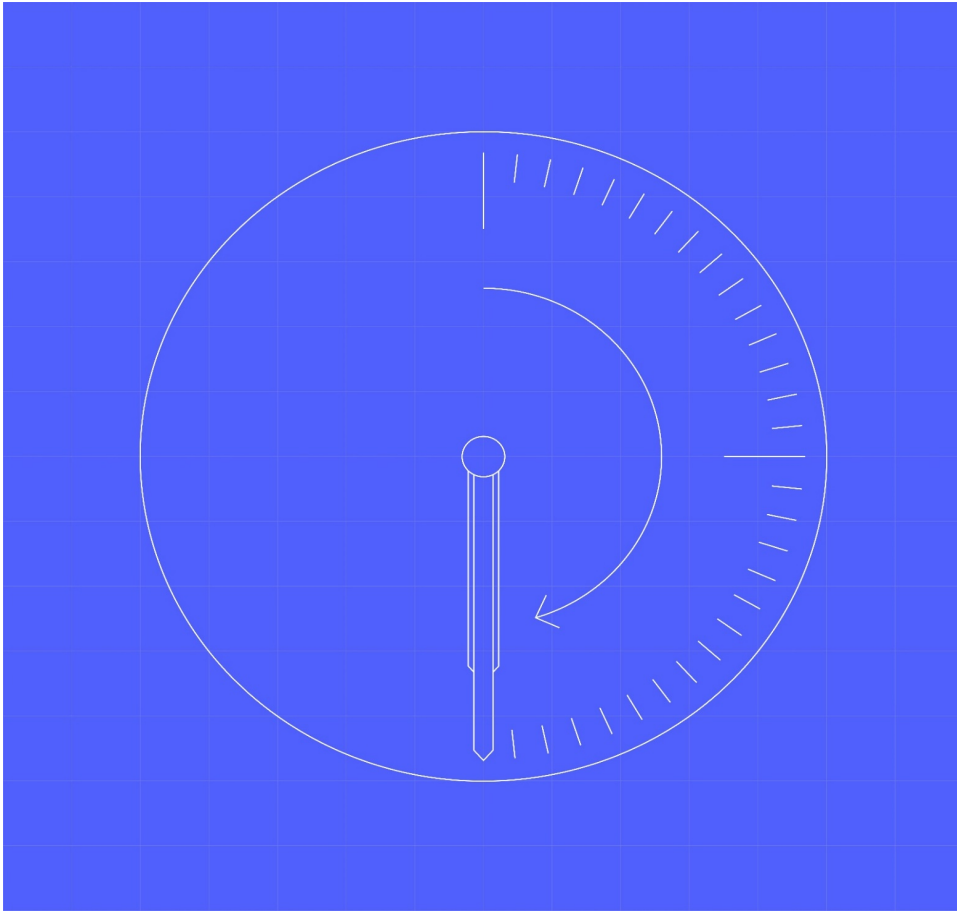


MHHS – Migration Thresholds Document

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1.1 Change Record

Date	Author	Version	Change Detail
27/09/2023	Migration Team	v0.1	Draft for Industry Consultation
18/10/2023	Migration Team	v0.2	Revised Draft for Assurance Meeting
27/10/2023	Migration Team	v0.3	Revised Draft following Assurance Meeting
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1.2 References

Document	Publisher	Published	Additional Information
MHHS-DEL961 – Migration Design Document v1.0	Migration Team	03/04/2023	
MHHS-DEL953 – Data Assessment Report	Migration Team	21/02/2023	
MHHS-DEL1128 – Migration, Cutover and Data Strategy v1.0	Migration Team	02/06/2023	
MHHS-DEL813 – Overarching Test Data Approach and Plan	Testing Team	19/07/2023	
MHHS-DEL1181 – Data Cleanse Plan v1.0	Migration Team	24/07/2023	

1.3 Terminology

Term	Description
BAU Process	This refers to a process within the MHHS arrangements as set out within the MHHS Core Design.
BSC	Balancing and Settlement Code
Central Services / Systems	MHHS Programme term referring to the parties and systems that comprise the supporting infrastructure for MHHS business processes and services, namely the Elexon Central Services, Electricity Enquiry Service, Data Service Provider, Central Switching Service, Data Transfer Network, and the Data Integration Platform.
CoA	Change of Agent
CoS	Change of Supplier
CSS	Central Switching Service
Daily Planned Migration Threshold	This is an industry-wide limit on the maximum planned for number of migrations that can take place on a given day under normal circumstances (200,000).
Data Cleanse Plan	The approach and activities required to improve and populate data prior to Migration start.
DC	Data Collector
DIP	Data Integration Platform
DS	Data Service
DSP	Data Services Provider
ECS	Elexon Central Services
EES	Electricity Enquiry Service
Export MPAN	An MPAN that exports energy to the grid from a premises.
Forward Migration	The process through which MPANs will move from legacy arrangements to MHHS arrangements.
IDNO	Independent Distribution Network Operator
Import MPAN	An MPAN that imports energy from the grid to a premises
ISD	Industry Standing Data

LDSO	Licensed Distribution System Operator
Legacy Arrangements	The existing arrangements set out under the BSC and REC. For the purposes of the Migration Design, this is primarily the REC Metering Services Schedule and the Balancing and Settlement Procedures related to Data Collection.
MCC	Migration Control Centre
MHHS	Market-Wide Half-Hourly Settlement
MHHS Arrangements	The new MHHS arrangements as set out in the MHHS Core Design Artefacts.
Migration Design	The technical articulation of how MPANs will move from legacy to new MHHS arrangements.
Migration Period	The period denoted by the Programme as occurring between the M11 and M15 milestones.
MOP	Meter Operator
MPAN	Meter Point Administration Number
MPID	Market Participant Identifier
MS	Metering Service
MWG	Migration Working Group
NFR	Non-Functional Requirement
Primary MPAN	The MPAN, within a Related MPAN arrangement, for which a Switch is initiated, or a forward migration (via an IF-031) is initiated.
Qualified Supplier	A Supplier recognised in ISD as both having passed the relevant System Integration Testing (SIT) requirements or BSC qualification requirements; and declared that their service is operational within the MHHS arrangements.
Registration Service	The service operated by LDSOs.
REC	Retail Energy Code
Reverse Migration	The process through which MPANs will move from MHHS arrangements to legacy arrangements.
Secondary MPAN	The MPAN, within a Related MPAN arrangement, for which a forward migration occurs when an IF-031 is received for a Primary MPAN.
Switch	The process by which a new Supplier Registration supersedes an existing Supplier Registration, managed by the CSS.
Upper Migration Threshold	This is an industry-wide limit on the maximum number of migrations that can take place on a given day under exceptional circumstances (300,000).

1.4 Programme Milestones

The below Programme milestones are referenced throughout this document.

