

# **Smart Metering Implementation Programme (SMIP)**

## **Systems Integration Test Approach Release 2.0**

<b>IT.0284</b>
<b>26/01/2018</b>
<b>1.0</b>



References

Ref	Title	Source
[1]	Joint Test Strategy	DCC
[2]	Smart Energy Code Stage 5.9	BEIS
[3]	Glossary of Testing terms	ISTQB
[4]	Test Approach for the Pre-Integration Test Phase	Arqiva
[5]	PIT Phase Test Approach	Telefonica
[6]	PIT Phase Test Approach	CGI
[7]	Schedule 6.2 (DSP version)	CGI
[8]	Schedule 6.2 (CSP N version)	Arqiva
[9]	Schedule 6.2 (CSP C/S version)	Telefonica
[10]	Integrated Solution Delivery Plan	DCC
[11]	DT.0034 System Integration Test Scenarios	CGI
[12]	IT.0200 Technical Readiness Testing Approach	CGI
[13]	SMIP Testing Approach Document for Release 2	DCC
[14]	EE.0464 SMKI and Repository Testing Approach	DSP(SIT)
[15]	Integration Test Environments Overview	DCC
[16]	SI Integrated Environment Schedule	DCC
[17]	DT.0116 DSP Solution Delivery Defect Management Approach	DSP(SIT)
[18]	IT.0222 ALM Technical Requirements Design and Build	DSP
[19]	IT.0017 HP ALM User Guide	DSP
[20]	IT.0100 SI Defect Management	DSP
[21]	IT.0014 Release Management Policy	DSP(SI)
[22]	DT.0198 SIT Business Test Data Plan	DSP
[23]	DB.0183 CSP Simulator Functionality and User Guide	DSP
[24]	DT.0238 DCC Quality Gate 3 (completion of FAT) Review Checklist	DCC

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# 1 Introduction

## 1.1 General

The DCC shall ensure that Systems Integration Testing for Release 2.0 (SIT) is carried out in accordance with this document and the provisions of the SEC Variation Testing Approach Document (SVTAD) for Release 2.0.

This document sets out the manner in which SIT will be conducted for the Smart Metering eco-system for a release, which is depicted in the following diagram. Readers of this document are expected to be familiar with the SMIP Testing Approach Document for R2.0 [13] and Joint Test Strategy, Reference [1]. Section 2.2 of Reference [13], states that where relevant, or where there is an apparent conflict with the Joint Testing Strategy and other Testing Approach documents developed for release 1.x, the Testing Approach Document for release 2 [13] supersedes and replaces the earlier documents.

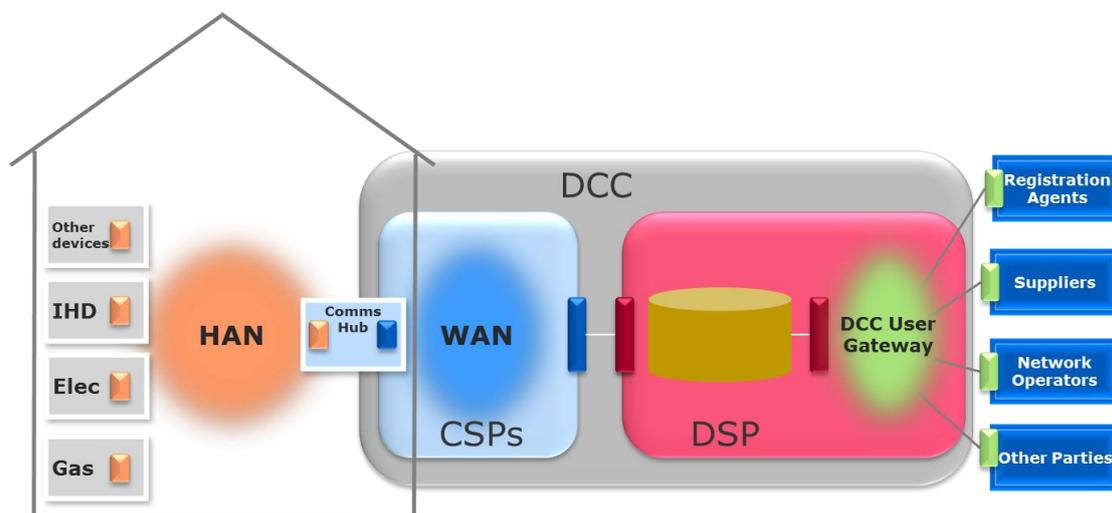


Figure 1 – DCC Solution

The Test Approach is based upon:

- The Testing Approach Document for Release 2.0[13] / Joint Testing Strategy [1].
- The DSP and CSP Service Provider Contracts (References [7], [8], [9]).
- Being compliant with the Smart Energy Code (SEC), Section X11, (Reference [2]).

The diagram below demonstrates how this Test Approach fits in with the hierarchy of other SIT Test documents.

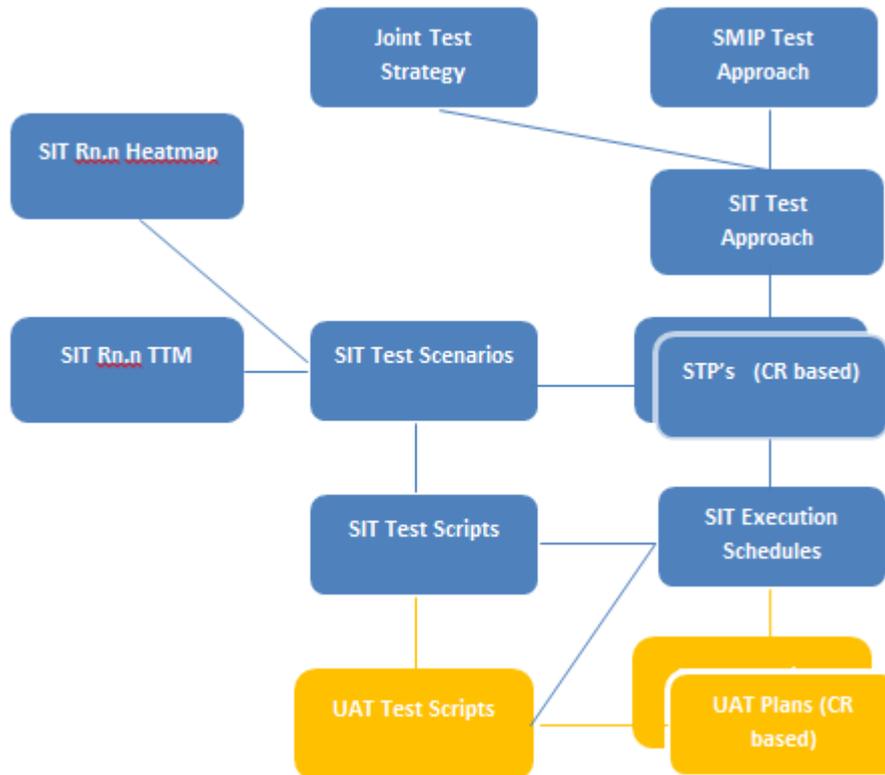


Figure 2 – SIT (including ST and UAT) Test Documentation Hierarchy

The activities described in this document will be further elaborated on within the individual Solution Test Plans and Service Provider User Acceptance Test (UAT) Plans which will be developed in collaboration with the Service Providers.

## 1.2 Change Forecast

Any revisions that do become necessary will be made in accordance with the review, approval and appeal process outlined below.

## 1.3 Reviews, Approvals and Appeals

The DCC will review and approve this document.

## 2 Scope

### 2.1 Overview

Solution Test (ST) is the first stage of the Systems Integration Testing (SIT) phase, the other stage being User Acceptance Testing (UAT). DSP SIT will manage SIT with support from the SPs as required, in accordance with the Testing Approach Document for R2.0 and Joint Test Strategy.

Release 2.0 consists of:

- Change Request 194 – Implementation of TSG2.0 document baseline for Single Band Communications Hubs (SBCH)
- Change Request 218 – Implementation of Dual Band Communications Hubs (DBCH)

Where this document refers to Release 2.0, this will mean both Change Requests listed above. Where required the document will differentiate between SBCH and DBCH implementations as the development and testing of SBCH will be conducted before DBCH.

