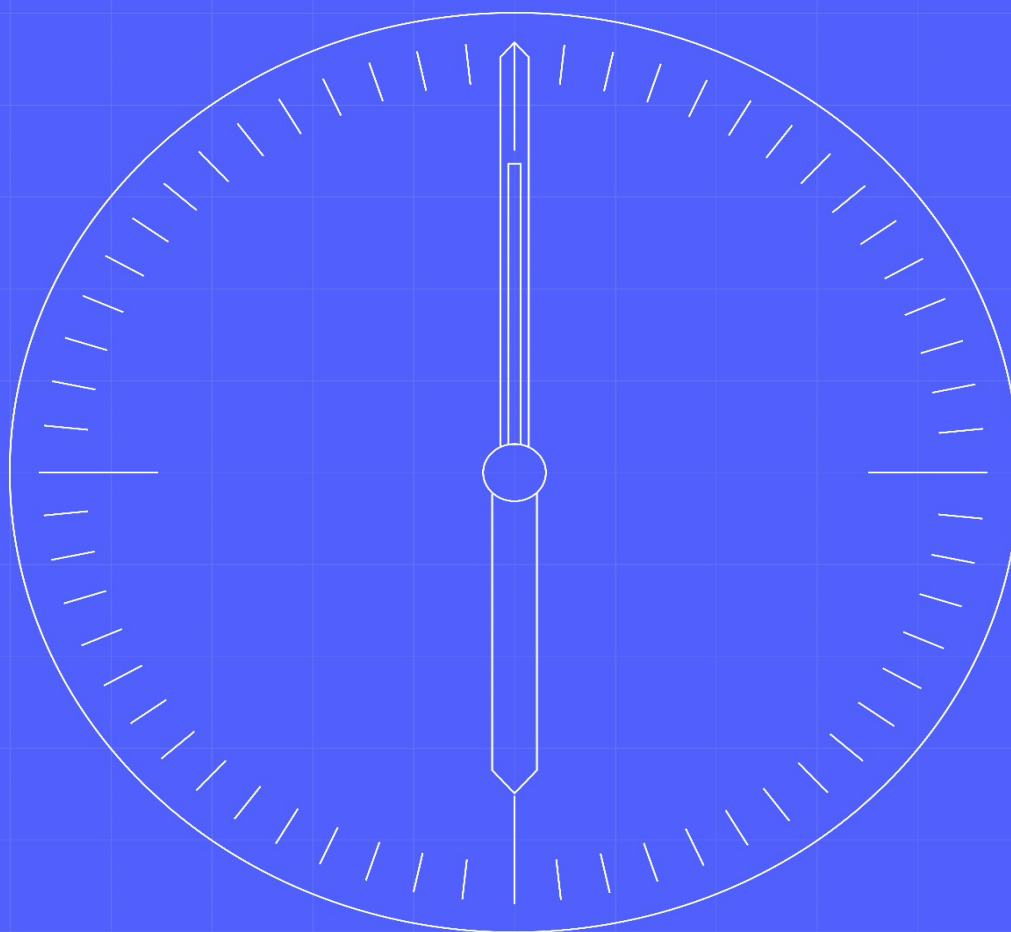


E2E Sandbox Test Data Approach and Plan



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References

Ref No.	Document/Link	Publisher	Published	Additional Information
REF-01	E2E Sandbox Guidance (MHHS-DEL2736)	MHHS Programme	May 2025 v2.3	
REF-02	Non-SIT LDSO Qualification Test Data Approach & Plan (MHHS-DEL2455)	MHHS Programme	August 2024 v2.0	
REF-03	Non-SIT S&A Qualification Test Data Approach & Plan (MHHS-DEL2746)	MHHS Programme	April 2025 v1.2	

Terminology

Term	Description
	For terminology, see Programme Glossary on the MHHS portal: Programme Glossary (SharePoint.com)

2 Executive Summary

The **End-to-End Sandbox Test Data Approach & Plan** should be read in conjunction with the **E2E Sandbox Guidance** document.

This document is a child document of the **E2E Sandbox Guidance** document which establishes a clear scope for Sandbox Testing and outlines the key principles supporting the creation, set up and operation of the Sandbox test environment for optional use by Programme participants.

