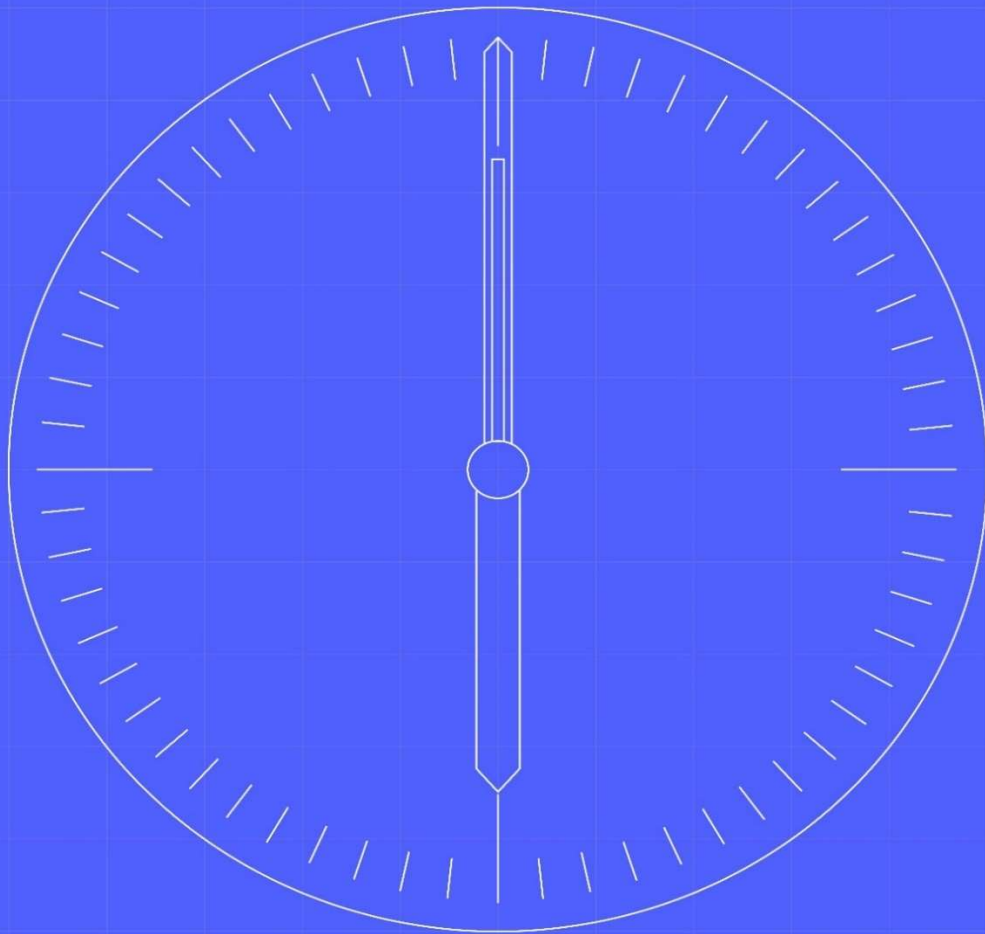




QA&P Annex 2 - Non-SIT Supplier and Agent MHHS Qualification Testing Approach & Plan



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1.1 Change Record

Date	Author	Version	Change Detail
15/12/2023	Non-SIT S&A QT Team	0.1	Initial Draft
07/01/2024	Non-SIT S&A QT Team	0.2	All sections updated
20/02/2024	Non-SIT S&A QT Team	0.3	Updated with proposed approach
23/02/2024	Non-SIT S&A QT Team	0.4	All sections updated for internal review
15/03/2024	Non-SIT S&A QT Team	0.5	All sections updated post review

1.2 Reviewers

Reviewer	Role
Various	Non-SIT S&A QT Team
Various	LDP
Various	SRO
Various	Code Bodies (BSC and REC)

1.3 References

Ref No.	Document/Link	Publisher	Published	Additional Information
REF-01	Qualification Approach and Plan (QA&P)	BSC and REC Code Bodies	5 th March 2023	
REF-02	Qualification Assessment Document (QAD)	BSC and REC Code Bodies	Under Development	
REF-03	MHHS Programme Environment Approach and Plan	MHHSP	15 th November 2023	This will be updated to reflect environment requirements for QT
REF-04	MHHS-DEL852 – Pre-Integration Test Guidance	MHHSP	18 th August 2023	This will be updated to provide further guidance for QT
REF-05	MHHS Programme Release and Configuration Approach and Plan	MHHSP	17 th May 2023	
REF-06	MHHS Placing Reliance Policy	MHHSP	27 th April 2023	
REF-07	REC Assessment Criteria for MHHS Qualification	REC Code Manager	5 th September 2023	This will be updated to include Migration, Non-Functional and Operational requirements
REF-08	BSC Assessment Criteria for MHHS Qualification	BSC Code Manager	Under Development	This will be updated to include Migration, Non-Functional and Operational requirements
REF-09	MHHS-DEL466 Defect Management Plan	MHHSP	29 th February 2024	
REF-10	MHHS-DEL1197 Interface Code of Connection Guide	MHHSP	30 th November 2023	
REF-11	MHHS-DEL1671 DIP Onboarding Guide	MHHSP	24 th November 2023	
REF-12	MHHS-DEL1911 Webhook URL Configuration Guide	MHHSP	24 th November 2023	
REF-13	MHHS Operational Choreography	MHHSP	21 st September 2023	

1.4 Terminology

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

2 Executive Summary

This document is an annex to the Qualification Approach and Plan [REF-01] which sets out the scope, approach and plan for Programme Participants to qualify as part of the MHHS Programme.

The Non-SIT Supplier and Agent MHHS Qualification Testing Approach and Plan is applicable to existing Suppliers and Agents not participating in SIT, who are looking to operate under the new MHHS arrangements, as well as Suppliers and Agents that intend to enter the market prior to M14. It describes the scope and MHHS Qualification testing requirements, along with the test framework for MHHS Qualification and the assurance processes to assess whether Non-SIT Supplier and Agent Qualification Testing (Non-SIT S&A QT) Participants have met the MHHS Qualification testing 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. Non-SIT S&A QT will be managed by the Non-SIT S&A Qualification Testing (QT) Team¹, which is part of the Elexon Helix Programme, with the Code Bodies undertaking an assurance role to confirm the scope of testing and the output satisfies the wider MHHS Qualification needs. The successful completion of Qualification Testing (QT) and associated test evidence will provide an input into the participant's final QAD submission.

As per the Qualification Approach and Plan [REF-01], the current working assumption is that all Non-SIT Suppliers and Agents will complete QT across four Qualification Waves, with the first wave starting in January 2025, and all waves completing before M14. Participants who have not completed QT prior to M14 would need to be transferred into the Enduring Qualification process which is out of scope of this document. Prior to commencing their allocated Qualification Wave, all Non-SIT S&A QT Participants will be expected to complete all relevant preparation activities.

3 Introduction

This section covers the purpose and content of the annex, as well as how this annex should be read in conjunction with other documentation.

3.1 Document Purpose

The Non-SIT Supplier and Agent MHHS Qualification Testing Approach and Plan sets out the testing framework, objectives, and approach for the Qualification Waves for Suppliers and Agents who are choosing to qualify through the Non-SIT route (Non-SIT S&A QT Participants). The purpose of the document is to:

- Define the QT scope, as well as the test management and assurance activities necessary to demonstrate that Non-SIT S&A QT Participants can operate under the new MHHS arrangements.
- Identify the activities and responsibilities of the Non-SIT S&A QT Participants required to successfully complete QT.
- Deliver an approach to Non-SIT S&A QT that meets Code Body requirements, and is practicable, appropriate, and achievable.
- Provide a robust schedule to implement Non-SIT S&A QT in accordance with the MHHSP implementation timetable that will enable Suppliers and Agents to be MHHS Qualified ahead of the M14 milestone.
- Describe the governance, resources, environment, data, and tools that underpin Non-SIT S&A QT and the effective delivery of the expected capabilities.

The document aims to cover the technical components, i.e. preparation, development and execution of the tests, environments, data, harnesses, and assurance methods.

¹ This team is referred to as the Elexon Qualification Test Manager in the Qualification Approach and Plan [REF-01]

As the document only covers the activities required for the Non-SIT S&A QT Participants to successfully complete Qualification Testing, it must be read in conjunction with Qualification Approach & Plan [REF-01] and Qualification Assessment Document [REF-02] and Code Bodies Assessment Criteria [REF-07 and REF-08], which are the overarching documents for Qualification, as well as any other documents referenced in Section 5 of the Qualification Approach and Plan [REF-01]. There are also a number of testing documents which are relevant to QT which Non-SIT S&A QT Participants should be familiar with. The full hierarchy of documents is shown on the diagram below:

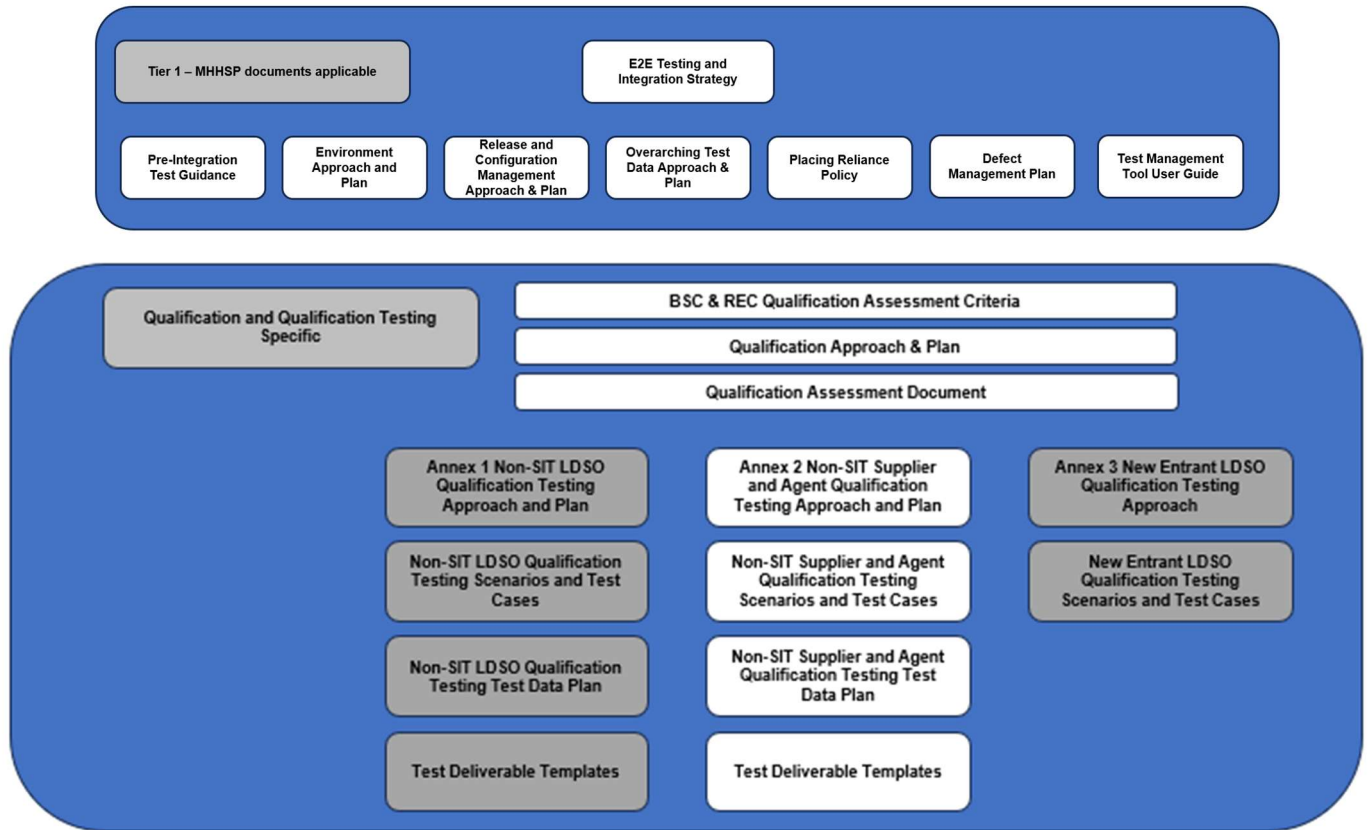


Figure 1: Document Hierarchy

The Non-SIT Supplier and Agent MHHS Qualification Testing Approach and Plan covers:

- Test Stage Objectives
- Scope
- Architecture and Coverage
- Approach for Preparation & Execution, this sets out requirements for Non-SIT S&A QT Participants' and the Non-SIT S&A QT Team and covers:
 - Test Scenarios and Cases
 - Test Data
 - Test Harnesses
 - Test Management Tool
 - Evidence Capture
 - Defect Management
 - Environment & Release Management
 - Readiness Activities and Documentation
 - Entry and Exit Criteria
- Test Schedules
- Management and Organisation
- Governance and Reporting
- Assurance

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

- Suppliers, Agents and 3rd Parties
- SRO Function (SRO)
- Lead Delivery Partner (LDP)
- Qualification Assurance Group (QAG) and Qualification Working Group (QWG)
- BSC and REC Code Body Qualification Teams
- BSC and REC Performance Assurance Boards (PABs)
- Independent Programme Assurance (IPA)

3.2 Reviewers and Approvals

As the Non-SIT Supplier and Agent Qualification Testing Approach and Plan is an annex to the Qualification Approach and Plan [REF-01], as such, it will follow the review and approval cycle in Section 5 of that document.

3.3 Document Change Control

The Non-SIT S&A 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 in line with the updates being made.

4 Objectives

It is the objective of Non-SIT S&A QT to:

- Provide confidence that individual Non-SIT S&A QT Participants can successfully operate under the MHHS arrangements by M14 within scope of their roles, meeting the assessment criteria set out by BSC and REC and approved by the BSC and REC PABs.
- Ensure sufficient testing evidence is provided by each Non-SIT S&A QT Participant to demonstrate that they have tested their systems in an integrated MHHSP test environment and that those systems meet MHHS design requirements and assessment criteria defined by Code Bodies.
- Provide opportunity for Non-SIT S&A QT Participants to test using their own environment connected to the DIP to minimise the risk of future operational issues.
- Prove the capabilities of the Non-SIT S&A QT Participants against the MHHS Design Baseline, including functional, migration, operational and non-functional requirements (covered in more detail later in this document).

5 Scope

This section sets out what is considered in and out of scope of Non-SIT S&A QT. For information on the full scope of MHHS Qualification, please refer to Section 7 of the Qualification Approach and Plan [REF-01].

5.1 In Scope

The following items are considered in scope for this document.

5.1.1 Roles

Roles in scope of Non-SIT S&A QT and the Codes to which they relate are:

- Smart Data Services (SDS) – BSC
 - Advanced Data Services (ADS) – BSC
 - Unmetered Supply Data Services (UMSDS) – BSC
 - Supplier – BSC and REC
 - Metering Equipment Manager (MEM) Advanced – REC
 - Metering Equipment Manager (MEM) Smart – REC
-

5.1.2 Participants

The anticipated scope of participants is:

- All existing Suppliers and Agents who have not volunteered to participate in the MHHSP SIT phase and who wish to operate MHHS arrangements.
- New entrant Suppliers and Agents who intend to qualify ahead of M14.

For further information on MHHS Qualification routes and regulatory context, please refer to Section 4 of the Qualification Approach and Plan [REF-01].

5.1.3 Requirements

Requirements in scope for Non-SIT S&A QT are:

- Functional:
 - Requirement specifications covering all Supplier & Agent roles as detailed in the MHHSP Design Baseline and aligned to the Code Body assessment criteria documents:
 - REC Assessment Criteria for MHHS Qualification [REF-07]
 - BSC Assessment Criteria for MHHSP Qualification [REF-08]
- Non-Functional, Migration and Operational requirements will be defined based on the MHHSP Design and will be updated in the REC and BSC Assessment Criteria as the SIT testing artefacts are signed off.

5.1.4 Business Processes and Design

The following business processes are included in the Non-SIT S&A QT scope:

E2E Walkthrough	Reference	Business Process	Constituency	
			Supplier	Agent
MPAN Ownership	MHHSP-BP001	Change of Supplier	Y	
	MHHSP-BP010	Change of Registration Data	Y	Data Service & MEM
	MHHSP-BP002	Change of Service - Metering Service	Y	Data Service & MEM
	MHHSP-BP003	Change of Service - Data Service	Y	Data Service & MEM
	MHHSP-BP003A	CSS and DCC Update		Data Service
	MHHSP-BP003B	Change of Existing Service Appointment Detail	Y	Data Service & MEM
	MHHSP-BP003C	Transfer of Reads - Change of Data Service	Y	Data Service
Metering Changes	MHHSP-BP007	Disconnection	Y	
	MHHSP-BP008	Change of Energisation Status	Y	Data Service & MEM
	MHHSP-BP009	Change of Meter	Y	Data Service & MEM
	MHHSP-BP011	Change of Market Segment and/or Connection Type	Y	Data Service & MEM
Meter To Bank	MHHSP-BP004	Data Collection	Y	Data Service
	MHHSP-BP005	Data Processing	Y	Data Service
	MHHSP-BP016	Consumption Amendment	Y	Data Service
	MHHSP-BP018	Load Shaping Service (LSS)	Y	Data Service
	MHHSP-BP021	Industry Standing Data (ISD)	Y	Data Service & MEM

5.2 Out of Scope

The following items are out of scope for this 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 S&A QT Test Data Plan.
- All SIT Stages – these will be the subject of separate Test Approach and Plan documents:
 - SIT Component Integration Test
 - SIT Functional Test
 - SIT Migration Test
 - SIT Non-Functional Test
 - SIT Operational Test
- Other Qualification routes and UIT Test Stages:
 - Non-SIT LDSO Qualification Testing – Please refer to Annex 1 of the Qualification Approach and Plan [REF-01]
 - New entrant LDSOs entering the market post-M10 – Please refer to Annex 3 of the Qualification Approach and Plan once published
 - E2E Sandbox
 - Enduring Qualification process
- Other elements of the MHHS Qualification process such as QAD submission which are covered by the Qualification Approach & Plan [REF-01] and Qualification Assessment Document [REF-02].
- Interfaces or activities not changed by the MHHS Design.
- Any requirements that are excluded from the scope of testing by Code Bodies.
- Testing of consequential changes, for example changes that participants need to make as a result of MHHS that are outside of the MHHS Design baselines or outside of changes that participants need to make to meet code requirements.

6 Test Architecture and Approach

This section sets out the way the Non-SIT S&A QT Team will structure the testing and plan to achieve its objectives. For information on the approach to MHHS Qualification as a whole, please refer to Section 9 of the Qualification Approach and Plan [REF-01].

6.1 Approach

Non-SIT S&A QT will take place over four Qualification Waves, starting in January 2025 and completing by February 2026 in line with the MHHS M14 milestone. Details of the process for initial allocation of Non-SIT S&A QT Participants to waves are provided in Section 9.3 of the Qualification Approach and Plan [REF-01]. Once a Supplier or Agent is assigned to a wave it will be expected to meet all of the pre-requisite dates associated with its wave start date (detailed in Appendix C of the Qualification Approach and Plan [REF-01]). The Non-SIT S&A QT Team will hold regular checkpoints with Non-SIT S&A QT Participants and advise Code Bodies/MHHS (including the Migration Control Centre) where a participant is not on track to meet its wave start date, in these cases a Non-SIT S&A QT Participant may be required to move to a later wave. Non-SIT S&A QT Participants will be expected to flag any slippage to the Non-SIT S&A QT Team and Code Bodies as soon as possible to enable the impact of the delay to be assessed and discussed with MHHS and the Migration Control Centre where this is likely to result in a wave allocation change. A wait list will be maintained for Non-SIT S&A QT Participants who are looking to move waves and they will be notified as soon as possible if an opportunity to switch wave arises.

Non-SIT S&A QT will be role based and align with the associated requirements and business processes for the in-scope roles. Testing for 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. Testing will focus on processes that pose the highest risk to settlement and retail arrangements. There will be a defined set of negative and exception test cases defined for high-risk functions.

As the full MHHS ecosystem will not be available, and to facilitate the aim that each participant can conduct its QT without the need for pairing with another participant, where an input would be needed from another industry role, this will be achieved by using a set of test harnesses.