M9 – Start of System Integration Testing (SIT)

M10 – Go live of new services

M11 – Start of 1 Year Migration for UMS / Advanced

M12 – Start of 1 Year Migration for Smart / Non-Smart

M14 – All Suppliers must be able to access MPANs under the new TOM

M15 – Full transition complete

M16 – Cutover to the new Settlement timetable

2 Executive Summary

Throughout the Migration period, a significant number of messages will be sent between industry participants to migrate MPANs from legacy Arrangements to MHHS Arrangements. A Migration Threshold, a limit on the total number of MPANs that can be migrated across a single day, needs to be set to ensure the systems of Central Services are able to support these volumes.

Within this document, we set out a 'Daily Planned Migration Threshold' and an 'Upper Migration Threshold' of 200,000 and 300,000 MPANs respectively. The former is the maximum limit of daily migrations across the UK market under standard operations, whilst the latter is an increased maximum limit that will apply only under exceptional circumstances.

These thresholds have also been broken down to an individual Licensed Distribution System Operator (LDSO) Market Participant Identifier (MPID) level to provide individual LDSOs with clarity on the migration volumes they will need to be able to support on a given day within the Migration period. These daily thresholds are based on a LDSOs portfolio size and range from 10,000 to 40,000 MPANs. The full detail of these numbers can be found within Section 8.

From a message volume perspective, the exact number of messages per migration will differ significantly for each Central Service, these volumes have been presented in Section 9. These message counts have then been multiplied up by the Daily Planned Migration Threshold and Upper Migration Threshold to provide the total daily message threshold for each Central Service. These are the ultimate non-functional requirements (NFRs) that Central Services should work to when reviewing the capacity of their systems.

As is to be expected, these numbers vary significantly depending on the individual Central Service. They range from 400,000 for services such as the CSS and Electricity Enquiry Service (EES), up to as high as 10,500,000 daily messages for the DIP in the Upper Migration Threshold scenario.

Thresholds have been set to ensure Suppliers have the available capacity to migrate their MPANs prior to the Programme milestone of M15, irrespective of which Qualification Tranche they will be allocated by the Code Bodies. Equally, the ability for LDSOs and Central Service providers to support these NFRs, will require investment in their infrastructure. Setting the NFR volumes too high, to levels which will never be used in practice, would pass on needless cost to consumers. The analysis presented within this document demonstrates that the proposed NFRs balance these two key requirements across a range of potential scenarios which may occur. The analysis also supports Suppliers who may wish to migrate at scale in short periods of time, thus meeting the Programme objective to realise the significant benefits of MHHS earlier.

All numbers presented in this document have been developed in collaboration with Programme participants through the Migration Working Group (MWG) meetings. This document presents not just the proposed NFRs by service / role, but also the thinking and assumptions that underlie these calculations, in addition to excerpts from the detailed modelling where relevant.

3 Introduction, Overview and Scope

3.1 Introduction

Throughout the Migration period of the MHHS Programme, a significant number of messages will be sent between industry participants to migrate MPANs. This number of messages will far exceed the volumes sent during normal MHHS Business As Usual (BAU) operations. To ensure industry participants, Central Systems and the Registration Services can support these increased volumes, a Daily Planned Migration Threshold as well as an Upper Threshold, that limits the total number of migrations that can be initiated or completed across the industry on a particular day, needs to be set.

These thresholds need to be sufficiently large to provide capacity to migrate all MPANs by the end of the Migration period (M15), whilst also providing contingency. However, the thresholds cannot be so large that they are unable to be supported by Central System providers.

The purpose of this document is to define the Daily Planned Migration Threshold and the Upper Threshold. This will provide certainty to Central System providers and industry participants on the maximum number of migrations that they will be required to support throughout the MHHS Migration period on a single day.

Furthermore, this document breaks the national threshold down to an individual Registration Service (MPID) level, one or more of which is operated by a Licensed Distribution System Operator (LDSO). This is to provide clarity to LDSOs of the maximum number of migrations each of their Registration Services will be expected to support on a particular day.

It is recognised that LDSOs are not currently able to validate that the Registration Service can support these volumes until their service provider, St Clements, has undertaken testing in January 2024. The testing, whilst not based on migration code, will utilise the BAU code to simulate the volume load which will be created in the migration period. A programme risk (Programme Risk ID = R677) has been raised with a supporting mitigation plan, based on the testing set out above.

3.2 Overview

The following sections are included within this document:

- **Changes to the Migration Approach following Approval of CR022**
 - **CR022 Change to Migration Approach** – Outlines the changes to the Migration approach because of CR022.
 - **Current Baselined Migration Non-Functional Requirement (NFR)** – Outlines what the previous NFR is that will be replaced following the approval of this document.
- **Migration Planning Assumptions**
 - Reviews the assumptions that have been made about the Migration period and that have been used to frame the scenarios that we are planning for.
- **Migration Thresholds**
 - **Planned for National MPAN Migration Volume** – Outlines the threshold for migrations which will be initiated and completed daily. This is the national capacity and each individual Supplier's Migration Plan will utilise a proportion of the available capacity.
 - **Rationale for Planned National Migration Volume** – States the rationale behind the Daily Planned Migration Threshold and the Upper Migration Threshold and explains the analysis that has gone into setting these thresholds.
 - **Modelling** – Presents a model of the Migration period based on the Daily Planned Migration Threshold that has been set.
 - **Maximum Threshold for Exceptional Circumstances** – Outlines the possible peak daily threshold. The 'Upper Migration Threshold' is a term we have used to define the number of daily migrations that can be initiated and completed under exceptional circumstances. For example, there is a delay in the migration delivery plan or external activities such as customer switching increase the volume of completed migrations on a given day.
- **Migration Thresholds by LDSO**
 - **Upper Thresholds for LDSOs** – Outlines the maximum number of migrations each LDSO MPID is expected to be able to support daily. Each LDSO will support a proportion of the national volume on a given day.
 - **Rationale** – Outlines the rationale behind the Migration Thresholds for LDSOs and explains the analysis that has gone into setting this upper limit.
 - **Modelling** – In this section we have modelled various scenarios to validate that the volumes proposed will support events which may occur within the life of the Migration period.
- **Migration Messages**

- Analyses the number of messages that each of the Registration Services, Central Switching Service (CSS), Helix and Data Services Provider (DSP) will be expected to send to support the forward and reverse migration of an MPAN.

- **Assumptions, Risks and Dependencies**

4 Intended Audience

These parties are:

- The Registration Services (including Service Providers);
- Suppliers;
- Data Collectors / Aggregators;
- Meter Operators;
- The DIP Service Provider;
- Metering Services (i.e., MSS, MSA);
- Data Services (i.e., SDS, ADS, UMSDS);
- EES;
- LDSOs (i.e., DNOs and iDNOs);
- Meter Administrators;
- The DCC, operating Smart Metering and CSS;
- ESO;
- Elexon Central Services (ECS);
- Electralink (DTN);
- REC and BSC Performance Assurance Boards;
- UMSOs.

5 Changes to the Migration Approach following Approval of CR022

This section sets out the current baselined NFRs related to migration and the changes to the Migration approach set out within the Programme Change Request CR022.