As outlined within the **E2E Sandbox Guidance** document, the definition of the test environments for Qualification Testing will have a direct influence on the operation of Sandbox testing using the UIT environment as both testing activities share the use of the same environment.

- The E2E Sandbox in the UIT environment is provided on the basis of being supported by the UIT test environment that has been used for the Qualification testing.
- The Central Service environments (i.e. DIP) and Test Harnesses (i.e. QTF Test Harness (Qualification Test Framework) and Non-SIT LDSO Test Harness) approved for use in Qualification Testing will be used for Sandbox Testing in the UIT environment and determines what facilities are available for Sandbox testing.
- It should be recognised that the E2E Sandbox is not subject to a separate set of requirements to support PPs test activities, the scope of activities that can be undertaken by participants will be determined by what is supported by the UIT environment.

As a result of these agreed principles and approach, this document defining the **Sandbox Test Data Approach and Plan** relies heavily on the **Qualification Test Data Approach and Plan documents for both Non-SIT LDSOs and Non-SIT Supplier and Agents** (see REF-02 and REF-03 above), as the process used for E2E Sandbox in the UIT environment will essentially be a repeat of the same approach as used for Qualification Testing.

Therefore, it is recommended that this document is read alongside the relevant Qualification document, which contains fuller details, based upon Participant type.

- LDSO Participants – See REF-02 = **Non-SIT LDSO Qualification Test Data Approach and Plan**
- Supplier & Agent Participants – See REF-03 = **Supplier & Agent Qualification Test Data Approach and Plan**

3 Introduction

3.1 Document Purpose

This document aims to define a test data approach and provide a view of specific data requirements that will support Sandbox Testing using the UIT Environment.

This document, read alongside the **Qualification Test Data Approach and Plan documents for both Non-SIT LDSOs and Non-SIT Supplier and Agents** (see REF-02 and REF-03 above), defines the approach to providing the test data necessary for all test participants (LDSOs, Suppliers or Agents) to conduct Sandbox Testing in the UIT environment

It sets out the process for requesting and generating the required test data and how this should be populated within the Test Participants systems prior to commencing Sandbox Testing.

3.2 Background

End-to-End Sandbox (E2E Sandbox) is referenced as a key test stage within the **Programme E2E Testing and Integration Strategy** document as part of the User Integration Testing (UIT) testing phase.

E2E Sandbox testing has been proposed as a voluntary test stage where Programme Participants (PPs) can optionally use this testing service, post SIT (System Integration Testing) or Qualification Testing (QT) being completed, to undertake additional testing and continuing to prove their systems and processes.

The optional use of E2E Sandbox by Programme participants is anticipated to help reduce the risk of any negative impacts being experienced within the live service by providing additional testing facilitates and time to continue testing post SIT or QT activities and pre go-live (but could also in be used post-Go-Live).

4 Using the Sandbox in the UIT Environment - Requesting Access

The use of the Sandbox in the UIT environment is optional for all Test Participants and can be used at any point, but either SIT or Qualification Testing must have been successfully completed by the test Participant prior to being able to use the Sandbox.

Any participant looking to use the Sandbox for testing purposes should contact the Sandbox support team to discuss their pathway to Sandbox testing.

4.1 Pathways to Sandbox Testing

It is noted that each Programme participant is likely to have a different pathway to using the Sandbox for testing purposes, and depending on the pathway taking it has some considerations for the subsequent required activities that are required to request access to the Sandbox in the UIT environment.

Any test participant who chooses to use the Sandbox in the UIT environment that has been through non-SIT Qualification Testing will already be onboarded for Test harness and DIP use and so these steps do not need to be repeated for the use of Sandbox Testing. This shown in the figure below, split by test Participant roles

