![MHHS PROGRAMME - Industry-led, Elexon facilitated]

QA&P Annex 1 - Non-SIT LDSO MHHS QT Approach & Plan

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Figures

Tables

Change Record

Date	Author(s)	Version	Change Detail
28/11/2023	MHHSP LDSO QT Team	0.1	Initial draft
15/01/2023	MHHSP LDSO QT Team	V0.3	Updates post review by MHHSP LDSO QT Team
25/01/2024	MHHSP LDSO QT Team	V0.3	Updates post review by MHHSP and Code Bodies
31/01/2024	MHHSP LDSO QT Team	V0.4	Consultation version
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[OBJ]28/03/2024	MHHSP LDSO QT Team	[OBJ]V1.0	[OBJ]Baselined verisionversion post BSC and REC PAB approval,
28/0322/04/2024	MHHSP LDSO NFT Team	V1.01	Non-Functional and Operational Testing updates, updates for helix being a test harness, Alignment with Annex 2 of the QA&P.

Reviewers

Reviewer	Role
MHHSP LDSO QT Team	Various
LDP	Various
SRO	Various
Code Bodies (BSC and REC)	Various

References

Ref No.	Document/Link	Publisher	Published	Additional Information
REF-1	MHHS-DEL1118 The Qualification Approach and Plan (QA&P)	BSC and REC Code Bodies	5th March3rd April 2024	
REF-2	Qualification Assessment Document	BSC and REC Code Bodies	3rd April 2024Under development	
REF-3	MHHS-DEL618 MHHS Programme Environment Approach & Plan	SI Environment Lead	15th November 202327th March 2024	This will be updated to reflect environment requirements for qualification
REF-4	Not used			
REF-5	MHHS-DEL852 - Pre-Integration Test Guidance.	MHHSP	18th 5 April 2024August 2023	This will be updated to provide further guidance for LDSO QT
REF-6	MHHS Programme Release and Configuration Approach and Plan	MHHSP	17 May 2023	
REF-7	REC Assessment Criteria for MHHS Qualification	REC Code Manager	3rd April 202405th September 2023	
REF-8	BSC Assessment Criteria for MHHS Qualification	BSC Code Manager	3rd April 2024Under development	
REF-9	MHHS Metering Service Requirements v5.5	MHHS Design Team	23rd September 2023	Not used
REF-10	MHHSP Business Requirements v5.4	MHHS Design Team	18th October 2023	Not used

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REF-12	MHHS DEL-1624 NFR PIT and SIT scope	MHHS Design Team	Under development	
REF-13	MHHS Operational Choreography	MHHS Design Team	21st Sep 2023	
REF-14	MHHS Placing Reliance Policy	MHHS Design Team	27th April 2023	
REF-15	LDSO QT Test Scenario Template	MHHS Test Team	11th December 2023	
REF-16	MHHS-DEL466 Defect Management Plan	MHHSP	29th February 2024	
REF-17	QT: Test Harness Requirements	MHHSP	13th December 2023	Not used
REF-18	MHHS-DEL1332 - Test Management Tool User Guide.	MHHSP	16th June 2023	
REF-19	MHHS-DEL1197 Interface Code of Connection Guide.	MHHSP	30th November 2023	
REF-20	MHHS DEL1671 DIP Onboarding Guide	MHHSP	24th November 2023	
REF-21	MHHS-DEL813 - Overarching Test Data Approach and Plan.	MHHSP	July 19th 2023	
REF-22	Placing Reliance Submission – worked example	Code Bodies	6th December 2023	
REF-23	Placing Reliance Submission Form	Code Bodies	6th December 2023	
REF-24	MHHS-DEL030 - Programme Governance Framework	MHHSP	6th December 2023	Not used
REF-25	MHHS-DEL1140 - Milestone Register	MHHSP	Working document	Not used
REF-26	MHHS-DEL961- Migration Design Document v1.1	MHHSP	3rd April 2023	
REF-27	MHHS-DEL2127 SIT Non-Functional Test Approach and Plan	MHHSP	Under development	Not used
REF-28	MHHS-DEL2455 MHHS non-SIT LDSO QT Data Approach and Plan	MHHSP	Under development28th March 2024	
REF-29	MHHS-DEL1911-Webhook URL Configuration Guide	MHHSP	24 November 2023	
REF-30	MHHS-DEL1259 SIT -Functional Test Approach and Plan	MHHSP	16th August 2023	Not used
REF-31	MHHS-DEL1477 DIP Certification Process Map	MHHSP	13 July 2023	
REF-32	MHHS-DEL974 Migration Design requirements	MHHSP	3 April 2023	
REF-33	MHHS-DEL2437 Non-Functional Test Policy	MHHSP	Under development	
REF-34	MHHS-DEL2324 Initial BAU Volume Model	MHHSP	13th February 2024	

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REF-35	MHHS-DEL2128 NFR Categorisation	MHHSP	Under development	

Terminology

Term	Description
Various	For terminology, see MHHSP Glossary on the MHHS portal: Programme Glossary (SharePoint.com) Please also see Appendix 15 in QA&P: List of Acronyms

1   Executive Summary

Non-SIT LDSO MHHS QT Approach and Plan is an annex of the Qualification Approach and Plan (QA&P) [REF-01]. It is applicable to all existing Licensed Distribution System Operators (LDSOs) seeking to qualify through the non-SIT route and new entrant LDSO who are seeking to operate in the market prior to M10. It describes the scope and MHHS QT requirements, the test framework for LDSO Qualification and assurance processes to assess whether LDSO Programme Participants have met the MHHS QT requirements.

The Code Bodies (REC and BSC) have overall accountability for MHHS Qualification, which includes reviewing Qualification Assessment Document submissions and confirming a Programme participant has met the requirements to become qualified under the BSC and / or the REC. Responsibility for testing activities that provide evidence to support MHHS Qualification are split between Code Bodies and the MHHS Programme. LDSO QT will be managed by the MHHS LDSO Qualification Test (QT) Team[1], which is part of MHHSP, with the Code Bodies undertaking an assurance role to confirm the scope of testing and the output satisfies the wider Qualification needs, whilst QT (QT) for remaining Programme Participants will be managed via the Code Bodies. The successful completion of QT and associated test evidence will provide an input into the participant's ~~final Qualification~~final Qualification Assessment Document (QAD) submission.

The current working assumption is that non-SIT LDSO QT execution will commence from 1st October '24 and will be preceded by the completion of SIT Functional Testing Cycle 2, the release of Interim Release 8 and Non-SIT LDSO Participants' readiness activities. The non-SIT LDSO QT execution commencement date is currently not aligned with the MHHSP overall plan; however, the plan will be re-baselined to this upon approval of ~~this Annex~~CR47.

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[1] This team is referred to as the MHHSP Test Manager in the QA&P [REF-01].

2 Introduction

This section covers the annex purpose and content as well as how this annex works in conjunction with other documentation.

2.1 Document Purpose

The non-SIT LDSO MHHS QT Approach and Plan (this document) sets out the testing framework, objectives, and approach to the LDSO QT – only for the non-SIT LDSO QT participants, who are choosing to qualify through the non-SIT route in order to operate in the MHHS market at M10. This includes new entrant LDSO who are seeking to enter the market prior to M10 but excludes new entrant LDSO who are seeking to enter the market post M10, who should follow the process set out in Annex 3 of the QA&P.

The purpose of the document is to:

- Define QT scope, test management and assurance activities necessary to demonstrate that LDSOs can operate under the new MHHS arrangements.

- Identify activities and responsibilities of non-SIT LDSO QT participants to be able to successfully complete QT.

- Deliver an approach to QT that meets Code Body requirements, and is practicable, appropriate, and achievable.

- Provide a robust schedule to implement non-SIT LDSO QT in accordance with the MHHSP implementation timetable that will enable LDSO parties to be qualified ahead of the M10 milestone.

- Describe governance and change processes, resources, environment, data and tools to underpin LDSO QT and effective delivery of the expected capabilities.

The document provides the technical components, i.e. preparation, development and execution of the tests, environments, data, simulators and managing the MHHS 'Placing Reliance' policy submissions and assurance methods.

It also includes the administrative components related to planning, templates design and documentation development.

As this annex only covers activities needed for non-SIT LDSO QT participants to complete QT, it must be read in conjunction with QA&P [REF-1], QAD [REF-2] (once published) and Code Bodies Assessment Criteria which are the overarching documents for Qualification as well as any other documents reference in section 5 of the QA&P [REF-1]. There is also a number of testing documents that are relevant to QT which non-SIT LDSO QT participant should be familiar with. The full hierarchy of documents is shown on the diagram below.
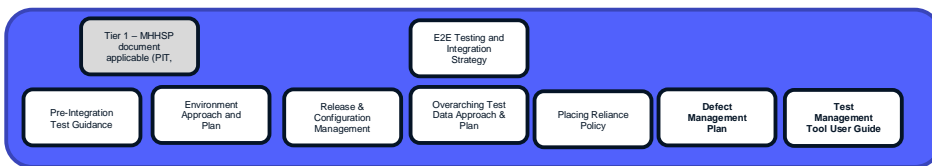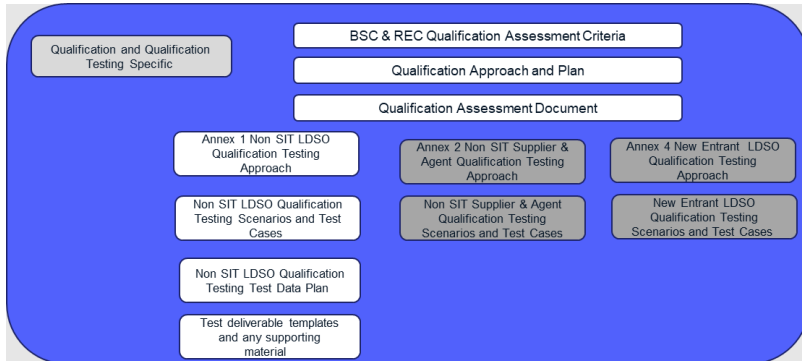
Figure 1: Document Hierarchy

The non-SIT LDSO MHHS QT Approach and Plan covers:

- Test Stage Objectives
- Scope
- Architecture and Coverage
- Approach (Preparation & Execution), this is split into non-SIT LDSO QT participants' preparation and MHHS LDSO QT Team's preparation, covering:
  - o Test Scenarios and Cases
  - o Test Data
  - o Stubs and Harnesses
  - o Test Management Tool
  - o Evidence Capture
  - o Defects Management
  - o Environments & Releases
  - o Readiness activities and documentation
  - o Entry and Exit Criteria
- Test Schedules
- Management & Organisation
- Governance & Reporting
- Assurance

This document is intended to be read by the following groups:

- LDSO and 3rd parties
- SRO Function (SRO)
- Lead Delivery Partner (LDP)
- Qualification Advisory Group (QAG) & Qualification Working Group (QWG)
- BSC and REC Code Body Qualification teams
- BSC and REC Performance Assurance Boards (PAB)
- Independent Programme Assurance (IPA).

2.2   Reviewers and Approvals

As set out in in section 5 of the QA&P [REF-1].

2.3   Document Change Control

The MHHSP LDSO QT Team are responsible for maintaining this document. Each new version supersedes the previous version in its entirety.

This document has been developed based on the best view of MHHSP design, Qualification Assessment Criteria, and test artefacts available at the time, and will be approved subject to MHHSP, BSC PAB and REC PAB governance. Subsequent versions of the document will be subject to appropriate governance if they need to be updated due to constituent artefacts changing over time.

3   Objectives

The high level of the objectives of non-SIT LDSO QT are as follows:

- To provide confidence that individual non-SIT LDSO QT participants can successfully operate under the MHHS arrangements by M10 for the scope of their roles and MPIDs, meeting the assessment criteria set out by BSCCo and RECCo and approved by the BSC and REC PABs.

- Sufficient testing evidence provided by each non-SIT LDSO QT participant that they have tested their systems in an integrated MHHSP test environment and those systems meet MHHSP design requirements and assessment criteria defined by Code Bodies.

- Provide opportunity to non-SIT LDSO QT participants to test using their own environment to minimise risk of operational issues.

- Prove capabilities of LDSOs' systems against MHHS Design Baseline, including functional and non-functional requirements (covered in more detail later in this document).

4   Scope

This section sets out what is in and out of scope of non-SIT LDSO QT. For information on the scope of MHHS Qualification, as a whole, please see section 7 of the QA&P [REF-1].

4.1   In scope

The scope of the MHHS ecosystem that needs to be available to support LDSO QT, corresponds to MHHSP design required for LDSO roles and is shown at high level in the red outline on the logical architecture diagram, Figure 2. It is the orange boxes that are the LDSO services under test.

The systems and interfaces in scope relate to LDSO services: Registration, Unmetered Supplies Operator (UMSO) and LDSOs[2] that are connected to MHHSP central systems – DIP. and BSC Central Systems (known as Helix). BSC Central Systems (known as Helix) will be simulated. All other roles, services and systems are out of scope for non-SIT LDSO QT and will be simulated if required to facilitate testing.

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[2] Please note, this role can also be referred to as Network Operations but the terminology of LDSO is used within this document. Network Operations or LDSO is a defined role within the MHHS Design Baseline which encompasses LDSO functions that are required for MHHS, but not part of Registration or UMSO
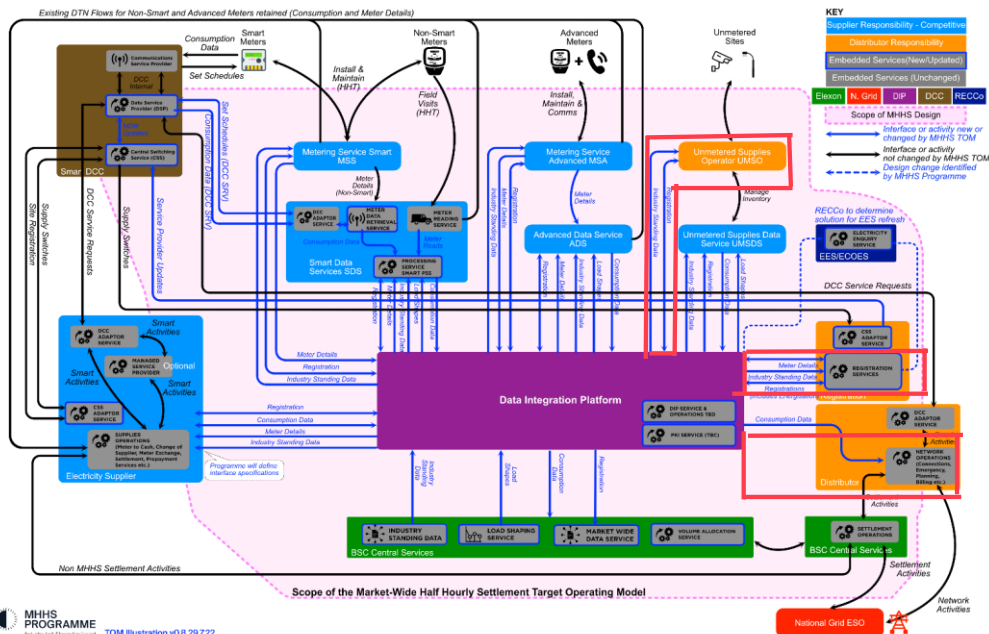
Figure 2: MHHSP TOM

- **Roles**

LDSOs will execute tests on the following roles (as defined in the MHHSP design baseline) as the primary structure for demonstrating LDSO capability:

LDSO Role In Scope	Industry Code
Registration Service (REGS)	BSC/REC
Licensed Distribution System Operator (LDSO)	BSC/REC
Unmetered Supplies Operator (UMSO)	BSC

Table 1: Testing Roles

- **Participants**

All existing LDSOs, licensed by Ofgem, who have not volunteered to participate in MHHSP SIT phase will be participants in this QT workstream. New entrant LDSOs who are looking to enter the market prior to M10 (and are able to complete BSC and REC Qualification by the end of 2024[3]) will also be participants in this QT workstream.

