focus	Framework Pillar
Replaced legacy systems containing meter and property information with a new updated system	In September 2021 we replaced legacy systems which master our NHH property and meter data and trigger CMOS updates.	Our new system offers improved functionality which better enables process automation and data quality controls. This improves the efficiency of our day-to-day operations and reduces the risk of human error when making data updates.	 
Strengthened management controls of transaction flows to CMOS and built frontline ownership for performance	As part of the new system rollout, we reviewed and strengthened controls over the management of transaction flows from master systems through to CMOS. New exception and rejection reports were introduced to highlight data issues at source.	During 2021, our frontline teams took ownership of this monitoring and responsibility for improving performance to better prevent incorrect data reaching the market. Previously reporting was carried out by the Data integrity team but they were not responsible for the performance.	  
External audits of our data management approach	As part of our Ofwat undertakings we agreed to two external audits to help identify further opportunities to improve our management of data issues in day-to-day operations and major change projects. We will receive the findings of the audit around major change projects in December 2021.	To identify targeted improvements to our processes and controls that will be reviewed and implemented as part of our improvement plan. The key improvements from the audit of our management of data issues are listed in section 4.1 which lists our planned improvements.	
Rollout of an intelligent meter data assistant 'Blicker'	Our metering operations have implemented an intelligent meter data assistant to scan photos of new meters and reject the photo into corporate systems if the meter data cannot be read or does not meet required data standards.	The use of technology establishes a quality gateway to ensure assured data is fed into digital applications following the physical activity to install the meter. Over 20,000 new meters, installed by Thames in November 2021, benefitted from this approach.	

2.2 Improvements to specific data issues

For the specific data issues listed below in table 2 we have:

- Successfully implemented a range of specific data resolutions as well as implemented process changes to address root causes; and

- Established rigorous monitoring for those areas that are awaiting a permanent root cause resolution fix. This allows us to track and efficiently address any subsequent data issues that arise whilst we continue to resolve the true root cause.

As we gain a greater depth of understanding of our data issues, either through investigation or resolution, this can lead to the identification of further issues that need to be addressed. For instance, addressing specific meter asset data issues such as serial numbers may reveal other issues with the physical size of the meter when we cross reference this serial number with the original manufacturer details.

Table 2 – Recent Improvements to specific data issues[4]

Description	Issue Description	Actions taken to address root cause
Return to Sewer (RTS) – Pre-Market Issues	• Following initial meter data uploads for market opening, some RTS values, which would have reduced waste volumes, were incorrectly overwritten as a result of a data refresh in preparation for market opening. • Other meters were uploaded with the incorrect RTS values. • This resulted in incorrect volume calculation for the waste supply point identifiers (SPIDs) and in turn wrong charges being applied.	• Issue has been identified as one-off resulting from market opening data migration and controls. • We have reconciled all pre and post market allowances and are taking steps to strengthen project governance. • We have taken steps to strengthen the consistency and depth of our data investigations which did not initially identify all issues.
RTS – Loss of RTS following a Meter Exchange	• For exchanges performed via two-step meter exchange transaction sequences, one to remove the old meter and the other to install the new meter, the systems did not transfer RTS allowances from the old meter to the new.	• Identified as a systemised process issue. • We introduced a system change to transfer previously agreed allowances to new meters.
Surface Water Drainage (SWD) Allowance – Pre-Market Issues	• Following our initial tariff uploads in preparation for market opening, updates to SWD information which continued to be applied to our source systems during shadow operations were not reflected in the market.	• Issue has been identified as a one-off resulting from market opening data migration and controls. • We have reconciled all pre and post market allowances and are taking steps to strengthen project

[4] Whilst some of this activity occurred prior to 2021, the data cleanses or root cause resolution for all items listed here all continued into 2021