5.1 CR022 Change to Migration Approach

Change Request 022 (CR022) resulted in several changes to the Migration approach being taken by the Programme. The below bullet points taken from the Implementation Approach and the Change Request set out the changes being made and the rationale for them.

From the Implementation Approach:

- Programme participants enter Migration in phased manner over extended period as SIT and each Qualification Tranche completes. Phased entry to Migration helps drive early achievement of benefits for SIT / MVC Programme participants from 2025.

From CR022:

- Phasing has allowed the early realisation of benefits starting with SIT / MVC Programme participants migrating sooner, followed by Qualification in parallel enabling all remaining Programme participants to qualify by M14.
- The timelines for Migration are driven by this phasing approach with the Programme having taken the opportunity to reduce later migration windows because of the ramp up of migration volumes delivered by phasing.
- The earliest we are facilitating SIT / MVC participants to be able to start Migration to start realising benefits is at M11 in April 2025.
- Qualification starts in January 2025 once SIT Functional Testing is complete, allowing the first Qualification Tranche to complete testing and start Migration in September 2025.
- The last Programme participants are planned to complete Qualification and start Migration at M14 in March 2026.
- The original MHHS Transition Timetable planned 9 months for M14-M15, but in this replan we have been able to reduce this to less than seven months due to the ramp up of migrations in the period M11-M14 but needing to allow for reasonable migration volumes for those parties that come through the last tranches of Qualification.
- Although the revised Migration period now spans 18 months, as opposed to 12 months in the original MHHS Transition Timetable, this is not a like-for-like comparison due to the timings driven by phasing, as described above. The alternative would be to take a more “big bang” approach to implementation where we would lose the early realisation of benefits and likely have delays from a slower delivery pace to the Programme, as described above.

5.2 Current Baselined Migration NFRs

The previous NFR that relates to the number of migrations that systems need to be able to support throughout the Migration period, and is included in MHHS-E2E002 Requirements v3.1 (Requirement E2E1007), was developed before the Migration Design was produced. In addition, this requirement is based on the Migration period lasting 12 months instead of 18 months as was confirmed as part of CR022.

This requirement stated:

“During Transition, all meter points (ca. 31M) will be transition[ed] between the old and new services. Therefore assuming a linear migration over the year this would result in the load below, hence services shall be capable of processing the following volumes:

- Average daily volume of 680,000
- Peak daily volume of 5.0m
- Annual volume of 500m”

Given the change to the length of the Migration period and the details we now have about how, technically, the migration process will be carried out as a result of the Migration Design, an updated set of NFRs is required. The basis for these NFRs is set out in the remainder of this document.

The previous NFR was based on assumptions that are now invalid:

- 1) 33m, not 31m MPANs, will need to be migrated in total;
- 2) The Migration period will last 18 months and not 12 months;
- 3) Each MPAN migration was assumed to utilise 8 messages but, up to 32 messages can be generated for each migration.

6 Migration Planning Assumptions

Below we have summarised the assumptions that have been made when determining the Migration Thresholds. These assumptions have been developed to ensure the effective delivery of the Migration period and to ensure the Programme is able to meet M15.

1. The Migration period must contain a ‘ramp-up’ and a ‘ramp-down’ phase, including early-life proving

Suppliers will be constrained within the early stages of the Migration period as Central Systems performance is verified against a set of agreed criteria. It is currently assumed that this period will last no longer than three months from M11. It is also assumed that migration volumes will lower as more problematic MPANs require migrating towards the end of the Migration period.

Exit from this period will be based on the Programme verifying performance against the agreed set of criteria. If the criteria is met prior to the end of the planned period, it will be possible for Suppliers to revise their migration plans and ramp up volumes sooner than was initially forecast.

2. Each Supplier will be expected to operate their own ‘ramp-up’ and ‘ramp-down’

The expectation is that each Supplier will need to undertake a period of proving their own systems are operating correctly, and can scale prior to operating migration at a high volume. The criteria and the timescales related to this activity will be developed within the design of the Migration Control Centre (MCC). The ramp up period will be significantly less than the initial ramp up period set out above (as the Central Services will have been proved by that point in time).

3. Planning needs to support a large volume of MPANs only being available for migration following Tranche 7 of qualification

Based on the non-discriminatory assignment of Qualification Tranches by Code Bodies, one or more Large Suppliers may not be qualified until the later tranches.

4. Parties will not be obliged to migrate every day once they are qualified

Parties may choose to only migrate MPANs on four out of five working days in a week (we have also modelled a three-day week at LDSO level to ‘stress test’ volumes). This is to allow for at least one working day each week where migration exceptions can be investigated and resolved by the Supplier, Supplier Agents and LDSO. Following approval of CR018, exception resolution processes which require the sending of messages to and from the Registration Service, can only occur within certain windows on working days only.

5. Each Supplier’s portfolio is not split evenly across all LDSOs

We have used real data from the EES to develop the models.

6. Suppliers will be able to increase and decrease the rate at which they are migrating MPANs

This will be agreed between each Supplier and the MHHS Programme and set out within each Supplier’s Migration Plan.

7. Migration capacity incorporates reverse migrations

This is an assumed figure applied to our modelling. However as Reverse Migration is driven by Switching events only, we have not included those message volumes within our modelling as those message volumes would not be additional to the message volumes which would occur in BAU activities normally.

8. Suppliers and LDSOs will be incentivised by Ofgem to migrate Supplier portfolios in-line with the plans each Supplier agrees with the Programme

9. Migration planning will support the early realisation of MHHS benefits by enabling multiple Suppliers to simultaneously operate at scale throughout the Migration period

10. Migration planning will support the non-discriminatory allocation of Qualification Tranches and capacity to Suppliers

7 Migration Thresholds

In this section we outline the Daily Planned Migration Threshold and the Upper Migration Threshold for migrations that can occur on a single day during the Migration period of the MHHS Programme across the entire industry. The Daily Planned Migration Threshold is the maximum number of migrations that will be planned for daily, while the Upper Threshold is defined as the maximum number of migrations that can collectively be initiated and completed on a single day across all industry participants under exceptional circumstances.

Throughout the Migration period, a proportion of this capacity will be allocated to qualified Suppliers who will be able to initiate and complete migrations based on the capacity that they have been allocated via the approval of their respective Migration Plans. Each Supplier will be allocated the required capacity to migrate their entire portfolio to the new arrangements by M15. Suppliers will be required to work with the Programme to develop a plan that allows them to migrate their entire portfolio within the Migration period and within the capacity constraints that have been defined.

The methodology for the assignment of capacity to each individual Supplier will be developed in 2024 via the MWG as part of the design of the MCC and the Migration Planning and Management Tool (as set out in MHS-DEL1128 Migration, Cutover and Data Strategy Document).