Note that for Release 2.0 the Defect Mask will apply separately for Single Band Communications Hub (CR194) and for Dual Band Communications Hub (CR218). Note that the Defect Mask will apply to each Region/Service Provider.

SIT will be run against emulators instead of meters, and emulators may be used for other devices if the actual device is not available. The selection of real devices and emulators for ST and UAT will be agreed with the DCC.

SIT will perform some early confidence testing against a CSP Simulator, but this is not formal SIT. SIT will be executed on the fully integrated solution with the DSP, CSPs, TSP, P&C, DCC-E and ITES and Fusion.

The Release 2.0 SIT Tests will be mapped to changes in the relevant SEC documents underpinning the Release within SBCH and DBCH Test Traceability Matrixes and will include suitable regression tests.

The DCC will witness an agreed subset of Tests during the Solution Test stage for the UAT stage of SIT.

Where functionality is introduced into SIT, the System Integrator will develop release notes setting out the functionality being introduced; work-off plans for the functionality yet to be introduced; and any supporting Test Results.

When functionality is released from SIT, that functionality must have met its SIT Exit Criteria (see Section 8.3.2).

### 2.2 Out of Scope

The following assurance activities are outside the scope of SIT:

- Certification of Meter Device Models (energy Suppliers are responsible for ensuring that any meters they install at consumers' premises are SMETS compliant, including a requirement that they are protocol certified).

- Certification of Communications Hubs (the CSPs, in conjunction with their Communications Hub manufacturers, are responsible for this activity).
- Testing of the Home Area Network (HAN) other than its interaction with the DCC solution.
- Testing the interaction of the DCC systems with User systems (this will be undertaken in UIT, User systems will be stubbed in SIT).
- Testing of DCC Business Processes. These will be tested as part of Business Acceptance Testing (a component of Operational Acceptance).
- Testing of User Business Processes (Users can test their back-office systems 'against the DCC' during the End to End Test stage on a voluntary basis).
- Real meters are out of scope. SIT will use Device Emulators for ESME, GSME, PPMID, HCALCS and IHD.
- Load and Stress testing.
- Performance testing, other than 'round trip' testing.
- Other Non-Functional testing including OCT and TTO, unless deemed in scope as part of the Release. The SIT Team will support OCT testing that is run in parallel to SIT, however, OCT will be documented separately from the Solution Test Plan.
- Any TTM Requirement from DCC that is not flagged for SIT.

## 2.3 Test Configuration and Prioritisation for Release 2.0

This section provides an overview of the principles applied in the selection of the testing to be included in Release 2.0, ensuring that the lessons learned from Release 1.3 testing are applied.

### 2.3.1 SIT Approach Improvements Since Release 1.3

In planning the test approach, we have actively incorporated lessons learned from R1.3 and best practice from our SI into our plans. Below are the key changes that have been adopted in Release 2.0.

1. We have enhanced the Service User Simulator to include a capability to decrypt messages to ensure correct functioning of GPF/CH functions
2. We have ensured that SIT does not overlap with other key test phases (PIT and UIT), however there is some overlap with DIT
3. We have introduced testing based on sequences of SRs. This is consistent with the sequences being used in DIT to test the Business Scenarios
4. We have focussed testing on GPF and CH functions to ensure all variants of service requests relevant to these services are fully tested
5. We have enhanced the device emulator to support GBCS2.0 use cases and improve usability. We have also introduced a more comprehensive approach to the Emulator assurance.

6. Automation has been extended to enable enhanced throughput of testing from the outset. For Release 2.0, we expect to achieve 60% automation of our SIT testing.
7. Early integration testing has been introduced to test DSP functionality ahead of CSPs in SIT
8. To improve the capture of data during testing, we will have CH diagnostics logging switched on by default during testing. This will help reduce the number of re-tests and ensure we have logged data for any defects which are difficult to repeat.
9. We have increased the number of test sets to allow more parallel testing and to reduce number of blocking defects. This also gives more flexibility with the set configurations used during testing.

### 2.3.2 GPF Function and Decryption

We have enhanced the Service User Simulator (SUS) to enable decryption of payloads to enable proper testing of the GPF function within the SIT environment.

We have included the ability to decrypt 'on demand' and support 'future dated' encryption scenarios.

We have ensured that all SRs which carry an encrypted payload will be tested in SIT with GPF and a meter emulator.

### 2.3.3 Device Emulator Enhancements

The following are a list of the specific enhancements that have been added to the SLS Emulators to be used in our SIT Testing:

- GBCS Use Case and Alert alignment with GBCS 2.0
- Enhanced support for security, time / date and HAN management use cases
- Introduction of configurability to some GBCS use cases. Test user can configure responses to many use cases
- User triggered alerts
- Support for large GBT messages
- Support for GPF population with configurable values
- Sleepy device support
- Specific support for a large number of Sub GHz focused tests
- Support for local payments

### 2.3.4 NXP and SLS Emulator Interoperability

To assure that Communications Hubs and devices which use different chip sets can operate together, limited testing of interoperability will be carried out in SIT between our SLS and NXP Emulators.

- The NXP Communications Hub with a SiLabs device is already covered using the Arqiva hub
- To test a SiLabs hub with an NXP device a new NXP device emulator is being procured. This will have limited functionality but will test the ability to create a HAN
- Further testing of NXP devices will take place during DIT

#### 2.3.5 Emulator Assurance

To ensure confidence in the emulators to be used in the SIT environment, we will be undertaking a 4-stage assurance process for new deliveries from emulator providers.

1. On arrival of a new emulator release, DCC will carry out PIT assurance including the review of the Release Note, Documents, Testing Reports and testing evidence. This will then be subject to a Test Assurance Board prior to moving to step 2
2. The Emulator will be downloaded (for firmware) or installed (for new hardware) into a reserved SIT set to run a set of PIT/SIT confidence regression tests on the emulator. A test plan has been developed for this purpose, the table below provides a high-level overview of the tests. Test outcomes will be recorded and a report produced for the testing exercise.
3. Once testing has completed successfully, the new emulator will be deployed into additional SIT sets for SIT testing.
4. DCC are procuring independent emulator assurance planned to consist of:
  - a. Conducting a review of the SLS design and (PIT) test documentation (focussing on enhanced requirements for SLS)
  - b. Conducting a review of the emulator proving being executed in the CSP labs and overseen by the SI

The procured NXP emulator will also be subject to Service Provider and independent assurance.

Note that in the table below the “X” indicates where this requirement is to be tested

Emulator Assurance Requirement	PIT	CSP TL	SIT
Emulator has been proven to meet the relevant GBCS specification.	X		
emulator has been proven to meet the new functionality - Defect Mask and WOP (as per CR217)	X		
Defects management Process - Retest.	X		
SMETS compliant	X		
ZigBee Certified	X		
ZigBee test certificate	X		
All relevant logs can include at least one entry to be read using SR 6.13	X		
Profile data log can include sufficient data to cause response using GBT	X		
Test CPL File Details	X		
SIT SMKI device certificate – New Hardware only		X	
SIT SMKI Remote party organisation certificate - New Hardware only		X	
Able to join with an IHD PPMID with each of the communication hub variants			X
Able to perform a Prepayment top up with each of the communication hubs variants, directly on the meter using a UTRN and/or with a joined PPMID.			X
Meters must be able to establish a HAN with a Communications Hub compliant with CHTS v1.1			X
Time is correct			X

### 2.3.6 Test Sequences

There is a recognition of the important of test sequencing and this has been incorporated fully into the SIT (and DIT) testing for Release 2.0.

SRs will be run in sequences to test each SR in a variety of business contexts based on end-end business scenarios.

Test sequences used in SIT are consistent with DIT scenarios.

The following test sequences have been incorporated into SIT:

SIT Service Request Sequence Groups			
GPF	Alerts	Certs & SMKI	CH Replacement
CH Returns Lifecycle	Change of Mode	Change of Tenancy	Change of Supplier
CPL	Credit	Decommission	DSMS
ESI	Firmware Management	Firmware Upgrade	Suspended Devices
Install & Commission	Inventory	Large Messages	Load Control
Org Certs	Prepay Reads	Prepayment	Read management
Reporting	SSI	SSMI	Supply

### 2.3.7 Test Prioritisation of SR Configurations

To select the appropriate tests to execute for Release 2.0, tests were prioritised for the release and then reviewed to assess if they should be included in the SIT testing.