Description	Issue Description	Actions taken to address root cause
		governance and our data investigations.
Business assessed service component review	• A pre and post market reconciliation of our business assessed properties revealed a difference on multiple properties.	• Identified as one-off issue, resulting from market opening data migration and controls. • Established a process with the retailers to update the charges based on latest information.
SPIDs in partial status (i.e. not tradable)	• A MOSL report showed a number of SPIDs remained in partial state, i.e., not reaching tradable status in a timely manner. This issue resulted in SPIDs not charging.	• System and BAU processes were determined to be causing delays in transactions reaching the market. • We have introduced a monthly monitoring process to unlock any identified issues while ongoing work continues to strengthen processes overall.
Failed meter exchanges resulting in two meters registered in the market instead of one	• When a meter exchange is performed via two separate transactions, any failed removal of old meter, followed by a successful meter install of the new meter, results in two active meters in the market	• Issues caused by the use of a two-step meter exchange transaction sequences where a new meter was added before the exchanged meter was removed. • Weekly monitoring in place to unlock any failed exchanges whilst we continue to explore a long-term solution to perform one step meter exchanges.
Meter Networks missing or not setup in CMOS	• Certain meter networks set up in our source systems were not reflected in the market.	• Issue identified with system design not handling sub meter exchanges correctly, resulting in a break of the meter network relationship. • We undertake a monthly review of meter networks to ensure timely corrective actions.
Meter Charge Size does not match the Physical Size of the meter	• Issue with newly exchanged or installed meters where the chargeable sizes are entered independently from the physical size, resulting in the charge sizes to be different to	• Issue identified with BAU processes. • Monthly monitoring of newly installed meters is in place to correct any newly introduced errors.

Description	Issue Description	Actions taken to address root cause
	the physical size in certain cases.	• A review of legacy data is in progress, supported by the meter asset data reviews described in section 3.
Frequency of Meter readings incorrectly setup in the market	• Meter read frequency in the market appearing as bi-annual instead of monthly and vice versa resulting in meters being read less or more frequently than required.	• Issue caused by BAU processes and market rule ambiguity/differing retailer interpretations. • One off-changes made during 2021 with a change deployment planned for Jan 2022 to update read frequencies daily.
Inaccurate Internal / external meter locations in CMOS.	• The flag to identify if a meter is installed internally or externally is sometimes captured inaccurately.	• Issue identified with BAU processes. • Regular monitoring in place.
Inaccurate Meter Manufacturer	• Meter manufacturer captured inaccurately in internal systems resulting in the wrong meter manufacturer being reflected in the market.	• Issue identified with BAU processes. • Regular monitoring in place.

Prioritisation Principles

As part of our BAU processes to monitor, investigate and rectify the data symptoms and underlying causes of data issues we assess the scale, impact and priority of the risks presented by all new issues identified. When we identify new data issues, we actively consider all the following risk factors in the round with issues being frequently reassessed as we learn more about the nature and causes of individual data issues. We are sharing our thinking in this area to test and seek your views as to whether we are adopting an appropriate approach.

Data risks and issues are not given an explicit 'score', the number of variables to consider makes this impractical. As such only the highest risks and issues are escalated and reported as part of our business unit and, if appropriate, corporate risk registers and assigned a risk score, but all issues are systematically escalated, assessed and reassessed and reviewed by Senior Management.

1. What is the potential scope and impact of the data issues on retailers?

- Is this an active and growing issue, with new data errors being generated by underlying processes?
- Is this a legacy issue with a fixed volume that is not increasing? We are likely to look to address active and growing issues before fixed issues.
- Is there the potential for a material operational impact on our retailers? For some issues we may need retailers' help with customer contact. High impact issues are likely to be prioritised to ensure a clear route to resolution.

2. Is there a customer charging concern?
    - Is the issue actively changing customers charges such they are likely to be seeing changes in bills?
    - Is this a longstanding issue such that although charges may not be correct there is no impact until we fix the issues? Active changes are often given higher priority relative to longstanding issues on the basis of the risk of customer contact and complaints.
    - Have issues increased or reduced charges? Addressing overcharging is often given higher priority relative to undercharges on the basis of the increased likelihood of negative customer experience.
    - Is there a pre-market risk such that charges were incorrectly changed at market opening? Anything identified with these characteristics is a very high risk factor.
3. Is there a compliance concern?
    - Issues which may give rise to Market Code or other compliance risks have a higher weighting than those that do not.
4. Have retailers or customers escalated or complained about the issues?
    - These issues are given higher weighting relative to issues without known impacts.