New entrant LDSO participants aiming to qualify after M10 or who enter QT at the later stage should follow the process outlined as set out in QA&P Annex 3 [REF-1].

For further information on Qualification routes and regulatory context, please section 4 of the QA&P.

- **Test Items**

LDSO Systems under test are as follows.

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[3] This refers to the current BSC and REC qualification process as new entrant LDSO will need to be qualified to support exiting arrangement as well as new arrangements introduced by MHHSP.

- UMSO (Unmetered Supplies Operator) - is the service that interfaces with the Unmetered Supplies (UMS) customer and other industry stakeholders.
- Registration Service - is the LDSO service that holds meter point standing data information about each MPAN within its distribution region.
- LDSO – is the LDSO service that is defined role within the MHHS Design Baseline which encompasses LDSO functions that are required for MHHS, but not part of Registration (e.g. services related to billing, operation and maintenance of the distribution networks).

Non-SIT LDSO QT will be aligned to Interim Release 8 (IR8) as this is the expected to be the last Major Code Release. Please see section of 10.6 of this annex for further considerations on this.

It is, therefore, expected that the systems under test will align with the standards and configuration of that release. Non-SIT LDSO QT participants should only deploy systems in UIT with release drops aligned with IR8. If non-SIT LDSO QT participants is using a system that has been involved in SIT, then it is expected that the release drop they deploy should include any defect fixes found in SIT cycle 1 and cycle 2.

- **MHHSP Design Requirements**

Requirements in scope for MHHS Qualification are all references to the three roles highlighted above in the MHHS Design Baseline, including:

Functional
- Requirement specifications covering all three roles as detailed in MHHSP baselined design.
- All relevant interfaces. Number of interfaces per role is shown in the table. Please note, a number of DIP publications are optional for LDSO as such the number of DIP publications applicable to each LDSO will vary depending on if they are opting out of receiving any DIP publications.

	Interface IF (Sender Party)	Interface PUB (Recipient Party)
	19	9
Registration Services	IF-050, IF-045, IF-044, IF-043, IF-039, IF-037, IF-036, IF-035, IF-033, IF-032, IF-026, IF-020, IF-018, IF-009, IF-008, IF-006, IF-003, IF-002, IF-001	PUB-47, PUB-040, PUB-038, PUB-034, PUB-031, PUB-025, PUB-019, PUB-007, PUB-005
	1	18
LDSO	IF-020	PUB-47, PUB-044, PUB-043, PUB-041, PUB-040, PUB-36, PUB-037, PUB-026, PUB-021, PUB-20, PUB-019, PUB-018, PUB-013, PUB-009, PUB-008, PUB-006, PUB-003, PUB-001
	3	10
UMSO	IF-038, IF-034, IF-007	PUB-47, PUB-039, PUB-037, PUB-036, PUB-035, PUB-033, PUB-026, PUB-018, PUB-008, PUB-003

Table 2: Interfaces by Role

- The following business processes will be included in LDSO QT scope:
  - MPAN Ownership
    1. Change of Supplier MHHSP-BP001
    2. Change of Registration Data MHHSP-BP010
    3. Change of Service – Metering Service MHHSP-BP002
    4. Change of Service – Data Service MHHSP-BP003[4]
    5. Change of Existing Service Appointment Details MHHSP-BP003B

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[4] MHHS-BP-003A - Registration Service – CSS/DCC MDR Update is not listed in scope, even though it involves Registration Service as CSS/DCC interactions are out of scope of QT.

- o Metering Changes
    1. Disconnection MHHSP-BP007
    2. Change of energisation Status MHHSP-BP008
    3. Change of Meter MHHSP-BP009
    4. Change of Market Segment and/or Connection Type MHHS-BP011
- o Meter to Bank[5]
    1. Data Processing MHHS-BP005
    2. Demand Disconnection Events MHHS-BP013
    3. Consumption Amendment MMHS-BP016
    4. Load Shaping Services MHHS-BP018
    5. BSC Central Services – Market Wide Data Service MHHS-BP019
    6. Industry Standing Data MHHS-BP021
- Generation of the REP-900 [E-Bill] and REP-901 [Aggregated DUoS Charges]

Migration Requirements

The below list includes migration processes as described in MHHS - Migration Design Document [REF-26] and MHHS-DEL974 Migration Design requirements {REF-32}.

- Forward Migration: the transfer of an MPAN from the legacy arrangements to the new MHHS arrangements
- Reverse Migration: Which will involve the transfer of an MPAN from the MHHS arrangements back to the legacy arrangements.
- Reporting
- Exception handling
- Migration thresholds
- The following business processes will be included in LDSO QT scope:
    - MHHS-DEL962 - BPM-001 - Change of Supply – Forward Migration
    - MHHS-DEL963 - BPM-002 - Change of Service – Metering Service – Forward Migration
    - MHHS-DEL964 - BPM-003 - Change of Service – Data Service – Forward Migration
    - MHHS-DEL965 - BPM-001 - Change of Supply – Reverse Migration
    - MHHS-DEL966 - BPM-002 - Change of Service – Metering Service – Reverse Migration
    - MHHS-DEL967 - BPM-003 - Change of Service – Data Service – Reverse Migration
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Non-Functional and Operational Requirements

Operational and Non-Functional Requirements applicable to LDSO roles as specifiedspecific to daily processing can be found in:

- MHHS Operational Choreography [REF-13]. Non-Functional Requirements: as specified in
- MHHSP Non-Functional Requirements PIT and SIT scope document, [REF-12] MHHS DEL-1624 NFR
- MHHS-DEL2324 Initial BAU Volume Model [REF-34] and
- fFor information only, MHHS-DEL2128 NFR Categorisation [REF-35]

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[5] MHHSP-BP-004B – UMS Data Collection is not listed as in scope, even though it involves interaction with the UMSO, as UMSO/UMSDS Data Service interactions are Data flows which participant are expected to test in PIT and there is no UMSO activity that results in DIP interaction. MHHSP - BP020 – Volume Allocation Service Volume Allocation Service is not listed as in scope even though it involves the delivery of report to LDSO as this is an existing report and interface.

- **Code Body Assessment Criteria**

The BSC [REF-8] and REC [REF-7] Qualification Assessment Criteria sets out which MHHS design requirements that Code Bodies expect LDSOs to demonstrate in integrated environment and therefore sets out QT scope. It is expected that the BSC and REC assessment criteria will be updated to include ~~non-functional and~~ operational requirements. The non-SIT LDSO QT artefacts will be expected to reflect the latest version of the Assessment Criteria (or whatever baseline is agreed in the interim) and will be reviewed and updated as necessary.

- **Design Baseline**

The MHHS Design baseline will continue to develop in accordance with the Release and Configuration Management Approach and Plan and the current plan is that Interim Release 8 will form the Design Baseline at the start of non-SIT LDSO QT, so it is expected all LDSOs to be compliant with this Design Baseline for testing. The non-SIT LDSO QT artefacts will be expected to reflect this version of the Design Baseline (or whatever baseline is agreed in the interim) and will be reviewed and updated as necessary.

4.2   Out of Scope

The following aspects are out of scope for this annex as they are covered in another document.

- The lower-level details and mechanics of how test data will be allocated and used during testing will be the subject of the non-SIT LDSO QT Test Data Plan. The first draft of this will be issued for review and comment in March 2024.
- All test stages preceding QT.
- All SIT Stages – these will be the subject of separate Test Approach and Plan documents:
  - SIT Component Integration Test
  - SIT Functional Testing
  - SIT Migration Testing
  - SIT Non-Functional Test
  - SIT Operational Test
- All other Qualification routes and UIT Test stages - these will be the subject of separate Test Approach and Plan documents:
  - E2E Sandbox
  - Supplier & Agent QT – please see Annex 2 of the QA&P
- Other elements of the Qualification process, such as S the QAD submission are covered by the Qualification Approach & Plan [REF-01] and Qualification Assessment Document [REF-02].
- Enduring Qualification approach and process as this will be the subject of separate documentation.
- Testing of LDSO's Registration Service and CSS interface, i.e. LDSO participant's CSS adaptor and CSS system.
- Data Transfer Network (DTN) interfaces are required to be tested in PIT.
- Interfaces or activities not changed by MHHS TOM.
- Any requirements to be excluded from the scope of testing by Code Bodies.
- ~~LDSO internal monitoring and management processes.~~
- Testing of consequential changes, for example changes parties need to make for MHHS that are outside of the MHHS Design baseline or changes that parties need to make to meet code requirements (e.g. billing).

5 Test Architecture and Approach

This section covers the way the MHHSP LDSO QT Team will structure the project and plan to achieve its objectives. For information on the approach to MHHS Qualification as whole please see section 9 of the QA&P [REF-1].

5.1 Approach

The testing approach is as follows:

- Non-SIT LDSO QT will be role based and in line with associated MHHSP design requirements and business processes.

- Test Roles will reflect the operational systems, processes and practices of the functions once live, recognising that fully scaled operational environments are not required for functional testing.

- LDSO participants will need to be able to demonstrate and evidence being able to send and receive messages through all interfaces within the scope of the LDSO, UMSO, and Registration Services roles. Please note, a number of DIP publications are optional for LDSO as such the number of DIP publications applicable to each LDSO will vary depending on if they are opting out of receiving any DIP publications.

- As MHHSP SIT will focus on testing of full E2E design, it is assumed that Registration Service have been functionally tested in SIT. If it is agreed that a LDSO can place reliance on the SIT testing of Registration Service, then Registration Service's functionality does not need to be retested in non-SIT LDSO QT. Instead, the scope of Registration Services testing will be to support each non-SIT LDSO QT participant being able to demonstrate that the Registration Services system works within their own infrastructure and set up, unless this has already been proven by testing in SIT.

- Non-SIT LDSO QT, therefore, will focus on verification of UMSO and LDSO roles/systems' ability to generate messages for onward processing (via DIP or between LDSO's systems) and receive and process messages generated by Registration Services and other roles.

- Duplication of testing will be avoided, where possible, if a test case covers a combination of Network Ops, UMSO, and Registration Services roles, this would be considered successful for all the roles under test rather than a test case having to be run multiple times.

- There will be a defined set of negative and exception test cases defined that will focus on areas that pose risk to settlement and retail arrangements.

- Migration testing will be scheduled first because migration processes will be used to populate test data where possible. This will ensure data consistency across LDSOs' systems whilst in parallel verifying migration requirements and business processes.

- LDSO Qualification Testing will be scheduled to complete within one tranche as non-SIT LDSO QT participants will need to be MHHS qualified ahead of the M10 milestone (March 2025). New entrant LDSO parties who decide to notify for Qualification after the scheduled period, should discuss entering Qualification with Code Bodies as per the process described in Annex 3 of the QA&P [REF-1].

- "Placing reliance" mechanisms set out within the MHHS Placing Reliance Policy [REF-14] will be available to non-SIT LDSO QT participants. This will be subject to MHHSP and Code Body approval. Please see section 10 of the QA&P [REF-1] as well as section 9.4 of this annex.

- A large proportion of systems being ~~implemented into~~delivered as part of this programme already exist, while ~~additional~~ processing at new ~~traffic~~messaging volumes may be main drive behind the bulk of NFT testing, as whole, for the programme, ~~existing performance profiles in conjunction with~~the results gathered during PIT NFT (at production volumes) will provide a level of ~~system performance~~ assurance, ~~this allows~~ allowing for a more focussed approach to Non-Functional Testing on the UIT environment to take place, namely Interface based testing.

- As per the BSC, LDSOs need to qualify all three roles for MHHS (i.e. Registration, Network Ops and UMSO), even if they do not intend to support Unmetered Segment (UMS) MPANs

5.2 LDSO Roles and Services

In line with the QA&P [REF-1], non-SIT LDSO QT will be role based. However, to reduce complexities, be closer to how operational process will operate and increase assurance that LDSOs are able to operate under the new MHHS arrangements, Registration Services, UMSO and LDSO will be considered as a suite of roles. Non-SIT LDSO QT participants will be expected to commission test instances of all test roles in an integrated test environment as shown on Figure 3. This is expected to be consistent with the LDSO production infrastructure and host arrangements and therefore non-SIT LDSO QT participants should be standing up like for like environments where possible. Please note, the requirement to stand up test instance of systems may vary depending on agreed placing reliance proposals.
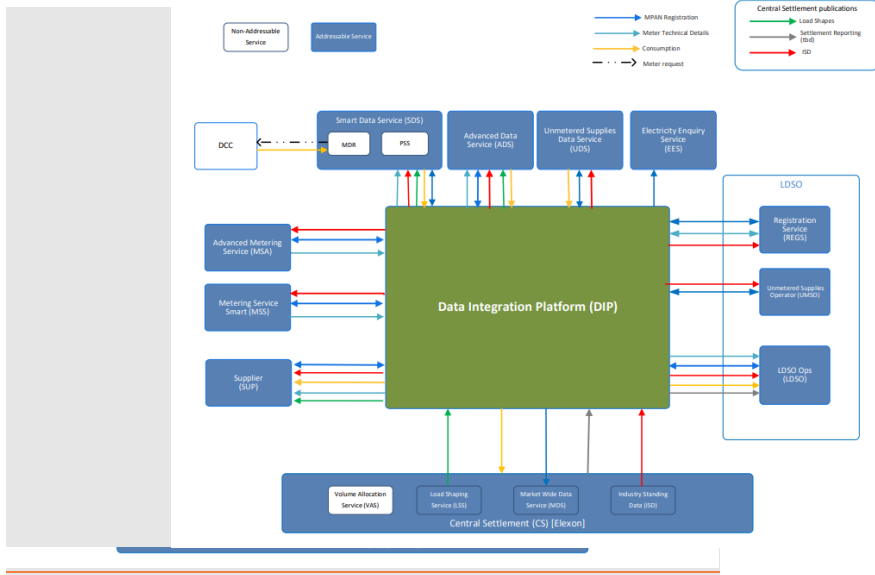
Figure 3: MHHSP TOM workflow

As a non-SIT LDSO QT participant will have to qualify in all roles, as per current BSC obligations, this will include UMSO even if a non-SIT LDSO QT participant has no UMS MPANs.