The Daily Planned Migration Threshold that is defined below has been produced to provide industry participants and Central Systems with clarity regarding the number of migrations that they will be expected to support throughout the Migration period. This Daily Planned Migration Threshold has been produced in collaboration with industry participants through the MWG and is based on:

- Analysis of the portfolio sizes of both Suppliers and LDSOs;
- Analysis of the number of migrations required on a daily basis to reach M15;
- Allowing for contingency within the Migration Plan;
- Allowing for an industry-wide 'ramp-up' and 'ramp-down';
- Allowing individual Suppliers to operate their own 'ramp-up' and 'ramp-down';
- An expected exception rate;
- An expected reverse migration rate;
- The number of messages that will be sent throughout the migration process;
- And historic switching volumes.

7.1 Planned for National MPAN Migration Volume

Based on the analysis that we have carried out in collaboration with the MWG, the Programme has concluded that the Daily Planned Migration Threshold shall be 200,000 MPANs.

This means that across all industry participants, the total maximum number of planned for migration initiations or completions on any day, under normal circumstances, should each not exceed 200,000. Throughout the migration planning process, Suppliers will be individually apportioned a percentage of the total volume for their own migration.

The methodology for allocating capacity, on a non-discriminatory basis, to each Supplier will be developed in 2024 within the MWG.

Each of the Central Services within the MHHS scope should be capable of supporting the planned for volume of 200,000 MPAN migrations but also have the capabilities of supporting up to 300,000 MPAN migrations in exceptional circumstances. There is more detail on this within Section 7.4.

Those exceptional circumstances could include:

- 1) A requirement to support higher volumes than those initially planned for if a recovery to the plan is required to reduce a risk of failure to meet the M15 milestone.

- 2) If there are issues relating to the qualification process which cause delay to when MPANs become available to migrate.

7.2 Rationale for Planned National Migration Volumes

The Daily Planned Migration Threshold has been developed in collaboration with Programme participants through a number of MWG sessions as well as additional information gathering sessions. Based on the feedback gathered during these sessions we have aligned on a national upper threshold of 200,000 migration initiations per day. The key points of consideration which supported this decision have been listed below:

- **Analysis of the number of daily migrations required to reach M15**

Throughout the Migration period, a significant number of daily migrations will need to be initiated and completed to enable the entire market to be migrated by M15. Given that there will not be a linear pattern to when these migrations are initiated, i.e. migrations will not always be able to take place at peak capacity throughout the Migration period, the threshold needs to be great enough to account for days when a lower number of migrations are initiated and completed, such as at the beginning of the Migration period.

- **Allowing for contingency within the Migration Plan**

The total number of MPANs that can be migrated on a particular day needs to be significant enough that if there are any issues encountered throughout the Migration period, which limit the number of MPANs that can be migrated on a certain day, this delay can be made up for on subsequent days. By providing additional capacity, this will help to prevent any delays to the end of the Migration period and prevent the Programme from missing M15.

- **Allowing for an industry-wide 'ramp-up' and 'ramp-down'**

To prevent issues arising from migrating a large number of MPANs too quickly at the start of the Migration period, a gradual industry-wide 'ramp-up' will be required. A limited number of MPANs per day will be initially migrated and this number will gradually be increased. This will 'prove' that no issues are arising because of the migration processes being followed. An industry-wide 'ramp down' will also be required to provide additional contingency to the plan and to allow for the migration of MPANs that may be more difficult to migrate and remain in significant numbers towards the end of the Migration period.

- **Allowing individual Suppliers to have their own 'ramp up' and 'ramp down'**

Similarly, each individual Supplier will require a 'ramp up' to ensure that the processes that they are following are working correctly, and a 'ramp down' to allow them to migrate MPANs that may be more difficult to migrate towards the end of the Migration period.

- **An expected exception rate**

It is expected that exceptions will arise throughout the process of migrating MPANs and therefore the threshold needs to be sufficient to account for these 'failed' migrations. The planning assumption used is that 1% of attempted migrations will fail and will require resolution and re-submission by the Supplier.

- **An expected reverse migration rate**

Throughout our analysis, we have taken into account an expected rate of reverse migrations. Any MPANs that are reverse migrated will need to be subsequently re-migrated to the new arrangements, and the thresholds also take into account these additional migration events.

- **The number of messages that will be sent throughout the migration process**

To process each migration event, a specific number of messages need to be sent and received as described in the Migration Design. Section 9 describes the number of messages required to be transferred for each Central Service. Given there is a significant number of messages that will need to be sent, the daily threshold has been set bearing this number of messages in mind.

- **Historic switching volumes**

When deliberating the Migration Thresholds, we have also considered historic switching volumes as the number of BAU switches taking place will impact the capacity that all participants have to process migrations in certain events such as the I&C contract rounds. For the avoidance of doubt, the obligations (and supporting SLAs) developed to support migration are separate to existing SLAs related to MHHS BAU activities or other activities such as Switching.

- **Parties will not be obliged to migrate every day once they are qualified**

Parties will not be obliged to migrate every day once they are qualified. For example, parties could choose to only migrate MPANs on four out of five working days in a week.

- **Migration planning will support early realisation of MHHS benefits**

The migration planning carried out by the Programme will support the early realisation of MHHS benefits by enabling multiple Suppliers to simultaneously operate at scale throughout the Migration period.

- **Migration planning and Qualification Tranche allocation will be non-discriminatory**

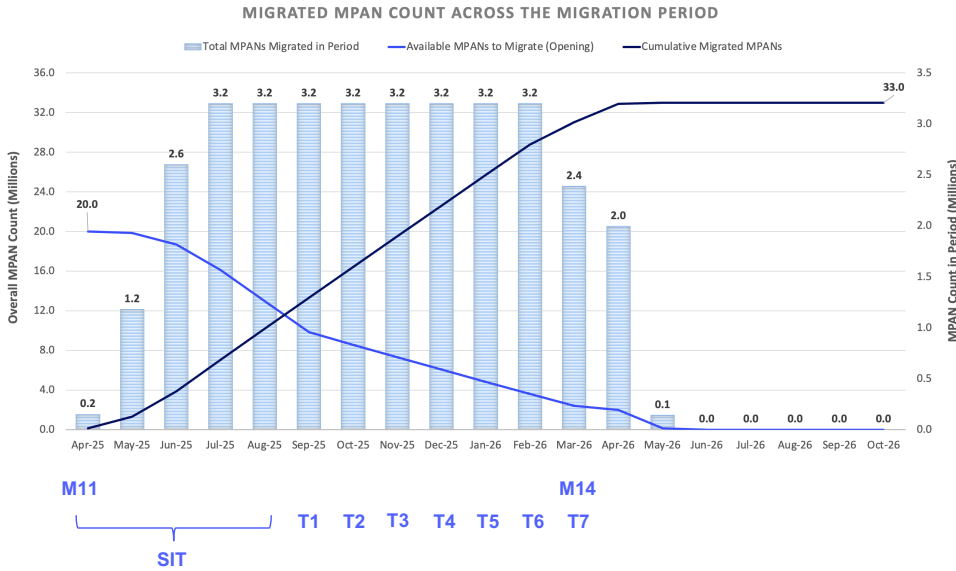
Migration planning and Qualification Tranche allocation will be carried out in a non-discriminatory way. This means that each Supplier will be allocated sufficient capacity to migrate their entire portfolio and no Supplier will be given preference over another for any reason.