This approach and these principles govern the allocation of resources across business and digital teams to:

- Investigate issues
- Source and validate accurate data
- Design and implement data updates
- Identify root cause
- Design and implement root causes solutions

3. Our current performance

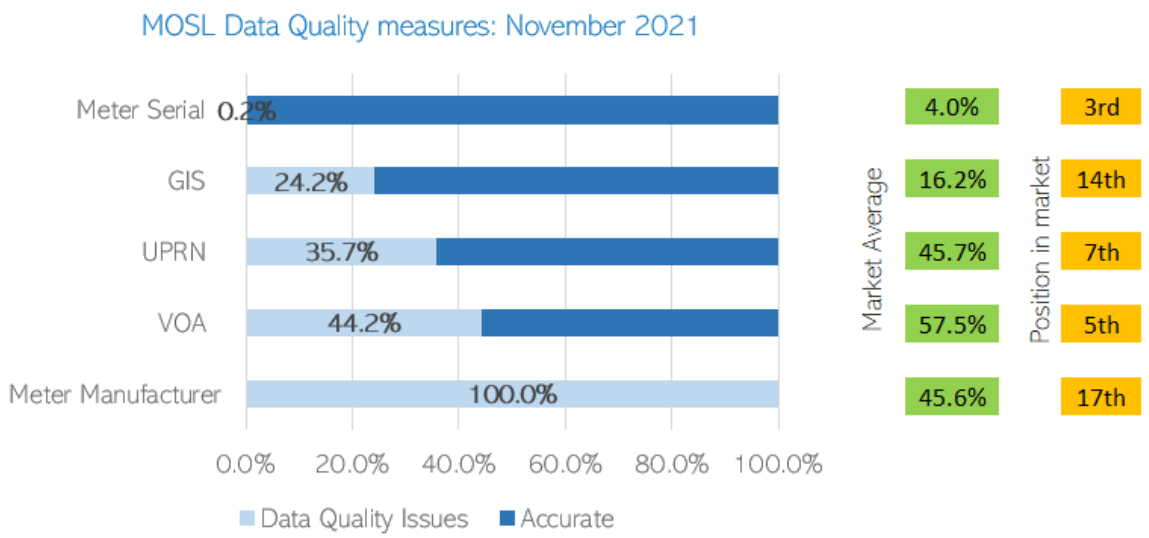
This section contains commentary on our current performance against a range of internal and external measures including MOSL Data Quality Dashboards, Market Performance Standards (MPS), R-MeX data scores and internal measures. Importantly, we also look at complaint performance data and summarise the key feedback and concerns raised by customers or retailers.

During 2021 there have been some positive signs of progress in both R-MeX (in terms of data quality scores) and MPS (in terms of timeliness). While encouraging, we can progress much further against these measures as well as responding to qualitative feedback from retailers and improving our relative position on MOSL's Data Quality Dashboard.

3.1 MOSL Data Quality Dashboard

Table 1 summarises Thames absolute performance against MOSL data quality measures as of November 2021 and our performance ranking as one of 17 wholesalers. The key metrics on the dashboard measure the percentage of our total data set assessed as having data quality issues.

Graph 1 – MOSL Data Quality Measures[5]



3.1a Meter Serial and Meter Manufacturer data quality

We currently rank 3rd in the Meter Serial field and have a quality performance of 99.8%.

Our high performance in this field is the result of routine activity to internally measure the accuracy of our meter asset data by comparing CMOS data against data from the meter

[5] The explanation as to why we are currently being reported as having issues with 100% of our meter manufacturer data is explored fully in 3.1a

manufacturer and rectifying the data when needed.[6] We discuss this further in a Case Study on pg18 of this report.

We are currently reported as having issues with 100% of our meter manufacturer data, we believe that the true value is closer to 2%.[7] Our reported performance is a consequence of our use of the full-length meter manufacturer name (including the exact make of the meter). For example:

- **Elster**_Meters_V100
- **Kent**_Meters_Helix_3000_HEL
- **Sensus**_Meters_SRD_II_/_SR_II

These three examples fail MOSL's 'close match' validation in approximately 98% of cases. The validation measure only looks for the information in **bold** and does not expect the additional data.

We believe the additional data should enable retailers to see which data loggers are compatible with our meters allowing them to offer a wider range of services to customers. However, we plan to engage with MOSL and our retailers in 2022 to clarify whether the additional data adds value (or not) and to consider changes in the light of the outcome of this engagement. We would welcome your views on this issue.

