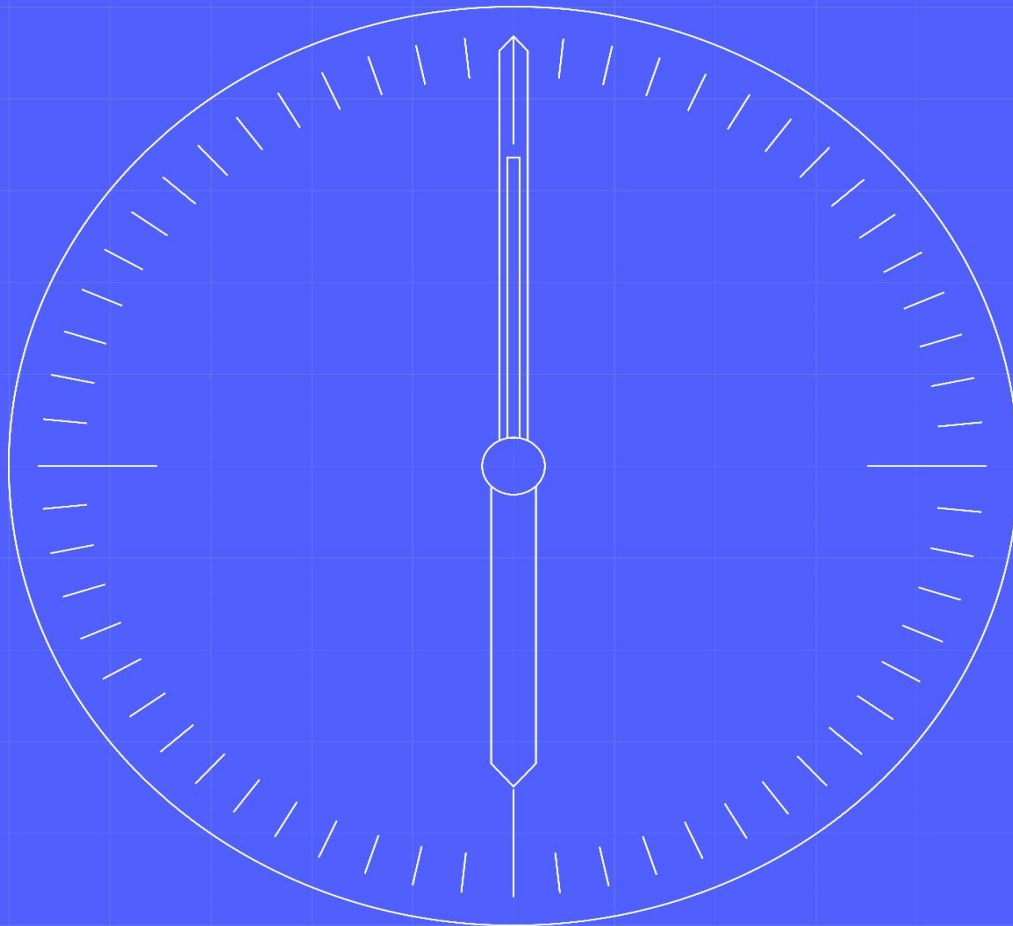




Pre-Integration Testing Guidance



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1.1 Change Record

Date	Author	Version	Change Detail
23/12/22	Rakhee Shah	0.1	Initial structure and draft for LDP peer review. Content contributions from: <ul style="list-style-type: none">• Dominic Mooney, LDP SIT Lead• Kate Goodman, Test Architect• Jason Brogden, Industry Programme Expert• Nigel Hunt, LDP Test Manager.
13/01/23	Rakhee Shah	0.2	Updated following comments from LDP review.
31/01/23	Rakhee Shah	0.3	Updated following comments from SRO and Code Delivery Bodies review.
31/01/23	Rakhee Shah	1.0	Approved version ready to be published on Programme Collaboration Base.
29/03/23	Rakhee Shah	1.1	Based on the PIT test deliverables templates, the following section no. have been updated: 5.3, 5.3.1, 5.5, 6.4, 7.1 and 8.1.
30/03/23	Rakhee Shah	1.2	Updated details on: Execution summary, change forecast, summary of changes, assumptions, PIT introduction, scope of PIT testing, PIT deliverables, test harnesses, test evidence and test assurance.
03/04/2023	Rakhee Shah	1.3	Updated following SRO review.
01/06/2023	Rakhee Shah	1.4	Updated additional information on: Test harness, PIT deliverable timelines for SIT participants, test assurance, layout changes and failure to exit PIT.
28/06/2023	Rakhee Shah	1.5	Updated DBT2 section based on Code Delivery Bodies walkthrough session and internal LDP review comments.
29/06/2023	Rakhee Shah	1.6	Updated following comments from LDP review.
05/07/2023	Rakhee Shah	1.7	Updated following comments from SRO and Code Delivery Bodies review.
07/07/2023	Rakhee Shah	2.0	Approved version ready to be published on Programme Collaboration Base.
18/08/2023	Rakhee Shah/Lee Cox	2.1	Section 1.2 – REF-18 added Section 5.7.2 – Revised to reflect IR2 aligned to CIT and IR5 to SIT Functional Updates throughout on DBT2 regarding change in position to remove DBT2 testing from Qualification obligations.

1.2 Reviewers

Reviewer	Role
Lee Cox	LDP Test Manager
Kevin Davis	Test Architect
Dominic Mooney	LDP SIT Manager
Jason Brogden	Industry Programme Expert
Code Delivery Bodies (BSC and REC)	Various
Chan Dabare	SRO Client Programme Test Manager
Adrian Ackroyd	SRO Client Programme Test Manager
Smitha Pichrikat	SRO Client Delivery Manager

References

Reference	Document/Link	Publisher	Published	Additional Information
REF-01	MHHS-DEL315 E2E Testing & Integration Strategy	SI Testing	29 th April 2022	
REF-02	MHHS-DES189 Design Artefact Matrix	Design Team	21 st February 2023	
REF-03	MHHS-DEL872 SIT Scope for Voluntary Participant's Planning	SI Testing	06 th March 2023	
REF-04	Baseline Design Artefacts	Design Team		
REF-05	MHHS-DEL1258 SIT Component Integration Testing Approach & Plan	SI Testing	28 th June 2023	
REF-06	MHHS-DEL1118 Qualification Approach & Plan	BSC and REC Code Bodies	30 th May 2023	
REF-07	MHHS-DEL1049 PIT Approach and Plan Template	SI Testing	03 rd April 2023	
REF-08	MHHS-DEL1050 PIT Requirements To Test Traceability Matrix Template	SI Testing	03 rd April 2023	
REF-09	MHHS-DEL1051 PIT Scenarios Template	SI Testing	03 rd April 2023	
REF-10	MHHS-DEL1052 PIT Test Completion Report Template	SI Testing	03 rd April 2023	
REF-11	MHHS-DEL1053 PIT Test Readiness Report Template	SI Testing	03 rd April 2023	
REF-12	MHHS-DEL1054 PIT Test Execution Progress Report Template	SI Testing	03 rd April 2023	
REF-13	MHHS-DEL1064 Placing Reliance Policy	SI Testing	27 th April 2023	
REF-14	MHHS-DEL466 Defect Management Plan	SI Testing	23 rd May 2023	
REF-15	Simulators and Emulators	Sims & Ems		
REF-16	MHHS Outline Plan	PMO		
REF-17	MHHS-DEL1259 SIT Functional Test Approach & Plan	SI Testing	30 th June 2023	
REF-18	MHHS-DEL1275 Design Interim Release 2 Notes	Design Team	05 th July 2023	

1.3 Terminology

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

2 Executive Summary

The Market-wide Half Hourly Settlement programme (MHHS) when completed will contribute to a more cost-effective electricity system, encouraging more flexible use of energy and helping consumers lower their bills.

This document describes what is expected of all Programme participants with regard to Pre-Integration Testing (PIT), where each component Service (e.g. Load Shaping Service, Supplier's system, etc) is tested in isolation by its owning organisation.

PIT will be performed by all users of the new settlement arrangements to validate every system or service that is included in the MHHS E2E Design for compliance with its functional and technical requirements. This includes back-office systems if affected. The system/service may have several components and PIT refers to the testing conducted when those components have all been internally integrated. Programme participants are expected to carry out a final test where all components are tested for business scenarios in an end-to-end manner which is often referenced as User Acceptance Testing (UAT). PIT refers to this UAT and not to any earlier tests carried out as part of development.

PIT is the responsibility of each Programme participant, using their own systems, test environments, test data, test artefacts (scenarios and test cases), test processes, test tools, test management tool and defect management process.

PIT will include functional, migration, non-functional and operational testing. We would also expect an appropriate regression test to be included in PIT.

DBT1 PIT refers to the Design, Build and Test activities required to enter into either Systems Integration Testing (SIT) or Qualification Testing, depending on the path the Programme participants intends to take. DBT1 PIT will be performed by all participants, whether this is via the SIT route or non-SIT/Qualification route.

DBT2 comprises system and process changes delivered by Programme participants that will not be tested in SIT or Qualification Testing as they are not part of the MHHS Baselined Design but are needed for MHHS more widely, defined as Consequential Change (definition: a change required by parties to enact the core industry design being delivered by the Programme within their own system and process landscapes). Suppliers (Domestic and Non-Domestic) and LDSOs conducting SIT or Qualification Testing are not required to provide evidence of DBT2 PIT testing in order to exit MHHS Qualification if and where applicable.

Programme participants can follow either the SIT or non-SIT route for each of their roles to become MHHS Qualified. SIT Programme participants will execute SIT on an End-to-End basis to prove the MHHS design. Qualification Testing will be defined on a role-by-role basis and executed on an individual organization level to assure the robust operation of Programme participants before they are allowed to start operating in the live MHHS arrangements.

For SIT, Programme participants must complete DBT1 PIT prior to the start of each SIT stage. For non-SIT, Programme participants must complete DBT1 PIT prior to the start of Qualification Testing.

MHHS Programme have provided templates as guidance for PIT test deliverables and these are available in the Programme Collaboration Base.