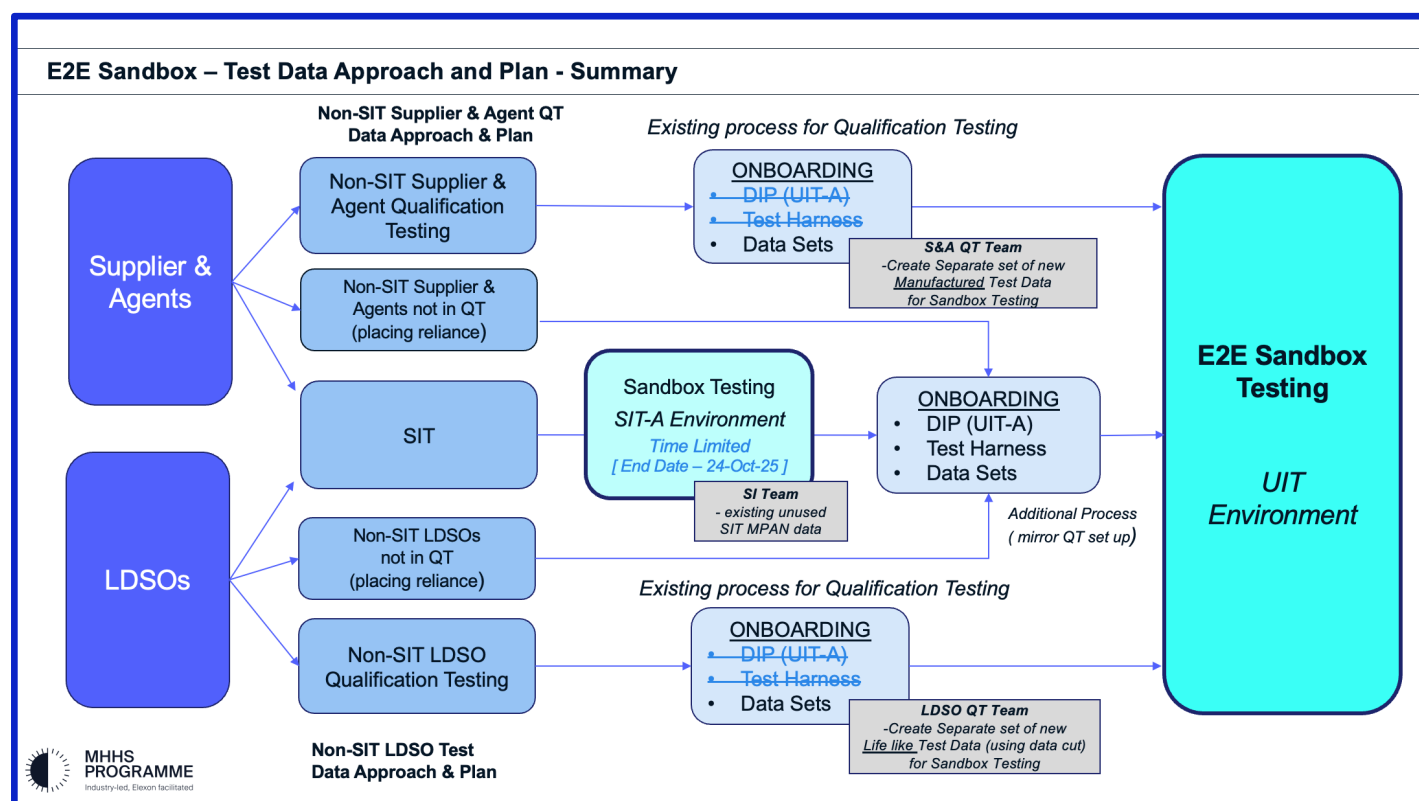


Figure 1 – E2E Sandbox – Pathways to Sandbox Testing

Figure 2 below illustrates the high-level process required to be followed for the additional activities required to use the Sandbox post completion of System Integration Testing (SIT) or Qualification Testing (QT) ;