This case study below demonstrates how our performance in these measures is underpinned by internal metrics and controls.

[6] When we purchase a meter, we are provided with a record of its physical attributes including its physical size, serial number, make and number of dials. If any of this data is not accurately recorded in our systems, we can identify the discrepancy.

[7] On this previous MOSL metric we ranked 2nd out of the 15 wholesalers for the quality of our meter manufacturer data before the categorisation change.
MOSL (October 2020) Request for Information: Core Market Data Cleanse (mosl.co.uk) , pg26

Case Study 1

Our strong performance in meter serial data is underpinned by internal metrics and controls. We annually review the data quality of our meter base against an internal grading system to gain an understanding of the health of our meter base, displayed below in graph 2.

Graph 2 – Internal Review of Meter Asset Data Quality

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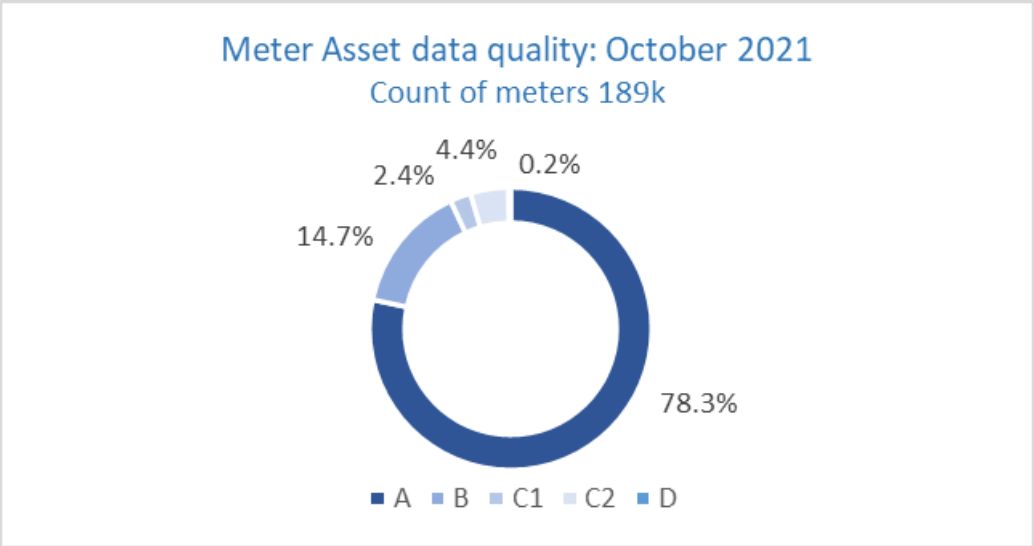

Each NHH meter in CMOS is checked and rated using the following internal grading system:

Grade	Meaning	Meter Standing Data Confidence Grade
A	The serial number in CMOS can be matched to a serial number provided by our suppliers and other asset details match.	Data is viewed to be correct based on this assurance, and no faults have been found.
B	The data formats for serial number, model, size and dials in CMOS match a known list of valid formats.	Data is probably correct but there is no direct check possible against supplier details. This is mostly applicable to older meter details
C1	The serial number in CMOS matches a supplier record but some other element (make, size, dials) does not mach.	The implication is that there is definitely an error for at least one meter asset attribute in the CMOS data.
C2	The serial number in CMOS does not match supplier data and also does not match a known data format	There is probably an error in the CMOS data or the meters is very old or of an unknown format.
D	The meter serial number duplicates at more than one SPID	Genuine duplicate meter serial numbers are very rare. The implication is that one or both of the serial numbers is incorrect.

As a result of this activity, we can also:

- Distinguish between data issues arising on new meters updated to CMOS as a result of 'new' processes, i.e., those put in place since Retail Market Opening, from legacy data issues generated by pre-market processes. This allows us to target root causes from data handling in our current market processes as well as tacking legacy meter issues;
- Use improvements in the accuracy of our meter manufacturer and serial data to cross-reference all meter asset data against the original manufacturer's data at purchase. In this way, by fixing issues with one data attribute (meter serial) we can uncover more data issues and fill in previously unknown information about meter sizing or the number of dials.