DBT1 PIT Test assurance covering all testing-related deliverables and activities will be conducted in 2 stages:

- 1st line assurance - Self-assurance will be carried out by Programme participants;
- 2nd line assurance - MHHS SI Test team will assure all SIT Programme participants; and
- 2nd line assurance - Code Delivery Bodies will assure all non-SIT Programme participants.
 - MHHS SI Test Team will additionally assure a small sample of non-SIT Programme participants as agreed at the time with SRO and Code Delivery Bodies.

DBT2 PIT Test assurance covering all testing-related deliverables and activities:

- Self-assurance will be carried out by Programme participants.

3 Introduction

3.1 Document Purpose

This document sets out what is expected of all Programme participants regarding their own testing (PIT) whether the Programme participant chooses to go through the SIT or non-SIT route.

This document should be read in conjunction with the [REF-01] MHHS-DEL315 E2E Testing & Integration Strategy. In this document, readers will also be sign posted to other documents where relevant.

Note: Some of the documents which are signed posted may be produced at a later stage or further information will be available in future iterations.

The PIT guidance covers:

- Scope and objectives;
- PIT section covering:
 - PIT overview;
 - PIT stages including:
 - DBT1 PIT for SIT Programme participants;
 - DBT1 PIT for non-SIT Programme participants;
 - Scope and test coverage for DBT1 PIT;
 - PIT preparations including:
 - Programme participants adopting the Placing Reliance Policy; and
 - PIT entry criteria.
 - PIT deliverables for:
 - SIT Programme participants (including phased approach for entry into SIT);
 - Non-SIT Programme participants;
 - PIT execution including test harnesses;
 - PIT completion including:
 - Test evidence (how to provide, where to store and retention period of test evidence);
 - PIT exit criteria; and
 - Failure to exit PIT.
 - Test assurance including:
 - Assurance overview;
 - Test assurance scope;
 - Test assurance approach;
 - Assurance criteria;
 - Engagement;
 - Outputs; and
 - Roles and responsibilities.

3.2 Intended Audience

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

- Lead Delivery Partner (LDP)
- SRO Function (SRO)
- Code Delivery Bodies
- MHHS Programme participants who are required to participate in SIT and Qualification Testing
- Software providers to the above Programme participants
- Independent Programme Assurance (IPA).

3.3 Reviews and Approvals

The Pre-Integration Testing Guidance document will go through an initial formal LDP review by the following LDP team members:

- Dominic Mooney, SI SIT Manager
- Jason Brogden, Industry Programme Expert
- Lee Cox, SI Test Manager
- Kevin Davis, SI Test Architect.

Upon completion of LDP review it will then go through a formal SRO team review by:

- Smitha Pichrikat, SRO Client Delivery Manager
- Chan Dabare, MHHS Programme Test Manager
- Adrian Ackroyd, MHHS Programme Test Manager.

The document will be reviewed by the Code Delivery Bodies. A further SRO review may be required based on any significant changes made.

Once comments and feedback has been incorporated, approval and sign off will be requested from:

- Smitha Pichrikat, SRO Client Delivery Manager.

3.4 Change Forecast

The MHHS SI Test Team will own this document and keep it up to date, with review and approval by MHHS Programme governance as appropriate. Each new version supersedes the previous version in its entirety. Updates to this document will follow the review and approval process outlined above in Section 3.3 - Reviews and Approvals.

3.5 Summary of Changes

This is version 2.1, has added aligned to the latest Programme position regarding Interim Release versions to be utilised during CIT and SIT Functional Test execution, alongside clarity on availability of supporting DIP Simulators for Programme participants PIT Activities.

DBT2 testing evidence is not a requirement for MHHS Qualification based on the following position stated by the Code Delivery Bodies:

- The scope of Qualification under BSC and REC is defined by the relevant Code Delivery Bodies' vires that are limited to the requirements within the respective Code.
- The Code Delivery Bodies have not identified any code requirements yet that are outside of the scope of the MHHS design that Programme participants will be required to cover as part of their PIT evidence for Qualification.

3.6 Assumptions

The following assumptions have been made in this document, which may be revised in later versions:

- Test evidence requirements for Migration, Non-Functional and Operational Testing will be updated in the future version of PIT Guidance document;
- Any further information required for entry into SIT will be specified (current or future versions) in SIT Approach & Plan (per stage); and
- Any further information required for entry into Qualification Testing will be specified in [REF-06] MHHS-DEL1118 Qualification Approach and Plan (current or future versions).

3.7 Caveats

N/A

4 Scope and Objectives

4.1 Objectives

The objective of this PIT guidance is to:

- Define the principles of what is expected of Programme participants regarding their PIT including successful PIT exit. It also describes the related obligations and activities of the MHHS Programme and Code Delivery Bodies.

4.2 Scope

The scope of this document covers the key focus area of:

- Programme participants' ability to demonstrate successful completion of PIT or DBT1 elements of PIT will be a core-entry criteria to both the SIT (phased approach) and Qualification Testing phases, however this will be in conjunction with the assessment of other readiness criteria to join these test phases e.g. environments, connectivity, test cases, test data and Code Delivery Bodies' engagement processes.
- For those Programme participants conducting SIT, details of the entry requirement criteria will be specified in the following separate deliverables:
 - SIT Approach & Plan (per test stage) - produced by the MHHS SI Test Team with the Code Delivery Bodies consulted and industry review through Programme governance. The separate documents per stage are:
 - [REF-05] SIT Component Integration Testing Approach & Plan;
 - [REF-17] SIT Functional Testing Approach & Plan;
 - SIT Migration Testing Approach & Plan;
 - SIT Non-Functional Testing Approach & Plan; and
 - SIT Operational Testing Approach & Plan.
- For those Programme participants conducting Qualification Testing, details of the entry requirement criteria will be specified in the following separate deliverables:
 - [REF-06] MHHS-DEL1118 Qualification Approach & Plan - produced by the Code Delivery Bodies with the MHHS SI Test Team consulted and industry review through Programme, BSC and REC PAB governance.
- This guidance will outline areas of PIT comprising of:
 - DBT1 will be carried out by all Programme participants. It refers to the design, build and test activities required to enter either SIT or Qualification Testing, depending on the path the Programme participant intends to take;
 - Phased approach for DBT1 PIT for SIT Programme participants; and
 - Exit from DBT1 PIT will be assured by the MHHS SI Test Team (for SIT Programme participants) and Code Delivery Bodies (non-SIT Programme participants).

5 Pre-Integration Testing

5.1 Pre-Integration Testing Overview

The PIT phase is focused on the Programme participants' own testing, proving that they have designed, developed and tested their systems and that their systems align to the requirements within the MHHS E2E Design. Programme participants will be required to provide testing results that demonstrates their compliance with their systems functional and non-functional requirements relevant to their role in the market and specified in the MHHS E2E Design.

The PIT test phase will comprise the following different types of testing:

- Functional;
- Migration;
- Non-Functional:
 - Performance;
 - Load;
 - Resilience; and
 - Security.
- Operational; and
- Regression.

PIT is the responsibility of each individual participant using their own:

- Systems;
- Test Environments;
- Test Data;
- Test Scenarios;
- Test Cases;
- Test Processes;
- Test Tools;
- Test Management Tool; and
- Defect Management Process.

5.2 PIT Stages

PIT relevant to entry into SIT may be carried out in several stages i.e. DBT1 PIT in readiness for CIT, SIT Functional, SIT Migration, SIT Non-Functional, SIT Operational.

Participants choosing the Qualification Testing route will be expected to conduct a single DBT1 PIT Activity in readiness for Qualification Testing

This section will further describe in detail the different stages of DBT1 PIT.

5.2.1 DBT1 PIT

It refers to the Design, Build and Test activities required to enter either SIT or Qualification Testing, depending on the path the Programme participants intends to take. DBT1 PIT will be carried out by all Programme participants, whether this is via the SIT route or non-SIT route i.e. Qualification Testing.

SIT Programme participants are required to provide evidence of successful DBT1 PIT completion of CIT for entry into SIT CIT. Participants will then be required to provide successful DBT1 PIT completion for remaining phased approach for SIT. Please see further details in section 5.2.1.1.

Non-SIT Programme participants must complete and provide evidence of DBT1 PIT prior to the start of Qualification Testing. Please see further details in section 5.2.1.2.

To become MHHS Qualified in an MHHS role, all Programme participants need to submit a Qualification Assessment Document (QAD) and complete all elements of the QAD relevant to that role. Please reference [REF-06] MHHS-DEL1118 Qualification Approach and Plan for further information.

5.2.1.1 DBT1 PIT for SIT Programme Participants

The MHHS Programme has considered a request from the Large Supplier Constituency (LSC) to phase the PIT DBT1 approach and has accepted an option that allows all SIT Volunteers to split DBT1 PIT test scope across multiple tranches of PIT i.e. MHHS Programme has adopted a model for a phased approach for Programme participant's entry into 5 Stages of SIT:

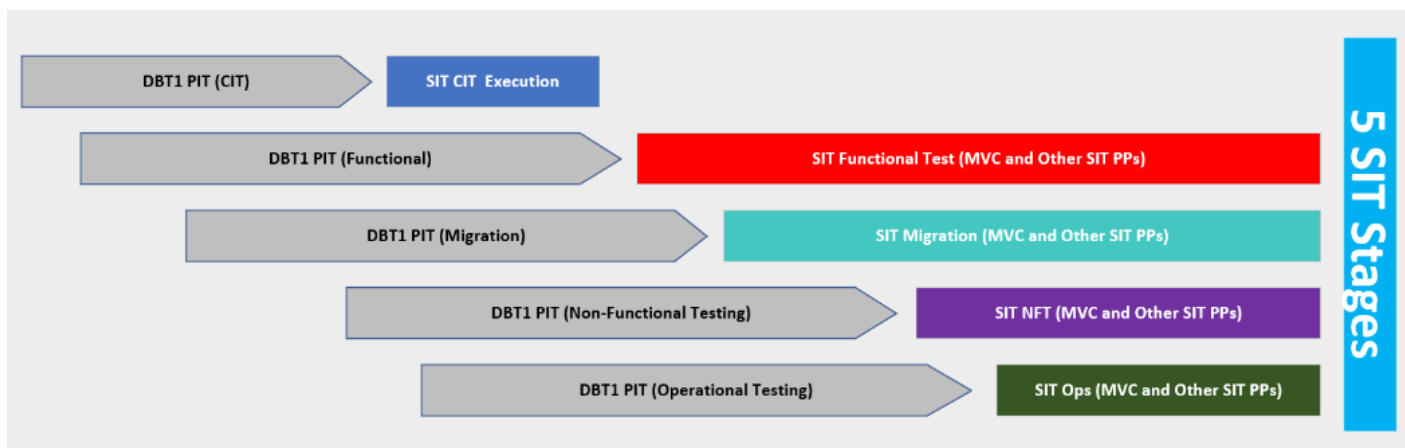


Figure 1 PIT Phased Approach for Entry into SIT

With this approach, LSC SIT Volunteers have the option to complete:

- DBT1 PIT (CIT) - completed one month prior to the LSCs entry into appropriate CIT Intervals;
- DBT1 PIT (Functional) – completed one month prior to the Programme start of SIT Functional Testing;
- DBT1 PIT (Migration) – completed one month prior to the Programme start of SIT Migration Testing;
- DBT1 PIT(NFT) – completed one month prior to the Programme start of SIT Non-Functional Testing; and
- DBT1 PIT (Operational) – completed one month prior to the Programme start of SIT Operational Testing.