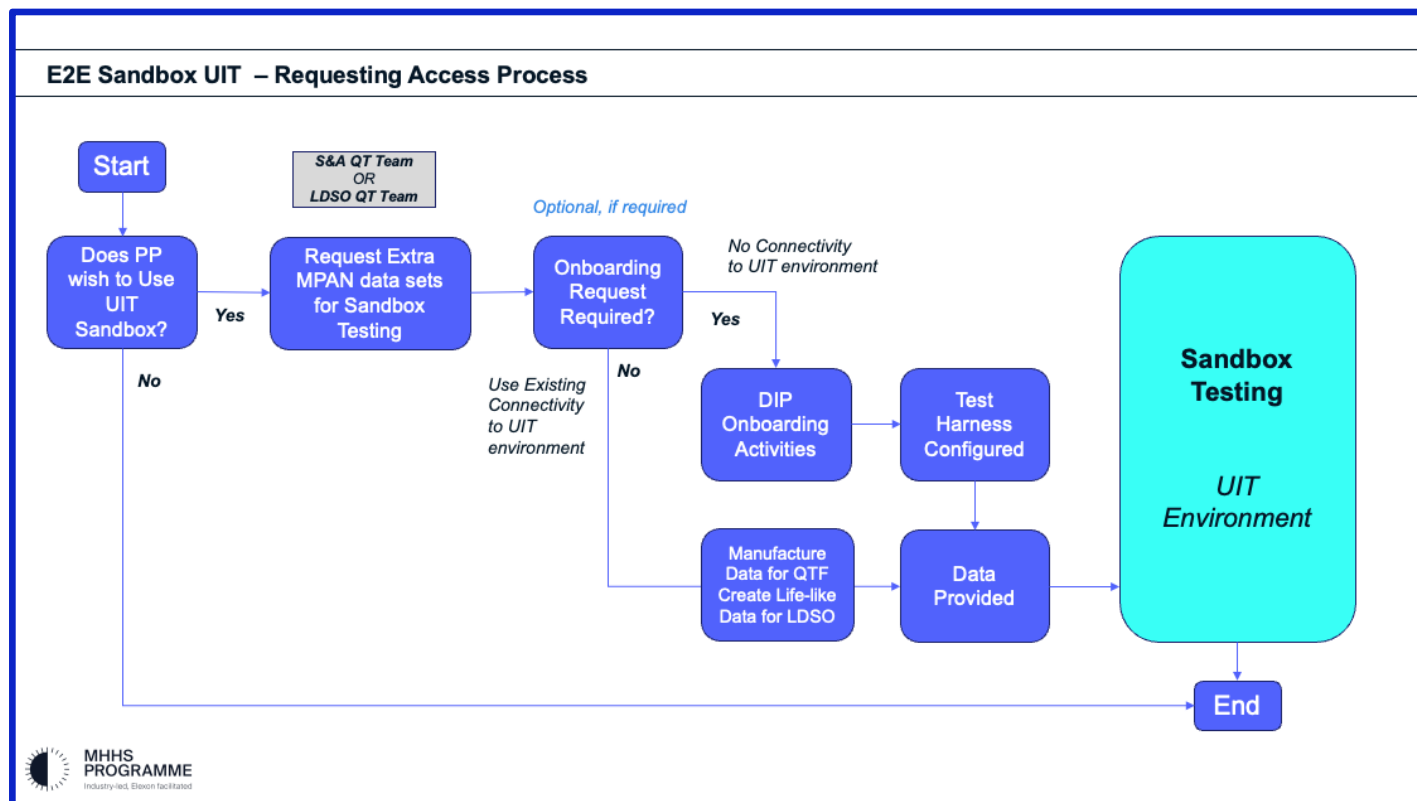


Figure 2 – E2E Sandbox – Requesting Access Process

5 Sandbox Testing – Key Test Data Principles

The following key Test Data principles apply to **ALL** Sandbox test Participants

- Wherever possible and viable, different MPAN sets are intended to be used for Sandbox Testing in the UIT environment to those used for Qualification Testing. This approach will,
 - create a logical separation for testing activities and mitigate against any potential testing contentions (noting that Participants cannot run Sandbox tests until they have completed Qualification ensuring that these tests will not run in parallel).
 - allow test participants to easily identify the Test Phase being executed, ensuring that there is no conflict in data between Qualification and Sandbox testing using the UIT environment.
 - Note – For LDSOs, the aim if possible is to try and re-use MPANs from non-SIT QT to reduce data set up and support levels (see section 6.4 below for more details)
- The Sandbox environment will use the same Industry Standing Data (ISD) data set configured for use in the UIT environment and used for Qualification Testing
 - Single set of ISD used for supporting the UIT Environment for both Qualification Testing and Sandbox Testing

6 LDSO Participants

This section should be read by any test participants who are using the Sandbox as an LDSO test participant.