3.1b GIS or Meter location co-ordinates

Our improvement roadmap, discussed in section 4, summarises our planned performance improvements against this measure. We currently rank 14th with 24% of our data being classed as having data quality issues. We plan to significantly improve this so that by September 2022 we will have less than 3% of our meter base with validation issues.

Reasons for our current level of performance include:

- Providing a meter location which is identical to the property location coordinates, this is our largest validation failure;
- A large proportion of our meter base failing the above validation are internal meters. We believe there is an argument that in many cases a property location may be a sufficiently detailed geo location for an internal meter. We will continue to provide a meter specific location for internal meters while we seek further evidence to prove or challenge this hypothesis; and
- Legacy systems enabled only single property level co-ordinates to be captured in systems necessary to update CMOS. Our migration to SAP in 2021 has removed this constraint however monitoring of the accuracy of new meter updates shows we have further to go meet quality standard the first time a meter is updated to CMOS.

3.1c Property Data Issues

The key metrics for property data are the following:

- Unique Property Reference Number (UPRN)
- Valuation Office Agency (VOA)

As shown in graph 1, for VOA and UPRN we ranked 5th and 7th respectively and above the market average performance. Despite this ranking, feedback from our customers and MOSL's data strategy have highlighted the importance of these data items and we acknowledge a clear need for us to make significant improvements.

We have committed to improving our UPRN performance and so will seek to reduce this error percentage for UPRN from 35.7% to less than 8% by September 2021. We will target UPRN improvements initially over VOA data as we believe that complete and clean UPRN data is a key precursor to more accurate VOA data.

Our key UPRN challenges are:

1. The proportion of our property base without a UPRN record;
2. Duplicate UPRN records; and
3. Low levels of UPRN completeness for new properties registered in CMOS.

We believe there are market opportunities to better use UPRN data to drive clearer registration policy (in what form new premises are registered to CMOS) and to identify changes to the property base when properties are demolished or converted. We believe there may be market efficiency opportunities if this activity is coordinated on a national level by MOSL and are supportive of proposals to consider centralised data cleaning opportunities to complement our own.

3.2 Retailer Measure of Experience (R-MeX)

Our retailer customers provide feedback on their experience of our performance on a routine basis by scoring us out of 10 in a range of key categories including on the 'quality of data maintenance and improvements'. Whilst we have made improvements in every category since October 2020 [8], this section will specifically address our data quality scores listed in table 3 below:

Table 3 – Summary of R-MeX scores 'Quality of Data' [9]

Area	October 2020	August 2021	Difference	Market Average 2021
Quality of data maintenance and improvement	4.7	6.6	1.9	6.9
Ranking (out of 15)	15th	9th =	+6	

Whilst we are pleased to report an improvement of 1.9 to our data quality score, we still have much further to go. This is underlined by our score of 6.6 being below the market average of 6.9. We do however believe this movement provides visible confirmation that we are moving in the right direction.

There is also a qualitative aspect to R-MeX which we receive as part of the survey itself in response to a series of questions and flesh out with follow up account management calls with our retailer customers. The most recent feedback highlighted the following points should be focused upon:

1. Process time of transactions into market - in particular metering transactions
2. The accuracy of our market updates
    a. The quality of our meter manufacturer data which one retailer classed as poor
    b. Meter physical and chargeable sizes
    c. Meter coordinates
    d. Meter serial and supply addresses
3. Providing advance notice of changes to chargeable data so they can better manage the customer journey

We are taking steps to address all the above concerns many details of which are listed in this report.

3.3 Market Performance Standards (MPS)

Several retailers have highlighted via R-MeX feedback and other routes a need for us to continue to improve the speed of our market data updates. In this section, we comment on our MPS performance which measures the speed of market data updates for several key operational service outcomes. Whilst these do not cover all market updates, they cover many key areas including deregistration, meter installations and meter exchanges. Our MPS performance also contributes to our performance against CMOS data update SLAs in accordance with CSD 104.