This approach applies to the SIT Volunteer Participants only. The delivery approach for Central Parties remains unchanged.

SIT Programme participants retain the ability to manage an appropriate amount of iterative DBT1 PIT Test Phases to support their own needs, aligned to entry into the 5 stages of SIT i.e. a Programme participant could 100% complete DBT1 PIT scope for all 5 stages in readiness for CIT Entry or be fully functionally complete for CIT and have a 2nd DBT1 PIT activity for Migration, Non-Functional and Operational ahead of those activities or have 5 stages of DBT1 PIT ahead of 5 stages of SIT.

It remains in the control of each Programme participant to decide what they want to do. Programme participants will be required to inform MHHS SI Test Team via bi-lateral meetings in conjunction with issuance of the first PIT Test Approach & Plan.

Based on which PIT phased approach a Programme participant chooses, MHHS SI Test Team expect a full set of PIT deliverables for each PIT phase to be delivered and subsequently assured.

5.2.1.2 DBT1 PIT for Non-SIT Participants

The current expectation is that all non-SIT LDSO Programme participants must complete and provide evidence of DBT1 PIT prior to the start of non-SIT LDSO Qualification Testing, but this will be developed further in the [REF-06] MHHS-DEL1118 Qualification Approach and Plan.

The current expectation is that all non-SIT Programme participants must complete and provide evidence of DBT1 PIT prior to the start of Qualification Testing, but this will be developed further in the [REF-06] MHHS-DEL1118 Qualification Approach and Plan.

It is currently planned that non-SIT LDSO Qualification Testing will start at the beginning of Cycle 2 of SIT Functional Testing. There may be the opportunity to schedule and choreograph different phases of Qualification Testing or different LDSOs, but this will be developed further in the [REF-06] MHHS-DEL1118 Qualification Approach and Plan.



Figure 2 DBT1 PIT Approach for non-SIT Programme Participants

Following shows how non-SIT Programme participants will conduct Qualification Testing based on Tranches:

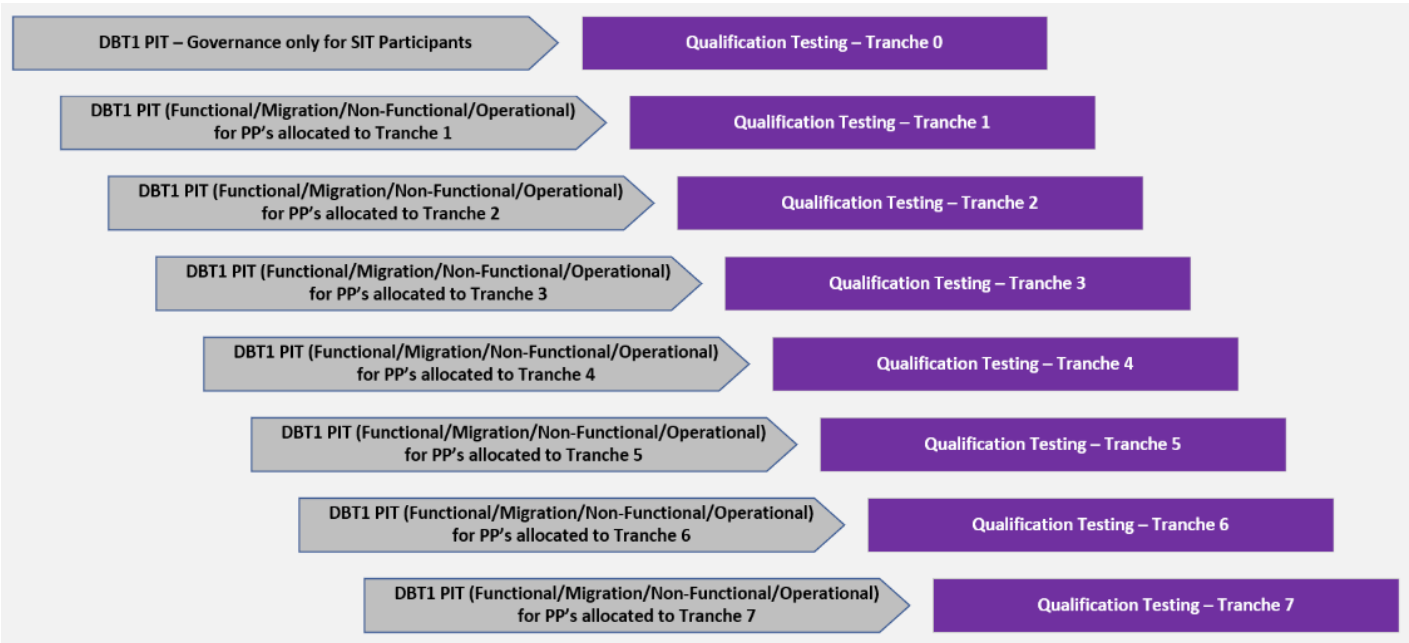


Figure 3 Qualification Testing Tranches for DBT1 PIT

Please reference the [REF-06] MHHS-DEL1118 Qualification Approach and Plan for further information regarding DBT1 PIT for non-SIT Programme participants.

5.3 Scope of PIT Testing

5.3.1 Scope for DBT1 PIT

In PIT, each component system (e.g. Data Integration Platform – DIP, Load Shaping Service, Supplier’s system) is tested in isolation by its owning organisation. This testing demonstrates the systems work as designed when running in a standalone manner and comply with the MHHS E2E Design.

Programme participants can view the [REF-04] Baseline Design Artefacts and the [REF-02] MHHSP-DES189 Design Artefact Matrix on the Programme Collaboration Base to identify their scope of testing based on their market role.

Further, for information regarding all Programme Testing, Programme participants are encouraged to visit MHHS Website or Programme Collaboration Base to enhance their ability to identify the scope of their PIT.

For both SIT and non-SIT Participants, we will expect Programme participants as part of their PIT to demonstrate that the processes have been tested in their environment in an end-to-end manner as they will operate in the live system.

For existing market participants who are incorporating the new MHHS requirements into existing systems and processes, should demonstrate that the outcome from business processes previously assessed through code qualification is not impacted by MHHS. For example, Code Delivery Bodies will require evidence from Suppliers that their customer gains process has been updated to recognise the new DIP interactions and the new agent appointment process. Existing Metering Equipment Managers (MEMs) will need to demonstrate that their process for managing Meter Technical Details (MTDs) and sharing with other market participants have been updated to recognise the new DIP interfaces and the new market roles within DTN messages.

5.3.2 Test Coverage for DBT1 PIT

To define test coverage, Programme participants are expected to reference the MHHS E2E Design available on the Programme Collaboration Base to enable each Programme participant to produce a Requirements to Test Traceability Matrix (RTTM) for PIT. These artefacts are sign-posted in the document below:

- [REF-02] MHHS-DES189 Design Artefact Matrix (where all the MHHS Design Artefact Types are referenced).

This approach applies to all types of testing (e.g. functional, migration, non-functional, operational) and will be done by the Programme participant responsible for producing test scenarios and cases based on their market role.

The test scenarios in the PIT test phase should be mapped back to the corresponding MHHS E2E Design so that the breadth of test coverage can be measured and verified. This should be done by the Programme participant responsible for producing the test cases.

Test coverage must be demonstrated by Programme participants prior to test execution commencing and any subsequent changes must be updated at test completion. We expect the scope of DBT1 PIT testing and therefore DBT1 PIT evidence to reflect the scope of testing that will be required to be executed in either SIT or Qualification Testing.

Note: Non-SIT Programme participants, please reference the [REF-06] MHHS-DEL1118 Qualification Approach and Plan for further information in regard to test coverage for DBT1 PIT and note that any DBT1 PIT test coverage will be set out in a future iteration of this document.

5.4 PIT Preparations

PIT is the responsibility of each individual Programme participant, using their own systems, test environments, test data, test scenarios, testcases, test processes, test management tool and defect management process.

Programme participants are expected to produce test preparation deliverables such as Test Approach and Plan, Requirements to Test Traceability Matrix (RTTM), Test scenarios, Test Readiness Report, Test Execution Progress Report and Test Completion Report. See Section 5.5 PIT Deliverables for further details.

5.4.1 Programme Participant's adopting the Placing Reliance Policy

The MHHS 'Placing Reliance Policy' [REF-13] can be adopted where Programme participants conducting PIT can either:

1. Intend to delegate some or all their PIT testing to a 3rd Party Software/IT Provider; or
2. Intend to conduct PIT as a group and delegate or place reliance within that group.

In either case, the accountability remains with the Programme participant's market role defined organisation to declare, organise the execution of and evidence their completed test coverage.

How Programme participants choose to delegate PIT obligations may differ between participants. The details associated with a Programme participant's proposal along with how it would be practically delivered needs to be documented in the Programme participant's PIT Approach and Plan.