6.1 Key Principles

- LDSO Participants who choose to use the Sandbox in the UIT environment will need to use the Non-SIT LDSO Qualification Test Harness Tool.
- Test data will be provided in a similar way as per Non-SIT Qualification, as documented in the ***Non-SIT LDSO Qualification Test Data Approach and Plan – MHHS-DEL2455***.
- The Business Processes in scope for Sandbox Testing will be the same as defined for Non-SIT LDSO qualification, as documented in the *Non-SIT LDSO Qualification Test Data Approach and Plan – MHHS-DEL2455*.
- In the event that there are any competing testing activities /priorities between Sandbox Testing and Qualification Testing then it should be noted that any Qualification Testing activities would take priority over Sandbox testing activities.
 - Supporting Participants with their qualification process so that they are able to successfully migrate and operate MPANs within the new MHHS systems as soon as possible is a key Programme priority.
 - Therefore, support for any new entrants through their qualification testing process, which uses the same test harness and UIT environment, would take priority for test support resource over similar support requests for Sandbox testing.

6.2 MHHS Non-SIT LDSO Qualification Test Harness Tool

For LDSO Participants, Sandbox Testing in the UIT environment requires a test environment in which certain roles outside of LDSO, Registration Services and UMSO (for example Agents and Suppliers) will be simulated by a Non-SIT LDSO Qualification Test Tool.

As part of Sandbox testing, LDSO Participants will be required to stand up their own instances of LDSO, Registration Services and UMSO and as a result these roles will not be included within the Test Tool build.

This tool has been built by the MHHS Programme Sims & Ems Team and has been used by Non-SIT LDSOs as part of Non-SIT LDSO Qualification testing. It will have the ability to send IF messages to the DIP and receive PUB messages from the DIP. This tool will mimic the DIP responses for roles outside of the three roles listed above, for example a message relating to a Supplier role will be generated via the Tool rather than a physical Supplier role and the data will be manipulated to support this Business Process/Test Case i.e. supplier.

The Test Data identified by the Non-SIT LDSOs for Sandbox Testing will need to be manipulated by the Non-SIT LDSOs in order to replace current Supplier and Agents with the Test Harness Tool Supplier and Agents. The replacement values will be provided by the Qualification Test team ('QT team') enabling DIP messages to be sent to the Test Harness Tool.

6.3 Supporting the use of the MHHS Non-SIT LDSO Qualification Test Harness Tool

In order to support LDSO Participants use the Sandbox, ongoing support will be required from the QT team to help execute the required Test Cases and business processes for the duration of the Sandbox availability dates. The QT Team providing support will include similar people who support the Non-SIT LDSOs through their Qualification Testing activities.

The use of Sandbox is not expected to be as intensive as during Non-SIT LDSO Qualification Testing and is likely to be more sporadic. Unlike Non-SIT LDSO Qualification Testing, no specified named contacts will be provided for Sandbox testing support, instead a more general support will be available upon request from test participants. The support team

can generate any CSS messages required for testing, but these will need to be provided with the required details to use to help support the required test activity with some notice period required.

Due to the unpredictable nature of Sandbox testing, determining required support levels is challenging and so it is likely that there will be resource capacity limits within the support team. Capacity limits will be advised if there are conflicts and any conflicts will be resolved as fairly as possible. If Participants advise the support teams in advance of testing of the support required and when then this would help reduce the likelihood of any conflicts and allow the team to better manage all support requests.

6.4 Test Data Process

Test data will be provided in a similar way as per **Non-SIT Qualification as defined in Section 7 of the Non-SIT LDSO Qualification Test Data Approach and Plan – MHHS-DEL2455**).