#### High Priority:

1. **SRs which are new or changed** - test delivery via WAN and local delivery, future dated, ESME, GSME, prepay, credit, future dated
2. **All SRs sent to GPF** - test variants as Item 1
3. **Install & Commission** - test variants as Item 1
4. **Firmware Upgrade** - test variants as Item 1

#### Medium Priority:

1. **Test unchanged SRs** - focus on WAN delivery only, test against ESME and GSME using GS and IS user roles (automated tests only).

#### Low Priority:

1. **Unchanged SRs** - other user roles and combinations of delivery, future dated etc.

For Release 2.0, all high priority tests will be executed. All automated medium priority tests will be executed, medium priority manual tests will not be executed except where they are needed to complete a test sequence or to ensure full coverage of testing every SR is achieved. Low priority tests will not be executed.

#### Other Testing Decisions:

- **Install and commission** – formal testing only on a defined number of test sets. Commissioning of remaining sets will be part of test preparation
- **Electricity SRs** – focus testing on common command variants only where an SR is unchanged
- **Devices** – tests for joining and unjoining the HAN will not be repeated across multiple tests sets. They will be run at least once.

### 2.3.8 Approach to Testing Communications Hubs Variants

A Full suite of SIT tests will be carried out against Communications Hubs from three vendors, for both single and dual band Communications Hubs variants.

All three Toshiba SKUs will be included in SIT test sets, but each SKU will not be subject to a full suite of tests. This is because each SKU has identical firmware, as identified in the Certified Product List, and are therefore functionally equivalent.

DBCH will be fully tested at both 2.4GHz and Sub-GHz frequencies

Fylingdales DBCH will be included in End of Cycle Regression testing.

Non-debug images for CH firmware to be subject to regression test.

Note: that testing of ITCHes will be included in DIT testing.

### 2.3.9 Deployment Scenarios and Backward Compatibility

At 'Go Live' the Communications Hubs and Meters will remain unchanged but DSP/CSP systems will be upgraded to R2.0. These critical scenarios will be tested in SIT, checking backward compatibility with existing (Release 1.3) Communications Hubs and emulator firmware. This will also be tested in DIT.

Following a 'Firmware Upgrade' the Communications Hubs will be upgraded to R2.0 firmware but meters will remain unchanged (i.e. SMETS2). This scenario will be tested in SIT (and in DIT).

For the SMETS2 v3.0 Meters scenario the Communications Hubs will be upgraded to R2.0 firmware to operate with the SMETS2 v3.0 meters (2.4GHz & 868MHz). These scenarios will be tested in SIT (and in DIT).

Release 2.0 of the DCC Systems will be the first release of the DCC Systems that will support devices that comply to different versions of GBCS, SMETS and CHTS according to the entry for the Device Model in the Certified Product list. Within SIT, objectives include;

- The technical versioning, DCC systems can operate successfully within a wider DCC ecosystem comprised of multiple Devices (or simulations) operating to different technical specifications;
  - Regression Testing of DUIS 1.0 with GBCS 1.0
  - DUIS 2.0 can operate with GBCS 1.0 and GBCS v2.0
  - DUIS 1.0 can be used with GBCS v2.0 (use cases permitting)
  - DUIS 1.0 cannot be used for new GBCS v2.0 use cases
  - DUIS 1.0 and GBCS v1.0 can be OTA upgraded to DUIS 2.0 and GBCS v 2.0
- Regression Testing of key aspects of the service

#### 2.3.10 Approach to Testing the Local Command Interface

In the absence of hand held terminal devices, DCC will develop and assure a testing tool capable of fulfilling the requirements of the SVTAD to test the Local Command Interface, as described in section 5.2 of that document.

The testing of the Local Command Interface will take place with real devices in DIT, rather than with emulators in SIT.

#### 2.3.11 Regression Testing Phases for Release 2.0

Regression Testing is a key part of the testing approach for Release 2.0 to support the assurance that key functional paths within the systems operate as expected with any software, firmware and device updates.

Regression testing is employed within Release 2.0 thus:

- 1) New Software or Firmware drop into the SIT Environment: Following the deployment of a Release onto the SIT Environment, a series of Sanity or Smoke Tests will be executed, these are Regression Tests to ensure existing interfaces or integration points function correctly.
- 2) End of Cycle Regression: this is regression testing of existing functionality together with the new functionality Release performed prior to SIT Exit. This will be carried out at the end of SIT testing for both SBCH and DBCH. These regression tests will all be run against all 3 Communications Hubs variants and prove the stability of the final release on SIT exit. EOC Regression is comprised of two cycles, the first to take account of any maintenance release, in terms of merged code from production, and the second as a clean run. Some details of these tests are below:
  - EOC Regression will comprise of Regression Testing for all Releases prior to Release 2.0 (SBCH and DBCH), together with selective tests from SBCH or DBCH Solution Test Plans
  - EOC testing will use Emulators for ESME, GSME, HCALCS and PPMID.
  - The Regression Pack will be agreed with between the Service Providers and approved by the DCC and will comprise of:

- Regression tests for SBCH or DBCH scope where the selection criteria will be a subset of tests performed as part of SBCH or DBCH functional testing.
- End of Cycle Regression will include Communications Hubs in non-debug mode
- Regression testing of previous releases which includes the following functionalities :
  - Unjoin & Decommission (GSME/ESME/PPMID/HCALC)
  - I&C & Join (GSME/ESME/PPMID/HCALC)
  - FW Upgrades
  - Subset of R1.2 and R1.3 SRs to include:
    - Safety Related SRs
    - On Demand and Future Dated, default CV for SR, User Role CS (EIS/GIS)
    - Critical / Non-Critical SRs
    - Alerts
    - Prepayment
    - Read Management (Credit & Prepayment)
    - Load Control
    - CoS
    - GPF testing
    - ESI/SSI/SSMI/DSMS testing

In addition to Regression testing executed through Solution Test, End of Cycle Regression test cycles will be executed following Solution Test. End of Cycle Regression testing will include a representative selection of new and existing functionality. The selection will be agreed with DCC and the choice will target any areas identified during Solution Test as being higher risk e.g. higher defect rates.

- 3) In addition to the above there will also be Early Release Regression testing which will allow for early individual implementations of Change Requests across releases ahead of the full Release 2.0 deployment, if required. For this purpose, some devices on the SIT environment, will be kept at a firmware version that is on Production. The Tests selected for Early Release Regression, will be selected based on the functionality that will be provided for early release, and will be agreed with the DCC.
- The ERR test set will be run spread across the 3 Communications Hubs suppliers.

- ERR testing may use the CSP Simulator comprising of virtual devices for example: CHF, ESME, GSME, HCALCS, PPMID or GPF and on the Emulator Device Set.
- The Early Release Regression Pack will be agreed with DCC and consist of the following:
  - Sample of impacted and non-impacted motorway SR's
  - Sample of ESI existing reports/extracts
  - SSMI screen workflows.
- The detailed scope of the tests run in ERR are defined in the Release 2.0 SIT Heatmap as reviewed and approved by DCC.
- Where required, tests will be added to the End of Cycle Regression pack

#### 2.3.12 Regression Testing Exit Criteria

For the purposes of assessing against Exit Criterion 2 SIT Regression, Regression Testing is agreed to be all the tests:

- executed on the Device Compatibility sets where:
  - Communication Hub version is R1.3, Device emulators GBCS 1.0
  - Communication Hub version is R2.0, Device emulators GBCS 1.0
- the Service Requests / Service Responses / Alerts were introduced prior to Release 2.0 (i.e. R1.1, R1.2, R1.3)

## **3 Objectives**

### **3.1 SIT Objective**

The objectives of SIT:

- Confirm DCC End to End changes for Release 2.0 (between DSP and CSP's) work as designed.
- Confirm DCC End to End changes for Release 2.0 (between DSP and DCC-E) work as designed.
- Confirm DCC End to End changes in Release 2.0 have not caused any regression to existing functionality (between SP systems / components).