Non-SIT S&A QT Participants must be able to demonstrate test evidence of being able to send and receive messages through all interfaces within the scope of their roles. While MHHS SIT will focus testing on the full E2E design, Non-SIT S&A QT will be role based and therefore will focus on verification of the participant's ability to generate message for onward processing via the DIP as well as receiving/processing messages (as per the requirements of the MHHS Design Baseline) generated by the test harnesses, rather than testing the central systems as these are being tested in SIT.

There is a Placing Reliance mechanism in place and Non-SIT S&A QT Participants, whose Placing Reliance proposal has been approved by the relevant Code Body, will work with the Non-SIT S&A QT Team and Code Bodies to agree how this impacts their test scope.

6.2 Testing Types

The following testing types make up Non-SIT S&A QT.

6.2.1 Functional

The purpose of functional test scenarios is to verify that the Non-SIT S&A QT Participants' systems function correctly to be able to operate MHHS arrangements for the in-scope Supplier and Agent roles according to the design requirements and aligned to the BSC & REC Assessment Criteria [REF-07 & REF-08].

As part of DIP onboarding, connectivity proving (smoke) tests will be run to check connectivity between the participant systems and the DIP in the UIT environment before the participant can proceed into the QT phase.

Participants should refer to section 7.3.7 of the Qualification Approach & Plan [REF-01] on the process to disclose changes to the Code Bodies in the window between them completing QT but not having commenced live MHHS operations.

6.2.2 Non-Functional

The Non-Functional testing scope for Non-SIT S&A QT will be finalised once the relevant SIT artefacts are made available and agreed but will be developed collaboratively in parallel to ensure alignment between QT and SIT artefacts.

As the UIT environment is not built to support full scale performance and volume/load testing, there may be some Test Scenarios or requirements which will not be fully demonstratable as part of Non-SIT S&A QT. It is likely that participants will be expected to test these requirements within their own internal environments rather than in UIT. In this situation, it is expected that the submission of test evidence would need to be in time for Non-SIT S&A QT exit rather than for QT entry.

6.2.3 Migration

The Migration testing scope for Non-SIT S&A QT will be finalised once the relevant SIT artefacts are made available and agreed but will be developed collaboratively in parallel to ensure alignment between the QT and SIT artefacts.

6.2.4 Operational

The Operational testing scope for Non-SIT S&A QT Participants will be finalised once the SIT Operational Testing Approach and Plan is agreed and test scenarios/test cases published but will be developed collaboratively in parallel to ensure alignment between the QT and SIT artefacts.

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

6.2.5 Testing Coverage

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

Each requirement in scope for QT, which is deemed testable, will have at least one test case associated with it. Where evidence cannot be gathered through testing, within the UIT environment, it is expected to be covered by either a question in the Qualification Assessment Document [REF-02] or Pre-Integration Testing (PIT).

7 Supplier and Agent QT Process

This section sets out high level information on the Non-SIT S&A QT process from PIT through to QT Exit. More detailed information on the different test stages is provided in later sections of this annex.

7.1 High Level Qualification Process

There are a number of high-level steps within the MHHS Qualification process (Figure 2), of which QT is one (Step 4b in Figure 2). For further information, please refer to Section 9 of the Qualification Approach and Plan [REF-01]. QT itself consists of several stages to support the successful and consistent management of testing which are set out in the following section.

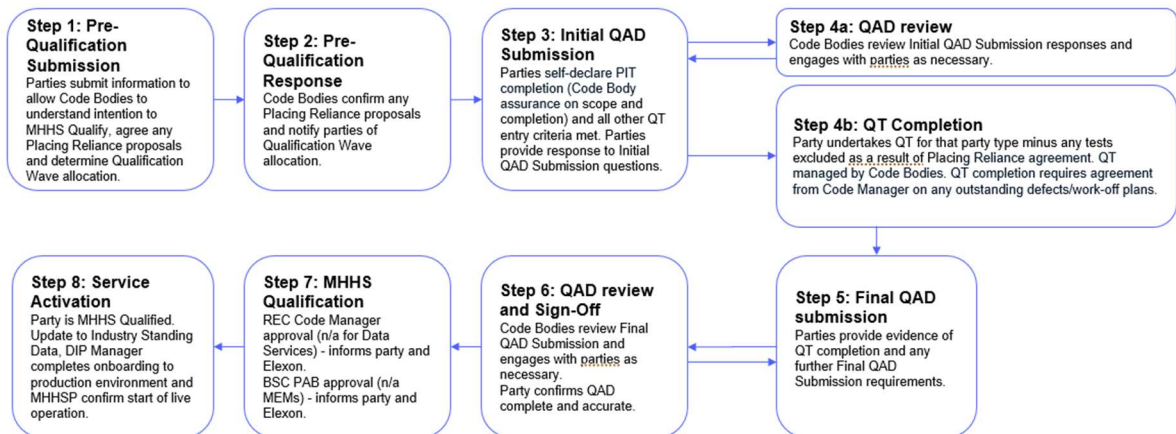


Figure 2: High level MHHS Qualification Steps for Non-SIT S&A QT Participants (Source: QA&P)

7.2 QT Process

The high-level stages within QT are **QT Preparation (Entry)**, **QT Execution** and **QT Exit**. Each stage contains a number of activities and deliverables, detailed information on each stage is covered in later sections of the document.

Please note, the figures below show key activities within each stage but do not provide an exhaustive list of activities in each stage. Activities may run in parallel during the stage but are expected to complete prior to commencement of the following stage.

QT Preparation (Entry) covers the activities that are needed to meet the entry criteria for both the commencement of the overall MHHS Qualification Waves Phase and the Non-SIT S&A QT Participants entry into their respective wave.



Figure 3: QT Preparation (Entry) High Level Activities for Non-SIT S&A QT Participants

Pre-Integration Testing (PIT) is the internal testing that a Non-SIT S&A QT Participant will complete within their own environment to confirm systems are developed and robust enough to move into QT execution. The Non-SIT S&A QT Team will assure the output as a part of assurance of the entry to Non-SIT S&A QT, this output will include the PIT RTTM and PIT Completion Report. Please refer to Section 10.1 of this annex and Section 10 of the Qualification Approach and Plan [REF-01] for more information.



Figure 4: QT Preparation (Entry) High Level Activities for Non-SIT S&A QT Team

As part of the QT Entry stage there will be an overall entry gate as well as individual entry gates for each Non-SIT S&A QT Participant to confirm that all entry criteria has been met and both the Programme and Non-SIT S&A QT Participants are ready to move into QT Execution. The dates for the Non-SIT S&A QT Participant Entry Gates will vary depending on a participant's wave and readiness. Further details on the entry criteria for the overall entry and individual Non-SIT S&A QT participants is covered in Sections 9.7 and 10.6 of this annex.

QT Execution covers the activities needed for the execution of each Non-SIT S&A QT Participant's agreed test scope, monitoring of progress, and assurance of test output, as well as the processes needed to support testing such as defect and release management. Please refer to Section 11 of this annex for more information.



Figure 5: QT Execution High Level Activities for Non-SIT S&A QT Participant

Non-SIT S&A QT Participants are expected to engage regularly with the Non-SIT S&A QT Team to report on progress against their plan as well as discussing any issues or risks which may impact their completion.



Figure 6: QT Execution High Level Activities for Non-SIT S&A QT Team

QT Exit covers the activities and assurance needed to confirm that each Non-SIT S&A QT Participant has met all of the exit criteria for QT to enable the Non-SIT S&A QT Team to confirm test completion to the Code Bodies. Please refer to Section 11.8 of this annex for more information regarding the exit criteria.

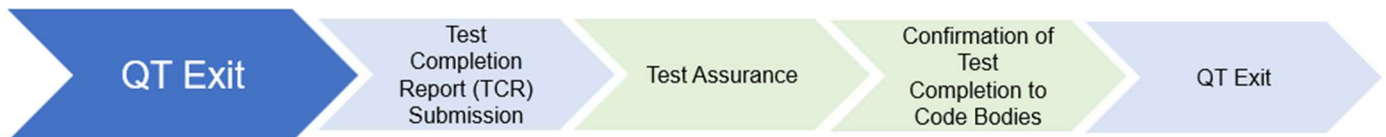


Figure 7: QT Exit High Level Activities for Both Non-SIT S&A QT Participants and Non-SIT S&A QT Team

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

8 High Level Schedule

The high-level schedule for the Non-SIT S&A QT waves is depicted below:

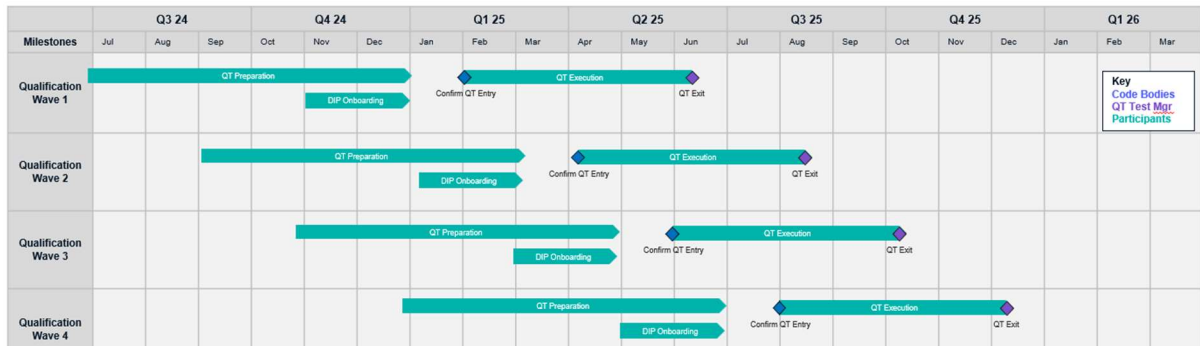


Figure 8: Qualification Waves High Level Schedule

QT Execution provides a window for Non-SIT S&A QT Participants to complete their QT. The schedule of test execution within the Qualification Wave should be detailed in the individual Non-SIT S&A QT Participant's QT Test Plan which will be signed off as part of the QT entry criteria, please refer to Section 10.6 for more information.

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

9 Test Preparation

This section sets out the test preparation activities undertaken by the Non-SIT S&A QT Team, MHHSP and the Code Bodies. For Non-SIT S&A QT Participant test preparation activity, please refer to Section 10 of this annex.