For LDSO Sandbox use, as Qualification testing has already been completed by all currently market participants. Therefore, most test Participants have a choice to either,

- Re-use the existing MPAN data if required. This is the proffered option wherever possible
 - This reduces the support levels required and avoids the need to have to migrate new data sets into the UIT environment> This is a difficult and resource intensive manual process for the support team.
- Request new additional test data to be created and used (participant to work with the support team)
 - It is recognised that extra MPAN data may be required over time and therefore needs to be created and migrated across from the data cut into the UIT environment upon request stating how many MPANs are required and of which type.
 - Sandbox support team will not be able to perform bulk migration activities, so LDSOs will need to only request a small number of MPANs at a time to be migrated.
 - Advance notice is required to be provided by the test participant to the support team for any requests for new additional MPANs to be used in the Sandbox environment i.e. a week's notice provided.
 - This is required in order to allow the support team time to prepare data prior to allow the required set up to ensure that the new MPANs can be used successfully by the test harness.
 - The same SFTP process as used in non-SIT Qualification Testing will continue to be used for data transfer as real MPANs are being used for Sandbox Testing – same naming convention will be used as per QT by adding references
 - LDSO test participants will be expected to have completed any data cleanse activities for the new additional MPANs requested to be used in the Sandbox environment and The MPANs registered Supplier will need to have been amended to the test harness supplier prior to migration.
 - Suggestion is to perform this activity in batches for test participants rather than on a one by one basis.
- Combination of both of the above options.

Information notes

- Test participants using Sandbox may receive Industry Standing Data (ISD) updates via PUB-047 messages when they are carrying out their testing activities. This is because as part of Qualification Testing, any new participant requests a smoke test and this involves sending this message to ALL participants using the UIT-environment.
 - *Note – Participants using the Sandbox should be aware that multiple sets of ISD may be sent to support QT tests, so it may not be appropriate to auto-load all ISD updates as they are likely to in production environments. Some ISD sets may be ignored for testing purposes.*

- The test harness mirrors HELIX messages, so Sandbox test participants may receive broadcast messages initiated from either test harness. If these are received, test participants should just ignore these and carry on with test activities.

6.5 Test Data Scenarios

Test data scenarios will be the same as per Non-SIT Qualification as defined in section 8 of the **Non-SIT LDSO Qualification Test Data Approach and Plan – MHHS-DEL2455**).

6.6 Test Data Anonymisation

Test data scenarios will be the same as per Non-SIT Qualification as defined in section 9 of the **Non-SIT LDSO Qualification Test Data Approach and Plan – MHHS-DEL2455**).

6.7 Reports

These will continue to be static as per previous qualification test phase. No bespoke updates supported for Sandbox testing.

6.8 Roles and Responsibilities

The table below represents the tasks that the LDSO test participants will need to perform in readiness to support Sandbox testing in the UIT environment:

Activity	Detail
As required, make Requests for new additional MPAN Creation and load into the Test Harness including any Test Data Conditions required for testing	Send in to support team, with a week's notice period for the support team to action.
Test Data Conditions	To be provided to support team - dependant on Test Scenarios and Test Cases
Test Data validation – LDSO support	Validate Test Data prior to data loading into LDSO environment prior to the start of running Sandbox tests
Secure File Transfer Process (SFTP)	Use the defined process for transferring and receiving data files
Data Loading	Data Load into LDSO systems for any MPANs and associated data sets under scope of Sandbox Testing
Data Transfer	Data Transfer to and from the Sandbox support team
Data Anonymisation	Anonymise sensitive data used for reporting including Defect Management during Test Execution

Table 1 LDSO Test Participant Roles and Responsibilities for Sandbox testing

The table below represents the tasks that the Support Team will need to perform in readiness to support LDSO Sandbox testing in the UIT environment:

Activity	Detail
Upon Request from LDSO test participant, create new additional MPAN Creation	Action request from LDSO test participant. Test MPANs align to Test Data Conditions requested by LDSOs
Test Data Manufacturing	Manufacture data where Live data not available
Test Data Loading	Load data into relevant Systems including Test Harness
Test Data transfer	Transfer data from/to LDSOs using SFTP
Test Data support	Provide general support to LDSOs within available support levels
Defect Management support – Test Data	Provide defect triage support for any defects relating to data
Secure File Transfer Process (SFTP)	Manage the SFTP process
Socialisation/support	to LDSOs and provide support as required

Table 2 Sandbox support team Roles and Responsibilities

7 Supplier and Agent Participants

This section should be read by any test participants who are using the Sandbox using as a Supplier or an Agent market role.