It is through this approach, of considering all LDSO roles as a suite, it will be significantly easier to ensure LDSOs will operate effectively in a production like environment. LDSOs have different operational environments for LDSO services/systems and in many cases bespoke synchronisation between all these systems (and the MHHS Design baseline does not prescribe the interfaces between roles in most instances), hence the need to perform testing on components combined, as it reduces complexities for gathering evidence and setting up a test harness for each role. As the full MHHS ecosystem will not be available and to facilitate the aim that each non-SIT LDSO QT participant can conduct their QT without the need for pairing with another non-SIT LDSO QT participant. If an input would be needed from another industry role (outside of DIP) such as a supplier, this will be achieved by using common test harnesses. This is consistent with the principle of role-based testing for Qualification and not needing other Programme Participants to execute role specific testing.

5.3 Testing types

- **Functional**

The purpose of functional test scenarios is to verify that a LDSO's systems function correctly for all three LDSO roles, according to MHHSP design baseline and aligned to the BSC & REC Assessment Criteria [REF-07 & REF-08].

As part of DIP onboarding, smoke or connectivity test will be run to check connectivity between non-SIT LDSO QT participant's systems and DIP in UIT before any non-SIT LDSO QT is conducted.

Where new releases or defect fixes have been deployed in UIT during a participant's QT, the participants should perform regression tests to ensure its systems continue to behave as expected as part of its QT completion activity. Non-SIT LDSO QT participants should refer to section 7.3.7 of the QA&P [REF-001] on the process to disclose changes to the Code Bodies in the window between them completing QT but not have commenced live MHHS operations. ~~Non-functional – indicative view~~

~~The scope of non-functional testing will be finalised post the development of SIT Non-Functional Approach and Plan [REF-27] as this is needed to inform Code Bodies update to BSC and REC assessment criteria. The below information is shared to support LDSO planning and preparation but LDSOs should note, this is subject to change.~~

Non-Functional

In terms of the specific roles and business processes under test during this phase, those activities already proven during the QT Functional phase of delivery will be replicated, but at suitably scaled volumes of messaging, ~~(~~, (the size of participant solutions in the UIT environment will be smaller than planned production environments) allowing the programme to carry out assurance against the following areas:

- Operational SLAs/ Performance efficiency – Testing to be carried out as a means of ensuring areas not under test during PIT, namely interfaces to DIP and the transfer of data between them, are not detrimentally affected.

- ~~Operational SLAs/ Performance efficiency which could include:~~

    o Target times to process incoming messages and issue responses.

    o Time to process messages and issue notifications when sending party and processing party are one of LDSO/Registration Service/UMSO services.

    o Processing of sequences/messages/data flows and issuing of notifications within specified timeframes, during and outside of operational hours.

- Reliability/Recoverability (event/message buffering when failing to communicate with the DIP systems). This type of testing will treat each interface as a component rather than the internals of the ~~participants~~participant's solution themselves.

- ~~Reliability (event/message buffering when failing to communicate with MHHSP central system - DIP)~~

- Security – NFRs around PKI and levels 1 through to 4 validations will take place during QT NFT delivery, this is the first point in time that these systems will be physically connected to the DIP allowing this validation to take place.

- Compatibility (message or schema validation~~)~~) – as above.

- Migration/Operational Choreography – Simulated settlement and migration processing will be carried out at scaled volumes and schedules/windows of processing in order to determine the overall behaviour of these processes, when run together with DIP.

- Observability –In terms of compatibility based NFRs, messages must be traceable via participant/DIP created reference and transaction IDs should any issue occur during E2E processing.

- ~~Recoverability (Data Loss)~~

- ~~Security~~

- ~~Compatibility (message or schema validation)~~

- ~~Reporting~~

As with SIT, it is not expected that the UIT environment will be built to support full scale performance and volume/load testing, suitably scaled scenarios for Non-Functional QT will be defined as part of ~~the~~Test Scenario/Test Case creation, and go through the relevant review processes with all involved parties,

Participants will validate their own solutions, at expected messaging volumes during the PIT stage of delivery rather than within Non-SIT LDSO QT.

In terms of process start/injection points, these will be identified within the QT NFT Test Scenarios and Test Case creation process. Participant support will be required in the replication of message injection/start point tests under scaled the levels of load (tbdTBD). At the time of writing, the use of load injection toolsets is still be considered.

A review of existing test harness/stub collateral is being carried out, it is envisaged that given the scope of Qualification functional testing, that a new method of simulating registration parties programme participants will bete required to generate a scaled volume of traffic across the UIT infrastructure for LDSO NFT QT testing. At the time of writing, discussions with the DIP provider are being set-up to determine any re-use of suitable test tool sets for QT.

Where DIP Adaptors are utilised by Programme Participants, these will form the entry and endexit points of their own segment of the environment within the QT Integrated environment, and so form the start/end timing points for message processing, where process timings are being logged or recorded. Where this part of the environment is either the start or end point of a business process, the programme would expect to see evidence of message creation or successful processing of received messages as a form of test evidence i.e. testing should include the systems adjacent to the DIP Adaptors. Where error handing and interface availability is also managed at this layer, these would also fall into the scope of QT NFT testing where, for example, error handling and buffering based testing will be taking place.

Non-Functional testing is still planned to be carried out during this phase. However, as the capacity of participants MHHS environments would have already been validated, Non-SIT LDSO QT testing will be carried out at low volumes, being formed of targeted interface based Non-Functional tests to validate error handling, buffering etc. in an end to end, integrated environment.

- **Migration**

LDSO QT will use the MHHS design repositories as a basis for test scenario and test case design. Test scenarios will cover business processes including:

- Forward Migration
- Reverse Migration
- Import/Export MPANs
- Exception Handling
- Reporting
- Migration threshold volumes

Operational – indicative view

The scope of operational testing will be agreed post the development of MHHS Service Management Strategy as this is needed to inform the Code Bodies update to BSC and REC assessment criteria. The below information is shared to support LDSO planning and preparationpreparation and has been updated based on SIT Operational Test Approach and Plan, but LDSOs should note this is subject to change.

Operational test scope may include but is not limited to the following areas:

- Operational process impacted as resulted of MHHS and include LDSO involvement
- Service Management.
- Functional Business Requirements (limited)
- Business Continuity and Disaster Recovery (BCDR)
- Operational Chorography
- CR44/CR45 (indicative as both – subject to change requests are still going through being approved via MHHS programme change process and have yet to be approved)governance
- Demonstrate LDSO operability with MPRS (in own target infrastructure)

It is expected that the following operational elements will be covered within the QAD

- Security as NF requirements around PKI will be covered in non-functional scope

- Business Continuity and Disaster Recovery (BCDR) as Reliability/Recoverability will be covered in non-functional scope

If operational testing does cover the above areas, it is likely that testing and assurance activities during non-SIT LDSO QT would consist of:

- Non-SIT LDSO QT participants providing information using self-declaration for operational processes that can't be tested in UIT environment. This could be related to Service Management processes.
- PIT phase activities - If the testing is contained within LDSO systems, PIT evidence can be considered to verify an operational requirement.
- Operational testing within the UIT environment however scope will likely be dependent on throughput volume and scale supported in UIT environment for non-SIT LDSO QT.

It is likely that the operational choreography requirements defined in MHHS Operational Choreography [REF-13] will be incorporating into non-functional Testing rather than operational testing, as evidence can be provided in the same manner as for non-functional Testing.

Operational Processes

Operational Testing will focus on any new, changed or key Operations processes where LDSO involvement is key for the process to successfully work. This testing should include both happy path and negative testing where applicable e.g. Error handling and fault management. The impacted Operational processes are not available at the time of writing this document. Once available they will be assessed, further detail added, and the correct Test technique will be assigned.

Service Management

Whilst is expected that service management scope in SIT Operational Testing will focus on the BSC service management, if there are key service management process that involved LDSO this will be covered in Qualification Testing. At the time of writing this document Service Management processes are not available. Once these processes are defined and available to the MHHSP Non-SIT LDSO QT team, they will be assessed, and the correct Test techniques and methods will be assigned and where required Test Scenarios will be created.

Business Requirements – Functional

Operational Testing will assess any Functional Business Requirements identified during the SIT Functional and / or non-SIT LDSO QT requirements traceability exercise - and where these requirements are deemed as applicable to Operational Testing whether as partial or full coverage to satisfy the requirement and where the Requirements have not been fully proven / covered by other Test Phases (e.g. due to elements of the Requirement being outside the remit of Functional Testing scope) have been considered for inclusion in the Operational Test scope.

Operational Choreography

Due to the nature of MHHS Operational Choreography [REF- XX13]X], the majority of this testing will be covered within Non-Functional testing. Operational testing of MHHS Operational Choreography [REF-XXX13]} will focus on Interfaces where manual work may be needed to validate that there are processes are in place to enable the any residual requests that have required manual corrections are being processed by the end of the next working day and Error handling and fault management processes.

CR044 – Implementation of Data 'Refresh' message IF-051 and CR045 Supply Start Date (SSD) Correction Tool (Both Cchange Request (CR)s are subject to approval by MHHS programme governance)

The below is provided to support LDSO planning and preparation as both CRs are still going through the MHHS change process and have not yet been approved. Full test scope will be determined if the CRs are approved, and any design work being completed.

CR044 has been raised into the Programme to implement a new interface/message – IF-051 "Data Refresh" which would, following an incident resulting in Data loss, be created by the Registration Service and passed to the DIP

Testing coverage

Test scenarios and test cases will be designed to achieve coverage of requirements and assessment criteria in scope for non-SIT LDSO QT: design, functional, non-functional, migration and operational. This will provide confidence in LDSO systems' ability to operate under new MHHS arrangements.

Each requirement in scope will have at least one scenario linked to it. Requirements deemed not testable, or for which evidence can't be gathered through testing or other assurance means, will be flagged accordingly and the reason for their status agreed with Code Bodies.

Test prioritisation

Prioritisation of test cases will be considered for regression packs, deployment test packs and test execution schedules. If test prioritisation is needed, test cases will be prioritised considering operational criticality of MHHS elements they cover, probability of a high severity defect being raised as an outcome of the test and a priority of the related assessment criteria. If prioritisation is needed, test cases will be prioritised considering operational criticality of MHHS elements they cover, probability of a high severity defect being raised as an outcome of the test and a priority of the related assessment criteria.

Please note, LDSOs will need to successfully complete their full test scope to meet the exit criteria for QT.

6 Qualification Testing Process

This section provides high level information on the QT Process from PIT through to test exit. More detailed information on the different test stages is provided in later sections of this in this annex.

6.1 High level Qualification Process

There are number of high-level steps within MHHS Qualification process (Figure 4), of which QT is one. QT, (step 4b in Figure 4) itself, consists of a number of stages to support the successfully and consistent management of the testing. For further information please see section 9 of the QA&P.
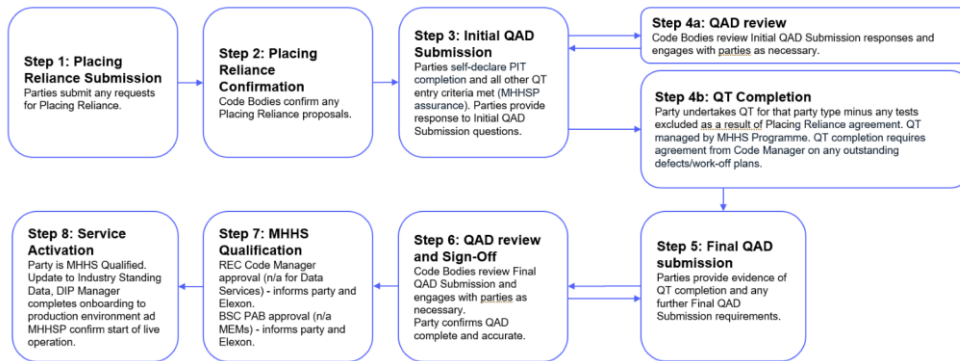
Figure 4: High level flowchart of MHHS Qualification process for non-SIT LDSO Programme Participants (Source: QA&P)

6.2 QT Process

The high-level test stages within QT are arePre-Integration Testing (PIT), QT Preparation, QT Entry, QT Execution and QT CompletionExit.

Please note, the figures below show key activities within each stage where LDSO input is needed. There is other activity in each stage that is not depicptured.

PIT – This is the internal testing a LDSO will complete within a LDSO's own test environment to confirm their systems are developed and robust to move into test execution. MHHSP LDSO QT Team will assure the output as a part of assurance of LDSO QT. PIT entry will be subject to approval of a submitted PIT Approach and Plan and the Test Manager to assure Requirement Test Traceability Matrix (RTTM) and PIT completion reports and confirmation that exit criteria are met. Please see section 9.1 of this annex and section 10 of the QA&P for more information.

QT Preparation covers the activities needed to meet the entry criteria for both LDSO and the MHHSP. This also includes activities to support LDSO successful participation in LDSO QT such as training on test management

Figure 5 PIT High Steps

tools. There will be a number of test deliverables LDSO will need to provide during this period to support tracking of their readiness. Please see section 8 of this annex for more information on MHHSP LDSO QT Team test preparation and section 9 for more information on LDSO test preparation.

Figure 6 Test Preparation High Level Steps

~~**QT Entry**~~ covers ~~activities to confirm that MHHSP has met all entry criteria to facilitate LDSO QT to start as well as confirming that each LDSO has met their entry criteria and are ready to start testing. Please see section 8.9 of this annex for more information~~

QT Preparation (Entry) covers the activities that are needed to meet the entry criteria for both the commencement of the overall MHHSP Non-SIT LDSO Qualification Testing Phase and the Non-SIT LDSO QT Participants entry.