9.1 Test Scenarios and Test Cases

The following describes the process of creating the test scenarios and test cases for Non-SIT S&A QT.

9.1.1 Derivation of Test Scenarios and Test Cases

To maintain equivalence between the testing carried out by SIT participants and Non-SIT S&A QT Participants, the Non-SIT S&A QT Test Scenarios and Test Cases will aim to re-use the SIT Test Scenarios and Test Cases as far as possible.

Selection of the specific SIT Test Scenarios and Test Cases for inclusion in Non-SIT S&A QT will focus on tests covering the MHHS Business Requirements identified by the Code Bodies as part of the BSC & REC Assessment Criteria [REF-07 & REF-08]. The selection of SIT Test Cases will be informed by the MHHS Business Requirement traceability tagging contained in the SIT Test Steps, with a view to providing maximum coverage of Code Body-identified MHHS Business Requirements whilst minimising the number of Qualification Test Cases each Non-SIT S&A QT Participant is required to perform. Responsibility for the final selection of Qualification Test Cases resides with the Code Bodies.

Each test step in the SIT Test Cases references the MHHS Business Requirement(s) that the test step is designed to exercise. The Non-SIT S&A QT Team will use these references to inform Qualification Test Case selection by identifying the test steps and, therefore, Test Cases and Test Scenarios that provide coverage of Code Body identified MHHS Business Requirements. This approach assumes that the SIT Tests meet the Qualification requirements for the MHHS Business Requirements they reference. The Non-SIT S&A QT Team will aim to minimise the number of test

cases which each role must execute by excluding, as far as possible, Test Cases where there is duplication of requirement coverage.

9.1.2 End-to-End Qualification Tests

SIT Test Cases involve multiple participants exchanging common data in an end-to-end business process-based scenario. Non-SIT S&A QT is role-based and intended for Non-SIT S&A QT Participants to execute independently based on the role(s) for which they are qualifying. Non-SIT S&A QT Participants must, however, demonstrate their ability to perform all required test steps relevant to their role(s) in any given QT Test Case.

As stated above, Non-SIT S&A QT Test Scenarios will be based on relevant SIT Test Scenarios; however, Non-SIT S&A QT Participants will only be required to complete those QT Scenarios, Test Cases and Test Steps relevant to the role in which they are qualifying. Each Non-SIT S&A QT Participant will have a bespoke list of QT Test Cases which has been agreed with the Non-SIT S&A QT Team and Code Bodies. This will be based on the standard list of QT Test Cases for their Qualification Role, modified as necessary to reflect placing reliance submissions and/or optionality within the QT Test Cases. Although QT testing is performed by a Non-SIT S&A QT Participant in isolation from other participants, the Test Steps they are required to perform form part of an end-to-end business process (similar to the multi-party end-to-end tests performed in SIT). In the case of QT testing, all parties other than the Data Integration Platform (DIP), the Data Transfer Network (DTN) and the Non-SIT S&A QT Participant itself are simulated using test harnesses and are referred to in this document as the Qualification Testing Framework (QTF) (as described in section 9.3).

A subset of test cases per role will be identified as candidate regression tests, where priority and risk level make these a good candidate for participants to include in regression packs.

9.1.3 Requirements Traceability

As described above, the Non-SIT S&A Qualification Test Scenarios and Test Cases will use the SIT Test Scenarios and Test Cases as the basis for the Non-SIT S&A QT scope. To demonstrate coverage of the Code Body Assessment Criteria, the Non-SIT S&A QT Team will produce a Requirements to Test Traceability Matrix (RTTM), mapping Code Body-required MHHS Business Requirements to the Non-SIT S&A QT Test Scenarios and Test Cases.

9.1.4 Qualification Test Scenario Review

Qualification Test Scenarios will be developed by the Non-SIT S&A QT Team and undergo the following review, consultation and approval process:

- Internal Peer Review
- Code Body and MHHSP Review
- Non-SIT S&A QT Industry Review (through QWG) / Consultation
- QAG Approval

9.2 Test Data

The following sections describe the high-level approach to test data for Non-SIT S&A QT. Further detail will be provided as part of the Non-SIT S&A Qualification Testing Test Data Approach and Plan.

9.2.1 Allocation of Test Data

Non-SIT S&A QT Participants will be issued a set of QT ISD to be loaded prior to commencing QT. This will include the MPIDs and identifiers relating to the simulated parties with whom they will communicate via the DIP and DTN during QT execution. Loading of ISD is likely to form one of the first tests to be conducted in QT.

Non-SIT S&A QT Participants will be allocated a unique set of test MPANs specific to their organisation and Qualification Role by the Non-SIT S&A QT Team during their QT onboarding. This is necessary to ensure segregation between participants who are executing QT concurrently and enable Non-SIT S&A QT Participants to undertake testing at their own pace and independently of other Non-SIT S&A QT Participants.

The MPANs allocated to each Non-SIT S&A QT Participant will also be specific to a Test Case. This allows the orchestration of the Non-SIT S&A QT execution to be automated as it allows the QTF to determine the simulated test steps required to support an end-to-end Test Case and the expected results from each test step. The proposed approach to test data for Non-SIT S&A QT requires each MPAN to be used only once as part of testing. To allow Non-SIT S&A QT Participants to repeat Test Cases in the event of test failures or for regression purposes, a batch of test MPANs will be allocated to each Non-SIT S&A QT Participant for each of their Test Cases.

9.2.2 Sourcing of MPAN Test Data

The proposed test data approach for Non-SIT S&A QT is to use representative, artificial test data. The advantages of this approach are:

- It avoids all GDPR constraints such as the need for secure transmission and obfuscation of MPANs.
- It simplifies production of MPANs with the characteristics required for each test case.
- It ensures that MPANs can be generated in sufficient volumes to allow Test Cases to be repeated in the event of failures and/or regression.
- It avoids the need for a Production data cut.
- It caters for new market entrants who are not able to take a Production data cut.
- It enables the QTF to automatically orchestrate the appropriate simulated messages and expected results checks associated with the Test Case being executed.

The disadvantage of this approach is the need for Suppliers to populate their systems with artificial MPANs rather than using copies of real MPANs already resident in their systems through loading of Production extracts. However, in the case of Non-SIT S&A QT Participants of other Qualification Roles, use of MPANs from Production extracts is not an option as the systems have yet to enter Production. Since artificial data will be required by these participants, the proposed test data approach is to use artificial data throughout Qualification Testing.

9.2.3 Test Data Population

The intention is to migrate MPANs from legacy settlement to MHHS following the migration processes. Starting with the migration Test Cases enables both the testing of the migration processes as well as providing the MPANs needed for the Non-SIT S&A QT functional testing. Suppliers will be required to migrate multiple MPANs to ensure that sufficient MPANs are available for QT. For new Agents (e.g. SDS, ADS), the simulated Supplier within the QTF will initiate the migrations which will populate the Non-SIT S&A QT Participants' systems via the appointment process.

Where Non-SIT S&A QT Participants are required to initiate the migration process to populate MPANs, the Non-SIT S&A QT Team will provide the Non-SIT S&A QT Participants with their specific set of MPANs and associated attributes. As a minimum, these will be provided in CSV format, but efforts will be made to also provide these in industry standard formats to aid population in Non-SIT S&A QT Participants' systems prior to migration.

9.2.4 Test MPAN Attributes

Each Non-SIT S&A QT Test Case requires an MPAN of a specific MPAN type defined by specific characteristics such as meter type (traditional, smart, advanced, unmetered), energy direction (import, export), relationship to other MPANs (linked, related), energisation status (energised, de-energised), consent granularity (half-hourly, daily, monthly) and tariff (E7, E10). In addition, each MPAN will require a full set of attributes required for operation in the MHHS market (e.g. address, CSS Registration ID, Metered Indicator, DUoS Tariff ID etc.). The Non-SIT S&A QT Team will generate artificial MPANs with full sets of MPAN attributes based on live MPAN examples taken from an existing Central System data extract. They will do this by creating a set of MPAN templates that map to the set of MPAN types required for the full set of Non-SIT S&A QT Test Cases and combining these with the Non-SIT S&A QT Participant's unique set of MPAN Cores.

When generating MPAN Cores, the Non-SIT S&A QT Team will ensure that each MPAN Core has a valid checksum, and that the Distribution Code matches its assigned Distributor ID/GSP Group Id/Postcode combination. The Non-SIT S&A QT Team will also ensure that all generated MPANs are unique within the QTF.

Based on the proposed approach, the Non-SIT S&A QT Team will generate sufficient volumes of MPANs with the appropriate set of characteristics required for each Test Case as part of the onboarding process for each Non-SIT S&A QT Participant. Additional sets of MPANs will be available on request.

9.3 Test Environment

Non-SIT S&A QT will take place in the MHHS UIT environment, an environment that will be separate from SIT. The same environment will be used for Non-SIT LDSO Qualification Testing and Sandbox Testing (that is available to Programme Participants for use after they have completed SIT or QT). The MHHS UIT environment is under the control of the MHHS Central Parties. Non-SIT S&A QT Participants will connect to this environment from their respective test environments as described in the MHHS Programme Environment Approach & Plan [REF-03].

9.3.1 Qualification Test Framework (QTF)

For clarification purposes, the term "QTF" is used to describe the orchestration engine and test harnesses that make up the testing framework within which Non-SIT S&A QT Participants perform Qualification Testing, whilst "UIT environment" is used to describe the environment in which the QTF runs and in which Non-SIT LDSO Qualification Testing and Sandbox testing is also performed.

The QTF will comprise a live instance of the Data Integration Platform (DIP) and, in line with SIT, will also have access to the Data Transfer Network (DTN). Non-SIT S&A QT Participants will be required to undergo DIP onboarding prior to commencing QT. Those roles required to send or receive Data Transfer Catalogue (DTC) flows as part of Qualification Test Cases will also require access to a DTN Gateway. DTC flows transmitted as part of Non-SIT S&A QT will use an agreed Test Flag. Use of the DTN is required to support the end-to-end nature of the Qualification Test Cases which often require transmission of DTC flows to progress from one test step to the next.