We expect the scope of DBT1 PIT testing and therefore DBT1 PIT evidence to reflect the scope of testing that will be required to be executed in Qualification Testing, given any agreed Placing Reliance Policy submission.

Note: For non-SIT Programme participants, Code Delivery Bodies will detail the approach and principles for Placing Reliance within the Qualification Approach and Plan and Qualification Assessment Document. Please reference the [REF-06] MHHS-DEL1118 Qualification Approach and Plan for further information and note that any Placing Reliance implications will be set out in a future iteration of this document, as referenced above.

5.4.2 PIT Entry Criteria for All Programme participants

Programme participants can define their own PIT entry criteria, however all test deliverables detailed in Section 5.5 - PIT Deliverables must be provided.

5.5 PIT Deliverables

Programme participants are responsible for managing their own testing process and will be required to demonstrate completion of their own internal PIT.

MHHS SI Test Team acknowledge that Programme participants will be using different methodologies and frameworks and how Programme participants deliver their testing should be aligned with the MHHS Programme's PIT Guidance. Each Programme participant undertaking PIT will be expected to provide the following test deliverables to the MHHS SI Test Team and/or Code Delivery Bodies:

- PIT Approach and Plan;
- Requirements to Test Traceability Matrix (RTTM) for PIT;
- PIT Test Scenarios; and
- PIT Test Completion Report.

Additionally, during PIT preparation and PIT test execution, Programme participants will also be expected to provide regular progress reports (including Test issues & defects):

- PIT Test Readiness Report; and
- PIT Test Execution Progress Report.

Note: For non-SIT Programme participants, please reference Section 11.3.3 of [REF-06] MHHS-DEL1118 Qualification Approach and Plan for further information regarding the requirements of submissions of these test deliverables.

MHHS SI Test Team have provided templates as guidance for the above test deliverables which are held in the Programme Collaboration Base. Please see table below:

Reference	MHHS Reference Number	Template Name
[REF-07]	MHHS-DEL1049	PIT Approach and Plan Template
[REF-08]	MHHS-DEL1050	PIT Requirements to Test Traceability Matrix Template
[REF-09]	MHHS-DEL1051	PIT Test Scenarios Template
[REF-10]	MHHS-DEL1052	PIT Test Completion Report Template
[REF-11]	MHHS-DEL1053	PIT Test Readiness Report
[REF-12]	MHHS-DEL1054	PIT Test Execution Progress Report

Table 1 PIT test deliverables templates

Note 1: For SIT, Programme participants are expected to supply the PIT Requirements to Test Traceability Matrix using the template provided. For all other test deliverables, Programme participants can choose to use their own templates provided all the required information specified in the MHHS templates is included.

Note 2: For non-SIT Programme participants, please reference Section 11.1.1 of [REF-06] MHHS-DEL1118 Qualification Approach and Plan for further information regarding the templates.

5.5.1 PIT Deliverables for SIT Programme Participants

As described in Section 5.2.1.1 - DBT1 PIT for SIT Programme Participants, for SIT Programme Participants delivery for DBT1 PIT will be split across multiple tranches of PIT i.e. a phased approach for Programme participant's entry into 5 Stages of SIT. We therefore expect that Programme participants to produce new or updated deliverables specific to each phase (based on the number of iterations of PIT being planned):

- PIT Approach and Plan;
- PIT Requirements to Test Traceability Matrix;
- PIT Test Scenarios;
- PIT Test Readiness Report;
- PIT Test Execution Progress Report; and
- PIT Test Completion Report (Draft and Final).

This means that Programme participants will have to produce DBT1 PIT deliverables for CIT, Functional, Migration, Non-Functional and Operational testing.

Note: Any DBT1 PIT activities related to each phase must be evidenced and assured before the appropriate SIT Phase commences.

5.5.2 Timescales for PIT Deliverables for SIT CIT Programme Participants

This section describes the details of activities and deliverables associated to PIT for SIT Programme participants for their SIT CIT readiness dates within each CIT interval.

Participants can reference MHHS website for the [REF-16] MHHS Outline Plan

5.5.2.1 Timescales for PIT Deliverables for SIT CIT - Interval 1

Systems/Services/Market Roles for Interval 1 are:

- DIP;
- LSS; and
- MDS.

Table below shows the DBT1 PIT deliverable milestones for Programme participants in readiness to enter SIT CIT – Interval 1:

Activity Milestone	Action	Deliverable Submission Timeline
PIT Approach and Plan	At least 12 Weeks before Programme Participant's Final Test Completion Report	07 th July 23 (No later than*)
PIT Test Readiness Report	To be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution	21 st July 23***

Activity Milestone	Action	Deliverable Submission Timeline
PIT Requirements to Test Traceability Matrix	At least 4 weeks after PIT Approach and Plan. The Requirements to Test Traceability Matrix (RTTM) will also be updated during test execution	4 th Aug 23*
PIT Test Scenarios	PIT Test Scenarios issued same day as RTTM	4 th Aug 23*
PIT Test Execution Progress Report	Every month following start of PIT test execution and on a weekly basis in the last 4 weeks before completion of testing	22 nd Sep 23**
PIT Execution	Assumption that PIT test execution runs up to PIT Test Completion Report is submitted	29 th Sep 23 (No later than*)
Programme participants issue draft PIT Test Completion Report	A draft of the PIT Test Completion Report to be submitted no later than 15 working days before the planned end of test execution	8 th Sep 23 (No later than*)
Programme participants issue final PIT Test Completion Report	Final PIT Test Completion Report submitted and allowing for any test completion delta	29 th Sep 23 (No later than*)
SIT CIT Ready to Start (TMAG Milestone)	TMAG Milestone - 1 week prior to CIT Start for each CIT Interval	23 rd Oct 23
SIT CIT Start	CIT Interval 1 Start = PSG Milestone (M9)	30 th Oct 23

Table 2 PIT Deliverable Milestones for entry into SIT CIT- Interval 1

Note 1* – MHHS SI Test Team will agree timelines for prior PIT deliverables with individual SIT Programme participants in line with their delivery plans, allowing for test assurance activities in the lead up to SIT CIT.

Note 2** – For the purpose of this plan, this is the final test execution progress report for the final month. In the final month, the requirement is to provide a weekly report and the monthly report is required to be provided once a month.

Note 3*** – For the purpose of this plan, this is the first PIT test readiness report we will be expecting from Programme participants. This will be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution.

5.5.2.2 Timescales for PIT Deliverables for SIT CIT - Interval 2

Systems/Services/Market Roles for Interval 2 are:

- MPRS (Drop 1).

Table below shows the DBT1 PIT deliverable milestones for Programme participants in readiness to enter SIT CIT – Interval 2:

Activity Milestone	Action	Deliverable Submission Timeline
PIT Approach and Plan	At least 12 Weeks before Programme Participant's Final Test Completion Report	28 th July 23 (No later than*)
PIT Test Readiness Report	To be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution	10 th Aug 23***
PIT Requirements to Test Traceability Matrix	At least 4 weeks after PIT Approach and Plan. The Requirements to Test Traceability Matrix (RTTM) will also be updated during test execution	1 st Sep 23*
PIT Test Scenarios	PIT Test Scenarios issued same day as RTTM	1 st Sep 23*
PIT Test Execution Progress Report	Every month following start of PIT test execution and on a weekly basis in the last 4 weeks before completion of testing	13 th Oct 23**

PIT Execution	Assumption that PIT test execution runs up to PIT Test Completion Report is submitted	20 th Oct 23 (No later than*)
Programme participants issue draft PIT Test Completion Report	A draft of the PIT Test Completion Report to be submitted no later than 15 working days before the planned end of test execution	29 th Sep 23 (No later than*)
Programme participants issue final PIT Test Completion Report	Final PIT Test Completion Report submitted and allowing for any test completion delta	20 th Oct 23 (No later than*)
SIT CIT Ready to Start (TMAG Milestone)	TMAG Milestone - 1 week prior to CIT Start for each CIT Interval	6 th Nov 23
SIT CIT Start	CIT Interval 2 Start = PSG Milestone (M9)	13 th Nov 23

Table 3 PIT Deliverable Milestones for entry into SIT CIT- Interval 2

Note 1* – MHHS SI Test Team will agree timelines for prior PIT deliverables with individual SIT Programme participants in line with their delivery plans, allowing for test assurance activities in the lead up to SIT CIT.

Note 2** – For the purpose of this plan, this is the final test execution progress report for the final month. In the final month, the requirement is to provide a weekly report and the monthly report is required to be provided once a month.

Note 3*** – For the purpose of this plan, this is the first PIT test readiness report we will be expecting from Programme participants. This will be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution.

5.5.2.3 Timescales for PIT Deliverables for SIT CIT - Interval 3

Systems/Services/Market Roles for Interval 3 are:

- Smart Data Services; and
- Advanced Data Services.

Table below shows the DBT1 PIT deliverable milestones for Programme participants in readiness to enter SIT CIT – Interval 3:

Activity Milestone	Action	Deliverable Submission Timeline
PIT Approach and Plan	At least 12 Weeks before Programme Participant's Final Test Completion Report	11 th Aug 23 (No later than*)
PIT Test Readiness Report	To be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution	25 th Aug 23***
PIT Requirements to Test Traceability Matrix	At least 4 weeks after PIT Approach and Plan. The Requirements to Test Traceability Matrix (RTTM) will also be updated during test execution	8 th Sep 23*
PIT Test Scenarios	PIT Test Scenarios issued same day as RTTM	8 th Sep 23*
PIT Test Execution Progress Report	Every month following start of PIT test execution and on a weekly basis in the last 4 weeks before completion of testing	27 th Oct 23**
PIT Execution	Assumption that PIT test execution runs up to PIT Test Completion Report is submitted	3 rd Nov 23 (No later than*)
Programme participants issue draft PIT Test Completion Report	A draft of the PIT Test Completion Report to be submitted no later than 15 working days before the planned end of test execution	13 th Oct 23 (No later than*)
Programme participants issue final PIT Test Completion Report	Final PIT Test Completion Report submitted and allowing for any test completion delta	3 rd Nov 23 (No later than*)
SIT CIT Ready to Start (TMAG Milestone)	TMAG Milestone - 1 week prior to CIT Start for each CIT Interval	20 th Nov 23
SIT CIT Start	CIT Interval 3 Start = PSG Milestone (M9)	27 th Nov 23

Table 4 PIT Deliverable Milestones for entry into SIT CIT- Interval 3

Note 1* – MHHS SI Test Team will agree timelines for prior PIT deliverables with individual SIT Programme participants in line with their delivery plans, allowing for test assurance activities in the lead up to SIT CIT.