Pre-Integration Testing (PIT) is the internal testing that a Non-SIT LDSO QT Participant will complete within their own environment to confirm systems are developed and robust enough to move into QT execution. The Non-SIT LDSO QT Team will assure the output as a part of assurance of the entry to Non-SIT LDSO QT, this output will include the PIT RTTM and PIT Completion Report. Please refer to Section 9.1 of this annex and Section 10 of the Qualification Approach and Plan [REF-01] for more information.

As part of the QT Entry stage there will be an overall entry gate as well as individual entry gates for each Non-SIT LDSO QT Participant to confirm that all entry criteria have been met and both the Programme and Non-SIT LDSO QT Participants are ready to move into QT Execution. Please see section 8 of this annex for more information on MHHSP LDSO QT Team test preparation and section 9 for more information on LDSO test preparation
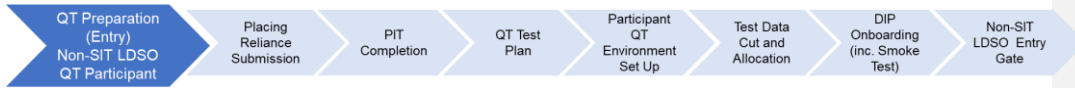
Figure 557 ~~Qualification~~ High level QT Preparation (entry) for non-SIT LDSO QT Participant~~Testing Entry~~

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Figure 6 High Level QT Preparation (entry) steps for Non-SIT LDSO QT Team
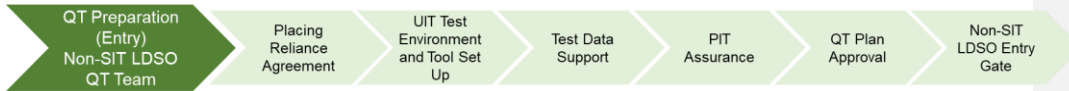
QT Execution covers execution of each LDSO's agreed test scope, monitoring of progress, and assurance of test output as well as support process needed to support testing such as defect and release management. Please see section 10.2 of this annex for more information. Non-SIT S&A QT Participants are expected to engage regularly with the Non-SIT LDSO QT Team to report on progress against test schedule as well as discussing any issues or risks which may impact their completion.

Figure 7 QT Execution High Level Steps for Non-SIT LDSO Participant

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Figure 8 Test Execution High Level Steps

Figure 8 QT Execution High Level Steps for Non-SIT LDSO QT Team

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QT Exit Completion covers activities and assurance to confirm that each LDSO has met all exit criteria so that the MHHSP LDSO QT Team can confirm test completion to the Code Bodies. Please see section 10.9 of this annex for more information

Figure 9 Test Completion and Exit High Level Steps
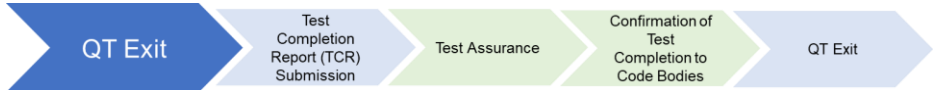
Figure 9 QT Exit High Level Steps for both Non-SIT LDSO QT Team and Non-SIT LDSO Participant

It will be not possible to progress into the next stage of testing until the exit criteria for the previous stage is met. .

Some activities within a stage could be run in parallel in accordance with the non-SIT LDSO MHHS test schedule. Test phases and associate activities are described in more detail in the forthcoming sections.

7 High Level Schedule

The high-level test schedule for LDSO Qualification is depicted below.
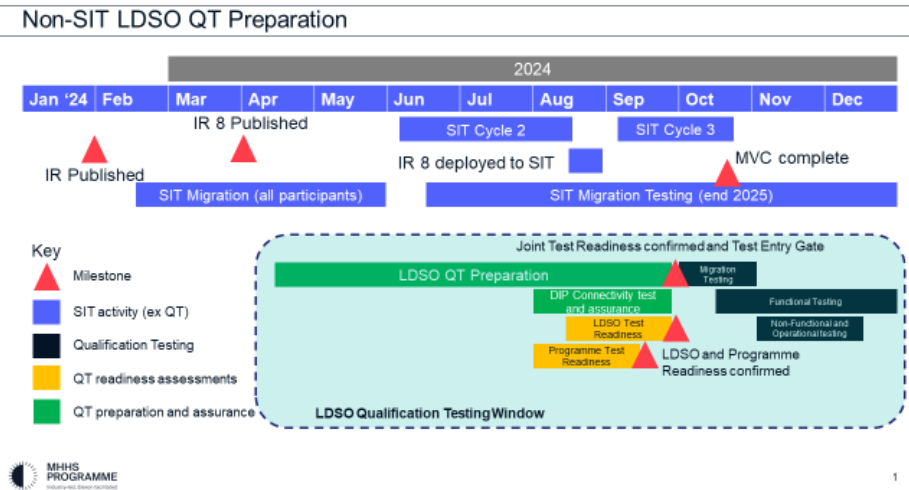
Figure 101010: Non-SIT LDSO QT Stages Plan on a Page

The test schedule and the scheduling of the execution of LDSO Qualification test scenarios will be managed by the MHHSP LDSO QT Team with support from the non-SIT LDSO participants. A more detailed test schedule with be produced by MHHSP LDSO QT Team at a later date.

The MMHSP LDSO QT Team will continually review any lessons learned from previous test phases, PIT/SIT/CIT, to ensure any learnings, improvements or corrective actions are implemented in non-SIT LDSO QT.

8 MHHSP Test Preparation

This section describes the test preparation activity undertaken by the MHHSP LDSO QT Team and/or wider MHHSP workstream. For LDSO test preparation activity, please see section 10 of this annex.

8.1 Test Scenarios & Test Cases

Non-SIT LDSO Qualification Testing test scenarios and test cases will be created by using the design artefacts and assessment criteria listed in section 5, and will be categorised as:

- Functional
- Non-Functional
- Operational (to be included alongside Non-Functional for execution)
- Migration

Non-SIT LDSO Qualification Testing test scenarios will be validated against MHHSP SIT test scenarios to ensure that no gaps exist in non-SIT LDSO Qualification scope and requirements and processes have been sufficiently covered to provide confidence that LDSO participants that haven't undergone SIT can operate in production. Non-SIT LDSO test scenarios will be reviewed against the scope of future interim design releases and necessary amendments made to ensure continue alignment with the MHHSP design baseline.

Test scenarios might be linked to multiple LDSO roles and requirements, considering the overall approach to test all three LDSO roles together as a suite, rather than individually. The starting point of a test scenario design is an analysis of a business process in scope for LDSO roles. As the test scenario is developed, it covers steps in the business process that can be manifested as interactions between LDSO roles on interfaces related to the steps in the process. Furthermore, each step of the business process is associated with a design requirement, so when
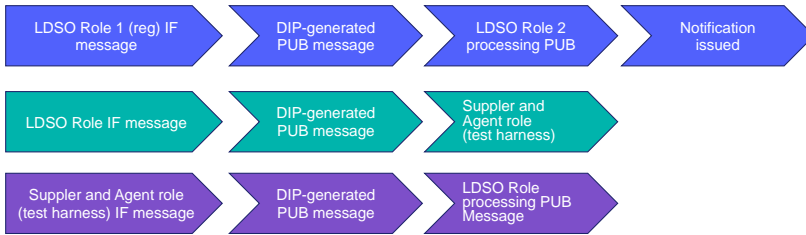
Figure 11111: Test Scenarios Design

developing a test scenario, both business processes and design requirements are taken into consideration.

Figure 8 illustrates the flow of messages from the originator to the recipient over the DIP central system that is typically included in the design of test scenarios. Additionally, test scenarios will cover internal message flows between LDSO systems and other message and data processing.

Requirements analysis will determine the broader set of test conditions that will be used as an input into developing test cases. Variances in the requirement such as types of MPAN, type of segment, data flows, etc. will be considered. Error conditions or failure scenarios such as failed validation or invalid response will be included in testing of high priority or risk areas of functionality.

The structure of the test scenario and the test case is shown in the template [REF-15] non-SIT LDSO QT Test Scenario template.

QT test scenarios will be developed by the MHHSP LDSO QT Team and undergo the following review, consultation, and approval process: and approval process:

- Internal Peer Review.
- Code Body Review
- LDSO Industry Review / Consultation
- QAG approval
- BSC and REC PAB approval

- **Requirements traceability**

The objective is to have full traceability between test cases all the way through test scenarios and associated MHHSP design requirements and Code Bodies' assessment criteria for LDSO roles. This approach will ensure that full test coverage of the requirements in scope is achieved.

Test scenarios design ensure traceability among test artefacts as shown on the diagram below:
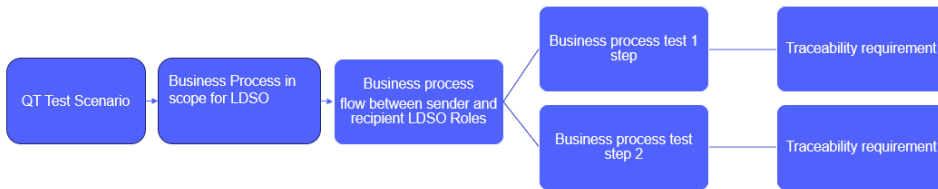
Figure 121212: Traceability Flow

8.2   Test Data

Test scenarios and associated test cases will drive detailed requirements for test data preparation, selection and augmentation.

The non-SIT LDSO QT Test Data Plan (REF-28), (to be released for review and comment in March 2024currently being consulted on) will provide further detail related to selection, augmentation, and upload of data to LDSO systems, however some high-level principles are outlined further in this section.

As each non-SIT LDSO will be completing QT individually[6] and as there is no pairing as in MHHS SIT, test data does not need to fully align between different participants. However, each non-SIT LDSO will be required to load valid and consistent data across their systems. We expect this to be sourced from a data cut taken by each LDSO at the same time to be defined non-SIT LDSO QT Test Data Plan (REF-28)by the MHHS Programme.

Additionally, the latest version of industry standing data (ISD) containing LDSO data should be available to non-SIT LDSO QT participants to update their systems. Meter Technical Details will also be required to be uploaded on non-SIT LDSO QT environment. MHHSP Central Systems would require appropriate data to be able to generate reports.

MHHSP LDSO QT Data Team will propose a list of data conditions from the Test Scenarios that is needed for non-SIT LDSO to check against their data cut and select appropriate data from the systems in scope of Qualification Testing - see section 4.1 . Data conditions will be derived from test scenarios and test cases and might be related to type of meters, segments or other categories. If a non-SIT LDSO does not have data that are matched to conditions, then MHHSP LDSO QT Data TTeam will work with LDSO to meet this gap.

Migrated MPANs will be used in functional testing which would not only prove migration processes, i.e. MPAN state being transitioned from the legacy to the new arrangement but will provide confidence in the full end to end process and non-SIT LDSO systems being able to operate with migrated data.

For more information on test data activities LDSO will need to undertake please see section 9.3.

Figure 131313 Qualification Test Data Plan on a Page

8.28.3 Test Environment

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[6] Note that new entrants might not have registered MPANs but may be part of this testing. The process for supporting them will be documented in non-SIT LDSO QT Test Data Approach and Plan (REF-026)
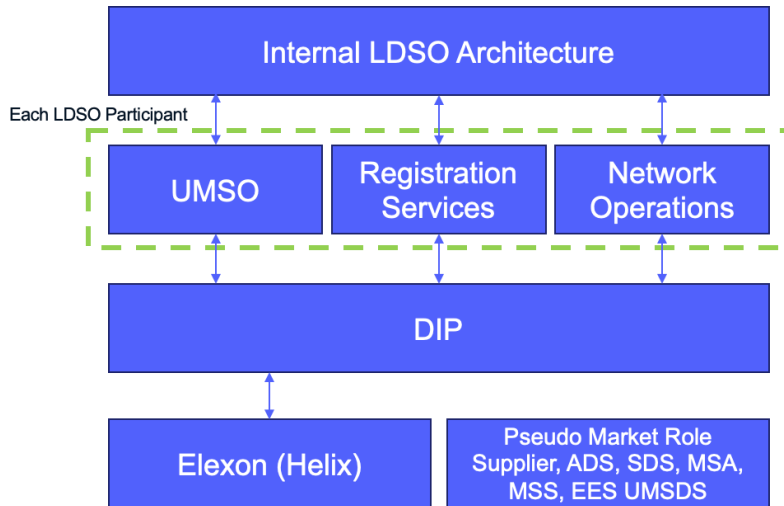
Figure ~~14~~14: LDSO QT Test Environment

Non-SIT LDSO QT will take place in the MHHSP UIT environment, an environment that will be separated from SIT. The same central system environment (~~DIP~~ DIP~~and Helix~~) will be used for other Programme Participants' QT.

MHHSP UIT is made up of test environments provided by and under the control of the MHHSP Central Parties that the LDS~~P~~O Test Participants will connect to with their respective test environments as described in [REF-3] MHHS Programme Environment Approach & Plan.

MHHSP central systems are not actively under test as part of non-SIT LDSO QT but are there to facilitate LDSO QT. If issues are found with MHHSP central systems during non-SIT LDSO QT, these will be managed as per the MHHSP Defect Management Process (REF-16).

MHHSP and MHHS Test Environment Manager will be responsible for provision of the following components on the UIT:

- Central systems - DIP to which LDSO may connect and test against.

- Balancing and Settlement Code (BSC) service (Helix).~~-~~ test harnesses to mimic flows sent by Helix to LDSO parties

- Pseudo Market Role test harnesses to mimic flows sent by non-LDSO parties to LDSO parties and reduce manual creation of messages.

No test harness is needed for both Central Switching Service (CSS) and Electricity Enquiry Service (EES) systems. This is due to LDSO services not being required to use EES data for any operational processes and as there has been no material changes to CSS interfaces and both are involved in SIT. Non-SIT LDSO QT participants might want to utilise CSS Simulator to inject CSS messages prior to sending data to the DIP or validate that the messages sent to/from CSS are formatted correctly.

Use of the DTN is considered optional for non-SIT LDSO QT functional testing, as DTN testing is expected to be test as part of PIT and any new entrants involved in non-SIT LDSO QT will have completed legacy Qualification which includes DTN testing. However, a non-SIT LDSO QT participant can choose to use DTN if they think it would support their functional QT execution. Test evidence of DTN interactions would not need to be submitted in this scenario. Please note: DTN may be needed for migration testing, and this is being confirmed.