As stated above, for Non-SIT S&A QT the QTF orchestrates testing between the DIP, DTN and systems of the Non-SIT S&A QT Participants seeking qualification. When executing a specific Test Case, all roles involved in the Test Case other than that of the Non-SIT S&A QT Participant executing the test (and the DIP and DTN) will be simulated by the QTF. This includes other Central Systems such as MDS, LSS, VAS, ISD, LDSO, REG, EES and CSS and other Supplier and/or Agent roles such as the Supplier, UMSO, UMSDS, SDS, ADS, SMS, MSS, MSA and AMS. In the case of the simulated CSS, Non-SIT S&A QT Participant systems will need to connect using the same integration method as for the Production CSS (i.e. webhooks). The QTF will include two instances of simulated Supplier and Agents to

support Qualification Test Scenarios which involve Change of Supplier and/or Agent (one for incoming and one for outgoing in each case).

Each simulated party will be capable of supporting multiple Non-SIT S&A QT Participants simultaneously, having been registered/appointed to the MPANs created specifically for the Non-SIT S&A QT Participant and Test Case.

A high-level view of the QTF architecture is shown below. Please note that only simulated parties are illustrated (Non-SIT S&A QT Participant systems are not shown).

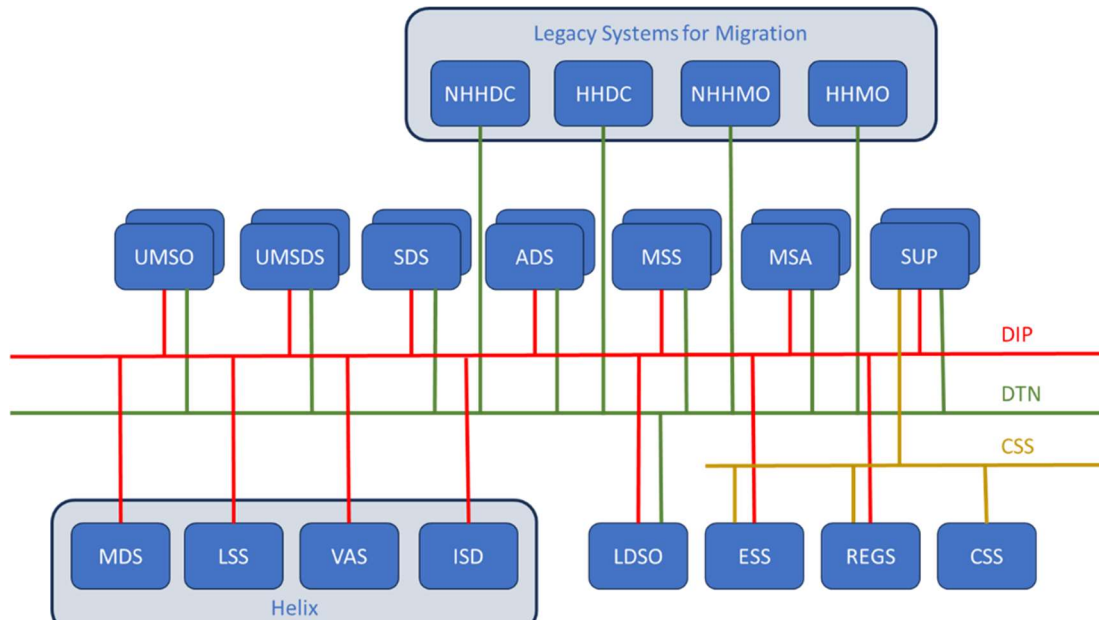


Figure 9: High Level Architecture for QTF

The QTF will be designed and developed by the Non-SIT S&A QT Team. The QTF simulators will be assigned individual MPIDs and appropriate certificates to enable DIP, DTN and (simulated) CSS on-boarding. The data flows they generate will be developed as part of the Non-SIT S&A QT Test Cases, as will expected results to allow automated validation of messages produced by Non-SIT S&A QT Participants. The Test Cases, themselves, will be data-driven based on configuration of an event table by the Non-SIT S&A QT Team, which will orchestrate the test steps comprising each Test Case. Where possible, evidence will be collected by the QTF on behalf of the Non-SIT S&A QT Participant. Technical investigations are currently underway to determine the extent to which this can be automated. It is recognised that some evidence specific to the Non-SIT S&A QT Participant's own systems will need to be captured and stored and will, therefore, require manual intervention by the Non-SIT S&A QT Participant during the execution of a Test Case.

9.3.2 UIT Availability

An advantage of simulating all parties other than the Non-SIT S&A QT Participant is that UIT availability is dependent only on the availability of the DIP, DTN and QTF. However, the DIP, DTN or QTF may be unavailable due to planned or unplanned downtime because of code deployments, infrastructure maintenance or data refresh activities. Planned outages will be communicated to Non-SIT S&A QT Participants and EWG with as much notice as possible, and any impact that an outage might have on testing progress and mitigation will be discussed with MHHSP.

9.3.3 Deployment Verification

Where new releases of the DIP, DTN and/or QTF are required, deployment verification will be performed by the Non-SIT S&A QT Team prior to Non-SIT S&A QT Participants resuming QT. The purpose of deployment verification is to verify performance of the QTF and avoid QT Test Case failures resulting from environmental issues. Deployment verification will be performed by running an identified set of regression Test Cases designed to exercise all functional

aspects of the environment (e.g. simulated data flow generation, automatic results comparison, primary and secondary DIP routing etc.). When running deployment verification Test Cases, all roles will be simulated and the Test Cases will be run as fully automated tests. Any issues encountered during deployment verification will be captured by the Non-SIT S&A QT Team in the Test Management Tool Azure DevOps (ADO) within the release and configuration category and will be triaged and managed as per the defect workflow set out in section 11.3 Defect Management, below.

For further information about the availability of UIT refer to MHHSP Environment Approach & Plan [REF-03].

9.3.4 Running Qualification Test Cases

The QTF will provide a User Interface (UI) that will allow Non-SIT S&A QT Participants to view the list of Test Cases they need to complete and select an individual Test Case to run. The UI will enable the Non-SIT S&A QT Participant to select the MPAN(s) to be used in the Test Case and enter any other prerequisite information. The UI will enable the Non-SIT S&A QT Participant to initiate the test. All test steps performed by simulated parties will run automatically by the QTF; however, execution of the Test Case will halt where interventions are required by the Non-SIT S&A QT Participant (e.g. capturing of specific evidence) or in the event of a test step failure resulting from a Non-SIT S&A QT Participant-generated message failing an expected result comparison. In the event of a Test Case failure that the Non-SIT S&A QT Participant is unable to easily resolve, the Non-SIT S&A QT Participant should raise a defect in ADO. Once the defect has been resolved, the Non-SIT S&A QT Participant can re-run the Test Case from the QTF UI selecting a new MPAN from the batch of MPANs allocated to that Test Case.

For clarity, the QTF UI, which is currently in design, is independent of the ADO UI. The Non-SIT S&A QT Participants will have access to both the QTF UI and ADO UI.

The Non-SIT S&A QT Team will provide support for the operation of the QTF but it is anticipated that the QTF will enable Non-SIT S&A QT Participants to 'self-serve' and conduct testing themselves. The Non-SIT S&A QT Team will be available to support triage defects and to advise of any workarounds for known problems.

9.4 Test Management Tool (ADO)

ADO provides capability for Non-SIT S&A QT Participants to:

- Manage defects: raise defects that can only be viewed by them and the Non-SIT S&A QT Team, assign, reassign and close defects.
- Report on defects and test progress.
- Define dashboards.
- Host test scenarios, test cases and test evidence.
- Tracking and reporting test execution progress and coverage.

In preparation for QT, all test cases applicable to a participant's role in the test stage will be loaded by the Non-SIT S&A QT Team into the Non-SIT S&A QT Participants individual test project.

In addition, Non-SIT S&A QT Participants will be expected to upload evidence extracted from their systems. During the execution period Non-SIT S&A QT Participants will be expected to keep ADO updated as execution is carried out.

MHHSP will support providing access to the tool and the Non-SIT S&A QT Team will provide support for questions related to ADO that might arise during the test phase.

9.4.1 ADO Onboarding

The Non-SIT S&A QT Team (with support from MHHSP) will set up all nominated test resources for each Non-SIT S&A QT Participant within ADO and provide the necessary access and user guidance tutorial material.

Details of ADO set up, onboarding and usage is published within MHHSP-DEL1332 – Test Management Tool User Guide [REF-11].

9.5 Non-SIT S&A QT Team Deliverables

The following deliverables will be produced by the Non-SIT S&A QT Team, MHHSP and Code Bodies for the Non-SIT S&A QT stage:

- Non-SIT Supplier and Agent Qualification Testing Approach and Plan
- Test Scenarios
- Test Cases
- Pre-Qualification Submission form
- Non-SIT S&A Qualification Testing Test Data Approach and Plan
- Test Harness (QTF) Design
- Increments to existing MHHSP documentation:
 - Environment Management
 - Defect Management
 - Release Management
 - ADO Guidance
 - PIT Guidance
 - PIT Templates for Test Deliverables
 - DIP Onboarding Guide (incorporating lessons learned from CIT)
- Non-SIT S&A QT Participant templates and guides:
 - QT Test Readiness Report Template
 - QT Test Plan Template
 - QT RTTM Template
 - QT Test Results Reporting
 - QT Test Completion Report Template
 - Test Harness (QTF) Guide

9.6 QT Test Phase Preparation Schedule

Test preparation schedule is depicted on the POAP stored on the MHHSP Collaboration Base.

9.7 Entry Criteria for Non-SIT Supplier and Agent QT Phase

The Non-SIT S&A QT Team, MHHSP and Code Bodies will need to meet the following entry criteria to confirm that all aspects are in place for Non-SIT S&A QT to commence, subject to participants meeting their individual QT entry criteria. Each individual Non-SIT S&A QT Participant will also need to meet a set of QT entry criteria which is set out in Section 10.6 of this annex.