Note 2** – For the purpose of this plan, this is the final test execution progress report for the final month. In the final month, the requirement is to provide a weekly report and the monthly report is required to be provided once a month.

Note 3*** – For the purpose of this plan, this is the first PIT test readiness report we will be expecting from Programme participants. This will be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution.

5.5.2.4 Timescales for PIT Deliverables for SIT CIT - Interval 4

Systems/Services/Market Roles for Interval 4 are:

- Metering Services.

Table below shows the DBT1 PIT deliverable milestones for Programme participants in readiness to enter SIT CIT – Interval 4:

Activity Milestone	Action	Deliverable Submission Timeline
PIT Approach and Plan	At least 12 Weeks before Programme Participant's Final Test Completion Report	25 th Aug 23 (No later than*)
PIT Test Readiness Report	To be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution	8 th Sep 23***
PIT Requirements to Test Traceability Matrix	At least 4 weeks after PIT Approach and Plan. The Requirements to Test Traceability Matrix (RTTM) will also be updated during test execution	15 th Sep 23*
PIT Test Scenarios	PIT Test Scenarios issued same day as RTTM	15 th Sep 23*
PIT Test Execution Progress Report	Every month following start of PIT test execution and on a weekly basis in the last 4 weeks before completion of testing	10 th Nov 23**
PIT Execution	Assumption that PIT test execution runs up to PIT Test Completion Report is submitted	17 th Nov 23 (No later than*)
Programme participants issue draft PIT Test Completion Report	A draft of the PIT Test Completion Report to be submitted no later than 15 working days before the planned end of test execution	27 th Oct 23 (No later than*)
Programme participants issue final PIT Test Completion Report	Final PIT Test Completion Report submitted and allowing for any test completion delta	17 th Nov 23 (No later than*)
SIT CIT Ready to Start (TMAG Milestone)	TMAG Milestone - 1 week prior to CIT Start for each CIT Interval	4 th Dec 23
SIT CIT Start	CIT Interval 4 Start = PSG Milestone (M9)	11 th Dec 23

Table 5 PIT Deliverable Milestones for entry into SIT CIT- Interval 4

Note 1* – MHHS SI Test Team will agree timelines for prior PIT deliverables with individual SIT Programme participants in line with their delivery plans, allowing for test assurance activities in the lead up to SIT CIT.

Note 2** – For the purpose of this plan, this is the final test execution progress report for the final month. In the final month, the requirement is to provide a weekly report and the monthly report is required to be provided once a month.

Note 3*** – For the purpose of this plan, this is the first PIT test readiness report we will be expecting from Programme participants. This will be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution.

5.5.2.5 Timescales for PIT Deliverables for SIT CIT - Interval 5

Systems/Services/Market Roles for Interval 5 are:

- Suppliers;
- Network Operations; and
- UMSO

Table below shows the DBT1 PIT deliverable milestones for Programme participants in readiness to enter SIT CIT – Interval 5:

Activity Milestone	Action	Deliverable Submission Timeline
PIT Approach and Plan	At least 12 Weeks before Programme Participant's Final Test Completion Report	15 th Sep 23 (No later than**)
PIT Test Readiness Report	To be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution	29 th Sep 23****
PIT Requirements to Test Traceability Matrix	At least 4 weeks after PIT Approach and Plan. The Requirements to Test Traceability Matrix (RTTM) will also be updated during test execution	06 th Oct 23**
PIT Test Scenarios	PIT Test Scenarios issued same day as RTTM	06 th Oct 23**
PIT Test Execution Progress Report	Every month following start of PIT test execution and on a weekly basis in the last 4 weeks before completion of testing	01 st Dec 23***
PIT Execution	Assumption that PIT test execution runs up to PIT Test Completion Report is submitted	8 th Dec 23 (No later than**)
Programme participants issue draft PIT Test Completion Report	A draft of the PIT Test Completion Report to be submitted no later than 15 working days before the planned end of test execution	17 th Nov 23 (No later than**)
Programme participants issue final PIT Test Completion Report	Final PIT Test Completion Report submitted and allowing for any test completion delta	8 th Dec 23 (No later than**)
SIT CIT Ready to Start (TMAG Milestone)	TMAG Milestone - 1 week prior to CIT Start for each CIT Interval	8 th Jan 24
SIT CIT Start	CIT Interval 5 Start = PSG Milestone (M9)	15 th Jan 24*

Table 6 PIT Deliverable Milestones for entry into SIT CIT- Interval 5

Note 1* – There is an extended period between CIT Intervals 4 and 5 allowing for the Xmas and New Year period. Some readiness dates have also been adjusted accordingly for CIT Intervals 5 and 6.

Note 2** – MHHS SI Test Team will agree timelines for prior PIT deliverables with individual SIT Programme participants in line with their delivery plans, allowing for test assurance activities in the lead up to SIT CIT.

Note 3*** – For the purpose of this plan, this is the final test execution progress report for the final month. In the final month, the requirement is to provide a weekly report and the monthly report is required to be provided once a month.

Note 4**** – For the purpose of this plan, this is the first PIT test readiness report we will be expecting from Programme participants. This will be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution.

5.5.2.6 Timescales for PIT Deliverables for SIT CIT - Interval 6

Systems/Services/Market Roles for Interval 6 are:

- MPRS (Drop 2);
- EES; and

- UMSDS

Table below shows the DBT1 PIT deliverable milestones for Programme participants in readiness to enter SIT CIT – Interval 6:

Activity Milestone	Action	Deliverable Submission Timeline
PIT Approach and Plan	At least 12 Weeks before Programme Participant's Final Test Completion Report	13 th Oct 23 (No later than*)
PIT Test Readiness Report	To be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution	27 th Oct 23***
PIT Requirements to Test Traceability Matrix	At least 4 weeks after PIT Approach and Plan. The Requirements to Test Traceability Matrix (RTTM) will also be updated during test execution	10 th Nov 23*
PIT Test Scenarios	PIT Test Scenarios issued same day as RTTM	10 th Nov 23*
PIT Test Execution Progress Report	Every month following start of PIT test execution and on a weekly basis in the last 4 weeks before completion of testing	29 th Dec 23**
PIT Execution	Assumption that PIT test execution runs up to PIT Test Completion Report is submitted	5 th Jan 24 (No later than*)
Programme participants issue draft PIT Test Completion Report	A draft of the PIT Test Completion Report to be submitted no later than 15 working days before the planned end of test execution	1 st Dec 23 (No later than*)
Programme participants issue final PIT Test Completion Report	Final PIT Test Completion Report submitted and allowing for any test completion delta	5 th Jan 24 (No later than*)
SIT CIT Ready to Start (TMAG Milestone)	TMAG Milestone - 1 week prior to CIT Start for each CIT Interval	22 nd Jan 24
SIT CIT Start	CIT Interval 6 Start = PSG Milestone (M9)	29 th Jan 24

Table 7 PIT Deliverable Milestones for entry into SIT CIT- Interval 6

Note 1* – MHHS SI Test Team will agree timelines for prior PIT deliverables with individual SIT Programme participants in line with their delivery plans, allowing for test assurance activities in the lead up to SIT CIT.

Note 2** – For the purpose of this plan, this is the final test execution progress report for the final month. In the final month, the requirement is to provide a weekly report and the monthly report is required to be provided once a month.

Note 3*** – For the purpose of this plan, this is the first PIT test readiness report we will be expecting from Programme participants. This will be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution.

5.5.3 Timescales for PIT Deliverables for SIT Functional Programme Participants

This section describes the details of activities and deliverables associated to PIT DBT1 for SIT Programme participants for their readiness to enter SIT Functional stage.

Table below shows the DBT1 PIT deliverable milestones associated to PIT Functional Testing for both MVC and all other SIT Programme participants in readiness to enter SIT Functional:

Activity Milestone	Action	Deliverable Submission Timeline
PIT Approach and Plan	At least 12 Weeks before Programme Participant's Final Test Completion Report	17 th Nov 23 (No later than*)

PIT Test Readiness Report	To be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution	01 st Dec 23 ^{***}
PIT Requirements to Test Traceability Matrix	At least 4 weeks after PIT Approach and Plan. The Requirements to Test Traceability Matrix (RTTM) will also be updated during test execution	15 th Dec 23 [*]
PIT Test Scenarios	PIT Test Scenarios issued same day as RTTM	15 th Dec 23 [*]
PIT Test Execution Progress Report	Every month following start of PIT test execution and on a weekly basis in the last 4 weeks before completion of testing	02 nd Feb 24 ^{**}
PIT Execution	Assumption that PIT test execution runs up to PIT Test Completion Report is submitted	09 th Feb 24 (No later than [*])
Programme participants issue draft PIT Test Completion Report	A draft of the PIT Test Completion Report to be submitted no later than 15 working days before the planned end of test execution	19 th Jan 24 (No later than [*])
Programme participants issue final PIT Test Completion Report	Final PIT Test Completion Report submitted and allowing for any test completion delta	9 th Feb 24 (No later than [*])
SIT Functional to Start (TMAG Milestone)	TMAG Milestone - 1 week prior to SIT Functional Start for all SIT Programme participants (MVC and other SIT Programme participants)	04 th Mar 24
SIT Functional Start	SIT Functional Start (MVC and Other SIT Programme participants)	11 th Mar 24

Table 8 PIT Deliverable Milestones for entry into SIT Functional Testing

Note 1* – MHHS SI Test Team will agree timelines for prior PIT deliverables with individual SIT Programme participants in line with their delivery plans, allowing for test assurance activities in the lead up to SIT Functional.

Note 2** – For the purpose of this plan, this is the final test execution progress report for the final month. In the final month, the requirement is to provide a weekly report and the monthly report is required to be provided once a month.