### **3.2 Test Approach Objectives**

The objectives of this Test Approach document are to:

- Define the scope, deliverables, activities, resources, entry/exit criteria and Test processes required for SIT, and
- Define the roles and responsibilities of those involved in SIT.

## 4 Test Approach

### 4.1 SIT Test Approach

This Test Approach defines the high-level activities to be performed to undertake ST and UAT testing.

The SIT Team will generate a Solution Test Plan for each Change Request that requires SIT testing, and this document describes all the SIT activities and Test planning for Solution Testing that Change Request.

The SIT Team will also generate a Solution Test Plan, for functionality in a release that has features enabled such that a piece of code is 'toggled off'. The Solution Test Plan in this instance will be to check that the code feature toggled off, is indeed turned off and the code not usable. Regression testing, in the form of Early Release Regression, will also occur as part of 'toggle off testing', including testing with CSPs, to ensure there is no impact to existing functionality. An example of a feature that can be

The SIT will also generate a Solution Test Plan for upgrade testing associated to the uplift from release or release phase to the next release or release phase.

The Testing Requirements will be generated by the SIT Team from the SEC documents described below, and SIT testable clauses will be identified and documented in the form of a TTM. The Test Traceability Matrix (TTM) provides the testable Requirements statements for each Change Request and is supplied by the DCC. For Release 2.0 the document baseline is:

Document Name	Version	Date
Smart Metering Equipment Technical Specification (SMETS)	V3.0 Draft 4	30 May 2017
Communication Hub Technical Specification (CHTS)	V1.1 Draft 3	30 May 2017
GB Companion Specification (GBCS)	V2.0 Draft 5	30 May 2017

The SIT Team will use the TTM, design documents and the Release Scope to write new or update existing SIT Scenarios, see Reference [11].

The SIT Team will document the high-level Test Data Requirements for the Release Scope, into the Business Test Data document, Reference [22].

The SIT Team will generate or update SIT Scripts for the Release Scope.

SIT Scripts for the Release are one of:

1. Functional Tests for new functionality of the Release
2. Regression Tests

- a. Early Release Regression – this is regression of existing functionality against the current ‘live’ base-lined code, to enable an early Change Request specific exit from SIT.
  - b. End of Cycle Regression – this is regression of existing functionality together with the new functionality for the Release performed prior to SIT Exit
3. Supporting Tests – exercising existing functionality to enable functional testing of the Release.

Based on all relevant documents including SEC, SEC Subsidiary Documents and any additional requirements defined in the relevant Change Requests, and where appropriate any relevant test or operational issues, the SIT Team will compile a Heatmap of all the testable Conditions from the TTM that should be tested, which will include for each testable Condition;

- The Change Request number
- The Test Scenario identifier, from the Test Scenarios document, Reference [11].
- Safety Related – is this Test Condition safety related, for example, does it relate to an SR that is concerned with customer safety.
- Criticality – this is a Risk Based Testing (RBT) indication and will be set to High, Medium or Low
- Allocation to a Functional Area. The Functional Areas will be agreed with the DCC, and can be used to separate areas of SIT testing, and can also be used for SIT Test Reporting purposes
- Manual / Automation. Test Conditions will be set to whether the resulting Test Script can be executed manually, or through Test automation.
- Previous Releases. This will indicate in which previous Release a Test Condition has been tested, or will be left blank if the Test Condition is a new area for SIT testing.
- Whether a Test Condition will be part of new SIT testing, or will be part of Regression testing
- A number of attributes that help to isolate the Test Condition;
  - User Role
  - Mode of Operation
  - Command Variant
  - Payment Mode (Credit / Prepayment)
  - Device type
  - Communications Hub type
- Sequencing – Test Conditions will be linked into sequences

The approval of the Heatmap by the DCC will determine the scope of SIT testing for a given SIT Exit

The SIT Team will map the SIT Scenarios to the TTM and to the Heatmap.

The SIT Team will map the Test Scripts to the TTM and to the Heatmap. Tests that are new or updated for the Release will be part of the new functional scope, any other Tests will either be Supporting Tests or Regression Tests.

The SIT Team will load the Test Scripts (Functional, Supporting, Regression), into the Test Plan in ALM.

The approval of the Test Scripts by the DCC will allow Test Scripts in ALM to be moved into the Test Lab in ALM ready for SIT Execution. These Test Scripts, together with the detailed Test Data Requirements for each Test Script will make up the SIT Test Specifications for the Release.

The DCC will also provide the SIT Team with Test Scripts they want to have in UAT Scope for the Release. This is done by flagging the tests required using the SIT Heatmap. UAT flagged tests are then updated in ALM for 'witness testing' by the DCC. The tests selected for UAT will be a representative sample of positive and negative tests, including regression testing.

The SIT Team will generate a UAT Test Plan for the Release, which will have a plan of the UAT schedule.

The SIT Team will generate a weekly and daily Test execution schedule from the Approved Test Scripts in ALM, and will distribute this to the Test Parties (refer Section 12) involved in the SIT testing for the Release.

Quality Gate 3 governs the entry into Solution Test execution. Quality Gate 4 governs the entry into User Acceptance Testing. Because ST and UAT will be running in parallel (UAT is a witnessed subset of ST), these Quality Gates will be run together as one gate. Upon successful completion of this combined Gate, the SIT Team will manage, coordinate and report upon the progress of the Solution Test execution and UAT execution.

Quality Gate5 governs the exit from ST and UAT. For Release 2.0 this will occur for both SBCH and DBCH implementations.

SIT Execution will be comprised of;

- Upgrade Testing (of the Release into the SIT Environment). Following the deployment of the Release onto the SIT Environment, a series of Sanity or Smoke Tests will be executed, these are Regression Tests to ensure existing interfaces or integration points function correctly.
- ST Support Testing. This will include UAT Tests where they have been selected by the DCC.
- ST Functional Testing. This will include UAT Tests where they have been selected by the DCC.
- ST Early Release Regression – additional regression testing to support an incremental release from SIT, see below. This will include UAT Tests where they have been selected by the DCC.

- ST End of Cycle (EOC) Regression. This will include UAT Tests where they have been selected by the DCC.

## 4.2 Test Environments

The Test Environment Overview is in IT.0005 Integration Test Environment Overview (see Reference [15]). The DI.0014 SI\_Integrated\_Environment Schedule (see Reference [16]) covers the allocation of Test and Production Environments (SIT / UIT / Production).

Solution Testing and UAT will be performed on a SIT Environment. There are two SIT Environments available, see references [15] and [16] above;

- SIT-A – primarily a production support environment, and will be at or close to the release version on Production.
- SIT-B – the main SIT Environment, available for Solution Test and UAT for a Release. Other test phases can also be run on SIT-B, for example DIT and OCT.

For further details on managing changes to Test Environments SIT-A and SIT-B, including the CRB and eCRB process, refer to 'IT.0014 Release Management Policy' [21].

### 4.2.1 Environment Constraints

Because there is only one SIT Environment for SIT Execution, there is potential contention for its use from other Test Phases: OCT or SRT. The risk severity and probability are not deemed sufficient to delay SIT.

### 4.2.2 Release Management

Production fixes are regularly applied to the SIT environments.

Defects/issues are merged in R2.0 as a standard practice by the SPs - the process is covered under the Release Management Policy for Integration Environments v1.7. Note that v1.8 is being updated to incorporate Prod Maintenance Release Process. Every time there is change in functionality delivered by an SP (which may be new functionality or a defect fix) this will be done by Release Note to the CRB which will increment the Release Baseline in the test environment to provide both current status and deployment history.

## 5 Deliverables

### 5.1 Deliverable hierarchy

The following diagram illustrates the dependencies and sequencing of deliverables impacting SIT.