There is no expectation for non-SIT LDSO QT participants to connect to other programme participants during Qualification testing, however non-SIT LDSO QT are expected to be able to connect and test against their various different LDSO roles.

Other LDSO environment considerations for non-SIT LDSO QT environment management are:

- Availability and monitoring of environments
- User access permissions and control
- Maintenance of environment
- Environment issues logging and resolution.

MHHSP central systems test environment might not be available due to unplanned or planned downtime, because of code deployments, infrastructure maintenance or data refresh activities. Planned environment outages will be communicated (in accordance with the Release Management Approach) to LDSO, QWG and QAG and any impact that an outage might have on LDSO testing progress and mitigation plans should be discussed with MHHSP and MHHSP LDSO QT Team at the earliest opportunity for agreement. For further information about the availability of UIT refer to MHHSP Environment Approach and Plan [REF-3].

As non-functional and operational test scope is expected on low volumes. It is not expected non-SIT LDSO QT participant would need to stand up another set of test environments to support this. As well as one UIT environment being sufficient to support test phases.

MHHSP will undertake proving activities of Central Systems as part of the environment readiness phase.

- **Deployment Verification**

The objective of deployment verification is to:

- Verify MHHSP central systems release in UIT environment and eliminate any potential deployment, data, configuration, or any other issues before non-SIT LDSO Qualification can commence.
- To minimise adverse impact of issues found later during non-SIT LDSO QT causing delays and rework.

Confirmation test or smoke test, consisting of subset of high priority test scenarios, covering each LDSO role will be run on the new build. Non-SIT LDSO participant might be required to support this activity, in which case should work closely with MHHSP and MHHSP LDSO QT Team on an implementation plan and schedule.

This process will be followed for any major, minor, patch, or emergency releases and including releases as a result of a change request and a defect fix.

Issues raised during deployment verification will be captured in ADO within release and configuration category and will be coordinated and triaged as per defect workflow described in Defect Management Plan [REF-16].

It is expected that non-SIT LDSO QT participants would complete deployment verification of releases of their internal systems.

8.38.4 Test Harness

As per set in section 8.3, a number of test harness will be required to support test execution. This section provides information on requirements and how they will design, built and tested.

- **Requirements**

The purpose of test harness is to replace "missing" market roles that do not need to be present in the UIT environment and as paring of participants will not be required. Test harness will be developed by MHHSP. Test harness will be able to generate flows sent by pseudo market roles to DIP for onward transmission to LDSO services. This enables the recipient to validate that they can receive DIP messages relevant to their LDSO role. Test harness will also act as an end point for receiving messages sent by LDSO roles.

Test harness developed for other test phases such as CIT are expected to be used as a basis to develop an appropriate tool for non-SIT LDSO QT. Detailed requirements are being developed as well as data requirements being identified through test scenarios/test cases for non-SIT LDSO QT

Non-SIT LDSO test harness should be able to:

- Generate valid flows for different test conditions.
- Generate flows that cause failed validation and error conditions at the recipient end.
- Generate IF flows by multiple user roles.
- Act as end point for PUB messages and apply required validation.[7]
- Support primary and secondary routing of all messages
- Support testing of migration requirements.
- Generate error messages.
- Log activities to support evidence capture.

Although where a test harness is built to support multiple LDSO participants, it is not designed for testing of non-functional requirements related to high volume processing.

MHHSP LDSO QT Team will provide support for operation of test harness during non-SIT LDSO test execution phase and a level of coordination is required among non-SIT LDSO QT participants and MHHSP LDSO QT Team to ensure smooth running of the test schedule. It is not expected that non-SIT LDSO QT participants will need to interact directly with test harnesses as this will be undertaken by the MHHSP LDSO QT Team.

Test scenarios and test cases will contain test harness and test data preconditions, so preparatory actions can be taken in time for the test execution, i.e. MHHSP LDSO QT Team can validate received messages or trigger messages from the test harness according to test case schedule.

Non-Functional Requirements

Given the scope of roles available within the Qualification Testing Phase, and the scale of QT test infrastructure being stood up on the QT test environment, further analysis of achievable testing volumes and to what volumes will be required. This will be determined as the QT NFT team complete their test scenario analysis.

A review of existing test harness/stub collateral is being carried out, it is envisaged that given the scope of for Qualification functional testing, that a new method of simulating Programme Parties will be required to generate a scaled volume of traffic across the UIT infrastructure.

At the time of writing, the re-use of load injection toolsets from DIP PIT NFT test execution is the preferred option, making use of existing test stubs or harnesses for message acceptance and processing outside of the scope of QT delivery. As the LDSO NFT team are defining the NFT Scenarios, a series of bi-lateral meetings between all relevant participants will take place to drive further through toolsets availability, suitability, and transferability to the Qualification Test infrastructure.

Design, Build and Test

Design, Build and Test stage will commence once the test harness requirements are baselined and approved by LDSO Qualification Test Team, MHHSP and Code Bodies.

Design, build and test phase will be based on the same model applied for CIT test harness. The non-SIT LDSO QT test harness will be acceptance tested by MHHSP and test results shared with Code Bodies and LDSO participants. The non-SIT LDSO QT test harness will be regression tested after any new release being deployed on UIT environment.

8.48.5 Test Management Tool

MHHSP Azure DevOps (ADO) Test Management Tool provides capability for non-SIT LDSO QT participants and MHHSP LDSO QT Team to:

- To track test execution progress

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[7] Level 3 and 4 validations are not required for messages received by a test harness, as they will be adequately validated by DIP.

- Manage defects: raise defect that can only be viewed by them and MHHSP LDSO QT Test Team, assign, reassign, close defects.

- Report on defects and test progress

- Define dashboards.

- Host test scenarios, test cases and test evidence

- Report of design / test coverage / test status traceability

- Managing test case execution

- Tracking and reporting test execution progress and coverage.

- Tracking and reporting test coverage status

In preparation, all test cases applicable to participants' role in the test stage will be loaded by MHHSP LDSO QT Team into non-SIT LDSO participant's individual ADO test project ready for execution.

In addition, non-SIT LDSO participants will be expected to develop test steps for each test case, add an execution date to align with the programme schedule, execute test steps, and provide test status/result and evidence. During execution period non-SIT LDSO will be expected to keep ADO updated in real time as execution is carried out.

MHHSP LDSO QT Team will provide access to the tool. It's expected that each Non-SIT LDSO participant will have a maximum of 5 ADO licences. MHHSP LDSO QT Team will provide support for questions related to ADO that might arise during any test phase. Queries can be sent to LDSO_QT mail inbox.

- **Test Management Tool Onboarding**

The MHHSP LDSO QT Team will set up all nominated test resources for each LDSO within ADO and provide the necessary access, training and user guidance tutorial material. It is expected access will be provided in June 2024.

Details of ADO set up, onboarding and usage is published within MHHS-DEL1332 - Test Management Tool User Guide [REF-18].

8.58.6 MHHSP LDSO QT Team Deliverables

The following deliverables will be produced by the MHHSP LDSO QT Test Team:

- non-SIT LDSO MHHS Qualification Test Approach and Plan (this annex)

- Test Scenarios

- Test Cases

- Placing Reliance Form (produced by Code Bodies)

- Templates for tracking assurance/readiness activities

- Programme increments to already published documentation:

   o Environment management

   o Defect management

   o Release management

   o ADO guidance

   o PIT Guidance

   o PIT Templates for Test Deliverables

   o DIP On-boarding guide (incorporating lessons learned from CIT)

- non-SIT LDSO QT facing documents, templates and guides:

   o Test readiness report

- o Test plan template

- o Test results reporting – test execution

- o Test completion report template

- o Test schedule

- o LDSO Qualification Test Data Approach and Plan

- o Requirements to Test Traceability Matrix Template

8.68.7 Test Preparation Schedule

High level Test preparations schedule is depicted on the POAP below.

Figure 151515 High Level Preparation Plan on the Page

8.78.8 Managing the Overlap between MHHSP SIT and non-SIT LDSO QT

There is a time overlap between non-SIT LDSO QT and SIT. This will need to be carefully managed as final non-SIT LDSO QT preparations will take place post the end of SIT functional cycle 2 and prior to the start of SIT functional cycle 3. Non-SIT LDSO QT execution also runs in parallel with SIT functional cycle 3, SIT migration, SIT non-functional and SIT Operational.

SIT functional cycle 2 will have completed against IR7, whilst SIT functional cycle 3 will be aligned to IR8 as will Non-SIT LDSO QT. Non-SIT LDSO QT being aligned to IR8 even though SIT functional cycle 3 will not have completed prior to non-SIT LDSO QT starting, is currently reviewed to be an acceptable overlap. This is because the current assumption is the IR8 will not have large functional changes but will be instead addressing low level
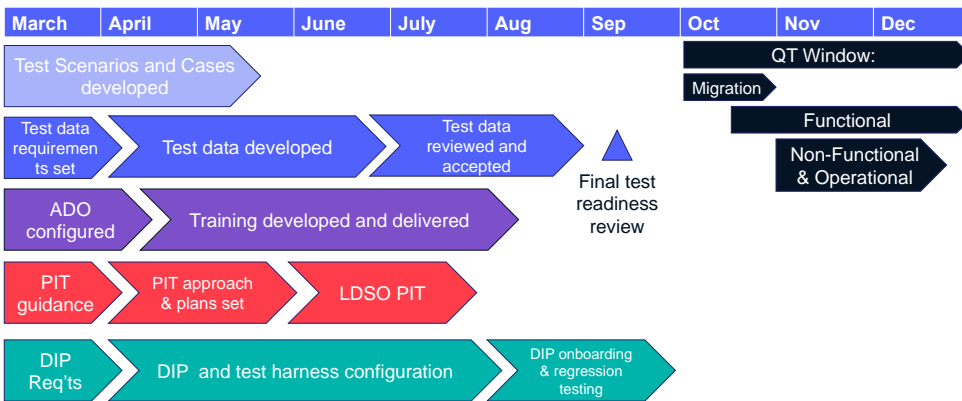
issues within the design to support testing. If additional content is added to the scope is added to IR8, this will need to be reviewed.

Non-SIT LDSO QT execution runs in parallel with SIT migration which means Non-SIT LDSO participants will start migration testing prior to SIT migration fully completing. MHHSP LDSO QT Team and SIT team are working closely together to ensure that tests in SIT migration is appropriately scheduled so that key functionality is thoroughly tested ahead of Non-SIT LDSO participant commencing migration testing.

The overlap in test stages between SIT and non-SIT LDSO QT will be by MHHSP LDSO QT Team and SIT team working closely together, in both test preparation and test execution stages, so that there is visibility of progress, defects, test deference, burn rate across both test phases and both test phases being considered in any decision making. Test scheduling of SIT will also consideredbe considered non-SIT LDSO QT scope to ensure that key functionality is thoroughly tested ahead of non-SIT LDSO QT commencement.

The progress, test coverage and defect status of both SIT Functional Cycle 2 and SIT Migration will be MHHSP programme entry criteria for non-SIT LDSO QT commencing to support the management of the overlap, please see section 9.7.

8.88.9 QT Entry criteria for non-SIT LDSO

The MHHSP LDSO QT Team and MHHSP will need to meet the following entry criteria to confirm that all aspects are in place for non-SIT LDSO Qualification Testing to commence subject to LDSO participants meeting their individual entry criteria. Each individual LDSO will also need to meet a set of entry criteria which is set out in section 9.8 of this annex.

The entry criteria are as follows:

	MHHSP Entry Criteria
1	Stable IR8 release deployed on UIT environment
2	SIT Functional Cycle 2 has sufficiently completed. As evidenced by no high severity defects (severity 1 or severity 2) that could impact non-SIT LDSO QT test scope outstanding from SIT and lower severity issues that could impact non-SIT LDSO QT testing scope has a workaround and work off plans documented, and test coverage sufficient to progress into non-SIT LDSO QT
3	SIT Migration has successfully completed sufficient test coverage as evidenced by no high severity (severity 1 or severity 2) issues that would impacted non-SIT LDSO QT migration test scope) and/or lower severity issues that could impact non-SIT LDSO QT migration test scope have agreed worked off.
4	Test harnesses and stubs acceptance testing completed. MHHSP LDSO QT Team is available to support operation of test harness
5	UIT environment is made available, deployment activities and verification checks competed.
6	Test Management Tool has been appropriately set up which includes: o ADO access granted to LDSO participants. o Test Management Tool Training material made available. o Test cases uploaded to relevant participants' area in ADO.
7	Processes, documents and guidance listed in section 8.6 have been produced by the MHHSP LDSO QT Test Team, reviewed, assured, and approved as appropriate for the test stage[8].
8	Test governance agreed
9	Test meetings agreed and scheduled.
10	Test Reporting agreed and in place.
11	MHHSP and MHHSP LDSO QT Team have sufficient resources to support non-SIT LDSO Qualification Testing in place.

Table 3 MHHSP Entry Criteria

9 LDSO Test Preparation

This section covers the test preparation activities each non-SIT LDSO QT participant will need to be complete to be ready to start QT. The test preparation activities that will need to be undertake by MHHSP LDSO QT Team is set out in section 8 of this annex.

9.1 PIT

Pre-Integration Test (PIT), which takes place in a LDSO's own standalone test environment and is a pre-requisite for entry into QT and subject to a participant readiness review prior to QT. Please refer to section 10 of the QA&P [REF-1] for information on PIT overview, deliverables and PIT exit criteria. Additional guidance for this test phase

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[8] Some deliverables might need to be available earlier in the readiness stage in preparation for entry into non-SIT LDSO QT, for example, placing reliance form, test case scenarios, etc.

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can be found in MHHS-DEL852 - Pre-Integration Test Guidance [REF-5]. ~~This is documented is the process of being updated and will be published shortly.~~

PIT submission has been split into two, with one submission covering functional and migration and a second submission covering non-functional and operational.

Please note: it is expected that non-SIT LDSO participants will be expected to complete their NFT testing at expected volumes and capacity ~~in~~ during PIT. Please ~~see~~ see MHHS-DEL852 ~~–~~ Pre-Integration Test Guidance [REF-5] for further information. [REF-35] MHHS-DEL2128 NFR Categorisation document contains guidance on what level of testing is expected during specific test phases.

Successful PIT exit criteria and submission of PIT deliverables and test evidence are a prerequisite for entry into QT and are subject to review and assurance by MHHSP LDSO QT Team. For PIT exit criteria, please see section 10.1 of the QA&P.

PIT deliverables and test evidence should be submitted to LDSO_QT@mhhsprogramme.co.uk. Submissions should be in line with the test preparation schedule in section 8.7.