Note 3*** – For the purpose of this plan, this is the first PIT test readiness report we will be expecting from Programme participants. This will be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution.

5.5.4 Timescales for PIT Deliverables for SIT Migration Programme Participants

This section describes the details of activities and deliverables associated to PIT DBT1 for SIT Programme participants for their readiness to enter SIT Migration stage.

Table below shows the DBT1 PIT deliverable milestones associated to PIT Migration Testing for both MVC and all other SIT Programme participants in readiness to enter SIT Migration:

Activity Milestone	Action	Deliverable Submission Timeline
PIT Approach and Plan	At least 12 Weeks before Programme Participant's Final Test Completion Report	16 th Feb 24 (No later than [*])
PIT Test Readiness Report	To be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution	01 st Mar 24 ^{***}
PIT Requirements to Test Traceability Matrix	At least 4 weeks after PIT Approach and Plan. The Requirements to Test Traceability Matrix (RTTM) will also be updated during test execution	15 th Mar 24 [*]
PIT Test Scenarios	PIT Test Scenarios issued same day as RTTM	15 th Mar 24 [*]

PIT Test Execution Progress Report	Every month following start of PIT test execution and on a weekly basis in the last 4 weeks before completion of testing	03 rd May 24**
PIT Execution	Assumption that PIT test execution runs up to PIT Test Completion Report is submitted	10 th May 24 (No later than*)
Programme participants issue Draft PIT Test Completion Report	A draft of the PIT Test Completion Report to be submitted no later than 15 working days before the planned end of test execution	19 th Apr 24 (No later than*)
Programme participants issue Final PIT Test Completion Report	Final PIT Test Completion Report submitted and allowing for any test completion delta	10 th May 24 (No later than*)
SIT Migration Ready to Start (TMAG Milestone)	TMAG Milestone - 1 week prior to SIT Migration Start for all SIT Programme participants (MVC and other SIT Programme participants)	03 rd June 24
SIT Migration Start	SIT Migration Start (MVC and Other SIT Programme participants)	10 th June 24

Table 9 PIT Deliverable Milestones for SIT Migration Testing

Note 1* – MHHS SI Test Team will agree timelines for prior PIT deliverables with individual SIT Programme participants in line with their delivery plans, allowing for test assurance activities in the lead up to SIT Migration.

Note 2** – For the purpose of this plan, this is the final PIT Test Execution Progress Report for the final month. In the final month, the requirement is to provide a weekly report and the monthly report is required to be provided once a month.

Note 3*** – For the purpose of this plan, this is the first PIT Test Readiness Report we will be expecting from Programme participants. This will be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution.

5.5.5 Timescales for PIT Deliverables for SIT Non-Functional Programme Participants

This section describes the details of activities and deliverables associated to PIT DBT1 for SIT Programme participants for their readiness to enter SIT Non-Functional stage.

Table below shows the DBT1 PIT deliverable milestones associated to PIT Non-Functional Testing for both MVC and all other SIT Programme participants in readiness to enter SIT Non-Functional:

Activity Milestone	Action	Deliverable Submission Timeline
PIT Approach and Plan	At least 12 Weeks before Programme Participant's Final Test Completion Report	10 th May 24 (No later than*)
PIT Test Readiness Report	To be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution	24 th May 24
PIT Requirements to Test Traceability Matrix	At least 4 weeks after PIT Approach and Plan. The Requirements to Test Traceability Matrix (RTTM) will also be updated during test execution	24 th May 24***
PIT Test Scenarios	PIT Test Scenarios issued same day as RTTM	07 th June 24*
PIT Test Execution Progress Report	Every month following start of PIT test execution and on a weekly basis in the last 4 weeks before completion of testing	21 st June 24
PIT Execution	Assumption that PIT test execution runs up to PIT Test Completion Report is submitted	02 nd Aug 24*
Programme participants issue draft PIT Test Completion Report	A draft of the PIT Test Completion Report to be submitted no later than 15 working days before the planned end of test execution	12 th July 24
Programme participants issue final PIT Test Completion Report	Final PIT Test Completion Report submitted and allowing for any test completion delta	02 nd Aug 24**

SIT Non-Functional Ready to Start (TMAG Milestone)	TMAG Milestone - 1 week prior to SIT NFT Start for all SIT Programme participants (MVC and other SIT Programme participants)	27 th Aug 24
SIT Non-Functional Start	SIT NFT Start (MVC and Other SIT Programme participants)	02 nd Sep 24

Table 10 PIT Deliverable Milestones for SIT Non-Functional Testing

Note 1* – MHHS SI Test Team will agree timelines for prior PIT deliverables with individual SIT Programme participants in line with their delivery plans, allowing for test assurance activities in the lead up to SIT Non-Functional.

Note 2** – For the purpose of this plan, this is the final PIT Test Execution Progress Report for the final month. In the final month, the requirement is to provide a weekly report and the monthly report is required to be provided once a month.

Note 3*** – For the purpose of this plan, this is the first PIT Test Readiness Report we will be expecting from Programme participants. This will be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution.

5.5.6 Timescales for PIT Deliverables for SIT Operational Programme Participants

This section describes the details of activities and deliverables associated to PIT DBT1 for SIT Programme participants for their readiness to enter SIT Operational stage.

Table below shows the DBT1 PIT deliverable milestones associated to PIT Operational Testing for both MVC and all other SIT Programme participants in readiness to enter SIT Operational:

Activity Milestone	Action	Deliverable Submission Timeline
PIT Approach and Plan	At least 12 Weeks before Programme Participant's Final Test Completion Report	14 th June 24 (No later than*)
PIT Test Readiness Report	To be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution	28 th June 24***
PIT Requirements to Test Traceability Matrix	At least 4 weeks after PIT Approach and Plan. The Requirements to Test Traceability Matrix (RTTM) will also be updated during test execution	12 th July 24*
PIT Test Scenarios	PIT Test Scenarios issued same day as RTTM	12 th July 24*
PIT Test Execution Progress Report	Every month following start of PIT test execution and on a weekly basis in the last 4 weeks before completion of testing	30 th Aug 24**
PIT Execution	Assumption that PIT test execution runs up to PIT Test Completion Report is submitted	06 th Sep 24 (No later than*)
Programme participants issue draft PIT Test Completion Report	A draft of the PIT Test Completion Report to be submitted no later than 15 working days before the planned end of test execution	16 th Aug 24 (No later than*)
Programme participants issue final PIT Test Completion Report	Final PIT Test Completion Report submitted and allowing for any test completion delta	06 th Sep 24 (No later than*)
SIT Operation Ready to Start (TMAG Milestone)	TMAG Milestone - 1 week prior to SIT Operation Start for all SIT Programme participants (MVC and other SIT Programme participants)	30 th Sep 24
SIT Operation Start	SIT Operation Start (MVC and Other SIT Programme participants)	07 th Oct 24

Table 11 PIT Deliverable Milestones for SIT Operational Testing

Note 1* – MHHS SI Test Team will agree timelines for prior PIT deliverables with individual SIT Programme participants in line with their delivery plans, allowing for test assurance activities in the lead up to SIT Operational.

Note 2** – For the purpose of this plan, this is the final PIT Test Execution Progress Report for the final month. In the final month, the requirement is to provide a weekly report and the monthly report is required to be provided once a month.

Note 3*** – For the purpose of this plan, this is the first PIT Test Readiness Report we will be expecting from Programme participants. This will be submitted every two weeks on a Friday after issuing PIT Approach and Plan, until the start of PIT test execution.

5.5.7 PIT Deliverables for non-SIT Programme Participants

For non-SIT Programme participants conducting DBT1 PIT, the PIT test deliverables based on the Qualification Testing will be detailed further in Section 11.1.1 PIT Deliverables – Applicable to all participants and Section 11.3.3 QT Entry & Exit Criteria – Non-SIT participants only of [REF-06] MHHS-DEL1118 Qualification Approach & Plan.

5.5.7.1 Timescales for PIT Deliverables for non-SIT Programme Participants

For non-SIT Programme participants conducting DBT1 PIT, the timelines expectations for test deliverables based on the qualification tranches will be confirmed in the [REF-06] MHHS-DEL1118 Qualification Approach & Plan.

5.6 PIT Execution

Each Programme participant will use and manage its own test processes, resources, test environments, test data, test tools and test labs for PIT, noting the need to report progress to the MHHS SI Test Team and/or Code Delivery Bodies. Regardless of the development methodology used, there will be an activity performed towards the end of development, where the Programme participant performs business and/or acceptance testing of its integrated solution.

5.6.1 Test Harnesses

In principle, each Programme participant will be testing its own system(s) in a stand-alone manner and each party needs to develop any test harnesses/stubs it needs to adequately test its own systems. These mechanisms need to exercise the proving of the message sending and receipt. Please reference [REF-01] MHHS-DEL315 E2E Testing Integration Test Strategy.

However, the Programme is producing two test stubs for use by participants in order to aid and evidence PIT:

- DIP Simulator; and
- Consumption Data Generator.

Each Programme participant will be required to provide test evidence of a final test execution run covering all applicable IF messages and receipts of PUB messages using the DIP Simulator. The DIP Simulator will provide logging of the success or failure of IF messages received by the DIP Simulator. These DIP Simulator logs must be used as part of evidence for PIT completion, together with logs showing full details of the messages sent and received (the full details will be provided by the Programme participant and not by the DIP Simulator functionality). Please see section 5.7.3 - Test Evidence.

Programme participants can find further information regarding the DIP Simulator and Consumption Data Generator on the Programme Collaboration. Please see [REF-15] Simulators and Emulators.

Please see reference further information about DIP Simulator versions on section 5.7.2.3 DIP Simulator Versions.

5.7 PIT Completion

5.7.1 PIT Completion Overview

The exit criteria for completing PIT are set out in section 5.7.7 – PIT Exit Criteria for Programme Participants. This requires that all test scenarios executed are passed successfully (within thresholds), that test results and evidence (including interface testing evidence) are submitted for assurance and that any agreed work-off plan if required is provided to the MHHS Programme (SI Test Team) and/or to the Code Delivery Bodies for Qualification Testing.