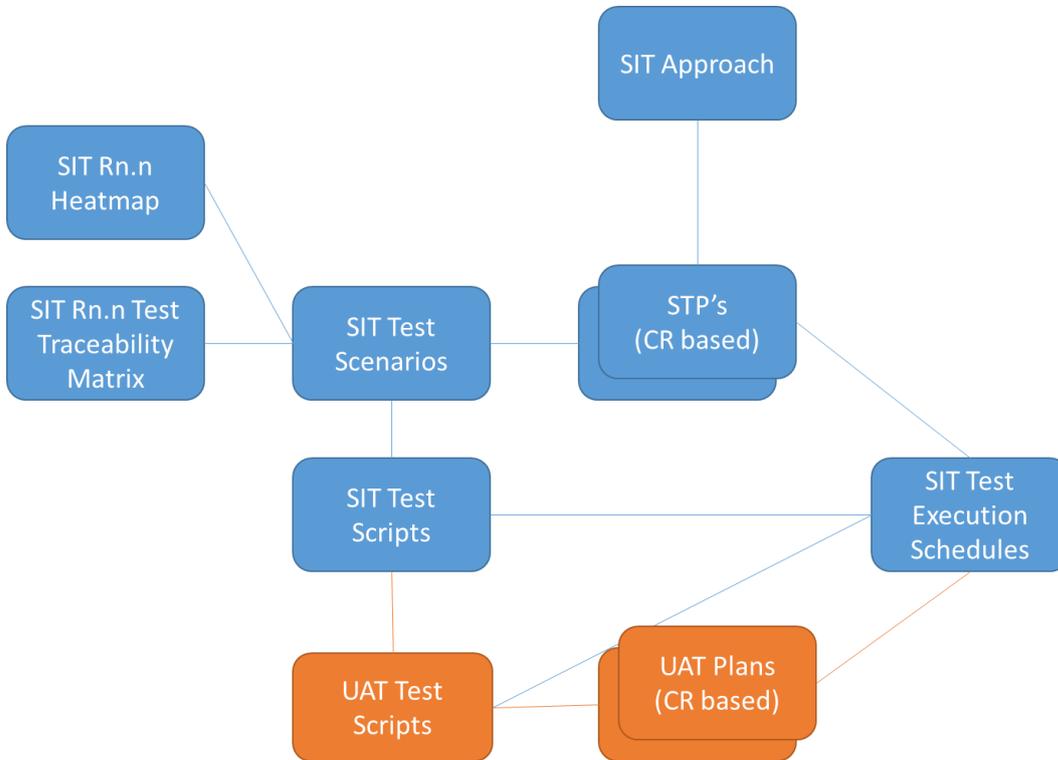


Figure 3: Deliverables Hierarchy

### 5.2 SIT Deliverables

The following is a list of SIT deliverables. These deliverables will be tracked in the Level4 Plan.

Team	Deliverables from Implementation Plan	Timing
SIT	System Integration Test Approach (this document)	Following any applicable review cycle with DCC, final version to be submitted to DCC by the relevant Service Provider no later than 20 working days before the commencement of test execution. Following acceptance by DCC, Test Phase Approach documents will be published on the DCC website.
SIT	Solution Test Plans	Final version to be submitted to DCC no later than 10 working days before the commencement of test execution, including identification of any security constraints, e.g. sensitive scripts
SIT	Test Scenarios	To be available at the same time as the finalised Test Phase Approach.

Team	Deliverables from Implementation Plan	Timing
SIT	TTM for SIT	
SIT	Test Scenario mapping to TTM Requirements	
SIT	Test Scenario mapping to Heatmap	
SIT	Business Test Data Plan to support Release scope changes	
SIT	Solution Test Mid-level Test Execution Schedule (as part of L4 Plan)	
SIT	Solution Test Daily Execution Schedule	
SIT	SIT Test Specifications	
SIT	SIT Scripts (New & Amended) for Test Scenarios	To be submitted to DCC no later than 20 days before the commencement of test execution
SIT	SIT Scripts (Regression Selection)	To be submitted to DCC with the final Test Stage Completion Report
SIT	SIT Scripts mapping to TTM Requirements	
SIT	SIT Scripts mapping to Heatmap	
SIT	Solution Test Issues Log	Available for inspection by DCC throughout test execution
SIT	Solution Test Daily Execution Progress & Issues Reports	
SIT	Solution Test Results	Available for inspection by DCC throughout test execution
SIT	Solution Test 5 Day Ahead Report (sent weekly)	
SIT	Solution Test Completion Reports	
SIT	Quality Gate 4 Review Report	
SIT	SIT Testing Issues Report	Available for inspection by DCC throughout test execution
DCC	SIT Phase Completion Reports	Draft version to be submitted to DCC by DCC System Integrator no later than 10 working days before the planned end of test execution Final version to be submitted to DCC within 5 working days of the completion of test execution
SIT	UAT Plans	
SIT	UAT Test Specifications	
SIT	UAT Daily Execution Schedule	
DCC SI ENV	DCC SI Environments Overview	
DCC SI ENV	DCC SI Environments Plan	
DCC	UAT Completion Reports	

Table 1 - SIT Deliverables

## 6 Test Phase Description

### 6.1 Focus Areas for Systems Integration Testing

#### 6.1.1 Early SIT

Early SIT is an informal Test Stage to allow the DSP to exercise their elements of the Release 2.0 Solution in the SIT –B environment, prior to integration with the CSPs and other SPs. This testing is conducted using the CSP simulator and includes both Release 2.0 functionality and regression testing.

#### 6.1.2 Solution Test

The primary focus of SIT Solution Test will be the integration points of the DCC solution. The approach to Solution Test is described in Section 2.3.

#### 6.1.3 Early Release Regression

Early Release Regression (ERR) will include Regression testing against scope or functionality that is currently in Production, so that if a Change Request needs to exit SIT ahead of the completion of Release 2.0, then this can be tested before SIT Release 2.0 Exit. This will include a selection of regression tests for each CSP. For this purpose, some devices on the SIT environment, will be kept at a firmware version that is on Production. The Tests selected for Early Release Regression, will be selected based on the functionality that will be provided for early release, and will be agreed between DSP, CSPs and DCC and approved by DCC.

#### 6.1.4 End of Cycle Regression

EOC Regression scope will include:

- Operation of the DCC Solution, including high risk functionality, safety critical SR's, I&C, CoS, Prepayment/Credit, GPF, Alerts, OTA, DSMS and ESI.
- Operation of the Service Management system, this will involve multiple interactions between the DSP and CSP systems.
- Testing of the Parse & Correlation solution element.

SIT coverage will be proved using a Test Traceability Matrix (TTM) and the Heatmap Requirements. The TTM sets out which phase of testing will prove that the SEC Requirements and the Testing Baseline Requirements Document are met.

### 6.2 Planning Assumptions

The approach to SIT outlined in this document and the underlying timescales, quality levels and costs are predicated on the principle that all solution elements will be fully PIT tested before they are SIT tested. However, where SP solution elements are introduced into SIT incrementally, each increment will be subject to a Quality Review Gate 3, as described in Section 7.3.

The normal deployment progression, is that a deployment from PIT should enter SIT, and then progress through UIT to Production. In exceptional circumstances, the DCC may opt to alter this, where the risk of not doing SIT is minimal relative to the time and cost associated. The DCC will inform the DCC Systems Integrator in this instance and this will be added to the Entry Criteria. This would normally only be

countenanced where there are no (or very few) integration points between the component in question and the wider DCC Solution.

The approach to exit SIT is that the SIT testing for a Release has met its Exit Criteria, see Section 8.3.2. Where a separate implementation into UIT is required for SBCH, this will be subject to a Quality Gate4, as described in Section 8.4.

### 6.3 De-risking SIT

The following will help de-risk SIT.

- The DCC (DSP and DCC-ITES and DCC-GRIS) will assure Service Provider PIT by:
  - Reviewing SP PIT Approach documents;
  - Reviewing SP System Test Plan and FAT Plan;
  - Reviewing SP Requirements Traceability Matrix
  - Reviewing SP FAT Test Scenarios and data;
  - Reviewing SP Test Completion Reports including
    - Work-Off Plans for System Test and FAT
  - Attending SP Quality Gate Review 2.
- ESI files from PIT will be provided to DCC-E for review before SIT commences (allowing time for any defect fixes to happen).
- Use of the CSP Simulator for the DSP Only stage of SIT execution.
- Sanity and Smoke testing consist of running a small suite of Tests run by the SIT Execution Team to verify that all required SIT components function correctly following any release code deployment to the SIT-B environment.

### 6.4 Device Strategy

SIT Release 2.0 will use Device Emulators for ESME, GSME, GPF, PPMID, HCALCS and IHD.