7.3 Modelling

Throughout the discussions we have had with Programme participants during the MWG, we have refined our thinking of what a 'best case' Migration period would look like. Taking this thinking into account, along with the key points set out in section 7.2, we have modelled this 'best case' scenario below, which is based on the following assumptions and a daily threshold of 200,000.

- Only 80% of the daily capacity is ever used, based on the assumption that not all Suppliers will be able to meet their planned for capacity each day.
- Four Large Suppliers are expected to be taking part in SIT.
- 1% of migrations will 'fail' and need to be repeated.
- A number of reverse migrations will take place each month, which is equal to the proportion of MPANs that have been migrated multiplied by the average expected number of customer switches on a monthly basis.
- It is assumed that an equal number of MPANs will become available in each of the Qualification Tranches (as these have not yet been prescribed).
- An industry-wide 'ramp-up' and 'ramp-down' has been included, which assumes that the industry will not reach peak capacity until Month 4 of the Migration period and that the Programme will operate a three month 'ramp-down'.

These assumptions lead to a 'best case' Migration period that can be seen in the below chart. In this scenario, the Programme will be able to migrate all MPANs by Month 15 and the Programme will not be constrained by Suppliers becoming qualified later in the Migration period.



While this indicates that the migration can comfortably take place within the Migration period, without exceeding the planned for daily volumes and with an industry-wide ramp-up and ramp-down, this is a best-case-scenario. Given the importance of hitting the M15 milestone and the potential for issues to arise during the Migration period, the Programme believes that a daily threshold of 200,000 provides a sufficient level of contingency to successfully deliver the Migration period even if there are issues that arise that are out of control of the Programme.

This plan will be revised once SIT Suppliers are formally engaged to submit plans and the Qualification Tranches are assigned to Suppliers. These activities will occur within 2024 and will be refined across the year leading to the formalisation of the initial version of the Migration Plan in Q1 2025 prior to M10.

7.4 Maximum Threshold for Exceptional Circumstances

Under exceptional circumstances, the Daily Planned Migration Threshold described above may not be sufficient for the Programme to meet the M15 milestone. This could happen due to significant delays throughout the Migration period, that could be brought about by a number of issues, such as delays to the MHHS qualification process.

Under these exceptional circumstances, it may be necessary to increase the number of migrations that can be initiated and completed on a given day. Under these circumstances, the threshold would be increased up to a maximum of 300,000 migration initiations and completions per day.

If these circumstances were to arise, Programme participants would be consulted before the threshold was increased to ensure that they are prepared for the increase in traffic that this would bring.

8 Migration Thresholds by LDSO

In this section we outline the maximum number of migrations that LDSOs of different sizes will be expected to support on a single day during the Migration period of the MHHS Programme. This upper threshold is defined as the maximum number of migrations that a single LDSO MPID will be expected to process on a single day.

The MHHS Programme will ensure that the plans they agree with each Supplier will not exceed the volume limits set for each LDSO MPID on a given day. This will include the volume of MPAN migrations initiated and completed on a day.

8.1 Migration Thresholds for LDSOs

In addition to the national Upper Thresholds outlined in the previous section, the Programme has carried out analysis of an appropriate threshold per LDSO Registration Service / MPID given the impact that migration will have on those individual services.

To avoid overly constraining each Supplier's migration and the overarching Migration Plan, it is proposed that each service will be required to support the below volumes based on the portfolio size of each Registration Service.

	LDSO MPID Portfolio Size (MPANs)				
	< 900k	900k – 1.4m	1.4m – 2.0m	2.0m – 3.0m	> 3.0m
Upper Threshold	10,000	15,000	20,000	30,000	40,000

8.2 Rationale

The Upper Thresholds for LDSOs have been developed in collaboration with Programme participants through a number of MWG sessions as well as additional information gathering sessions. Based on the feedback gathered during these sessions we have aligned on thresholds that are based on the number of MPANs that each LDSO supports as set out above. The key points of consideration which supported this decision have been listed below:

- **Allowing the early realisation of MHHS benefits**

To avoid overly constraining Suppliers and to ensure that MHHS benefits can start to be realised early on, it is important that the LDSO thresholds do not overly limit the number of migrations a Supplier can carry out. This means upper LDSO thresholds must ensure that there is sufficient capacity to support multiple Suppliers migrating at pace at the same time.

- **Not overloading LDSO systems, in particular MPRS**

Given the migration process is dependent on a significant number of messages being sent by MPRS for each migration (see Section 9), it is important that the volume of messages to be processed on a given day are known to the LDSO so they can ensure they have implemented the required infrastructure to process those volumes.

- **Not constraining Suppliers that wish to carry out migration at pace**

If Suppliers wish to carry out migrations at pace, it is important that this is not overly limited by LDSO capacity. This is a particular risk for Suppliers who have large volumes of MPANs located in specific LDSO portfolios.

- **Ensuring thresholds are proportionate to the size of each LDSO**

As LDSO portfolio sizes vary significantly, the Programme has set thresholds that vary based on portfolio size. This means that smaller LDSOs are not burdened with excessively upgrading their systems to support migration volumes that they are unlikely to ever process within a single day.

8.3 Modelling

To model the number of migrations LDSOs need to be able to support throughout the Migration period, we have considered several different scenarios and the maximum number of daily migrations an individual LDSO would be required to support within each scenario.

Each scenario has been considered using LDSOs of varying sizes. The four LDSO sizes that were considered are: An LDSO with 1.2m MPANS, an LDSO with 1.8m MPANS, an LDSO with 2.8m MPANS and an LDSO with 3.8m MPANS. These sizes were selected based on the actual portfolio sizes of LDSOs.

The different scenarios that were considered are set out below:

1. 50% of Portfolio Available at M11, 6 Month Migration – 5 Working Days

In this scenario, we have assumed that 50% of the LDSO's portfolio becomes available to migrate at M11, and the Suppliers that make up this share of their portfolio intend to migrate their entire portfolio within 6 months.

2. 50% of Portfolio Available at M11, 6 Month Migration – 4 Working Days

In this scenario, we have assumed that 50% of the LDSO's portfolio becomes available to migrate at M11, the Suppliers that make up this share of their portfolio intend to migrate their entire portfolio within 6 months, and the Suppliers are taking a 4 working day approach to migrating MPANS. This means that they only migrate MPANS on 4 out of 5 working days in a week.

3. 60% of Portfolio Available at M11, 6 Month Migration – 5 Working Days

In this scenario, we have assumed that 60% of the LDSO's portfolio becomes available to migrate at M11, and the Suppliers that make up this share of their portfolio intend to migrate their entire portfolio within 6 months.

4. 60% of Portfolio Available at M11, 6 Month Migration – 4 Working Days

In this scenario, we have assumed that 60% of the LDSO's portfolio becomes available to migrate at M11, the Suppliers that make up this share of their portfolio intend to migrate their entire portfolio within 6 months, and the Suppliers are taking a 4 working day approach to migrating MPANS. This means that they only migrate MPANS on 4 out of 5 working days in a week.