~~9.1~~9.2 Environment Preparation and DIP Onboarding

Non-SIT LDSO will need to provision their test environments and complete DIP onboarding activities in preparation for QT.

More detail on the steps is provided below:

- Provide their own production like environments to support LDSO QT functional, non-functional, migration and operational. It is expect~~ed~~ that test environments have hosting and systems that match an LDSO's ~~-~~production set up. It is not expected, however, that these test environments will need to be production sized.

- Perform an internal connectivity test to ensure that they have their test environments stood-up. This activity can be taken independently from external connectivity proving. This will follow the same timeline as for other MHHSP test phases, i.e. connectivity proving commence eight weeks prior to the test execution.

- Appoint individuals responsible for digital certificate registration and request digital certificates. Guidance on how to request a digital certificate is provided in, MHHS-DEL1671 DIP Onboarding Guide [REF-20] and MHHSIDEl1477 DIP Certification Process Map [REF-31] and DIP 094 Interface Code of Connection Guide [REF-19].

- Perform an external connectivity test (controlled smoke test), connect their own systems to DIP, including registering webhooks, and verify that certificates are installed correctly on UIT. Guidance on how to register webhooks please see [REF-29] MHHS-DEL1911-Webhook URL Configuration Guide. MHHSP will work closely with the non-SIT LDSO participant to agree on the message to send to the DIP and receive response. If this step has been successfully completed, i.e. end to end connectivity of their test environment have been proven, non-SIT LDSO will be ready to commence test execution, subject to all other entry criteria being satisfied. Appropriate data should exist on LDSO systems in advance of external connectivity proving. For guidance on how to connect LDSO systems to the DIP please refer to MHHS DEL1671 DIP Onboarding Guide [REF-20].

- Deploy a code base that have passed PIT or in case of placing reliance, the release that has been tested against the latest, approved MHHSP interim release. If PIT/SIT was conducted against an earlier MHHSP interim release, or LDSO systems have a new code deployed, it is expected that the non-SIT LDSO QT participant will retest defects and regression test against changes in staging/PIT environments prior to promoting the code into UIT.

- LDSO systems should be built and tested against IR8, and PIT undertaken against same release.

Non-SIT LDSO QT participants are responsible for monitoring of their own environments. Connection to the DIP will need to be monitored for availability and readiness as per Environment Approach and Plan [REF-3].

9.3 LDSO Test Data

Non-SIT LDSO participants will provide their own data cut/selection of MPANs to the ~~MHHSP~~LDSO QT ~~MHHSP Test~~ Data team via Secure File Transfer Protocol (SFTP) - to satisfy conditions determined by MHHSP LDSO QT Data ~~Test~~ Team, who will assure that data cut has satisfied conditions and quality criteria and provide feedback to LDSO participant where needed. It is expected that new entrant LDSOs will not be able to provide their own test data cut. MHHSP LDSO QT data Team will work with new entrant LDSOs to address this gap and it is likely data augmentation will be needed.

Non-SIT LDSO infrastructure build teams are required to:

- Load data to satisfy Qualification Test scenarios on their systems where migration processes are not being used.
- Load the industry standing data prior to commencement of testing.

Non-SIT LDSO participants need to ensure the correct data requirements are confirmed prior to testing in relation to the testing schedule.

Migration processes will be used to update or populate data in LDSO systems and DIP. This approach would enable consistency of data across the systems, reduce the need for development of any additional tools to load data, enable testing of reverse migration in more consistent way and is aligned with how the activities will be run in operations.

Further information ~~will be~~is provided in non-SIT LDSO QT Data Approach and Plan. this document is currently out for consultation ~~that will be circulated to the non-SIT LDSOs in March 2024 with~~ the aim this will be approved via MHHS governance in May~~April~~ 202~~4~~4A.

High level test data principles are included in section 8.2 of this annex.

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~~• Data Selection and Data Augmentation~~
~~There will be no changes to MPAN details for MPANs already existing in the data cut as any amendments might have a detrimental impact on data consistency across LDSOs' systems and processing of DIP requests.~~
~~MHHSP LDSO QT Team will provide a list of data conditions derived from test scenarios and non-SIT LDSO participants will review their data cut and select appropriate MPANs and associated data that meet such conditions. If a non-SIT LDSO does not have data that matches the data condition needed, then MHHSP LDSO QT Team will work with them to meet this gap. In such case non-SIT LDSO might be able create a new data/MPAN using their BAU processes or data augmentation will be considered for data that is required to run a test scenario.~~
~~It is expected that new entrant LDSOs will not be able to provide their own test data cut. MHHSP LDSO QT Team will work with new entrant LDSOs to address this gap and it is likely data augmentation will be needed.~~
~~If test data needs to be shared between MHHSP LDSO QT Team and non-SIT LDSO QT participant, this will be done via SFTP. MHHSP will work with non-SIT LDSO QT participants to set up SFTP.~~
~~Non-SIT LDSO will be responsible for data cleansing activities performed on their existing data cut. MHHSP LDSO QT Team further investigate requirements to anonymize/adapt specific test data, such as home addresses, etc. to satisfy GDPR.~~
~~Further detail about the data approach will be outlined in the non-SIT LDSO QT Test Data Approach and Plan.~~
~~• Data Loading~~
~~Migration processes/service will be used to update the test data or populate LDSO systems with the new MPANs and associated data when possible. This approach would enable consistency of data across the systems, reduce the need for development of any additional tools to load data and enable testing of reverse migration in more valid way (recognising that the load of test data for SIT into Registration has been a challenge) see section 5.3 for further detail~~
~~UMSO services – the existing data inventory/data cut might be used to load into non-SIT LDSO participant's test environment..~~environment.

9.2~~9.4~~ Placing Reliance

Non-SIT LDSO parties may wish to make use of the approach and mechanism MHHS Placing Reliance Policy [REF-14]. The principles for how MHHS Placing Reliance will be applied for QT is set out in section 10 of the QA&P [REF-1].

All non-SIT LDSO participants who wish to place reliance on MHHS industry testing already undertaken in SIT by another organisation/MPID acting in the same role, they must follow the process outlined below:

- Initial assessment – with applications due by at the beginning of January and with the MHHSP LDSO QT Team and Code Bodies review in January 2024 and February 2024 with confirmation back to LDSOs by the end of February 2024.

- Assessment against non-SIT LDSO QT Test Scenarios/Test Cases – MHHSP LDSO QT Team to work with LDSOs to determine their appropriate scope based on their placing reliance proposals including requirements coverage. This is to be documented in non-SIT LDSO QT participant's Test Plan (separate to the QAD). Please section 9.6 of this annex for more information on the non-SIT LDSO QT test deliverables.

Initial assessment submissions should be submitted via the form published on the Collaboration Base and submitted to LDSO_QT@mhhsprogramme.co.uk and were due by 5th January 2024. The MHHSP LDSO QT Team and Code Bodies are in the process of reviewing submissions. The standards and templates for applications are available on MHHSP Collaboration Base non-SIT Placing Reliance Proposal Form [REF-23] and Placing Reliance Proposal Form - Worked Example [REF-22].

9.39.5 LDSO Test Scope

Test scope for each non-SIT LDSO QT would take into account agreed placing reliance submissions. Code Bodies and MHHSP LDSO QT Team will work with each non-SIT LDSO QT participant to determine what testing scenarios and test cases would be appropriate considering areas such as testing performed in SIT and non-SIT LDSO QT participant's system set up. Non-SIT LDSO QT participant will set out the proposed scope of QT, excluding the Test Scenarios and Test Cases that are not required as a result of Placing Reliance, in their QT RTTM and QT Test Plan. Code Bodies/Test Manager will review the QT RTTM and QT Plan and confirm the QT scope to the Non-SIT LDSO QT participant.

If non-SIT LDSO QT participant is choosing to opt out of receiving certain DIP publications, this would not change the test scenarios in scope, unless this has been agreed with the Code Bodies, but rather what test evidence is expected to be submitted[9]. Please see section 10.10 of this annex for more information.

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[9] As agreed, as part of CR29

9.49.6 Test Deliverables

During the testing lifecycle, each non-SIT LDSO QT Participant will be required to produce and maintain documents, and reports. MHHSP LDSO QT Team will provide templates for the test deliverables which will be made available via the collaboration base. The required artefacts are shown in the table below. Please note, there are other Qualification deliverables, such as QAD, that a non-SIT LDSO QT Participant will need to complete. Please see the section 9.1.8. QA&P [REF-1] for more information.

QT deliverables, apart from test evidence and deliverables that are part of a QAD submission, should be submitted to LDSO_QT@mhhsprogramme.co.uk in line with schedule below. Please indicate the name of the LDSO and deliverable being submitted in the email subject. Please note that deliverables expected may vary depending on level of placing reliance agreed and test scope. This would be agreed with non-SIT LDSO QT participant on an individual basis.

LDSO Deliverable	Purpose	Format	By When	Entry or Exit Criteria	MHHSP LDSO QT Test Team	Code Bodies Activity
Placing Reliance Submission	Submission to confirm how an LDSO wishes to use Placing Reliance policy in regard to their QT.	Word template	5th Jan 2024	Entry Criteria	Review and approval	Review and approval
PIT Test Plan and Approach	Plan to detail LDSO approach and scope to PIT testing.	Word template	Test Preparation Phase	Entry Criteria	Review and approval	Review and approval
PIT Test Scenarios and Requirements to test traceability	Submission to confirm scope of PIT and requirements coverage.	Word template / excel template	Test Preparation Phase	Entry Criteria	Assurance	Review
PIT Test Completion Report including work off and supporting evidence	Report to provide summary of how the testing completed aligned with the original scope and any exceptions, details of any updates made to the test environment during the course	Word and excel template,	Test Preparation Phase	Entry Criteria	Assurance	Approval of work off

	of testing, testing participant summary of the Test Results, and details of all issues encountered during testing with details for fixed and outstanding ones. Please note, all work off items and plan are subject to Code Bodies review and approval.	test evidence				
Interim Test Readiness Report	An interim report on LDSO progress to completing preparation activity and entry criteria.	Word template	Test Preparation Phase	N/A	Review	Informed
Test Plan including QT RTTM	Plan to detail LDSO approach and scope to QT which should incorporating concessions for Placing Reliance etc. Submission should also include QT Requirements to Test Traceability Matrix	Word template	Test Preparation Phase	Entry Criteria	Review and approval	Review
Test steps/scripts added to Test Management Tool (ADO)	Test steps/scripts developed for test cases in scope	Updates via ADO	Test Preparation Phase	Entry Criteria	Review	Informed
Final Test Readiness Report	A final self-declaration of their completion status in relation to preparation activities outlined in section 10. This will need to include any exceptions and work off plans that have been agreed. This will be used to support test entry.	Word template	Test Entry Phase	Entry Criteria	Review and approval	Informed
Test Progress Reporting	Tracking of the progress during test execution phase	Updates via ADO	During test execution phase	N/A	Review and escalation	Informed
Test Evidence	Screenshot, audit log etc. attached to a test case to	Updates via ADO	During test execution	Exit Criteria	Assurance	Informed

	confirm that a test case has been successfully completed		phase/ Exit criteria			
QT Test Completion Report including work off	Report to provide summary of how the testing completed aligned with the original scope and any exceptions, details of any updates made to the test environment during the course of testing, testing participant summary of the Test Results, and details of all issues encountered during testing with details for fixed and outstanding ones. An updated QT RTTM should also be provided. Please note, all work off items and plan are subject to Code Bodies review and approval.	Word template	Test Exit Phase	Exit Criteria	Review and Approval	Review and Approval

Table 4 Non-SIT LDSO Participants Expected Deliverables

- **Test Readiness Reports**

Prior to commencement on non-SIT LDSO QT, each LDSO will be required to provide a Test Readiness Report as a self-declaration of their completion status in relation to preparation activities outlined in section 10 and entry criteria. This will need to include any exceptions and work off plans that have been agreed and must be signed by senior stakeholders within the LDSO's organisation. Please note the MHHSP LDSO QT Team will provide a report pro-forma for participants to complete. Non-SIT LDSO QT Participant will be expected to submit an interim and final test readiness report. The MHHSP LDSO QT Team will be engaged in Test Assurance and monitoring throughout these preparation activities; however, the report serves as a formal position at the point of Non- SIT LDSO QT entry governance.

- **Test Plan**

Each non-SIT LDSO QT participant will be required to provide a test plan. The test plan should include a testing scope (include information on if there are make use of the optionality of DIP interface messages), approach to testing and confirmation of resources available. A draft QT RTTM should also be submitted alongside the test plan. MHHSP LDSO QT Team will provide a template for this artefact.

9.59.7 LDSO Preparation Schedule

The high-level preparation schedule, for QT, is detailed below There are also timelines for submitting the QAD to Code Bodies that an LDSO will need to adhere to. These timelines are included in Appendix C of QA&P.

Activity	Scheduled
Placing reliance form submission	5 Jan 2024
Submission of draft MHHS-DEL1049 PIT Approach and Plan (functional and migration)	27th March 2024***
Submission of MHHS-DEL1049 PIT Approach and Plan (functional and migration)	26th April 2024*
Individual LDSO Test Scope agreed	April to May 2024
Test script development	April 2024 onwards
Submission of draft MHHS-DEL1049 PIT Approach and Plan (Non-functional and operational)	14th May2024***
Submission of MHHS-DEL1050 PIT Requirements to Test Traceability Matrix and PIT Test Scenarios (functional and migration)	3rd June 2024
QT Test Plan including draft QT RTTM submission	3rd June 2024*
Data cut	June 2024****
Submission of MHHS-DEL1049 PIT Approach and Plan (Non-functional and operational)	14th June 2024
Submission of MHHS-DEL1050 PIT Requirements to Test Traceability Matrix and PIT Test Scenarios (non-functional and operational)	12th July 2024
Submission of draft MHHS-DEL1052 PIT Test Completion Report (functional and migration)	26th July 2024*

Interim Test Readiness Report submission	26th July 2024*
internal environment- connectivity testing	July/August 2024
DIP Onboarding	5th August to 13th September
Submission of MHHS-DEL1052 PIT Test Completion Report, supporting test evidence and MHHS-DEL1050 PIT Requirements to Test Traceability Matrix (functional and migration)	31st August 2024&*
Final Test Readiness Submission	2nd September 2024
User Acceptance Testing (UAT) or regression testing of MPRS	September 2024
Non-SIT LDSO QT Entry Gate	27th September 2024**
MHHSP LDSO QT Team Review of PIT submission complete (functional and migration)	30th September 2024
Submission of MHHS-DEL1052 PIT Test Completion Report, supporting test evidence and MHHS-DEL1050 PIT Requirements to Test Traceability Matrix (Non-Functional, Operational and functional PIT of MPRS)	30th September 2024
Non-SIT LDSO QT starts	1st October 2024
Submission draft QT Test Completion Report	1st December 2024
Submission of final QT Test Completion Report	20th December 2024*
Non-SIT LDSO QT completion	20th December 2024

Table 5 Non-SIT LDSO Participant Preparation Schedule

*This is the last submission date; earlier submission is encouraged.
** This is the last date an entry gate can take place
***Draft submissions of PIT Test plan is not mandatory but it is recommended
**** Test Data dates will be agreed via the development of the Non-SIT LDSO QT Test Data Plan

9.69.8 Non-SIT LDSO QT Participant Entry Criteria

In addition to the MHHSP entry criteria (please see section 8.9), each individual non-SIT LDSO QT participant must meet the below entry criteria as well as the entry criteria listed in the QA&P [REF-1]. This will be confirmed by the final test readiness report as well as an entry gate for each non-SIT LDSO QT participant.