The following will need to be set up and confirmed by the MHHSP, Non-SIT S&A QT Team and Code Bodies as ready for test commencement:

MHHSP & Non-SIT S&A QT Team Entry Criteria

- | | |
|---|--|
| 1 | Stable IR8 release deployed on UIT environment. |
| 2 | All SIT phases have sufficiently completed, as evidenced by no high severity issues impacting Suppliers and Agents roles, with test coverage sufficient to progress into Non-SIT S&A QT. |

3	Test Harness/UI (QTF) development and acceptance testing completed.
4	UIT environment is made available, deployment activities and verification checks completed.
Test Management Tool	
5	<ul style="list-style-type: none"> ○ ADO access granted to Non-SIT S&A QT Participants. ○ QTF access granted to Non-SIT S&A QT Participants. ○ Training material made available. ○ Test Cases uploaded to relevant participants' area in ADO and QTF.
6	Processes, documents and guidance listed in Section 9.5 have been produced, reviewed, assured, and approved as appropriate for the test stage.
7	Test governance agreed.
8	Test meetings agreed and scheduled.
9	Test Reporting in place.
10	MHHSP, Non-SIT S&A QT Team and Code Bodies have sufficient resources to support Non-SIT S&A QT in place.

Please note, some elements of readiness will be staggered for participants depending on their Qualification Wave.

10 Supplier and Agent Preparation

This section sets out the test preparation activities which each Non-SIT S&A QT Participant will need to complete to be ready to start QT execution. The test preparation activities that will need to be undertaken by MHHSP, the Non-SIT S&A QT Team and Code Bodies are set out in Section 9 of this annex.

10.1 Pre-Integration Testing (PIT)

PIT, which takes place in a Non-SIT S&A QT Participant's own standalone test environment, is a pre-requisite for entry into QT execution and is subject to a participant readiness review prior to QT. Please refer to Section 10 of the Qualification Approach and Plan [REF-01] for information on PIT overview, deliverables, and PIT exit criteria. Additional guidance for this test phase can be found in MHHS-DEL852 - Pre-Integration Test Guidance [REF-04]. This document is in the process of being updated and will be published shortly.

The successful exit of PIT by meeting the PIT exit criteria and the submission of PIT deliverables and test evidence are a pre-requisite for entry into QT and are subject to review and assurance by the Non-SIT S&A QT Team, and where appropriate by Code Bodies. For PIT exit criteria, please refer to Section 10.1 of the Qualification Approach and Plan [REF-01].

PIT deliverables and test evidence should be submitted to MHHSQualification@elexon.co.uk. Submissions should be in line with the dates for each Qualification Wave, as set out in Appendix C of the Qualification Approach and Plan [REF-01].

10.2 Environment Preparation and DIP Onboarding

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

This includes the following activities:

- Provide their own production like environments to support Non-SIT S&A QT to enable testing of functional, migration, operational and non-functional (where appropriate) test cases. It is expected that test

environments are hosted and contain systems in a way that matches the Non-SIT S&A QT participant's production set up. It is not expected, however, that these test environments need to be fully scaled to production levels.

- Perform an internal connectivity test to ensure that they have their test environments correctly stood-up. This activity can be undertaken independently from the external connectivity proving.
- For DIP Onboarding, appoint individuals responsible for digital certificate registration and request digital certificates. Each environment requires a different set of digital certificates, hence the UIT environment will need appropriate set of certificates to be installed. Guidance on how to request a digital certificate is provided in, MHHS-DEL1671 DIP Onboarding Guide [REF-11] and MHHS-DEL1197 Interface Code of Connection Guide [REF-10].
- Perform an external connectivity test (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 MHHS-DEL1911-Webhook URL Configuration Guide [REF-12]. If this step has been successfully completed, i.e. end-to-end connectivity of its test environment has been proven, the Non-SIT S&A QT Participant will be ready to commence test execution, subject to all other entry criteria being satisfied. Appropriate data should exist on the participant's systems in advance of external connectivity proving. For guidance on how to connect systems to the DIP please refer to MHHS DEL1671 DIP Onboarding Guide [REF-10].
- Deploy a code base that has passed PIT or where a Placing Reliance arrangement has been agreed with Code Bodies, a code base that has been tested against the most recent, approved MHHSP Interim Release (IR). If PIT/SIT was conducted against an earlier MHHSP Interim Release, or systems have a new code deployed, it is expected that the Non-SIT S&A QT Participant will retest defects and regression test against changes in staging/PIT environments prior to promoting the code into UIT.
- Non-SIT S&A QT Participants systems should be built and tested against IR8, and PIT undertaken against same release.

Non-SIT S&A 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-03].

10.3 Test Scope

For QT Entry, each Non-SIT S&A QT Participant will be required to submit an RTTM, along with their QT Test Plan, to the Non-SIT S&A QT Test Team confirming whether for each requirement they intend to cover this via QT test execution or if they believe it is covered by their Placing Reliance submission. The Non-SIT S&A QT Team and Code Bodies will work with participants to review and confirm their test scope.

Approval of the QT Test Plan and the QT RTTM will be considered confirmation of the individual Non-SIT S&A QT Participant's QT scope. Templates for the QT RTTM and QT Test Plan will be provided to Non-SIT S&A QT Participants by the Non-SIT S&A QT Team.

The approved QT Test Plan for each participant will be shared with the Migration Control Centre for the purpose of migration planning and regular updates will be provided to the Migration Control Centre of the individual Non-SIT S&A QT Participant's progress against their plan.

The key principles for how MHHS Placing Reliance will be applied for QT is set out in Section 10 of the Qualification Approach and Plan [REF-01].

Please refer to Section 10.4 of this annex for more information on the Non-SIT S&A QT test deliverables.

10.4 Test Deliverables

During the testing lifecycle, each Non-SIT S&A QT Participant will be required to produce and maintain a number of documents and reports. The Non-SIT S&A QT Team and Code Bodies will provide templates for the test deliverables which will be made available via the MHHS Collaboration Base. The expected artefacts are shown in the table below.

Please note, there are other Qualification deliverables, such as the Qualification Assessment Document [REF-02], which Non-SIT S&A QT Participants will need to complete. Please refer to Section 9.1.8 of the Qualification Approach and Plan [REF-01] for more information.

QT deliverables, apart from test evidence uploaded into ADO and deliverables which are part of the Qualification Assessment Document, should be submitted to MHHSQualification@elexon.co.uk in line with the schedule set out in Appendix C of the Qualification Approach and Plan [REF-01] and the test preparation POAPs on the Collaboration Base. Please indicate the name of the Non-SIT S&A QT Participant and deliverable being submitted in the email subject.

Deliverable	Purpose	Format	Phase	Non-SIT S&A QT Team Activity	Code Bodies Activity
Pre-Qualification Submission	Placing Reliance assessment & Wave Allocation	Word template	Initial Submission	Review and approval	Review and approval
PIT Approach and Plan	Plan detailing the approach and scope of PIT	Word template	Initial Submission	Review	Informed
PIT Requirements to Test Traceability Matrix (incl. Test Scenarios)	RTTM showing mapping of requirements to PIT test scenarios	Excel Template	Readiness phase	Review	Review
PIT Draft Test Completion Report	Report to provide summary of how testing is progressing aligned with scope, exceptions, and details of any work off plans. ²	Word template	Readiness phase	Review	Review
Interim QT Readiness Report	An interim report on progress for completing preparation activities and entry criteria	Word template	Readiness Phase	Review	Informed
QT RTTM	RTTM showing coverage of requirements by either QT tests or by Placing Reliance	Excel Template	Readiness Phase	Review and approve	Review
QT Test Plan	Plan to detail approach, scope and execution schedule for QT	Word/Excel template	Readiness phase	Review and approve	Informed
PIT Final Test Completion Report	Report to provide summary of how testing completed aligned with scope, exceptions and details of any work off plans ²	Word/Excel template	Entry Criteria	Review and approve	Informed
Final QT Readiness Report	Self-declaration of completion status in relation to preparation activities for its Qualification Wave.	Word template	Entry Criteria	Review and approve	Informed
QT Execution Progress Reporting	Tracking of the progress during test execution phase	Updates via ADO	During QT execution phase	Review and escalation	Informed
Test Evidence	Screenshot, audit log etc. attached to a Test Case	Updates via ADO	During QT execution phase	Assurance	Informed
QT Test Completion Report	To include any exceptions and work-off plans that have been agreed. ²	Word template	Exit criteria	Review and Approve	Review and Approve

² Please note, all work off items and plans are subject to Code Bodies review and approval.

10.4.1 Interim and Final Test Readiness Reports

Prior to commencement of QT, a Non-SIT S&A QT Participant will be required to provide a QT Readiness Report as a self-declaration of its completion status in relation to the preparation activities, outlined in Section 10, and QT entry criteria. This will need to include any exceptions and work-off plans that have been agreed by Code Bodies and must be signed off by a senior stakeholder within the Non-SIT S&A QT Participant's organisation. A template will be provided by the Non-SIT S&A QT Team and Non-SIT S&A QT Participants will be expected to submit an interim and final QT Readiness Report. The Non-SIT S&A QT Team will be engaged in monitoring throughout the preparation activities. However, the report serves as a formal position as part of the Non-SIT S&A QT entry governance.

10.4.2 Test Plan

Each Non-SIT S&A QT Participant will be required to provide a QT Test Plan. The test plan should confirm the agreed testing scope based on Qualification Role, Placing Reliance etc., approach to testing, a high-level execution schedule and confirmation that the necessary resources to meet the plan are available. The Non-SIT S&A QT Team will provide a template for this artefact. The QT Test Plan should be submitted with the QT RTTM and approval of these artefacts will be confirmation of the agreed test scope.

The approved QT Test Plans will be shared with MHHSP and the Migration Control Centre to support Migration planning. The Non-SIT S&A QT Team will report participants progress against their agreed plans and provide regular updates to the Migration Control Centre to build confidence in the Non-SIT S&A QT Participant target Qualification date.

10.5 Supplier and Agent Preparation Schedule

A high-level preparation schedule for each Qualification Wave can be found in Appendix C of the Qualification Approach and Plan [REF-01]. More specific dates will be included in the participant readiness checklist which is available on the MHHS Collaboration Base.

10.6 Non-SIT S&A QT Participant Entry Criteria

Each individual Non-SIT S&A QT Participant must meet the below QT entry criteria, this includes the criteria set out in Section 10.6 of the Qualification Approach and Plan [REF-01], as well as additional requirements specifically for Non-SIT S&A QT Participants. This will be confirmed by the final QT Readiness Report as well as an entry gate review with the Non-SIT S&A QT Team.