#### 6.4.1 Certified Equipment – Smart Meters

DCC will conduct Device selection processes should it require the use of Devices as part of SIT, Reference [13].

#### 6.4.2 Certified Equipment – Communications Hubs

SIT will use certified versions of three Communications Hub variants. When improved versions of Communications Hubs become available during a later phase of any SIT testing, they will be introduced in a controlled manner subject to an assessment of the following:

- How thoroughly has the improved Communications Hub been tested by the manufacturer and/or the CSP prior to use.
- What additional confidence will be provided by testing with the improved Communications Hub.
- How much of the testing that has already been completed needs to be repeated to mitigate the risk of regression and create the requisite level of confidence.

Note that this assessment will be carried out by the DSP(SIT) in consultation with the CSPs. Where the DSP(SIT) does not consider that protocol certified Communications Hubs should be introduced into SIT, it will notify the DCC. The DCC will present the assessment to the Secretary of State for determination. (Note: It is not possible for the DCC to exit SIT without protocol certified Communications Hubs unless otherwise directed by the Secretary of State).

Communications Hubs will be “fully-certified” meaning that a Communications Hub has a ZigBee Alliance Assurance Certificate and a CPA Certificate.

Regarding Production Comms Hub firmware versions used for Regression testing (compatibility), Release 2.0 will use the latest versions as agreed with the Communications Service Providers and DSP/Sl. If required a further uplift to the Comms Hub firmware will take place prior to End of Cycle Regression.

#### 6.4.3 Device Risk Mitigation

Device Emulators will be assured for conformance to their stated requirements that DCC have provided to the Emulator Provider. The Device Emulators will be subject to external independent assurance against these requirements.

#### 6.4.4 Risk Mitigation – Certified Communications Hubs

Both CSPs are working closely with their Communications Hubs manufacturers to ensure that protocol certified Communications Hubs are available for and have been tested prior to the start of SIT.

#### 6.4.5 CSP Simulator

The CSP Simulator will receive a variety of Service Request messages output by the DSP Communications Handler and forwarded by the CSP Gateway, interpret those messages and produce an appropriate Service Response. The CSP Simulator will also need to produce Alert messages to be sent to the DSP. SIT will use a subset of Service Requests, Responses and Alerts E.g. Install and Commission, Meter Read.

The CSP Simulator will:

- Authenticate and, where necessary, decrypt the message, involving application of the public keys of the various message senders and the private key of the Smart Meter.
- Interpret the message to determine what sort of response is required.
- For certain messages include specific Test data in a response.
- Build and, where necessary, encrypt the response using appropriate keys and references to enable the DSP system to link the response to the original message.

The CSP Simulator will undergo significant assurance activities through DSP Pre-Integration Testing and Early SIT.

### 6.5 Non-Functional Testing

There is no specific Non-Functional Testing associated to the SIT scope. However, some Non-Functional aspects are tested as part of Functional Testing:

- Security aspects associated to SRT
- Some large messages, for example OTA FW southbound, and SR4.8.1 northbound (note that 'standard' large messages are included in SIT and considered entirely functional)
- Round trip timings of SR's.

#### 6.5.1 Performance Testing

There is no specific Performance Testing in SIT other than recording of 'round trip' timings.

#### 6.5.2 Resilience Testing

Full Resilience Testing in SIT is not feasible in the SIT environment. Instead, the resilience Test results from PIT will be analysed and SPs may be required to undertake additional "stand alone" Resilience testing of their solution elements on their own live-like Test Environment should such environments not have been fully available during PIT.

#### 6.5.3 Security Testing

The main Security Requirements defined in Section G of the SEC (e.g. recording system activity in event logs, detecting anomalous events) will be tested in PIT for those events which can be attributed to the SP solution in isolation. Any events that are relevant to the integrated DCC solution will be tested in SIT.

### 6.6 Automation

Wherever possible, automated testing will be used. Automation will use the toolsets that were used in previous releases. SIT will also look at expanding the scope of automation wherever feasible.

### 6.7 Sanity Testing

Prior to the start of Test execution each day, a subset of SR's will be run to verify the Test Environment is stable and functioning as expected. This suite of tests is fully automated.

### 6.8 Regression Testing

There will be two types of regression testing undertaken as part of the Release: ERR (Early Release Regression) and EOC (End of Cycle) Regression.

#### 6.8.1 Early Release Regression

Early Release Regression (ERR) testing which will allow for early individual implementations of Change Requests across releases ahead of the full Release 2.0 deployment. If required, ERR will require Release 2.0 functionality to be 'switched off' to allow testing of Change Request(s) to be deployed prior to Release 2.0.

#### 6.8.2 Early Release Regression

EOC Regression will occur after SIT testing is complete and will usually comprise two run cycles, the first to flush out any issues and the second as a clean run. Specific regression criteria to be defined in the individual STP for the relevant Change Request.

The scope of EOC Regression will include SBCH and DBCH as appropriate.

The DSP will develop a full EOC Regression Test Pack, building upon / extending the existing Regression Test Pack from previous Releases.

## 7 Test Method

### 7.1 Test Scenarios

SIT will be undertaken using Test Scenarios.

The Test Scenarios will cover the functionality being delivered for the Release and are derived from a set of design documents that are 'baselined' for each Release. The 'baselined' versions of Functional Specifications (FS) and Interface Specifications (IS) documents, which form the Test basis for SIT, are controlled by DAB (Design Authority Baselines).

The Test Scenarios in scope will be linked to TTM Requirements in ALM and the scope of Tests in ALM agreed with DCC, using the Heatmap, prior to QG3.

The scenarios cover both functional and non-functional aspects of the dynamic interaction between solution elements spanning SP boundaries and are based on:

- the DSP contracted Requirements;
- the Service Request Catalogue;
- the DSP PIT Test Approach documents ([6], [5], [4]);

The following key information is recorded for each Test Scenario:

- Description
- Responsibility for developing
- Type (Normal, Exception, Alternative)
- Verification method
- Final Test with Certified Communications Hub
- Final Test with Certified Smart Meter (if available)
- Mode of operation
- Test variations
- Pre-requisites
- Comments
- Command Variants/Test Condition

The Test Scenarios will ensure that the Service Requests are validated for correctness and consistency of content, alongside the correctness of the formatting.

The full list and details of Test Scenarios for SIT can be found in the System Integration Test Scenarios document (see Reference [11]).

## 7.2 Test Data

Test data will be designed to support the SIT Scenarios, and all Test data used in SIT will comply with the UK Data Protection Act. The Test data required for each Release will build upon the Test data from previous Releases. There will be regular housekeeping of the data, including the removal of corrupt and inconsistent data that prevent devices from working. For further detail regarding Test data refer to the 'SIT Business Test Data Plan' document (see Reference [22]).

Test Data Requirements are summarised as follows:

- Static Data (Infrastructure and Business Reference Data) - This will be updated in line with Business Test Data [22].
- Data created by the Registration Process - This Registration data was originally loaded into SIT-A by Xserve and St Clements Services Ltd.
- Data created by Key Generation - This is data that is created by the creation of organisational and device certificates which are loaded initially to the SMKI repository and subsequently to the DSP key repository. Refer [14] for further information.
- CPL data for EOC Regression devices will be loaded via the CPL upload file.
- Data created by Communications Hub Notification - This is data loaded via the CSP Management Interface notifying details of CHs which are active on the network and which is a prerequisite for the Install and Commission process in EOC Regression.
- Data created by Supporting Service Requests.
- Data created by Service Responses and Alerts - This data is received back from the CSP simulator in response to the Service Request and Alerts.
- DSMS - Service Management Data - This includes Foundation Data as setup within Remedy and transaction data as generated by operation of the system and end to end data as generated as part of the CH Lifecycle.

It will be the responsibility of the DCC SI representative within each Expert Group to check the integrity of the input/pre-requisite data prior to the Test execution commencing.

### 7.2.1 DCC Enterprise

Static data to be loaded into the DCC Enterprise environment includes details of the customers, i.e. the participating energy companies, their service lines and products. This data should be as realistic as possible.