5. 50% of Portfolio Available in T7 – 5 Working Days

In this scenario, we have assumed that 50% of the LDSO's portfolio becomes available to migrate in Tranche 7.

6. 50% of Portfolio Available in T7 – 4 Working Days

In this scenario, we have assumed that 50% of the LDSO's portfolio becomes available to migrate in Tranche 7, and the Suppliers are taking a 4 working day approach to migrating MPANS. This means that they only migrate MPANS on 4 out of 5 working days in a week.

The table below summarises the output of our modelling which indicated the below daily thresholds need to be supported by the LDSOs of varying sizes under each of the scenarios. More detail regarding this modelling can be found in Appendix 1.

		Scenario					
		50% of Portfolio Available in SIT, 6 Month Migration		60% of Portfolio Available in SIT, 6 Month Migration		50% of Portfolio Available in T7	
		5 Working Days	4 Working Days	5 Working Days	4 Working Days	5 Working Days	4 Working Days
LDSO Portfolio Size	3.8m	25,778	32,223	30,715	38,394	25,868	32,335
	2.8m	18,935	23,668	22,561	28,201	18,877	23,596
	1.8m	12,091	15,114	14,406	18,007	11,964	14,955
	1.2m	7,985	9,981	9,604	12,005	7,801	9,751

8.4 Migration Message Processing Choreography

As part of the industry consultation of the first draft of the Migration Threshold Document, LDSOs raised concern that the proposed thresholds, coupled with the SLA set out within the Migration Design for all migration messages received by LDSOs to be processed within 60 minutes, would require significant investment in IT infrastructure to support.

During discussions with industry participants, two solutions were discussed. These were:

1. Throttling the messages sent to LDSOs, to prevent too many being sent in one go or;
2. Removal of the SLA in place for LDSOs to respond to all migration messages within 60 minutes if the number of messages sent within 60 minutes exceeded a certain number.

The option of Suppliers throttling messages was discussed and disregarded as the Programme and Suppliers believed it would introduce significant complexity when scaled across a large number of Suppliers and LDSOs. The option of removing the SLA if a certain number of messages were received within 60 minutes was also discounted as this would lead to additional complexity. In addition, no parties identified a business need for the processing of migration messages (irrespective of volume) to be completed within the 60 minute SLA.

Following further analysis and additional feedback from Participants, the Programme's recommendation is that the SLA for LDSOs to respond to all migration messages within 60 minutes is replaced for CoA migration messages with a new set of conditions for each day of the Migration Period. These conditions are:

1. All CoA migration initiation messages (IF-031's) must be sent by Suppliers between the hours of 05:00 and 12:00.
2. For all CoA migration IF-031 messages received between 05:00 and 12:00, LDSOs must send all resulting IF-032's and IF-033's by 17:00.

Please note the below in relation to these conditions:

1. These processing windows and deadlines will apply to IF-031 CoA migration messages only. All other messages are considered part of BAU activities and will not be subject to these constraints.

2. These conditions will not be enforced through any system or functional changes. A Supplier could still physically send a CoA migration IF-031 post-12:00, however the receiving LDSO will not be obliged to process this before 17:00.
3. Similarly, in the case of message rejection, CoA migration IF-031 re-tries will be permitted to be sent outside the 05:00-12:00 window, however the receiving LDSO will not be obliged to process these before 17:00.
4. [All times are in local time.](#)

These conditions will provide LDSOs a minimum of 5 working hours to respond to messages. This will not overly limit the window within which Suppliers will be able to send messages and it will enable all migration messages necessary to be sent and actioned within day if required.

This also means that Agents will have (as a minimum) from 17:00 until 23:00 to process responses to the Migration Agent appointment messages.

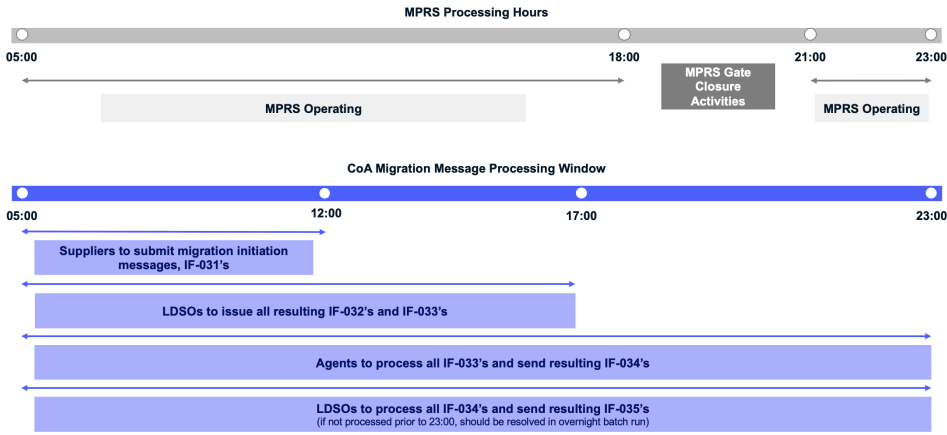
For the avoidance of doubt, this proposed change will not result in the 'batching' of messages to be sent at the end of the windows set out above. Messages will still be queued and processed as they are received. However, if large volumes of messages are received within a short period of time, the queues of messages could become large and require a number of hours to process.

For further clarity, there will be a 1:1 ratio between IF-031 messages and MPAN migrations / appointments. This means that each IF-031 that is sent can only reference a single MPAN migration / appointment ([except in the case of related MPANs](#)). Furthermore, the maximum file size for a single API call to the DIP is 1MB. As an approximate guide, 1MB corresponds very roughly to 200 IF-031's. These technical considerations will ensure that large volumes of IF-031's cannot be sent in very short spaces of time, meaning Suppliers will be required to start the transmission of these messages sufficiently early in the day to enable completion prior to 12:00.

Once the Migration Threshold Document has been approved, the Programme Design Change Process will be used to update the Migration Design with these revised requirements.

8.5 CoA Migration Message Windows

The below diagram and table illustrate the windows within which CoA migration messages must be sent by different industry participants throughout the Migration Period on Monday – Friday (working days only) in order for the sender to have assurances on the processing of that message by a specified deadline. Any CoA migration messages not sent within the windows indicated in the diagram and the table, are not subject to a processing deadline. This refers to messages relating to CoA migrations only, BAU messages are not impacted by these windows.



Process Description	CoA Migration Messages Sent	Window to Undertake Activity	Processing Deadline Conditionality
Suppliers to submit migration initiation messages	IF-031	05:00 – 12:00	N/A
LDSOs to issue all resulting IF-032's and IF-033's	IF-032, IF-033	05:00 – 17:00	Processing deadline of 17:00 only applies to messages resulting from IF-031's received between 05:00 – 12:00
Agents to process all IF-033's and send resulting IF-034's	IF-034	05:00 – 23:00	Processing deadline of 23:00 only applies to messages resulting from IF-033's received before 17:00
LDSOs to process all IF-034's and send resulting IF-035's	IF-035	05:00 – 23:00 and overnight batch run	Processing deadline of end of overnight batch run only applies to messages resulting from IF-034's received before 23:00

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9 Migration Messages

This section outlines the number and specific type of messages that are required to be sent and / or received for each Central Service as part of the forward migration of an MPAN. Reverse migration messages have not been counted as these volumes will not be any different to those that are created as part of BAU switching activity.