[8] MOSL (August 2021) Retailer Measure of Experience (R-MeX) Outputs file (mosl.co.uk), pg4
[9] MOSL (August 2021) Retailer Measure of Experience (R-MeX) Outputs file (mosl.co.uk), pg5

A comparison of our MPS performance across all measures is listed in table 4 below:

Table 4 – April – September 2020-21 comparison[10]

Area	April – Sept 2020 Performance	April – Sept 2021 Performance	Difference	Market Average April – Sept 2021
Performance	67.2%	87.1%	+19.9%	91.3%
Rank (out of 9)	9th	5th	+4 places	N/A

Our MPS performance has improved over this period increasing by nearly 20% over the course of the year. Despite this progress, we recognise there are opportunities to improve which is reflected by retailer feedback, our performance being below the 2021 market average by 4% and behind the highest performer by 9.7%.

We are also subject to an IPRP for MPS 3 which measures our speed of new connections.[11] This plan has been in place since August 2021 and commits to a series of improvement milestones which are reviewed by our Market Performance Committee.[12] We remain on track to recover our performance.

3.3a Metering specific performance

During 2021 we have focused on our MPS 7 performance (initial and final meter reads) which accounted for 75% of our MPS eligible market update in November 2021. It represents our biggest performance challenge highlight by R-MeX feedback and other retailer engagement. Our MPS 7 performance is also a measure of our ability to meet service levels set out in CSD104 for data updates following the physical change of a meter asset.

To achieve improvements in our MPS 7 performance we developed a reporting approach which categorised failures for MPS 7 by business unit and sub service. This made our challenges visible by process and accountable manager enabling us to pinpoint issues to drive improved performance. This increased focus has supported MPS 7 performance going from 44.7% in October 2020 to 92.1% in September 2021.

There has been a recent dip in October (78%) and November 2021 (83%) because of the replacement of our legacy property and metering system. MPS 7 performance is currently on track to return to 85%+ levels in December. This dip was in part a consequence of strict controls to ensure the integrity and quality of our data was maintained during our system migration.

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[10] These timescales have been used as a comparison to measure progress as they were chosen by MOSL for the peer comparison league tables for 2020-21 & 2021-22 respectively
MOSL Peer Comparison League Tables (mosl.co.uk)
MOSL 2020-21 Peer Comparison League Tables (mosl.co.uk)

[11] An IPRP stands for an initial performance rectification plan

[12] The next review will occur in February 2022 and will review whether our aim of improving performance from 80% to 92% by January 2022 has been achieved

3.4 Complaints and Escalations

We take complaints very seriously and strive to resolve these as quickly and effectively as possible. In the unfortunate circumstance that we receive a complaint we see it as a valuable source of insight to alert us to potential patterns of data quality issues. We have therefore embedded complaints data analysis in our overall data management approach, as a key trigger and priority for investigation and resolution processes.

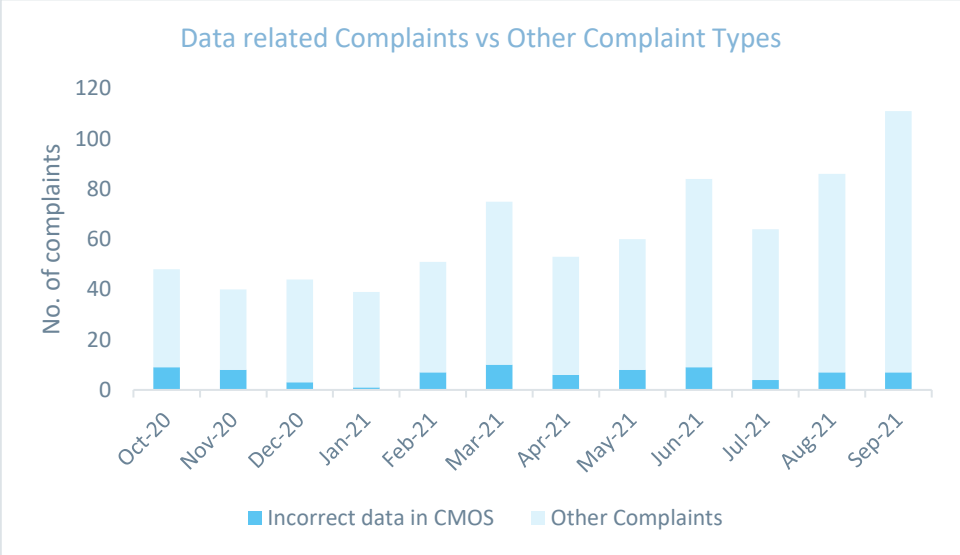
All complaints are handled and investigated by a dedicated NHH complaints team, with a view to prioritise resolution of the specific customer issue. They also class each complaint by its root cause enabling us to focus on data specific issues.