	LDSO Entry Criteria
1	Evidence of successful PIT Completion (functional and migration) has been submitted, assured by the MHHSP LDSO QT Team and any work off plans agreed with Code Bodies and tracked - please refer to MHHS-DEL852 - Pre-Integration Test Guidance [REF-05] for full details of the PIT exit criteria and submission timelines for PIT deliverables.
2	LDSO are on track to submit evidence of successful PIT Completion (non-functional and operational) by the agreed date
3	All relevant test artefacts listed as an entry criteria in section 9.6 must have been produced by the non-SIT LDSO QT participant and approved by MHHSP LDSO QT Team and Code Bodies (where applicable).
4	Successful completion of DIP onboarding and connectivity proving with no open issues which would impact the test schedule for non-SIT LDSO QT
5	Test Data has been allocated and loaded where migration regimes are not being used to populate test data.
6	Participants have confirmed they have resources with necessary skills and system access to support the test stage execution and defect management process
7	Participant users have been onboarded to the MHHSP Test Management Tool
8	~~Testing Participants has identified and updated the relevant test steps and test scripts in the Test Management Tool, including details of expected results, planned execution date~~
98	For any LDSO QT participants placing reliance, MHHS Placing Reliance submission reviewed and approved by MHHSP LDSO QT Team and Code Bodies.
109	Where test scope has been adjusted for Placing Reliance and or implementation of CR29, this has been documented in the LDSO QT test plan and this has been reviewed by MHHSP LDSO QT Team and Code Bodies

Table 6 Non-SIT LDSO QT Participant Entry Criteria

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10 Test Execution

This section provides information on how test execution will be managed on a day-to-day basis as well as including high level information on defect and release management processes.

10.1 Schedule

During non-SIT LDSO QT test execution phase, non-SIT LDSO QT Participants will be running migration, functional, non-functional and operational test cases and raising defects for failed test cases in ADO. Test scenarios and test cases may be required to be run in a specific order, to ensure they are executed correctly. Any prerequisites required and the order of executing are detailed within the test scenarios and test cases.

Non-SIT LDSO QT Participants will be running test cases and recording each test step in the Test Management Tool. MHHSP LDSO QT Team will keep the MHHSP and Code Bodies up to date with the progress against participants' test plan and test schedule.

Detailed test execution schedule will be developed by MHHS LDSO Qualification Test Team in conjunction with each non-SIT LDSO QT participant to ensure that support with test harness is available and to ensure M10 milestone is achieved.

10.2 Test Execution

During test execution, a high level of interaction is expected to be needed between the LDSO and their supporting test analyst from LDSO Qualification Test Team to coordinate the sending of messages from the test harness. This is expected to be coordinated via daily stand up and dedicated team channels. Test execution is only expected to happen within working hours.

10.3 Test Case Status

Non-SIT LDSO participant will record the outcome of test steps execution status in ADO. A test step will be marked as "pass" if the actual result matches the expected result otherwise it will be marked as failed and a defect will be raised. Relevant evidence should be attached to each test step to allow review and assurance to take place.

If the subsequent triage process determines that the defect has been raised in error (e.g. due to a tester error), the test can be re-run and depending on the outcome, the status can be changed from "fail" to "pass". The test will be scheduled for re-testing provided defect fix becomes available during non-SIT LDSO QT. If any tests remain in the failed state at the end of testing, then they will be clearly marked in the test completion report with an agreed work off plan and agreement sought with Code Bodies. During the non-SIT LDSO QT test execution phase, all high severity issues (severity 1 and severity 2) should be fixed and re-tested. The closure of successful severity 1 and severity 2 defect is an exit criteria of non-SIT LDSO QT. It is expected that a non- SIT LDSO participant will make all endeavours to fix and retest all lower severity issues (severity 3 and severity 4). Non- SIT LDSO participant should note that work off items will need to be agreed with Code Bodies as an exit criteria of QT. Please see section 10.5 of this annex for more information on defect management within non-SIT LDSO QT.

On some occasions, a Test Step required for a Test Case will be marked as "blocked" if they can't be run due to a known defect. This status will be used appropriately where it assists in informing stakeholders of the impact of open defects on LDSO QT participants' progress or completion.

Some tests may be set to "deferred" if it has been agreed by MHHSP LDSO QT Team and Code Bodies that they will be executed at a later date within LDSO QT execution schedule.

10.4 Test Data Usage

For each LDSO QT functional, migration and non-functional test scenario (if required), a required number of MPANs will be allocated to LDSO participants prior to the test execution phase in the UIT environment to allow for testing of various conditions. All required data conditions will be described in LDSO QT test cases.

Please see section 9.3 for more information on test data will be used within non-SIT LDSO QT.

10.410.5 Defect Management

Non-SIT LDSO QT participant are expected to comply with the MHHS Defect Management Plan [REF-16] which will be updated for non-SIT LDSO QT to ensure process is suitable.

Non-SIT LDSO QT participant should raise a defect10 in MHHS test management tool (ADO) if the outcome of the test execution doesn't match the expected outcome in the test case step being executed or the issue is preventing tests to be run. As well as if the scenario matches the definitions as set out in MHHS Defect Management Plan [REF-16].

All defects will be raised and managed within ADO, this includes any defects raised against MHHSP simulators, data generation tools or environment will be logged in ADO and assigned to MHHSP Triage Team for an initial assessment.

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[10] The MHHS programme defines a defect, in respect of any tests, as anything that is preventing the execution of the tests; or once commenced or executed, the test has an unexpected or unexplained outcome or response.

If the defect related to either system or environment is identified by non-SIT LDSO QT participant, it should be logged in ADO in the first instance and assigned correct priority and severity levels as per the guidance in [REF-16] Defect Management Plan.

Defect identified in the environment build during readiness stage should be raised by the LDSO Test Participant Test/ Environment Teams/SI Environment Manager and assigned directly to the relevant non-SIT LDSO QT participant's environment team for resolution.

Defects identified by Non-SIT LDSO QT participant in the execution phase of QT will be assigned to the MHHSP Triage Team and then the process for defect management will be followed (as in Defect Management plan). MHHSP Triage Team review will involve a cross check with raised SIT defects to understand if this a duplicate. There will be close working between LDSO defect management team and SI defect management team to support successful management of defects across the different environments and test phases.

All defects must be linked back to the test steps that were being run to ensure that the defect template is populated with a sufficient detail for anyone trying to reproduce the problem and appropriate evidence should be attached as well.

If the defect raised by a Non-SIT LDSO QT participant is deemed not valid by MHHSP Triage Team, it will be discussed with Non-SIT LDSO QT participant before being rejected and . Appropriatean appropriate explanation for Rejection will be provided.

There could be several reasons for defect rejection: it could be due to incorrect interpretation of a test case/test step, insufficient or no evidence provided, tester error or defect is a duplicate. MHHSP LDSO QT Team will support LDSO Test Participant to reduce the number of rejected defects by actively working on identifying root causes for rejection to remove any process or knowledge issues.

LDSOs are expected to actively engage with defect management process and as such they may need to support triage and defect resolution meetings.

Known issues will be shared with non-SIT LDSO QT participants so this can be factored into their test planning.

10.510.6   Release and Configuration Management

All non-SIT LDSO participants are expected to comply with Release and Configuration Approach [REF-6] and plan. Non-SIT LDSO participants will be able to access the release management plan and schedule on the MHHS collaboration base.

In addition to major releases, MHHSP might be required to schedule minor releases, patch releases and emergency releases in order to promote defect fixes and configuration changes into UIT environment. It is expected release will be deployed into SIT ahead of deployment into UIT. The MHHSP change release process will ensure that thorough impact assessment is conducted to determine impact of change, code, configuration or other on LDSO QT and participant's testing prior to communicating and engaging with impacted test parties.

At the time of writing this document Major Code Release (IR8) 8 is planned to be has been published 03/04/2024 and this is the Design Baseline to be used in non-SIT LDSO QT and for Non-SIT LDSO participants to build against for the execution of their PIT and preparation activities.

Please note, SIT functional cycle 2 will be aligned to IR7. SIT functional cycle 3 will be aligned to IR8 and this will not have completed prior to non-SIT LDSO QT starting. For more information on how this overlap is being managed please see section 8.8 of this annex.

10.610.7   Regression Testing

A regression scope should cover testing for changes introduced by a new release. Regression testing should be based on the scope analysis of modification, impact the fixes might have on testing that have been previously executed and release notes for the build describing system versions, defect statuses, etc.

Non-SIT LDSO participants should ensure that they are deploying quality releases in UIT. For releases containing fixes of their internal systems, Non-SIT LDSO participants might choose to utilise a staging environment to perform verification checks prior to promoting those releases into UIT. Non-SIT LDSO participants should also consider regression testing releases of internal systems within the UIT environment.

Non-SIT LDSO participants might want to use the UIT environment to regression test their systems against MHHSP major, minor, and emergency releases to ensure no new defects have been introduced and the quality of release is stable.

10.710.8   Test Suspension and Resumption Criteria.

During non-SIT LDSO QT, a participant has the right to suspend testing where it considers necessary, by agreement with the MHHSP LDSO QT Test Team. Testing will only recommence when agreed between the participant and MHHSP LDSO QT Test Team. Code Bodies will also be informed about suspension, impact on MHHSP and non-SIT LDSO participants, qualification timelines and possible risks to achieve programme milestones.

Reasonable grounds for suspending testing may include any of the following:

- Application components are not available as scheduled.
- A testing issue prevents further testing from proceeding.
- A large percentage of planned test scripts for a given day fail and significant root cause analysis needs to be undertaken to establish the cause.

Test scripts to be executed are in a "blocked" status due to an identified testing issue.

Where testing has been suspended, non-SIT LDSO participants will produce a test suspension report reflecting the cause of the suspension and steps to be taken for testing to resume – the test resumption criteria. Testing will only resume once the test resumption criteria have been met and evidence demonstrated to MHHSP LDSO QT Test Team.

10.810.9   Participant QT Test Completion Report

Each non-SIT LDSO participant will be required to provide a finalised version of the QT Test Completion Report once they've completed their testing. Non-SIT LDSO participant should also submit an updated QT RTTM. This should be submitted as soon as possible post completing testing. It will need to include summary of how the testing completed aligned with the original scope and any exceptions, details of any updates made to the test environment during the course of testing, summary of the test results, details of all issues encountered during testing any exceptions and work off plans that have been agreed with MHHSP LDSO QT Team and Code Bodies. It is recommended that non-SIT LDSO QT participant provide a draft version of the report for review ahead of final submission. This will be especially beneficial if the non-SIT LDSO QT participant needs to agree any work off items.

The MHHSP LDSO QT Team will be engaged in test assurance and monitoring throughout the execution activities; however, the report is required as evidence to support that the LDSO has met all test exit criteria as part of the QT exit governance.

10.910.10 Test Evidence

LDSO QT participants will be required to produce sufficient evidence of the successful execution of test steps that are executed in ADO and the test evidence is to be uploaded to ADO. This evidence must clearly show that the test step has met its objective when the test step passes or clear supporting evidence when the test step fails.

It will not be possible to provide evidence for each test step in the test case, as it could be a significant overhead to upload and assure that amount of information, however LDSO participants will be required to demonstrate:

- Receipt of a message by LDSO system and any subsequent onward processing such as validation and data update as per MHHS design business process steps.
- Message being generated by LDSO systems.
- For NFR and operational requirements evidence can vary depending on the type of assurance activities, further information will be provided in the non-functional testing guidance is currently being developed.
    - Self-declaration, statement of facts, annotations, and description of manual and automated processes.
    - Functional test evidence or performance test results (response times and environment usage stats)

If test evidence of receipt of a message by the test harness or a central system is required, the MHHSP LDSO QT Team will support the LDSO on obtaining this.

MHHSP LDSO QT Team will provide guidance to LDSO participants on what will be appropriate evidence that should be captured and attached to a test case or a defect. Screenshots of the test system, messages or electronic logs of messages must be provided as appropriate. Test evidence from DIP adaptor would not be considered satisfactory - this includes non-functional testing. There is a general principle that QT participants should have a logging mechanism so they can diagnose issues and capture additional information required should further evidence be requested.

Please note, test evidence will be expected to be captured and uploaded into ADO at the point of test execution, or no later than the end of the business day, any exceptions to this timing of evidence upload will need to be specifically agreed with the MHHSP LDSO QT Test Team. This is to facilitate the MHHSP LDSO QT Test Team being able to conduct test assurance activities during test execution.

Please note. non-SIT LDSO QT participants should follow the guidance on test data anonymisation for test reports and test evidence in Non-SIT LDSO Qualification Test Data Approach & Plan which is due to be shared in March 2024.

Please note, if non-SIT LDSO QT participant is seeking to 'opt out' of the "receipt" of DIP Publications[11], they will still be expected to complete the relevant test scenarios or test cases but provide test evidence of this information being received via their existing mechanism rather than the receipt of DIP Publications, unless it has been agreed with Code Bodies that this is not needed.

Please see section 10 of the QA&P [REF01] for wider information of MHHS Qualification Evidence.