7.1 Key Principles

- Supplier and Agent Participants who choose to use the Sandbox in the UIT environment will need to use the QTF Test Harness (Qualification Test Framework).
- Sandbox testing will inherit the same environment, QTF and Test Data approach as is provided for Qualification Testing. Therefore,
 - Test data will be provided in a similar way as per **Non-SIT Qualification. as documented in the Non-SIT S&A Qualification Test Data Approach & Plan - MHHS-DEL2746.**
 - The Business Processes in scope for Sandbox Testing will be the same as defined within the QTCs (Qualifications Test Cases) for Non-SIT Supplier and Agent qualification, as documented in the **Non-SIT S&A Qualification Test Data Approach & Plan - MHHS-DEL2746.**
- When reading the *Non-SIT S&A Qualification Test Data Approach & Plan* (MHHS-DEL2746), where the term 'Qualifying Party' has been used, please read this as 'Test Participant' in the context of Sandbox testing.
- The Sandbox test environment uses the same UIT environment as is being used for Qualification Testing (QT) over largely the same time period. In the event that there are any competing testing activities /priorities between Sandbox Testing and Qualification Testing then it should be noted that Qualification Testing activities would take priority over sandbox testing activities.
 - Supporting Participants with their qualification process so that they are able to migrate their MPANs into the new MHHS systems as soon as possible is a key Programme priority.
- The MHHS Programme retains overall responsibility for the provision of the Sandbox environment as described in the E2E Testing and Integration Strategy, but the Non-SIT S&A QT will support the creation and management of Test MPANs to support test Participants test execution as test data is heavily linked to the use of the Test Harness that is required to be used by Test Participants for Sandbox testing.

7.2 MHHS Non-SIT Supplier & Agent Qualification Test Harness Tool

For Supplier and Agent Participants, Sandbox Testing in the UIT environment requires a test environment in which certain roles outside of the test participants market role under test will be simulated by a Test Harness. As part of Sandbox testing, Supplier and Agent Participants will be required to stand up their own instances of their systems under test.

Test Participants will execute their test cases in Sandbox testing using the Qualification Test framework (QTF) Test Harness. This test harness allows for test cases to be executed by test participants to support their testing activities.

A test case (QTC) is a representation of an end-to-end business process and comprises a number of test steps (QTSs). The set of QTCs that each Test Participant may use (the "QTC Set") will be determined by the Market Role for which the Test Participant has successfully qualified against. As such, the number of test MPANs generated for each Test Participant will be dependent on their Market Role. Test data will be generated as part of the onboarding process.

When executing a test case (defined as QTCs in the Qualification documentation) within the Sandbox using the UIT environment and the QTF, Test Participants can run **ANY** QTSs relating to the Market Role for which they are registered to test against based on their qualified market roles, with all other Market Roles involved in the end-to-end QTC being simulated by the QTF.

The working assumption being used for initial planning purposes is that upon request a test participant using the Sandbox in the UIT environment will be provided with access to ALL the QTCs for the requested market role and that the same number of MPANs as provided for qualification testing to run each of these QTCs will be provided to support Sandbox Testing. If additional MPANs sets are required then this may be requested from the support team during the testing period.

7.3 Supporting the use of the Test Harness

Supplier and Agent use of the Sandbox using the UIT environment and the required QTF test harness is expected to run primarily alongside the Qualification Testing waves. This enables the same team to be available to support the QTF Test harness for both Sandbox testing and Qualification Testing. Ongoing support will be available for the duration of the Sandbox as required in line with the Qualification support provided for the QTF test harness.

7.4 Test Data

The test data required to use the Sandbox using the UIT environment will be similar to those used in the **Non-SIT Qualification, as outlined in section 4 of the *Non-SIT S&A Qualification Test Data Approach & Plan - MHHS-DEL2746***.

The same approach to MPANs creation and management will be taken for Sandbox Testing in the UIT environment as has been taken for Qualification Testing i.e. Sandbox Testing will use realistic, artificial MPANs modelled on Production data. MPAN Attributes, MPAN Types and dependencies as defined for Qualification testing will be re-used/repeated for Sandbox testing.