### 7.2.2 Service User Simulator

The Service Users' systems are not being tested as part of SIT and will be replaced by a Service User Simulator (SUS). The SUS will be situated on the same LAN as the DCC Gateway Connection from the Service Users and will interface with the DCC User Gateway. This approximates as closely as possible messages coming from Service

Users. For R2.0 onwards, the SUS will provide a decryption capability of the sensitive SRs. The SUS is extensively regression tested during Early SIT.

### 7.3 Requirements Traceability

The SP's will use their own tools to manage their Requirements and demonstrate traceability to both the Solution Design and the Pre-Integration Tests. The SP's will provide the DCC Licensee with a PIT Requirements Traceability Matrix (RTM), extracted from these separate tools.

The Test coverage of SIT will be mapped against the Test Traceability Matrix (TTM). DSP SIT will create the TTM for any new or changed SEC requirements and will provide the status and progress on the mapping and coverage to the DCC

The mapping of Requirements to Test Scenario's using the TTM's is carried out by the SIT TDA team. Each of the SIT specific TTM Requirements are loaded to the Requirements Tab of ALM and are then also mapped to the Test Scripts in ALM. This mapping is also maintained by the SIT TDA team. TTM Requirements are linked to Tests, prior to Test execution.

As Test execution proceeds the coverage progress of the SIT specific TTM Requirements will be reported on in a weekly coverage report from HP ALM. In addition, there is a governance process involving SI, DCC and BEIS for the TTM described in Appendix 15.7.

In addition to the TTM, there will be a Heatmap for the Release, which is generated by the SIT Team and agreed by the DCC. The Heatmap will define Test Conditions in context of functional areas, sequencing and RBT criteria. These Test Conditions will also map to Scenarios and Test Scripts.

### 7.4 Test Preparation

Test Sets for execution will be made ready in the Test Lab. Test data (pre-requisite, XML, etc.) will be made available at least one day in advance of commencing the associated test(s). The SIT Team responsible for the Test Step will check the Test Script and Test data ahead of execution.

### 7.5 Test Readiness

ST and UAT Readiness will be tracked and reported against the Entry Gate Criteria Checklist which will be presented at Release Boards by the DCC SI Team. The contents of this report are summarized in [1].

### 7.6 Test Execution

Quality Gate (Reference [24]) will review that the exit criteria for the relevant SPs FAT have been met, the entry criteria for SIT have been met and that execution of ST can now commence.

The SIT Team will create the daily Test Schedules from the Test Scripts in ALM and will be responsible for ensuring that SIT Execution occurs to plan.

It is assumed that the Test execution will be performed by SIT Teams supported by Expert People, and this is described in Section 11.2.1.

#### 7.6.1 Suspension and Resumption Criteria

The decision to suspend or resume Tests will be part of the SIT Team/Expert Group, but any such decision must be notified to the SIT Execution manager and the SIT manager so that the status of Test deliverables is known all the time.

##### **Suspension criteria**

A Test or Testing may be suspended under the following circumstances:

- Hardware or environmental problems hinder the completion of a Test/Test cycle
- A critical Test Issue has been identified which prevents continuation.

##### **Resumption criteria**

A Test or Testing may be resumed under the following circumstances and subject to Test Participant agreement:

- Hardware or environmental communication problems have been resolved
- All agreed critical Test Issues affecting the suspended Test/Test cycle have been fixed
- Where a Test Issue remains, which will require substantial effort to resolve, but a mutually agreed workaround has been proposed and accepted which would allow testing to resume.

## 8 Test Procedure

### 8.1 Test Stages

There are two Test stages in SIT:

- Solution Test.
- User Acceptance Test.

#### 8.1.1 Solution Test

The testing described in Section 6 above will take place in the Solution Test stage.

#### 8.1.2 UAT (Service Provider)

The purpose of the SP User Acceptance Test stage is to allow the DCC to witness an agreed subset of the Tests carried out in the Solution Test stage as part of its overall Acceptance Activities. This subset of Tests will be described in the UAT Test Plans. By default, the DCC Test Assurance Team will witness the selected tests when first executed, though by exception and where agreed with DCC, test execution can be repeated for UAT.

Giving at least 10 working days' notice, the DSP(SIT) will provide the DCC with a schedule of when and where these Tests will be executed and invite the DCC Licensee to witness onsite at Reading.

Execution of the agreed set of Tests will be managed by the SIT Manager and performed by the relevant Test Analyst, and there will be:

- No deviation from the scripts (e.g. in response to "what if" questions raised by witnesses);
- No hands-on execution by witnesses.

Test Issues raised during witnessing will be entered into HP ALM and progressed through the Test Issue Management process (see Section 9).

As far as possible, any queries and issues arising during the witnessing period will be addressed at the time with the relevant subject matter experts. A wash-up session will be convened at the end of the witnessing period to discuss the outcome of the witnessing and to agree any outstanding queries and issues.

#### 8.1.3 High Level Plan

The SIT Level4 Plan will be the framework of Release 2.0 Test execution and this plan will form part of the overall Integrated Project Plan, maintained by the DCC Systems Integrator and the DCC.

Refer to the Integrated Solution Delivery Plan [10].

### 8.2 Test Analysis

The Level4 Plan will identify testing against virtual device sets, (refer to section 2.4) and the SIT Team who will own the Tests.

The SIT (ST and UAT) Tests will be housed in an ALM project for that Release.

The ALM structure will allow for Functional and Regression Tests to be separated for reporting purposes.

Any changes to the ALM structure after the SIT Entry Gate, will be subject to Change Control.

Test Scripts to be loaded into ALM two weeks ahead of SIT Execution Start Date.

#### 8.2.1 Test Scripts

The Test Plan Module in ALM, which holds all the Test Scripts, will be divided into three parts as follows:

1. Core common pre-steps
2. Variants for Test Conditions
3. Core common post-steps

Test Scripts will be constructed in the ALM Test Plan module using reusable components as part of the 'variant' – these will be the variables associated to the core script such as command variant, user role, mode of operation and payment method. This will help to minimise tester errors at Test execution stage.

The ALM Test Plan folder structure is represented as follows:

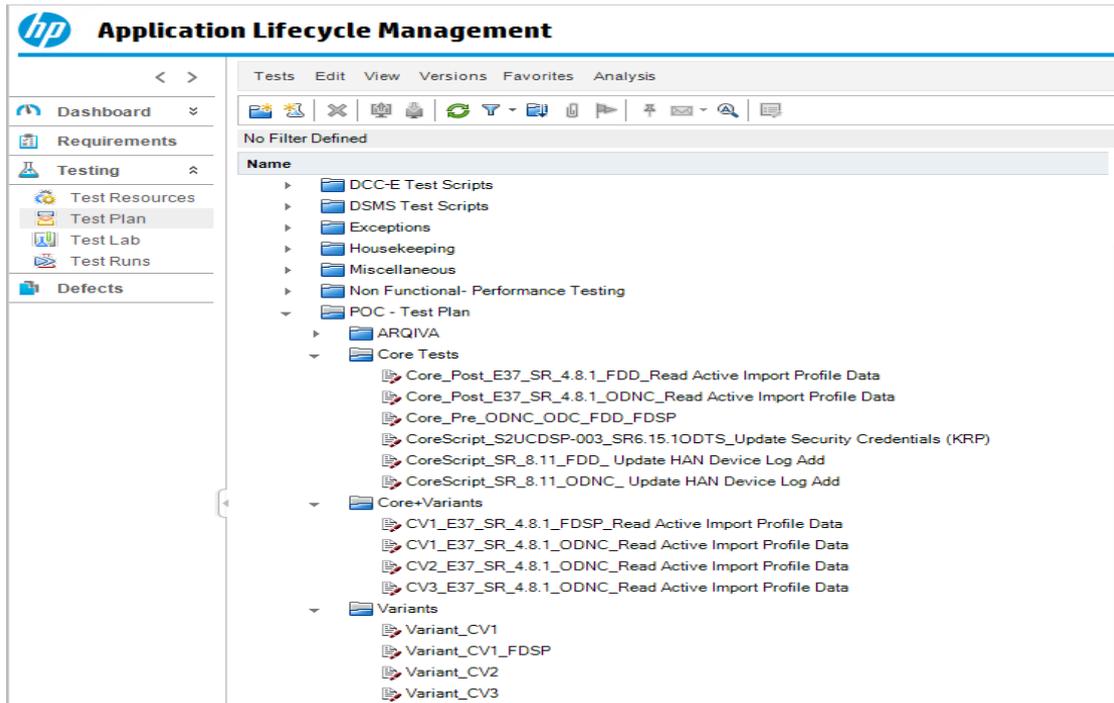


Figure 4: ALM Test Plan Folder Structure

Test Scripts, which will provide step-by-step instructions on how to set up, execute and validate the Test will be developed for each of the scenarios.