PIT Test Completion Report (including evidence and any work off plans) will be provided to MHHS SI Test Team and/or Code Delivery Bodies by all Programme participants to record the outcome of their PIT and will form part of the exit criteria from PIT.

5.7.2 Interim Design Release Plan for SIT Entry

The following figure shows the interim design release plan for SIT Programme participants entry into SIT CIT and SIT Functional:

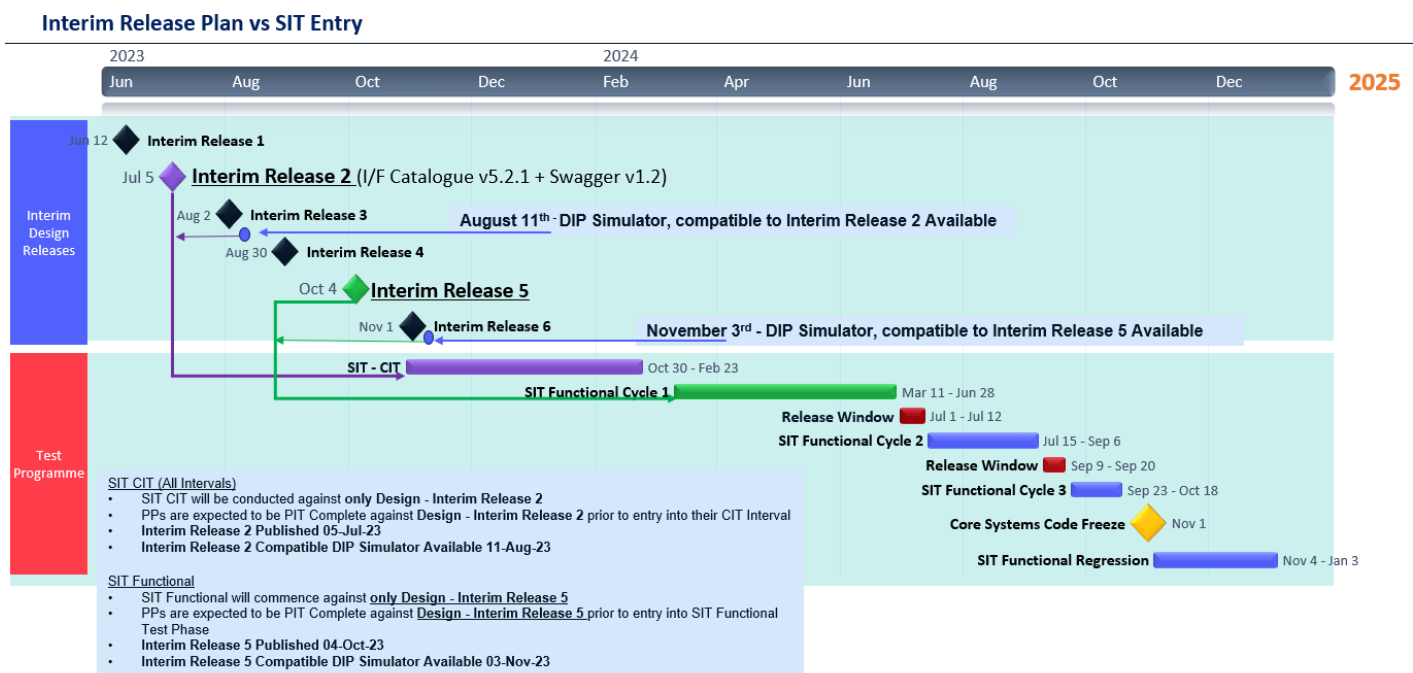


Figure 4 Interim Design Release Plan for SIT Entry

5.7.2.1 SIT CIT (All Intervals)

The following are key points for entry into SIT CIT for all intervals:

- SIT CIT will be conducted against Design - Interim Release 2 only. This will include all the design updates from Interim Release 1;
- Programme participants are expected to be PIT complete against Design – Interim Release 2 prior to entry into their respective CIT Interval;
- Programme participants are expected to provide:
 - An integrated Test Environment, built to Interim Release 2 to conduct CIT Testing; and

- A separate isolated Test Environment, built to Interim Release 2 in support of any CIT Defect Retesting.

Note 1: Programme participants can choose to continue their development against Interim Release 3 and Interim Release 4. However, this must be in a separate Test Environment using branched code.

Note 2: In addition, PIT test activities in readiness for SIT Functional also needs to be in separate Test Environments.

- Interim Release 2 published on 05th July 2023. Please see [REF-18] MHHS-DEL1275 Design Release 2 Notes for further information; and
- Interim Release 2 compatible DIP Simulator will be available on 11th August 2023.

5.7.2.2 *SIT Functional*

The following are key points for entry into SIT Functional:

- SIT Functional will commence against Design – Interim Release 5 only. This will include all the design updates from Interim Release 3 and Interim Release 4;
- Programme participants are expected to be PIT complete against Design – Interim Release 5 prior to entry into SIT Functional Test Phase;
- Programme participants are expected to provide:
 - An integrated Test Environment, built to Interim Release 5 to conduct SIT Functional Testing; and
 - A separate isolated Test Environment, built to Interim Release 5 in support of any SIT Functional Defect Retesting.

Note 1: Programme participants can choose to continue their development against Interim Releases beyond Interim Releases 5. However, this must be in separate Test Environment using branched code.

Note 2: In addition, PIT test activities in readiness for SIT Migration also needs to be in separate Test Environments.

- Interim Release 5 will be published on 05th October 2023; and
- Interim Release 5 compatible DIP Simulator will be available on 03rd November 2023.

5.7.2.3 *DIP Simulator Versions*

MHHS Programme will provide DIP Simulators to support PIT Testing against 2 concurrent releases:

- DIP Simulator #1 – Interim Release 2 compatible and available from 11th August 2023 - 01st March 2024
- DIP Simulator #2 – Interim Release 5 compatible and available from 03rd November 2023 - 28th June 2024
- DIP Simulator #1 – Interim Release X compatible and available from 08th March 2024 – 27th September 2024.

Note 1: 'X' Interim Release version number will be updated in future.

Note 2: The 2 DIP Simulator instances will be available in support of PIT activities throughout the SIT Test Phase and at least one instance will be available throughout the Qualification Test Phase.

Interim Release Plan vs SIT Entry

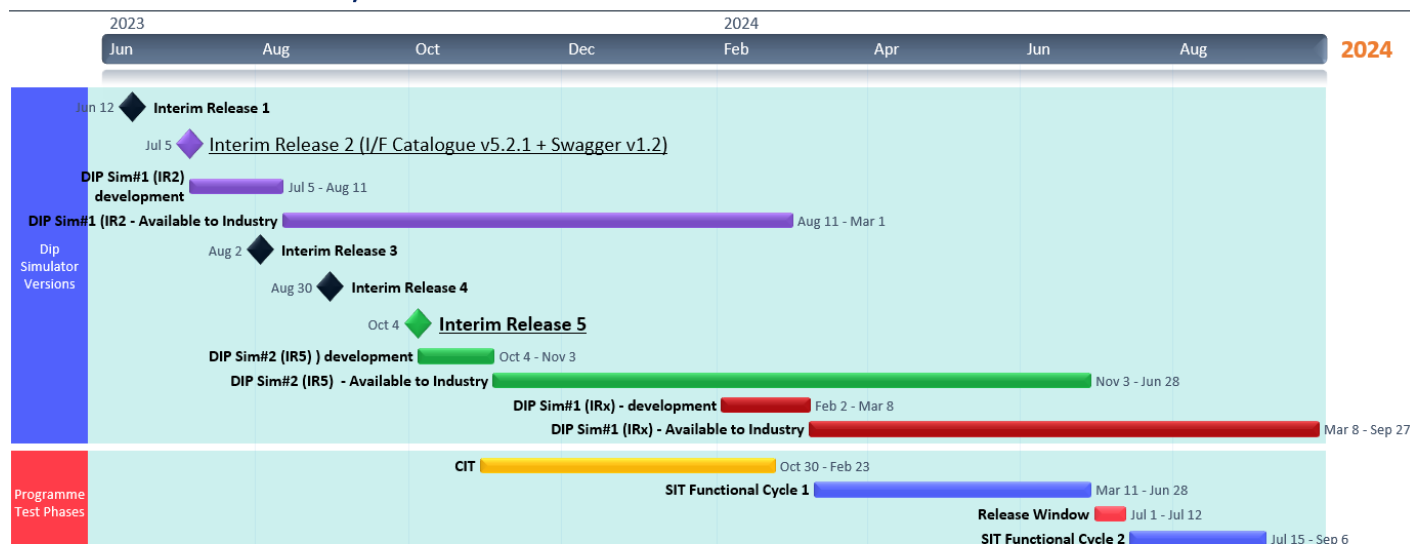


Figure 5 DIP Simulator Versions

5.7.3 Test Evidence

For Programme participants choosing the SIT route, will have to provide evidence for DBT1 PIT conducted for CIT, Functional, Migration, Non-Functional and Operational Testing.

5.7.3.1 DBT1 PIT Evidence for CIT

For SIT CIT, all Programme participants need to provide test evidence to validate that testing has taken place on each system or service included in the MHHS E2E Design. Evidence to be provided is as follows:

1. Evidence of successful messaging in and out of **all IF and PUB messages relevant to the market role** under test must be provided.
2. Evidence of a **sample of other tests as selected and agreed** between the assurer and the Programme participant must also be provided. NOTE that the Programme participant must collect **evidence of all tests run**. The assurer will agree which evidence is to be provided for assurance purposes, but the Programme participant is responsible for ensuring that, if necessary, all evidence can be provided; and
3. For the final test run with the DIP Simulator, the test evidence can take the form of DIP Simulator logs.

Evidence for (3) above must be:

- For **IF messages sent outward** from the application - links to the DIP Simulator test logs of tests successfully executed plus files showing the contents of each message used; and
- For **PUB messages sent inward** to the application, a file of the messages and record of their successful receipt (as shown by a http response sent out from the application) and screenshots showing the same information.