Non-SIT S&A QT Participant Entry Criteria

- | | |
|---|--|
| 1 | Evidence of successful PIT Completion has been submitted, assured by the Non-SIT S&A QT Test Team and any work off plans agreed and tracked with Non-SIT S&A QT Team and Code Bodies - please refer to MHHS-DEL852 - Pre-Integration Test Guidance [REF-04] for full details of the PIT exit criteria and submission timelines for PIT deliverables. |
| 2 | All relevant test artefacts listed in Section 10.4 as entry criteria must have been produced by the Non-SIT S&A QT Participant and approved by the Non-SIT S&A QT Team and Code Bodies (where applicable) |
| 3 | Successful completion of DIP onboarding and connectivity proving with no open issues which would impact the test schedule for QT |
| 4 | Test Data is known, agreed and loaded where migration regimes are not being used to populate test data |
| 5 | Non-SIT S&A QT Participants have confirmed they have resources with necessary skills and system access to support QT execution and defect management |
| 6 | Non-SIT S&A QT Participant users have been onboarded to and trained in the Test Management Tool |
| 7 | For Non-SIT S&A QT Participants placing reliance, the MHHS Placing Reliance submission has been reviewed and approved by the Non-SIT S&A QT Team and Code Bodies |

8	Where test scope has been adjusted for Placing Reliance, this has been documented in the Non-SIT S&A QT Participant's test plan/RTTM and this has been reviewed by Code Bodies
9	Code Bodies confirm that the Initial Qualification Assessment Document Submission has been completed.

11 Test Execution

This section sets out 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.

11.1 Schedule

During each Qualification Wave, Non-SIT S&A QT Participants will be running migration, functional, non-functional (where appropriate) and operational test cases, and raising defects for failed test cases in ADO. Some test scenarios and cases may be required to be run in a specific order to ensure they are executed correctly. Where applicable, any pre-requisites, and an order of execution, will be detailed within the test scenarios and test cases.

Non-SIT S&A QT Participants will independently run test cases and record the outcome in ADO supported by the Non-SIT S&A QT Team. While Non-SIT S&A QT Participants are able to move at their own pace they will be expected to meet either their approved QT Test Plan or the Qualification Wave end date. The Non-SIT S&A QT Team will keep the Code Bodies and Migration Control Centre up to date with progress against participants' QT test plans and Qualification Wave end dates. Non-SIT S&A QT Participants who are not on track must advise the Non-SIT S&A QT Team as soon as possible so mitigations can be put in place to bring them back on track or so a new plan can be agreed. Any changes or risks to a Non-SIT S&A QT Participant's QT Test Plan will be flagged to both Code Bodies and the Migration Control Centre so that any impacts on Qualification or migration timelines can be assessed.

There will be an overlap of in progress QT Waves throughout the QT Phase and this is being considered as part of the resourcing and wave allocation process to ensure there is minimal impact to participants going through Qualification.

11.2 Test Case Status

Non-SIT S&A QT Participants will record the outcome of test execution status where this isn't done automatically by the QTF. 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 raised. Relevant evidence should be attached to test steps 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 tester error), the test should be re-run and depending on the outcome, the status may be changed from "fail" to "pass". Where necessary tests will be rescheduled for retesting once the defect fix becomes available. If any tests remain in a failed state at the end of the QT and are deemed acceptable, then they will be clearly marked in the test completion report with an agreed work off plan which has been approved by Code Bodies. All high severity issues (severity 1 and 2) must be fixed and retested for a participant's QT exit, it is expected that Non-SIT S&A QT Participant will make all reasonable endeavours to fix and retest all lower severity issues (severity 3 and severity 4) prior to the end of their QT. Any work off items will need to be approved by Code Bodies as part of the exit criteria for QT. Please refer to Section 11.3 of this annex for more information on defect management.

A test will be marked as "blocked" where it can't be run due to a known defect. This status will be used to inform stakeholders of the impact of open defects on Non-SIT S&A QT Participants' progress or completion.

11.3 Defect Management

Non-SIT S&A QT Participants are expected to comply with the MHHS Defect Management Plan [REF-09] which will be updated for Non-SIT S&A QT Participants to ensure the process is suitable.

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.

All defects will be raised and managed within the ADO, this includes any defects raised against the Non-SIT S&A QT Participant's systems, Test Harnesses, test data, test data generation tools or environments. If a defect related to either system or environment is identified by a Non-SIT S&A QT Participant, it should be logged in the ADO in the first instance and assigned the correct priority and severity levels as per the guidance in the MHHS Defect Management Plan [REF-09].

Non-SIT S&A QT Participants should raise a defect in ADO if the outcome of the test doesn't match the expected result of the test step being executed or the issue is preventing tests being run. Defects will be assigned to a triage team and then the process for defect management will be followed (as per MHHS Defect Management Plan [REF-09]).

All defects must be linked back to the test which was being run and ensure that the defect template is populated with sufficient detail for anyone trying to reproduce the problem. Appropriate evidence should also be attached.

If the defect raised by a Non-SIT S&A QT Participant is deemed not valid by the triage team, it will be discussed with the participant before being rejected. There could be several reasons for defect rejection including incorrect interpretation of a test case/test step, insufficient or no evidence provided, tester error or duplicate defect. The Non-SIT S&A QT Team will support Non-SIT S&A QT Participants to reduce the number of rejected defects by actively working with the Non-SIT S&A QT Participant to overcome any process or knowledge issues.

Non-SIT S&A QT Participants are expected to actively engage with the defect management process and as such they may need to support triage and defect resolution meetings.

Known issues will be regularly shared with Non-SIT S&A QT Participants so this can be factored into their test planning.

Note, the Defect Management process is subject to change as part of the transition post-M10 and will be updated as part of the Service Transition work.

11.4 Release and Configuration Management

All Non-SIT S&A QT Participants are expected to comply with the Release and Configuration Approach and Plan [REF-03]. The release management plan and schedule can be accessed on the MHHS Collaboration Base.

In addition to major releases, MHHS might be required to schedule minor releases and emergency releases in order to promote defect fixes and configuration changes into the UIT environment. The MHHS change release process will ensure that thorough impact assessment is conducted to determine the impact of change, code, config or other on the UIT environment and participant's testing prior to communicating and engaging with the impacted test participants.

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

Note, the Release and Configuration Management process is subject to change as part of the transition post-M10 and will be updated as part of the Service Transition work.

11.5 Regression Testing During QT

Regression scope should cover testing for changes introduced by a new release. Non-SIT S&A QT Participants should have processes in place to ensure that they are only deploying quality code for QT. For releases containing fixes of their internal systems, Non-SIT S&A QT Participants may choose to utilise a staging environment to perform verification checks prior to promoting those releases into UIT.

Non-SIT S&A QT Participants may wish to use the UIT environment to regression test their systems against MHHSP major, minor and emergency releases. To support this, the Non-SIT S&A QT Team will impact assess the new release to determine whether it has a material impact on the QTF (e.g. updates to trigger messages and/or expected results). If there is a material impact, the Non-SIT S&A QT Team will update the QTF accordingly.

Regression testing should be based on the analysis of the scope of modification and the impact the fixes might have on testing that has been previously executed. There will be a list of test scenarios which have been marked as relevant for Regression and agreed with Code Bodies.

11.6 Test Suspension and Resumption Criteria

During Non-SIT S&A QT, a participant has the right to suspend testing where it considers necessary by agreement with the Non-SIT S&A QT Team. Testing will only recommence when agreed between the participant and the Non-SIT S&A QT Team. Code Bodies and the Migration Control Centre will also be informed about the suspension to consider the impact on MHHSP, MHHSP Qualification timelines and possible risks to 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.
- Significant test script, test data issues or test harness issues

Where testing has been suspended, the Non-SIT S&A QT Participant 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 has been met and evidence demonstrated to the Non-SIT S&A QT Team.

11.7 Participant QT Test Completion Report

Each Non-SIT S&A QT Participant will be required to provide a finalised QT Test Completion Report once it has completed its testing. This should be submitted as soon as possible post completing testing. It will need to include a summary of how the testing completed aligns with the original scope and any exceptions, details of any updates made to the test environment during the course of testing, a summary of the test results, details of any issues encountered during testing and any work-off plans that have been agreed with both the Non-SIT S&A QT Team and Code Bodies. The template for this report will be provided by the Non-SIT S&A QT Team. It is recommended that a draft version of the report is provided for review ahead of final submission, particularly if there are any workoff plans which will require agreement with Code Bodies.

While each Qualification Wave has a projected end date, it is not expected that Non-SIT S&A QT Participants must stop testing on this date where they have execution or defects still outstanding. If Non-SIT S&A QT Participants are not on track to meet either the wave end date or their QT Test plan, they should engage with the Non-SIT S&A QT Team as soon as possible to discuss the issues and any revisions which are needed to their plan/completion date. This will enable the Non-SIT S&A QT Team to engage with Code Bodies and the Migration Control Centre to discuss any impacts on a participant's Qualification or migration timelines.

The Non-SIT S&A QT Team will review this report against the evidence in ADO and assure that it is an accurate representation of testing. The Non-SIT S&A 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 Non-SIT S&A QT Participant has met all QT Exit Criteria as part of its QT Exit governance.

11.7.1 Test Evidence

Non-SIT S&A QT Participants will be required to produce sufficient evidence of the successful execution of test steps and the test evidence must be uploaded into the ADO. The evidence must clearly show that the test step has met its objective when the test step passes, or where a test step fails, clear supporting evidence should be attached to the defect.

It is not expected that evidence should be provided for every test step in the test case as it would be a significant overhead to upload and assure that amount of information, however, as a minimum Non-SIT S&A QT Participants will be required to demonstrate evidence of compliance with the business requirements through:

- Receipt of a message by Supplier or Agent systems (as appropriate) and any subsequent onward processing such as validation and data update as per business process steps.
- Message being generated by Supplier or Agent systems (as appropriate).

For non-functional and operational requirements, evidence can vary depending on the time of assurance activities. Further information will be provided in the non-functional testing guidance which is currently being developed but it is expected to include:

- Self-declaration, statement of facts, annotations, and descriptions 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 Non-SIT S&A QT Team will support participants to obtain this.

The Non-SIT S&A QT Team will provide guidance to Non-SIT S&A QT Participants on what would be considered appropriate evidence to capture and attach to a test step or a defect. Test evidence taken from a DIP adaptor would not be considered satisfactory.