The total messages per completed migration per Central Service have been multiplied by both the 'Planned For' threshold of 200,000 MPANs/day and the 'Upper Migration Threshold' of 300,000 MPANs/day to calculate the total daily messages threshold for each Central Service. As the larger number, the total daily messages that are generated under the 300,000 MPANs/day scenario, displayed in Column 7 in the below table, is the ultimate NFR that Central Services should be working to in planning the capacity of their systems.

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Central Service	'Daily Planned Migration Threshold'			'Upper Migration Threshold'		
	Daily MPAN Threshold	Total Messages / Forward Migration	Total Daily Messages Threshold	Daily MPAN Threshold	Total Messages / Forward Migration	Total Daily Messages Threshold
DIP	200,000	36.2	7,240,000	300,000	36.2	10,860,000
ECS		2.0	400,000		2.0	600,000
EES		2.0	400,000		2.0	600,000
CSS		5.0	1,000,000		5.0	1,500,000
DSP		2.0	400,000		2.0	600,000
DTN		15.0	3,000,000		15.0	4,500,000

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The Registration Services and LDSOs have been split out separately and are presented in the below table instead. This is because they will be working to different daily MPAN thresholds depending on the LDSO MPID portfolio size. The full background to this is set out within Section 8. In this table's case, the numbers displayed in Column 5 are the ultimate NFRs that LDSOs should be working to in planning the capacity of their systems.

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Central Service	LDSO MPID Portfolio Size (MPANs)	Daily MPAN Threshold	Total Messages / Forward Migration	Total Daily Messages Threshold
Registration Service	< 900k	10,000	16.0	160,000
	900k – 1.4m	15,000		240,000
	1.4m – 2.0m	20,000		320,000
	2.0m – 3.0m	30,000		480,000
	> 3.0m	40,000		640,000
LDSOs	< 900k	10,000	3.6	36,000
	900k – 1.4m	15,000		54,000
	1.4m – 2.0m	20,000		72,000
	2.0m – 3.0m	30,000		108,000
	> 3.0m	40,000		144,000

Within this section, we have only detailed the additional messages (above and beyond those required as part of a BAU CoS Switch) that are required to support forward migration. The messages that are only required for a BAU CoS Switch have not been included.

We have only documented detail for the 'happy path' scenario where all appointments are valid, and the migration completes successfully. The number of messages for unsuccessful migrations where the appointment lapses, for example, will be different.

We have not documented detail for the migration of Related and Export MPANs (but under these scenarios the pro-rata number of messages per MPAN migrated would be lower), or other similar 'edge cases', where the number of messages sent and received by each of the Central Services may vary.

Note, some messages are only sent for specific Meter Types. In these cases, market share estimates have been applied to each Meter Type to estimate the average number of messages sent for a generic migration.

9.1 Registration Service

Message	Meter Type	Count	Sent / Received	On Initiation / On Completion
PUB-031	All	2	Received	On Initiation
IF-032	All	2	Sent	On Initiation
IF-033	All	2	Sent	On Initiation
PUB-034	All	2	Received	On Initiation
D0170	All	2	Sent	On Initiation
IF-035	All	3	Sent	On Completion
IF-036	All	2	Sent	On Completion
D0209	All	1	Sent	On Completion
TOTAL MESSAGES		16		

The processing hours of the Registration Service are as follows:

DIP messages received by MPRS will only be processed between the hours of 05:00 to 18:00 and 21:00 to 23:00 on working days. Messages received outside of these hours will be held in a queue until the next processing window.

Suppliers are required to only initiate migrations between 05:00 to 12:00 on working days (i.e. IF-031s should only be sent within this window).

9.2 DIP

Message	Meter Type	Count	Sent / Received	On Initiation / On Completion
IF-031	All	2	Received	On Initiation
PUB-031	All	2	Sent	On Initiation
IF-032	All	2	Received	On Initiation
PUB-032	All	2	Sent	On Initiation
IF-033	All	2	Received	On Initiation
PUB-033	All	2	Sent	On Initiation
IF-034	All	2	Received	On Initiation
PUB-034	All	2	Sent	On Initiation
IF-035	All	2	Received	On Completion

PUB-035	All	4	Sent	On Completion
IF-036	All	2	Received	On Completion
PUB-036	All	11	Sent	On Completion
IF-041	NHH Smart	1	Sent	On Completion
PUB-041	NHH Smart	2	Received	On Completion
AVERAGE TOTAL MESSAGES		36.2		

9.3 LDSOs

Message	Market Segment	Count	Sent / Received	On Initiation / On Completion
PUB-036	All	2	Received	On Completion
D0010	Traditional	1	Received	On Completion
D0086	Traditional	1	Received	On Completion
D0036	HH Advanced	1	Received	On Completion
D0010	NHH Advanced	1	Received	On Completion
D0086	NHH Advanced	1	Received	On Completion
D0010	NHH Smart	1	Received	On Completion
AVERAGE TOTAL MESSAGES		3.6		

9.4 ECS

Message	Meter Type	Count	Sent / Received	On Initiation / On Completion
PUB-036	All	2	Received	On Completion

9.5 EES

Message	Meter Type	Count	Sent / Received	On Initiation / On Completion
PUB-036	All	2	Received	On Completion

9.6 CSS

Message	Meter Type	Count	Sent / Received	On Initiation / On Completion
RECM_SN_CSS00200	All	1	Received	On Completion
RECM_SN_CSS02900	All	2	Sent	On Completion
RECM_SN_CSS07000	All	1	Received	On Completion
RECM_SN_CSS07000	All	1	Sent	On Completion
TOTAL MESSAGES		5		

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9.7 DSP

Message	Meter Type	Count	Sent / Received	On Initiation / On Completion
RECM_SN_CSS02900	All	1	Received	On Completion
RECM_SN_CSS07000	All	1	Received	On Completion
TOTAL MESSAGES		2		

9.8 DTN

Message	Meter Type	Count	Sent / Received	On Initiation / On Completion
D0151	All	2	Received and Sent	On Initiation
D0170	All	2	Received and Sent	On Initiation
D0209	All	1	Received and Sent	On Completion
D0149	Traditional	4	Received and Sent	On Initiation
D0150	Traditional	4	Received and Sent	On Initiation
D0010	Traditional	4	Received and Sent	On Completion
D0086	Traditional	1	Received and Sent	On Completion
D0019	Traditional	1	Received and Sent	On Completion
D0268	HH / NHH Advanced	4	Received and Sent	On Initiation
D0383	HH / NHH Advanced	1	Received and Sent	On Initiation
D0384	HH / NHH Advanced	1	Received and Sent	On Initiation
D0036	HH Advanced	3	Received and Sent	On Completion
D0010	NHH Advanced	2	Received and Sent	On Completion
D0086	NHH Advanced	1	Received and Sent	On Completion
D0019	NHH Advanced	1	Received and Sent	On Completion
D0010	NHH Smart	3	Received and Sent	On Completion
D0019	NHH Smart	1	Received and Sent	On Completion
AVERAGE TOTAL MESSAGES		15.0		

10 Assumptions, Risks and Dependencies

Below we have detailed the high-level assumptions, risks and dependencies that relate to the Migration period of the Programme.