The Data Integrity Manager routinely reviews all received and actioned complaints alongside the Complaints Manager to ensure that root cause learnings are shared, and that appropriate action is taken. This process is part of our newly introduced standard investigation methodology which ensures that our investigation of these data related complaints is carried out in a rigorous and consistent manner.

We have provided a case study below which looks at the volume and key themes from recent complaints.

Case Study 2 – Analysis of data related complaints

The proportion of data related complaints from NHH customers/retailers has fallen over the last 6 months from 13% to 9%.



Whilst there has been an increase in total complaints – the level of complaints related to data has remained relatively low at roughly 6.

Our analysis of the data complaints received during 2021 shows that these data complaints relate to issues of which we are currently aware and addressing via quality monitoring of market updates. These include the following:

- Meter read incorrect or missing
- Meter/Property relationship incorrect
- Meter Size/Meter Serial Number incorrect

The findings show a need for a sustained focus on our metering processes to ensure that all data attributes are handled with care and appropriately validated.

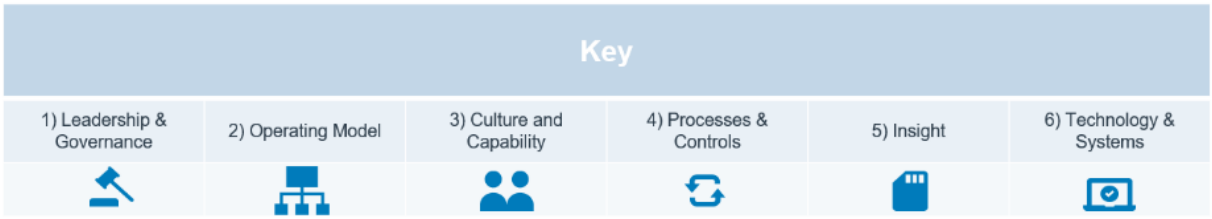
4. Planned Improvements – Overall Roadmap

This section provides an overview of a range of performance improvements planned for 2022. In Section 4.1, we summarise changes planned which seek to strengthen our grip on overall performance through improvements to our management framework. In section 4.2, we summarise changes planned to specific data items. These are not exhaustive lists of all changes planned but highlight key improvements.

4.1 Planned improvements to our overall data management approach

Each improvement we plan to undertake in 2022 is highlighted against the pillar(s) of our overall approach in table 5 below:

Table 5 – Planned Initiatives to be completed in 2022



Initiative	Description	Reason for focus	Framework Pillar
Document and review the risks and controls for key market data update processes	We plan to document the risks and controls we have in place for key market data changes looking at the interdependencies of both systems and processes. This is proposed for completion by 30 June 2022.	This exercise will help us identify the need for improvements to the controls currently in place and provide a documented base for ongoing reviews. It was proposed in response to an audit finding that our control framework was not sufficiently documented and there was no evidence of periodic reviews.	
Support the delivery of data quality outcomes by introducing a range of new internal data quality metrics	We intend to roll out new internal data quality metrics to prevent data issues reaching CMOS. These will be launched by April 2022.	Having seen evidence of success from the development of internal metrics relating to MPS, particularly MPS 7 as described in section 3.3a, we intend to expand this for specific data quality metrics initially UPRN and meter geolocations. Our audit findings were that we should go further to embed data quality measures and performance as part of	