Test evidence is expected to be captured and uploaded into the ADO at the point of test execution, but 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 Non-SIT S&A QT Team. This is to facilitate the Non-SIT S&A QT Team being able to conduct test assurance activities during test execution.

Please refer to Section 10 of the Qualification Approach and Plan [REF-01] for wider information regarding MHHS Qualification Evidence.

11.8 Test Exit Criteria

A Non-SIT S&A QT Participant is deemed to have successfully completed QT if the following criteria have been satisfied, this includes the criteria set out in Section 10.6 of the Qualification Approach and Plan [REF-01], as well as additional requirements specifically for Non-SIT S&A QT Participants:

- No outstanding Severity 1 or 2 defects.
- Severity 3 and 4 defects that cannot be resolved during QT are documented with impact assessment and a work off plan by the participant, reviewed by the Non-SIT S&A QT Team and agreed with the Code Bodies ahead of QT Exit.
- 100% test execution coverage, including functional, non-functional, migration and operational testing with approval from Code Bodies for any descoped/failed test cases prior to QT Exit.
- Test results and evidence captured in the ADO and assured by the Non-SIT S&A QT Team.
- Completion of any PIT work off plans or deferred PIT activity (as previously agreed with Code Bodies)

- Non-SIT S&A QT Completion Report, including work-off plans approved by Code Bodies, reviewed and approved by the Non-SIT S&A QT Team and submitted to Code Bodies.

There will be no formal exit gate for each Non-SIT S&A QT Participant as the approval and submission of the Non-SIT S&A QT Participant Test Completion Report to the Code Bodies will mark the end of the QT execution phase for the participant.

12 Test Management and Organisation

12.1 Roles and Responsibilities

The high-level RACI is shown in the Qualification Approach and Plan [REF-01], in addition the RACI developed specifically for Non-SIT S&A QT is displayed in the table below.

Type of Activity	Activity	Participant	Code Bodies (BSC & REC)	MHHSP	Non-SIT S&A Team	REC/BS C PAB	QA G	QW G
Approach / Governance	Non-SIT S&A QT Approach and Plan	C	C	C	A/R	AP	AP	C
	Test Harness Requirements	C	C	S	A/R			C
	Test Data Requirements	C	C	S	A/R			
	S&A Environment Requirements	C	C	A	R			
	Test Data Plan	C	C	S	A/R			C
	Non-SIT S&A QT Test Guidance	C	C	S	A/R			C
Overall Test Prep	UIT Environment Set Up	I	I	A/R	R		I	I
	UIT Environment Readiness Checks	I	I	A/R	R		I	I
	Test Harness Development	I	I	C	A/R			
	Test Harness Readiness and Set Up	I	I	C	A/R			
	Non-SIT S&A QT ADO Training Material	C	C	S	A/R			
	Templates for Participant Artefacts	C	C	I	A/R			C
	Non-SIT S&A QT ADO Set Up	C	C	S	A/R			
	Non-SIT S&A QT ADO Test Cases Assigned	C	I	I	A/R			
	Non-SIT S&A QT Participant Readiness Tracking	C	C	R	A/R			
	Non-SIT S&A QT Participant Test Plan	A/R	I	I	C			
Participant Readiness	Non-SIT S&A QT Participant Entry Criteria Met	A/R	I	I	C			

	Non-SIT S&A QT Participant PIT Assurance for QT Entry	C	C	I	A/R			
Test Execution	Non-SIT S&A QT Test Management	C	C	I	A/R			
	UIT Deployment for Central System Providers	I	I	A/R	C			
	UIT Deployment for Participants' Systems	A/R	I	C	C			
	Non-SIT S&A QT Defect Management Meetings	C	I	I	A/R			
	Issue Resolution - Central Systems	I	C	A	I			
	Non-SIT S&A QT Upload of Test Evidence to ADO	A/R	I	I	C			
Test Exit	Non-SIT S&A QT Review and Assurance of Test Evidence	I	I	I	A/R			
	Non-SIT S&A QT Participant Test Completion Report Submission	A/R	C	I	C			
	Non-SIT S&A QT Participant Test Completion Report Approval	C	AP	I	AP			

12.2 Organisation Structure

The following resources will be required to prepare and execute Non-SIT S&A QT. The below list is a guideline to the types of resource required by organisations participating in the day-to-day activities of Non-SIT S&A QT. It is the responsibility of each participant to provide sufficient and appropriate resources to support the Test Stage, noting that one resource may cover more than one role.

Organisation	Role/Resource Type
Non-SIT S&A QT Participants	<ul style="list-style-type: none"> • Test Manager • Test Analyst • Defect Manager / Analyst • Programme Management • Infrastructure, Application and Network Support • Release and Configuration Management Support • Environment Management support

Non-SIT S&A QT Team

- Test Manager
 - Test Lead / Analyst(s)
 - Test Data Lead / Analyst(s)
 - Defect Manager / Analyst(s)
 - Project Manager
 - Environment and Release Manager
 - Engagement Lead
 - Test Management Tool Lead / Analyst(s)
-

12.3 Stakeholder Engagement

The Non-SIT S&A QT Participant will be given a named point of contact in the Non-SIT S&A QT Team who will support through test preparation, test execution and test exit as well as assuring the testing. This will provide continuity for the participant and improve participant experience.

The Non-SIT S&A QT Team will work in conjunction with MHHSP PPC engagement leads to provide expert support to the Non-SIT S&A QT Participants during all test stages.

The engagement may be tailored to Non-SIT S&A QT Participants depending on their specific needs and is expected to take the form of bilateral meetings, fortnightly briefings, pre-governance meeting bilateral sessions, and wider QWG meetings. The Non-SIT S&A QT Team, MHHSP and Code Bodies will continue to work collaboratively with Non-SIT S&A QT Participants and will maintain bespoke interactions as necessary to discuss progress and issues alongside engagement through MHHSP channels such as the MHHS Collaboration Base and MHHS website.

12.4 Meetings

All participants involved in Non-SIT S&A QT are expected to attend regular meetings. The frequency will be dependent on the criticality of project deliverables and issues as well as the stage of testing. This could involve daily stand ups or weekly meetings based on testing schedules.

Typically, the following meetings will occur:

- Test Readiness meetings – to track progress of preparation activities
- Weekly Test Execution Progress Meetings
- Defect Management Meetings
- Environments and Release Management Meetings

The Non-SIT S&A QT Team will provide status updates to the relevant MHHSP governance forums including QWG and QAG.

13 Test Governance and Reporting

This section sets out the governance and reporting for Non-SIT S&A QT.

13.1 Governance

Non-SIT S&A QT will operate in accordance with the governance set out in the Qualification Approach and Plan [REF-01]. The Non-SIT S&A QT Team will monitor progress of the Non-SIT S&A QT Participants adhering to the decision making and escalation principles set out within Section 11 of the Qualification Approach and Plan [REF-01].

It is expected that participants are open, transparent and communicate with the Non-SIT S&A QT Team/Code Bodies if they think they are facing an issue which is blocking their testing or if they have concerns that they will not be able to meet their Qualification Wave. The Non-SIT S&A QT Team and Code Bodies would then work with participants on mitigating actions to overcome blockers in progress to ensure participants complete QT within the MHHSP timelines.

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

13.2 Reporting

The Non-SIT S&A QT Team will provide regular reporting on the progress towards meeting the entry criteria met in this annex as well as the progress of each Non-SIT S&A QT Participant to the MHHSP, Migration Control Centre and Code Bodies.

The confirmation that each milestone related to Non-SIT S&A QT has been met will happen in accordance with the MHHSP governance framework. The Non-SIT S&A QT Team will be responsible for reporting status and RAG status for all Tier 2 and 3 milestones relating to Non-SIT S&A QT.

During test execution, ADO will be used for test management and will be used to provide reports on Non-SIT S&A QT Participants' test progress and coverage. It will also be used for assurance against Non-SIT S&A QT Participants' plans and scope.

14 Test Assurance

Test assurance for Non-SIT S&A QT broadly falls into two categories, the verification of QT entry criteria being met, and the verification of QT exit criteria being met.

The Non-SIT S&A QT Team will engage in assurance of Non-SIT S&A QT readiness activities and artefacts to meet the entry criteria for QT including:

- Pre-Qualification Submission (including Placing Reliance)
- PIT Artefacts
- Non-SIT S&A QT Participant QT Test Plan
- QT RTTM
- Interim and Final Test Readiness Report

During and following Non-SIT S&A QT execution, the Non-SIT S&A QT Team will undertake assurance of test execution results with a specific focus on the below to ensure Non-SIT S&A QT Participants have met the exit criteria for QT:

- Validating evidence of actual vs expected results of tests.
- The quality of supporting information and evidence within defects, including validation of severity.

- QT Test Completion Report

Additional assurance may be conducted by the Code Bodies as part of their review of the final Qualification Assessment Document submission. Please refer to Section 10 of the Qualification Approach and Plan [REF-01] for further information.

15 Risks and Dependencies

The Qualification Approach and Plan [REF-01] covers the risks and dependencies relating to the wider MHHS Qualification. This section relates to risks and dependencies specifically relating to Non-SIT S&A QT.

15.1 Risks

The following risks have been identified in relation to the on-time commencement of Non-SIT S&A QT:

- There is a risk that SIT Testing is delayed due to technical issues or lack of resource causing a stable code base to be delivered/available later than expected to UIT. This may impact the commencement date for the Qualification Waves.
- There is a risk that the UIT environment (including test harnesses) is not available in the required time for Non-SIT S&A QT. This may impact ability for the Qualification Waves to start as scheduled.
- There is a risk that errors are identified in SIT Test Scenarios/Cases, which form the basis of the QT Test Scenarios/Cases during SIT execution. This may result in update and rework being required for the Test Scenarios and Cases which have been created for QT.

15.2 Dependencies

The following dependencies have been identified in relation to the on-time commencement of Non-SIT S&A QT:

- SIT Cycle 3 and Non-SIT LDSO QT has successfully completed to a sufficient level to ensure a stable base to begin Non-SIT S&A QT.
- SIT Migration Testing has proven migration design sufficiently to enable the start of migration testing as part of Non-SIT S&A QT.
- Non-SIT S&A QT Wave 1 participants have completed their preparation activities in line with the dates required for their wave.
- The Non-SIT S&A QT Team is mobilised and ready to support the QT execution.