10.1 Assumptions

- Migration processes will be executed in accordance with the Migration Design approved within the MHHS Programme.
- The MHHS Programme will dynamically plan, manage, and assure the migration of legacy MPANs to MHHS arrangements.

- Each Supplier's Migration Plan will be agreed with the Programme but will be constrained by the maximum daily threshold and the available capacity as per the previous assumption. A methodology will be developed by the Programme (and agreed via TMAG) which will support the allocation of capacity to Suppliers on a non-discriminatory basis.
- If a Supplier is MHHS qualified, they will not be able to 'choose' to reverse migrate an MPAN. An MPAN will only ever undergo reverse migration when it is being settled under the new MHHS arrangements and is switched from a MHHS qualified Supplier to a Supplier who is not MHHS qualified. For this reason, a reverse migration cannot occur via a CoA Migration.
- If a Supplier of Last Resort (SoLR) were to take place during the Migration period, Ofgem would need to give consideration to the portfolio and the MHHS status of the losing Supplier, as well as the MHHS status of the gaining Supplier and their Agents, before determining the appropriate process for moving customers over.
- Changes made by legacy Agents and Suppliers to support Migration Design will be covered under Code Bodies' existing BAU change implementation and assurance processes. This will ensure that changes are made to both legacy Agent (MOP, DC, DA) and Supplier systems and services to support the Migration Design in advance of M10. This refers to the ability to support a forward migration and a reverse migration irrespective of MHHS qualification status.
- Suppliers will only initiate migrations between 05:00 to 12:00 on working days, this assumption will be tested in the development of the Migration processes and controls.
- From M14 onwards, all new connections will be under the MHHS arrangements.
- As a working assumption, Suppliers can use their market share as a rough estimate of the proportion of the 200k – 300k national threshold that they will be apportioned as part of Migration Planning to provide a minimum amount of capacity available. The methodology for the apportionment will be developed through MWG as part of the design of the MCC. A number of other factors will be considered within the design which will increase the available capacity to Suppliers, such as the number of migrations which have already occurred, meaning Suppliers qualified in later tranches will pro-rata have a higher capacity apportioned to them at the time. This is only intended as an interim guide until the apportionment methodology has been developed and agreed by TMAG.
- No migrations will be planned when the I&C contract rounds are happening.

10.2 Risks

- Suppliers will not be permitted to undertake 'bulk change of agent' activities within the Migration Period as this would cause a significant volume impact to Central Services and LDSOs. Those activities relate to the bulk change of Legacy Agents to Legacy Agents or MHHS Agents to MHHS Agents (not migration related).
- All Suppliers and Agents will need to have made changes to their services and business processes by M11 to support the Migration of MPANs away from their portfolios when a Migration occurs at a minimum, regardless of their qualification plans. There is a risk that Parties who have not made these changes will cause data quality issues impacting consumers and Settlement and this has been raised with the relevant Code Bodies to mitigate.
- All Suppliers and Agents who are not qualified by M11 may have to operate the reverse migration process (to Switch consumers whose MPAN is under the MHHS arrangements) and therefore they must have made changes to their services and business processes by M10. There is a risk that Parties who have not made these changes will cause data quality issues impacting consumers and Settlement.
- Under legacy arrangements, the CoA process, the CoMC process, and the CoA coincident with a CoS process can be subject to exceptions. By re-using the CoA process for the purposes of Migration, without materially changing the process, there is a risk that Migration is also impacted by a similar level of error.

- Large Suppliers who are not part of the MVC / SIT, will have a more limited window to migrate their portfolios prior to M15 after they have become MHHS qualified. The Migration Plan will allocate sufficient capacity to Suppliers to enable them to complete their migration, irrespective of the point at which they become qualified between M11 and M14.
- A higher than assumed number of participants qualify in the later tranches, limiting the window for all MPANs to be migrated within. The setting of maximum daily Migration Thresholds needs to support this scenario.
- Data cleansing activities, as set out within the Data Cleanse Plan, are not completed in time to support M11.
- Registration Services will only operate on Working Days, a risk exists that exceptions may occur on non-working days which may create backlogs of work which can only be resolved on subsequent working days, impacting migration volumes on those days.
- There is a risk of a Supplier of Last Resort (SoLR) taking place during the Migration period. In this scenario, Ofgem would need to give consideration to the portfolio and the MHHS status of the losing Supplier, as well as the MHHS status of the gaining Supplier and their Agents, before determining the appropriate process for moving customers over.
- Development of the Migration code for MPRS is not due to take place until 2024. This means that St Clements will not be able to test the migration functionality of MPRS until late 2024. They are planning to test some similar functionality in Q1 2024 which will provide a robust level of assurance in regards to Registration Services being able to support the volumes for LDSOs set out within this document (Programme Risk ID = R677).
- [There is a risk that Suppliers send larger than planned volumes of migration messages during the Migration Period which exceeds the LDSO thresholds. This could overwhelm LDSO systems and may require a pause on migration activities until the relevant LDSO MPRS MPID has caught up.](#)

10.3 Dependencies

- There is a dependency on all Suppliers and Agents to make changes (as per the Migration Design) by the start of the Migration period, including Suppliers and Agents that are not planning to be qualified at the start of the Migration period. They will still need to be able to follow the Migration process where they are losing customers to a Supplier who is going to migrate them to the new arrangements.
- Equally, if unqualified Suppliers intend to switch consumers that have already migrated to the MHHS arrangements (between M11 and M14) they will need to operate the reverse migration process.
- Legacy MOPs and DCs will need to have implemented specific changes, prior to the start of the Migration period, to support forward and reverse migration processes.
- The data cleansing activities that have been set out in the Data Cleanse Plan are undertaken to minimise data quality issues by M11.
- There is dependency on Ofgem creating an incentive scheme for Suppliers and LDSOs to support delivery of the M15 milestone.
- As per the delivery plan set out in the Migration, Cutover and Data Strategy document, this document has focused on setting Migration Thresholds at a market-wide and Central Services level. Agents and Suppliers, although intentionally not the focus of this document, will also be central to the success of MHHS Migration. There is therefore a dependency on the Programme to develop a planning methodology which will include requirements related to Agents and Suppliers as part of the design of the MCC in 2024. This methodology will ensure that Suppliers are able to agree plans with the MHHS Programme which meet their M15 obligations, whilst also ensuring that the migration plans applicable to each Agent are approved by that Agent as achievable.

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