10.1010.11 Test Exit Criteria

Non-SIT LDSO participant is deemed to have successfully completed QT if the following criteria have been satisfied, in line with QA&P [REF-1]:

- No outstanding Severity 1 and Severity 2 Defects.
- Sev3 and Sev4 defects that cannot be resolved during QT are documented with impacts assessment and a work off plan by the Programme Participant, reviewed by the MHHSP LDSO QT Team and agreed with Code Bodies ahead of QT completion.
- 100% test execution coverage, including functional, non-functional, migration and operational testing with approval from Code Bodies for any de-scoped/ failed test cases prior to QT completion.
- LDSO QT Completion Report including work off reviewed by MHHSP LDSO QT Team and submitted to Code Bodies
- Test results and evidence has been captured in the test management tool and has been assured by MHHSP LDSO QT Test Team.
- Completion of any PIT work-off plans or deferred PIT activity (as agreed with Code Bodies)

There will be no formal exit gate for LDSO QT as the submission of LDSO QT Completion Report to Code Bodies will mark the end of test execution phase.

11 Test Management and Organisation

11.1 Roles and Responsibilities

This section contains a lower-level RACI specifically for LDSO QT. RACI covering other aspects of MHHS Qualification are included in section 8 of the QA&P [REF-1].

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[11] As agreed, as part CR29 DIP LDSO Interface Processing

Type of Activity	Activity	Participant	Code Bodies	MHHSP	MHHSP QTT	REC/BSC PAB	QAG	SITAG	QWG
Approach/Governance	Scenarios and test cases for LDSO	C	A	R	R	AP	AP		C
Approach/Governance	Test Data Plan	C	C	S	A/R		AP	C	C
Approach/Governance	Test Guidance	C	C	S	A/R		AP		C
Approach/Governance	Programme Release & Change Management Process	C	I	S	A/R		AP	AP	C
Approach/Governance	Confirming Release can be deployed LDSO QT	C	C	A	R				
Approach/Governance	Defect Management Plan Update	I	I	I	A/R		AP		C
Approach/Governance	ADO provision	I	I	A/R	C				
Overall Test Preparation	QT Environment Set Up	I	I	A/R	S		I		I
Overall Test Preparation	LDSO QT Environment Readiness Checks	I	I	A	R		I		I
Overall Test Preparation	Test Stub Development	I	I	A/R	C				
Overall Test Preparation	Test Stub Readiness and Set Up	I	I	A/R	C				
Overall Test Preparation	Data Availability	C	C	A/R	C				
Overall Test Preparation	Test Data set up	C	C	S	A/R				
Overall Test Preparation	Data Allocation	C	C	S	A/R				
Overall Test Preparation	ADO Training Materials	C	C	S	A/R				
Overall Test Preparation	Templates for Participant Artefacts e.g. Test Readiness Reports, test completion, test plan	C	C	I	A/R				C
Participant Readiness	Placing Reliance Review for LDSO QT	C	A/R	S	A/R				
Participant Readiness	ADO Set Up	C	C	S	A/R				

Participant Readiness	ADO Test Cases Assigned	C	I	I	A/R
Participant Readiness	ADO Training	C	C	S	A/R
Participant Readiness	Test Steps Added to ADO	A/R	I	I	C
Participant Readiness	Environment Connection for LDSO	A/R	I	S	S
Participant Readiness	Participant Engagement for QT Readiness	C	C	R	A/R
Participant Readiness	Participant Readiness Tracking for QT	C	C	R	A/R
Participant Readiness	Participant Scripts	A/R	I	I	C
Participant Readiness	Test Plan	A/R	I	I	C
Participant Readiness	Test Readiness Report	A/R	I	I	C
Participant Readiness	Programme Entry for LDSO	C	C	A	R
Participant Readiness	Participant Entry	A/R	I	I	C
Participant Readiness	DIP Onboarding for LDSO QT	A	I	I	S
Test execution	Test Management for LDSO	C	C	A	R
Test execution	Environment Deployment for Central System Providers (UIT)	I	I	A/R	C
Test execution	Environment Deployment of Participant Systems (UIT)	A/R		C	C
Test execution	Environment Coordination	C	I	A/R	C
Test execution	Test Execution For LDSO	R	C	A	R
Test execution	Defect Management Meetings	I	I	I	A/R
Test execution	Issue Resolution Central Systems	I	C	A	I
Test execution	Test Readiness Reports	A/R	I	I	C
Test execution	Participant Updating ADO with Test Progress	R	I	I	A
Test execution	Defect Reporting	I	I	I	A/R
Test execution	Programme Testing Progress Reporting	I	I	A/R	R
Test exit	Upload of Test Evidence to ADO	A/R			C
Test exit	QT Test Completion Report	A/R	C	I	C
Test exit	Participant Work off	A/R	AP	I	C

Test exit	Test Assurance	C	C	I	A/R
Test exit	Review of Test Evidence	C	C	I	A/R

Table 7: NON- SIT LDSO QT RACI[12]

11.2 Organisation Structure

The following resources/roles are expected to be required to prepare and execute LDSO QT. The below list is a guideline to the types of resource/roles required by organisations participating in the day-to-day activities of LDSO QT. Multiple roles may be carried out by the same resource. It is the responsibility of each participant to provide sufficient and appropriate resources to support the Test Stage.

Organisation	Role/Resource Type
LDSO	• Test Manager • Test Analyst • Defect Manager / Analyst • Programme Management • Infrastructure, application and network support • Release and configuration management support • Environment Management support
MHHSP LDSO Qualification Test Team	• Test Manager • Test Lead / Analyst(s) • Test Data Lead / Analyst(s) • Defect Lead / Analyst(s) • Project Manager • Environment and Release Manager • Engagement Lead • Test Management Tool Lead / Analyst
MHHSP SI	• Environment and Release Manager • Defect Lead / Analyst(s)

Table 8 Expected Resources per Organisation

MHHSP LDSO Qualification Test Team will be supported by MHHSP Design and Regulatory teams.

11.3 Stakeholder Engagement

Participant will be given a named point of contact in MHHSP LDSO QT Team who will support the participant through test preparation, test execution and test exit as well as assurance activities. A dedicated test participant contact will actively support the tracking of readiness activities and identify any issues that may hinder the progress of participants. This approach provides continuity for the participant and improved participant experience.

The MHHSP LDSO QT Team will work in conjunction with MHHSP PPC engagement leads to provide expert support to LDSO participants during all test stages.

The engagement will be tailored to LDSO depending on their specific needs, and will take a form of bilateral meetings, fortnightly briefings, pre-governance meetings bilateral sessions, or wider QWG meetings. The MHHSP LDSO QT Team and wider MHHSP workstreams will continue to work collaboratively with LDSO and will maintain bespoke interactions to discuss progress and issues alongside with engagement through MHHSP channels such as the collaboration base and website.

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[12] (R = Responsible, A = Accountable, C = Consulted, I = Informed, S = Supporting, AP = Approver)

11.4   Meetings

All participants involved in LDSO QT should attend regular meetings. Frequency will be dependent on the criticality of project deliverables and issues. This could involve daily stand-ups and weekly meetings based on testing schedules.

Typically, the following meetings will occur:

- Test Readiness meetings – track progress against plan of preparation activities
- Daily Test Meetings
- Weekly Test Execution Progress Meetings
- Defect Management Meetings
- Environments and Release Management Meetings – daily stand-up or weekly meetings

The MHHSP LDSO QT Team will provide status updates to the relevant MHHSP governance forums.

12 Test Governance and Reporting

12.1   Governance

LDSO QT will operate in accordance with QA&P [REF-1]. MHHSP LDSO QT Team will monitor progress of non-SIT LDSO QT participants and adhering to the decision making and escalation principles set out within section 11 of QA&P [REF-1]. MHHSP LDSO QT Team will raise any issues related to Central Systems will go through the MHHSP governance.

Regular bilateral sessions will be scheduled with participants to discuss issues and the testing progress, and any escalations will be referred to Code Bodies and relevant MHHS governance group as needed.

MHHSP LDSO QT Team would expect LDSO QT participants to be open and transparent and communicate with MHHSP LDSO QT Team /Code Bodies if they think they are facing an issue which is blocking their testing, or they have concerns they may not complete testing for the scope of LDSO QT within programme timelines.

MHHSP LDSO QT Team would then work with participants and Code Bodies on mitigation actions to overcome blockers in testing to ensure participants complete LDSO QT.

The confirmation that each milestone related to non-SIT LDSO QT has been met will happen in accordance with MHHSP governance framework. If there are escalations related to meeting a milestone this will be raised and managed via the MHHSP governance framework.

12.2   Reporting

MHHSP LDSO QT Team will provide regular reporting on the progress towards meeting the entry criteria set out in this annex, milestones as well as the progress of LSDO QT participants.

The confirmation that each milestone related to non-SIT LDSO QT has been met will happen in accordance with MHHSP governance framework. MHHSP LDSO QT Team will be responsible for reporting status and RAG for all Tier 2 and 3 QAG milestones.

During test execution, ADO will be used for test management and will be used to provide reports on LDSO QT participants' test progress and coverage. It will also be for assurance against LDSO QT participants' plans and scope. To support this LDSO QT participants are expected to update ADO on a daily basis.

13 Test Assurance

Test assurance will fall into two categories, verification of test readiness to confirm entry criteria have been met and verification of test exit to confirm exit criteria will be met.

MHHSP LDSO QT Team will engage in assurance of non-SIT LDSO QT readiness activities and artefacts, including those relating to PIT to ensure LDSO have met the entry criteria for entering QT i.e.

- Placing reliance submission form

- PIT artefacts listed in section 10.6

- LDSO QT Test Plan

- Test Steps

- LDSO QT Requirements to Test Traceability Matrix

- Final Test Readiness Report

- Entry Gate

During and following non-SIT LDSO QT execution, MHHSP LDSO QT Team will undertake assurance of test execution results with a specific focus, the below, to ensure LDSO have met the exit criteria for to exit QT.

- Validating evidence of actual vs. expected results of tests

- The quality of supporting information and evidence within defects.

- Test Completion Report

Additional assurance may be conducted by the Code Bodies as part of their review of the final QAD submission. Please see section 10 of the QA&P [REF-1]

13.1 Test Evidence

MHHSP LDSO QT Team will be responsible for assurance of test evidence provided by non-SIT LDSO QT participants in ADO during test execution.

MHHSP LDSO QT Team will verify that sufficient evidence has been provided for a sample of test steps run during test execution. Evidence can be in the form of screenshots of the system under test, electronic logs of messages, or reports, and will be used during test assurance to validate actual vs. expected result of the test. In addition, test evidence will be critical for triaging defects.

14 Risks and Dependencies

This section discusses key risk, dependencies and assurances that are applicable to non-SIT LDSO QT. Wider key risk, dependencies and assurances that are applicable to overall Qualification are documented in the QA&P. These be tracked and monitored via the MHHS programme RAID which is available on MHHS Collaboration Base.

14.1 Risks

Risk	Impact	Mitigation
Requirements There is a risk that LDSO QT requirements to define test products, environment and tooling required are not available or may change during test preparation or test execution phases.	Delays to start and completion of testing Extended execution timescales to run new and regression tests due to requirement changes Extended timescales to stand up test environment and tooling for LDSO.	Closely working with MHHSP on planning and tracking of deliverables. Raising risks and issues early.
SIT Functional Testing There is a risk that SIT Functional Cycle 2 testing is delayed due to technical issues, lack of resource or insufficient test coverage causing a stable code to set to be delivered later then expected to UIT environment.	Some readiness activities such as UAT/regression testing could be delayed and timescales for which they are planned for shortened so LDSO QT can commence on time.	Work with MHHSP to prioritise activities and identify SIT and UIT activities that can be run in parallel

SIT Migration Testing There is a risk that SIT migration testing~~gg~~ is delayed due to technical issues or does complete sufficient test coverage to facilitate LDSO QT starting with migration testing.	Test Data approach of using migration regimes may not be feasible. QT delayed or needs to be re-planned.	Closely working with SI team to understand progress. Development of alternative test data approach if using migration regimes is not available
Test Dependencies There is a risk that testing dependencies are not available as required in time for LDSO QT start. 1. MHHSP Central Systems not available 2. Environment training and handbook materials	Delays to start of LDSO participants connectivity testing.	Work with MHHSP to prioritise critical test activities, actively monitor deliverables and track progress, raise issues and risks early

Table 9 Non-SIT LDSO QT Risks

14.2 Dependencies

The following dependencies have been identified in relation to commencement of non-SIT LDSO QT.

- SIT Functional Testing Cycle 2 has successfully completed to plan.

- Outstanding issues from SIT Functional Cycle 2 are not significant to impact non-SIT LDSO testing and have been documented in the work off plan.

- SIT Migration Testing has proven migration design sufficiently to enable start of migrations in non-SIT LDSO QT

- IR8 has been published as per planned dates and has been successfully deployed into the UIT environment

- Outstanding issues from SIT migration are not significant enough to impact non-SIT LDSO testing.

- LDSOs have completed their preparation activities.

- UIT environment is available along with any supporting test harnesses.

- MHHS Programme LDSO QT team are ready and mobilised.

- Development of the MHHS Service Management Strategy and detailed service design

- REC and BSC Assessment Criteria has been updated for migration, operational and non-functional requirements.

14.3 Assumptions

There following assumptions have been identified that are applicable to non-SIT LDSO QT Participants:

- Participants can deploy their systems in UIT and load clean data, including standing data, to their systems.

- Participants will have their own Pre-Production and Production environments in line with their own strategies and the MHHS Programme Environment Approach and Plan [REF-3] and are also expected to have their own Service Management model in place.

- All LDSOs parties are eligible to participate in this phase of LDSO QT if they complete preparation activities in time for entry into LDSO QT, including submitting PIT evidence. Code Bodies will actively discuss Qualification plans with LDSOs, including those who may be going through the Market Entry process or not having registered MPANs, who are looking to be active on the market before M10.

- Non-SIT LDSO participants will state whether they are using the optional DIP flow or will rely on existing mechanisms and applicable test scenarios (subject to programme and Code Body agreement)

There following assumptions have been identified that are applicable to MHHSP LDSO QT Team and/or MHHSP:
- MHHSP central systems on the SIT and the non-SIT Test Environments will remain in sync, as per the Release and Configuration Management Approach and Plan [REF-6].

- MHHSP LDSO QT Team will support participants with their data requirements, test harness operation and scheduling of testing activities.

- Test acceptance activities will be undertaken by MHHSP Central Systems Providers in PIT/SIT phases before deployment into UIT.

- The test harness tool used in CIT and SIT will be further developed to be able to support non-SIT LDSO QT.

- Other MHHSP test phases, SIT and PIT, have or will met their aims and scope sufficiently to support commencement of LDSO QT phase.

- IR8 will not have significant functional change in it as such SIT cycle 3 and non-SIT LDSO QT can both be aligned to IR8.