The MPANs used for Sandbox Testing will be created by the Qualification team for consistency purposes with Qualification Testing, noting that different MPAN sets will be created for use in Sandbox Testing than used for Qualification Testing, to ensure that there is a separation between testing activities that use the same UIT environment.

7.5 Test Data Process

- The ***Non-SIT Supplier and Agent Qualification Test Data Approach and Plan*** sets out the method for generating the required test data and how this will be populated within the Qualifying Parties' systems prior to commencing Non-SIT Supplier and Agent Qualification Testing. The same approach will be used to support Sandbox testing in the UIT environment.
- Test Participants using Sandbox testing can select and use any of the QTCs that exist within the test Participants requested QTC set.
- Sandbox Testing in the UIT environment will commence with the population of a test Participant's system(s) with the Test Data necessary to conduct all QTCs requested within the test Participant's QTC Set. The process by which this is achieved is the same as used in Qualification Testing and outlined in the ***Non-SIT Supplier and Agent Qualification Test Data Approach and Plan*** (section 5).
- Where a test Participant wishes to use the QTF for Sandbox testing, the Non-SIT S&A QT Team will issue them with a new set of Test MPANs for this purpose. Issuing new Test MPANs for Sandbox testing will ensure segregation between Qualification and Sandbox testing is maintained. The Non-SIT S&A QT Team will generate multiple Test MPANs/Test MPAN sets for each QTC to enable QTC re-runs. The intention is to generate circa 20 Test MPANs/MPAN sets to support all re-runs likely to be required during Sandbox Testing. However, should a Qualifying Party require additional Test MPANs, these can be requested from the Non-SIT S&A QT Team.
- Any additional MPANs to be used for Sandbox Testing must be requested by the Participant to the Qualification team at least one week prior to the anticipated start of Sandbox Testing to allow time for the data set to be created.

Information notes

- Test participants using Sandbox may receive PUB-047 messages when they are carrying out their testing activities. This is because as part of Qualification Testing, any new participant requests a smoke test and this involves sending this message to ALL participants using the UIT-environment.

- The test harness mirrors HELIX messages, so Sandbox test participants may receive broadcast messages initiated from either test harness. If these are received, test participants should just ignore these and carry on with test activities.

7.6 Test Data Anonymisation

Test data scenarios will be the same as per Non-SIT Qualification testing as defined in section 6 of the **Non-SIT S&A Qualification Test Data Approach & Plan - MHHS-DEL2746**.

7.7 Roles and Responsibilities

The table below represents the tasks that the S&A QT Team will need to perform in readiness to support Sandbox testing in the UIT environment for Supplier & Agent participants

Activity	Detail
Generate Test MPANs	Upon request from a specific Test Participant, generate a set of Test MPANs for use in Sandbox testing, based on the full QTC Set for their qualified Market Role(s).
Allocate Test MPANs to QTCs	Assign Test MPANs to QTCs within Test Participants QTC Set.
Generate MPAN Files	Combine Test MPANs with appropriate MPAN Templates to generate Test MPANs based on their agreed QTC Set.
Generate Trigger Files and Expected Result Files	Generate a set of Trigger Files and Expected Result Files based on the QTCs in Test Participants QTC Set and the Test MPANs that have been allocated to them.
Test Data support	Provide general support to Sandbox Test Participants
Defect Management support – Test Data	Provide defect triage support for any defects relating to data

Table 3 Qualification team responsibilities for Sandbox testing

The table below represents the tasks that the Sandbox Test participants will need to perform to use the Sandbox in the UIT environment

Activity	Detail
Commence Sandbox Testing by executing the ISD QTC.	All Sandbox Test Participants should commence Sandbox Testing by loading the Qualification ISD set. This is done by executing the ISD QTC.
Commence Sandbox Testing by executing the Forward Migration QTCs	Having loaded the Qualification ISD set by successfully executing the ISD QTC, all Sandbox Test Participants should populate their systems with the necessary Sandbox Test MPANs required to complete Sandbox Testing by running the Forward Migration QTCs. Each single MPAN migration must be completed before attempting the QTC.

Table 4 All Supplier & Agent test participants responsibilities for Sandbox Testing