Initiative	Description	Reason for focus	Framework Pillar
		existing market performance governance arrangements.	
Migrate all property and meter related processes to a new workflow	Our current plan is to replace our workflow applications and migrate all property and meter related bilateral processes by August 2022.	This new system will provide further automation/ processing speed opportunities that will reduce the risk of human error when making data updates.	
Deliver our regulatory undertakings	This specifically relates to the delivery of all our data focussed regulatory undertakings that we have committed to Ofwat as a consequence of our failures at market opening. (See reference in the Foreword to this Report)	It is essential that we are compliant with the undertakings that we have agreed to implement to improve our data quality performance.	
Establish a new organisational structure reporting into the Head of Data Insights	Having appointed the new Head of Data Insights in November 2021, we will establish the new organisational structure reporting into this role. This will bring together the expertise of a range of internal teams to maximise capability improvements. Completion of this is planned for April 2022.	This reorganisation will provide greater strength in depth for data quality insights and will bring together insights from a variety of areas helping to further establish our centre of excellence. These teams will be critical to continuously improving how we identify and resolve data issues across our HH and NHH operations.	
Support and engage with MOSL data sharing initiatives	We are in the process of entering MOSL's data sharing initiative and plan to provide details of NHH smart meter readings in early 2022 to support water efficiency and other objectives.	We aim to provide hourly read data from up to 20k NHH smart meters to support a more granular analysis of water usage and wider market opportunities including water efficiency and demand forecasting.	

4.2 Planned improvements - Specific Data Issues

During 2022, we plan to specifically address the data issues in Table 6 below as a priority.

Table 6 – Planned Improvements Specific data issues to be addressed in 2022

Description	December 2021 Pass Rate	Interim Target Pass Rate	Target Date	Target Pass Rate	Target Date
Meter XY coordinate validation	76%	92%	March 22	97%	Sept 22
Unique Property Reference Number (UPRN) validation	64%	82%	March 22	92%	Sept 22
Improved codes for remote read types	-				May 22

4.2a UPRN and Meter GIS XY Coordinates

In response to MOSL's data validation measures we are committing to challenging property UPRN and Meter XY coordinate data validation improvements.

To achieve these targets, we are assuming a need to address both legacy validation issues and to improve the quality of current processes updating new meter and new property data to CMOS. As part of our approach, we will need to:

- Understand all meter and property data administration processes which introduce or update these data items;
- Identify the risks and failure points associated with each process and introduce enhanced quality monitoring;
- Identify, understand and validate source data for the correct data
- Address any system constraints preventing flows or updates of accurate data

We have a project team in place and have already identified nearly 30k missing UPRNs. We began updating CMOS with this new information in early December 2021.

4.2b Improved Codes for Remote Read Types

In the next CMOS release, scheduled for 13 May 2022, CPW123 is currently proposed to be implemented. This change seeks to rename and adjust remote read type meter codes to ensure they accurately represent the metering facilities available within the market today. We have summarised the confirmed changes in table 7 below:

Table 7 – Current and Proposed Read Types[13]

Current Remote Read Types	Proposed Read Types
Touch Read	Touch
1-Way Radio (1WRAD)	Outreader
2-Way Radio (2WRAD)	AMR
GPRS	Smart AMI
Other	Wi-Fi
	Dumb
	Other

We have already identified around 15k meters classified with Remote Read Type 2WRAD that need to be removed from the market. Given that transaction-based routes are either not available or not practicable for these data items, we have reached out to MOSL to consider options for facilitating this data cleanse centrally. We will continue to engage with MOSL over the optimal route for update.

[13] Details can be found in the following document Ofwat (November 2021) Wholesale Retail Code Change Proposal – Ref CPW123, Letter (ofwat.gov.uk) , pp2-3

5. Concluding Remarks

This report aims to provide transparency of our current performance in relation to data quality and the plans we have in place to achieve a step change in performance.

There have been some positive signs of progress during 2021although we also recognise that we have much further to go. Over the course of next year, we will set out to deliver our improvement plans, laid out in section 4, by seeking to continuously improve in each of our framework pillars and by addressing specific data issues in a consistent and robust manner.

An important part in achieving this will be continuing to engage with our customers, retailers and MOSL around the areas where we can improve and opportunities for further developments within the market. In this context we would welcome feedback on this report, suggestions for change/improvements and in particular the areas of discussion that we have raised throughout which include:

- The usefulness of providing the full make of meters as part of our meter manufacturer data?
- Whether for internal meters a property location coordinate would be considered sufficiently accurate to find the meter?
- Whether the principles or criteria we use to prioritise issue resolution can be improved?
- The opportunity to make better use of UPRN data at a national level through co-ordinated activity by MOSL in relation to changes to the property base (demolition or conversion) and registration
- Whether retailers would be willing and able to share recent meter XY coordinate data to help us keep CMOS accurately updated?

If you wish to provide any feedback on this report or to engage over any of the issues highlighted, please contact us below

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