5.7.3.2 DBT1 PIT Evidence for SIT Functional

Programme participants conducting PIT in readiness for SIT Functional, need to provide test evidence against the correct functioning of each Service (according to its market role) as follows:

1. Evidence of successful IF and PUB messages relevant to their market role using the DIP Simulator (repeat of what was conducted for CIT). Please reference section 5.7.3.1 DBT1 PIT Evidence for CIT; and

2. End-to-end processes have been successfully tested and the messages generated from the back-office systems. Successfully test the receipt and processing of the messages arriving at the appropriate destination point(s), which demonstrates the correct functioning of the system for each market role.

5.7.3.3 DBT1 PIT Evidence for SIT Migration, NFT and Operational Testing

Test evidence requirements for Migration, Non-Functional and Operational Testing will be updated in the later version of PIT Guidance document.

5.7.3.4 DBT1 PIT Evidence for non-SIT Programme Participants

For Programme participants choosing the non-SIT route, will have to provide evidence of PIT DBT1 completion to enter Qualification Testing which will prove specific functional, non-functional and migration-related characteristics of systems and processes.

Please reference the [REF-06] MHHS-DEL1118 Qualification Approach and Plan for further information and note that any PIT DBT1 evidence implications will be set out in a future iteration of this document.

5.7.4 How to Provide Evidence

All evidence provided by the Programme participant must be traceable by reference back to the specific test case and test scenario. The evidence for a completed PIT test must show the expected result, the actual result and pass or fail status. Screenshots of messages and or electronic logs of messages must be provided as appropriate. The evidence requested is standard for any test assurance process and should be similar to that required by the Programme participants' own quality gate and internal audit.

5.7.5 Where to Store Test Evidence

MHHS SI Test Team recognises that each Programme participant will have its own test management tool which they will use to manage their testing and test evidence. To facilitate the monitoring of test execution and test assurance, all Programme participants are expected to store copies of test evidence in their own test tools locally within the confines of their own DPIA.

5.7.6 Retention Period for Test Evidence

Programme participants will have to store and retain test evidence in their own test tools till the end of the MHHS Programme. This evidence will be used during test assurance to validate actual vs. expected results of the test. Participants may be requested copies of test evidence on an exception basis when a particular test scenario requires detailed research. Additionally, test evidence will be critical for triaging PIT defects which impacts SIT or Qualification Testing.

5.7.7 PIT Exit Criteria for Programme Participants

- All planned tests have been run to completion or any exceptions are documented and agreed with Programme participants internal stakeholders, MHHS SI Test Team and/or Code Delivery Bodies;
- All Priority 1 and 2 tests have passed, and the overall test pass rate is 85% or above, or any exceptions are documented and agreed with Programme participants internal stakeholders, MHHS SI Test Team and/or Code Delivery Bodies;
- There are no outstanding severity 1 or 2 defects, or any exceptions are documented and agreed with Programme participants internal stakeholders, MHHS SI Test Team and/or Code Delivery Bodies;
- Work-off plan for any outstanding defects has been produced and agreed with internal stakeholders, MHHS SI Test Team and/or Code Delivery Bodies;

- Test results and evidence have been submitted and assurance completed by MHHS SI Test Team and/or Code Delivery Bodies;
- All scope and coverage specified in section 5.3 - Scope of PIT Testing has been achieved and the test evidence specified in section - 5.7.3 Test Evidence submitted;
- All open defects at the end of PIT that have been assessed as materially impacting SIT or Qualification Testing have been captured in the MHHS defect management tool; and
- PIT test completion report produced and assured to record the outcome of Programme participants PIT.

Note: For Work-off plan and understanding the definition of severity for any PIT defects impacting entry into SIT or Qualification testing, please reference [REF14] MHHS-DEL466 Defect Management Plan.

5.7.8 Failure to Exit PIT

Failing to successfully complete PIT will prevent Programme participants from progressing into subsequent test phases i.e. SIT or Qualification Testing. In the case of a failure, the Programme participant will be asked to remedy the cause for failure and re-submit the request to exit.

When a Programme participant fails to exit PIT successfully, the MHHS SI Test Team (for SIT Participants) or Code Delivery Bodies (for Qualification Participants) will work with the Programme participant to agree a remediation plan. Where the failure to exit PIT has the potential to impact a Programme milestone, this will be presented by the MHHS SI Test Team/Code Delivery Bodies to MHHS Programme governance for assessment of the impact to the Programme plan.

6 Test Assurance

6.1 Assurance Overview

Test assurance covers all testing-related deliverables and activities, with the purpose of identifying significant risks and issues and ensuring high standards of quality. The risks and issues are those which impact the start and completion of testing and therefore the readiness for the start of the migration period. These risks and issues can have knock-on effects on overall programme timelines and market confidence in the end-to-end solution and are therefore important to identify and mitigate.

The test assurance adheres to the standard 3 lines of defence model. For 1st-line testing assurance, there will be self-assurance carried out by the party conducting the activity or producing the deliverable. This will be the Programme participant. 2nd-line testing assurance is carried out by the MHHS SI Test team and/or Code Delivery Bodies and 3rd-line assurance (where relevant) is conducted by the Independent Programme Assurance (IPA).

Note: The Test Assurance sections below applies mainly for SIT participants. For non-SIT participants, please reference the [REF-06] MHHS-DEL1118 Qualification Approach & Plan for further details and note that any Test Assurance implications will be set out in a future iteration of this document.

6.2 Test Assurance Scope

The scope of test assurance will be as follows:

- **Assurance of approach and plan** – This will be carried out as soon as the PIT Approach & Plan document is available (at the time agreed between the assurer and the Programme participant) and in any case before the start of test execution;
- **Assurance of coverage** – This will be carried out as soon as the RTTM and test scenarios are available (at the time agreed between assurer and the Programme participant) and must be completed before the start of test execution;
- **Assurance of readiness** - The Programme participant undertaking the testing will produce a Test Readiness Report which will be assured in time to feed into the Programme participant's decision point which initiates a test stage; and
- **Assurance of execution** – The Programme participant undertaking the testing will produce, during test execution, Test Execution Progress Reporting. On completion, a Test Completion Report (in both draft and final versions) which will be reviewed to inform the test assurance position associated with a Programme participant's completion.
- **Additional assurance** – The above may be supplemented by additional activities. These could include:
 - Interviews;
 - Test execution progress report reviews;
 - Test witnessing;
 - Test evidence reviews;
 - Defects reviews;
 - Quality gate attendance; and
 - Review of Programme participant's 1st-line assurance output.

Programme participants that are selected for additional assurance will be notified at least 10 working days prior to the activity taking place.

6.3 Assurance Criteria

- **Assurance of approach and plan** – The Test Approach & Plan document will be examined for the fitness for purpose of the following:
 - Planning and scheduling (including planned resources);

- Architectural assurance (where the way the systems and test stubs are assembled for testing is examined);
 - Defect triage and management;
 - Regression and re-test approach;
 - Test environments and release and configuration management;
 - Test case specification approach;
 - Test data allocation and management approach;
 - Test stubs provided;
 - Test coverage (functional and non-functional);
 - Approach to risk-based testing; and
 - Test basis.
- **Assurance of coverage** – The Requirements to Test Traceability Matrix (RTTM) and Test Scenarios are subject to review for:
 - Test coverage – do the scenarios collectively address the coverage defined in the PIT Approach and Plan;
 - Test quality – are the scenarios fit for purpose, complete and accurate to the scope defined; and
 - Traceability – can the scenarios be mapped to requirements and agreed scope.
 - **Assurance of readiness** – The Test Readiness Report will be assured for completeness and accuracy. Attendance at the quality gate may also be included and feedback provided for:
 - Any risks and issues that are still outstanding; and
 - Whether agreed criteria have been met.
 - **Assurance of execution** – The Test Execution Progress Report and Test Completion Report (both draft and final versions) will be assured for completeness and accuracy. This will include:
 - Test evidence – tests performed should be supported by auditable evidence. Selected test evidence will be reviewed;
 - Test quality – test findings (including defects) should be accurate and complete, providing good quality information to support analysis and resolution; and
 - Progress – actuals in high priority/risk areas; key areas of the solution.
 - **Assurance of work off plans** – The work off plans will be reviewed to assess:
 - Risks carried forward due to testing not completed or due to open defects; and
 - Viability of plans to close residual items.

6.4 Engagement

Where the MHHS SI Test Team are assuring a Programme participant, they (together with the PPC) will first obtain from the participant a plan for the deliverables and activities to be assured and make the participant aware of the material the MHHS SI Test Team expects to see. The MHHS SI Test Team will maintain a tracker of documentation and planned dates and will request the relevant material close to the planned date. The MHHS SI Test Team will then conduct the review and may request a meeting with the Programme participant for clarifications.

The MHHS SI Test Team will ensure full transparency and buy-in from the Programme participants being reviewed. Draft reports will be submitted to the Programme participant for comments before being concluded.

6.5 Outputs

For 1st-line assurance of deliverables, the outputs will be the review comments generated, together with the audit trail of the acceptance of the responses. For 1st-line assurance of activities, the output will be a short report or records of a Quality Gate meeting.

For 2nd-line assurance, the MHHS SI Test Team will produce a short report for each piece of assurance work conducted. If an important shortcoming is identified, then a risk or issue is raised. For a shortcoming that needs remediating but does not warrant a programme risk or issue, then an action is recommended in the report and a completion date assigned. The MHHS SI Test Team will then track such actions via a central register to ensure that they are addressed in a timely manner.

Records of quality assurance activities conducted by the MHHS SI Test Team will be stored centrally and used to drive Management Information (MI) reporting. This will assign a RAG status for quality to each Programme participant for the relevant stage of the programme plan. The RAG status may not be present (if no assurance has been carried out).

6.6 Roles and Responsibilities

PIT	1 st -line Assurance	2 nd -line Assurance (SIT Programme participants)	2 nd -line Assurance (non-SIT Participants)
DBT1	Programme participant self-assurance	MHHS SI Test Team	Code Delivery Bodies ^{Note 1}
DBT2	Programme participant self-assurance	N/A	N/A

Table 12 Parties Responsible for Testing Assurance

Note 1 – MHHS SI Test Team will additionally assure a small sample of Programme participants, as agreed at the time with SRO and Code Delivery Bodies.