The mandated Test Script information is:

- Sub SR
- Component
- Service Request
- Test ID
- Test Name
- CHF
- Functional Module
- Meter
- Functional Area /Sub-Area
- Command Variants
- Modes of Operations
- User Role Tested
- Communications Hubs
- Payment Mode
- UAT
- ESME Use Cases
- GSME Use Cases
- CHF Use Cases
- Test Scenario
- Status

It is expected that all relevant information is recorded in the Test Scripts and it is the responsibility of the SIT Team to ensure this happens. The SIT Team will check all

relevant information is contained in a Test Script prior to execution. Only those Test Scripts with a status of 'DCC Approved' in ALM Test Plan will be used as part of Test Execution in Test Lab.

Script Header Item	Description
Unique reference number and title	Derived from the Test Reference in the scenario spreadsheet
Objective	Objective of the test
Reference to the part of the specification defining the expected behaviour of the system	Derived from the Test reference in the Scenario spreadsheet
Prerequisites	Derived from the Pre-Requisites in the Scenario spreadsheet
Storyline	Derived from the Scenario description in the Scenario spreadsheet

**Table 2 - Test Script Header Information**

Script Step Item	Description
Step number	Sequence number
Action required	Detailed instructions e.g. of data to be entered
Expected result	Derived from "verified by" in the scenario spreadsheet

**Table 3 - Test Script Step Information**

The Test Scripts will be written with the intention that they contain sufficient detail to enable any Test Analyst to run the Test and check the expected results. The Scripts will be subject to a quality review before Test execution starts and quality checks will continue during execution to ensure the quality of the Test completion and supporting evidence.

A library of Test Scripts will exist in Test Plan in HP ALM that cover all of the Test Conditions. Each time a Test Script is run, the following information will be recorded in Test Lab:

- Date of execution
- Name of person executing the Test
- Test Instance Id
- Test data used
- Outcome for each step, this will be documented so that it is meaningful information
- Supporting evidence e.g. log files
- Test Step result
- Overall Test Result

The Test Lab folder structure will be to three folder levels only: Release n.n -> Functional (or Supporting SRs) -> Change Request.

The ALM Test Lab folder structure is represented as follows:

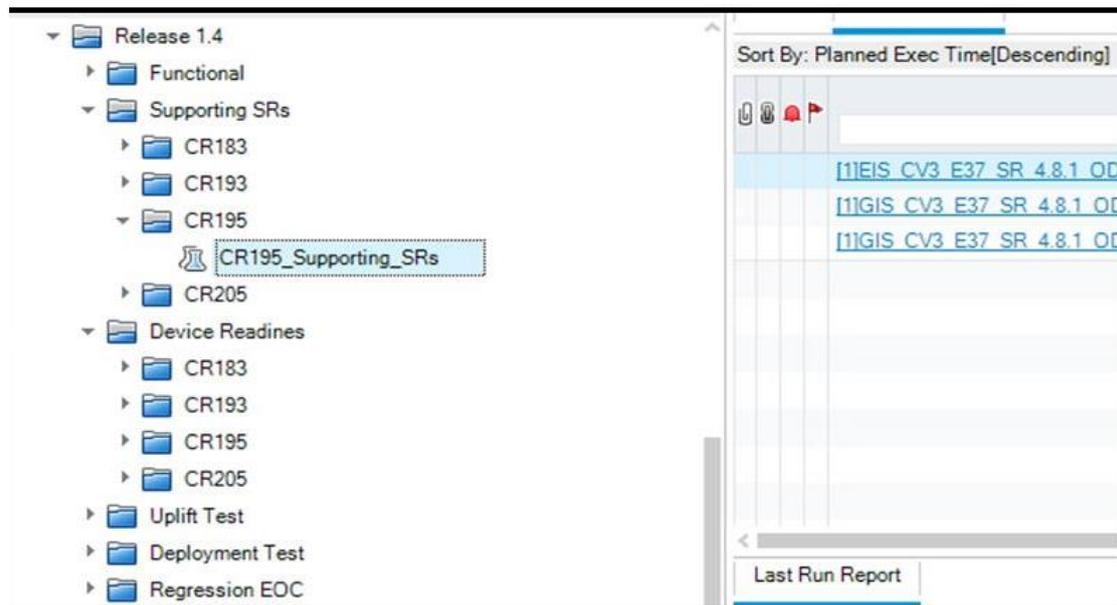


Figure 5: ALM Test Lab Folder Structure

A Testing Issue will be logged in HP ALM for each case where the actual result does not match the expected result and this will be recorded against the individual Test step that has failed. It is assumed that the SIT Testing Team will determine the impact of failures across other Tests it is responsible for and where necessary block other Tests from execution. When a defect is raised in ALM, the defect numbers will be unique across releases. A testing issue can also be created by SIT and service providers when solution behaviour is seen that does not match documented expectations.

Full details of the ALM re-structure can be found in Appendix 15.6.

For details of the DCC SI Defect Management process, refer to [20].

For a full list of attributes set up in ALM for Requirements, Test Plan and Test Lab refer to the ALM Data Model in Appendix 15.5.

## 8.3 Entry & Exit Criteria

The following Entry and Exit criteria apply for Release 2.0:

### 8.3.1 Entry Criteria

Note that any SIT Entry criteria not fully satisfied at SIT Entry will be monitored as SIT Exit criteria.

REF	Area	Entry Criteria	Success
SIT.EN.1	SP Readiness (DSP/DCC-E Only)	Exit criteria from PIT has been achieved and agreed	Functionality to be delivered from PIT has successfully passed TAB. DCC SI has assessed known defects from PIT and confirmed no material impact on ability to execute ST.
SIT.EN.2	SP Readiness (All SP's/DCC-E)	Able to support SIT testing - Resources - Devices - Triage Support - Expert People - Environment Support	Resources / Devices / Support available for SIT
SIT.EN.3	Environment Readiness	SIT-B available and TRT [12] on SIT-B, including test tools and stubs (e.g. SUS, CSP and Device Emulators)	Has been successfully completed
SIT.EN.4	Environment Readiness	Upgrade Testing	Has been successfully completed
SIT.EN.5	Certificate Readiness	Certificate requirements are understood and any CSRs raised	CSRs raised
SIT.EN.6	Certificate Readiness	Certificates are valid for the entirety of SIT	Confirmation of certificate expiry date
SIT.EN.7	Certificate / Keys Readiness	Each organisation has all required public keys to verify files received	Available
SIT.EN.8	DCC Readiness	Heatmap Requirements	Provided ahead of Entry Gate – (see below)
SIT.EN.9	DCC Readiness	Reporting Requirements	Provided ahead of Entry Gate (see below)
SIT.EN.10	DCC Readiness	Release Management Support Test Assurance UAT Witnesses Expert Support	Available
SIT.EN.11	SIT Readiness	Test Scenarios	Reviewed and Signed Off DCC and DSP Only need to sign off the Test Scenarios
SIT.EN.12	SIT Readiness	Test Scripts	Reviewed and Signed Off DCC and DSP Only need to sign off the Test Scripts
SIT.EN.13	SIT Readiness	Test Scripts mapped to TTM	Reviewed and Signed Off DCC to sign off
SIT.EN.14	SIT Readiness	Test Scripts mapped to Heatmap	Reviewed and Signed Off DCC to sign off

SIT.EN.15	SIT Readiness	SIT Approach	Reviewed and Signed Off DCC and SPs to sign off
SIT.EN.16	SIT Readiness	STP	Reviewed and Signed Off DCC and SPs to sign off
SIT.EN.17	SIT Readiness	L4 Plan including Mid-Level Schedule	Reviewed and Signed Off DCC and DSP to sign off
SIT.EN.18	SIT Readiness	ALM Project(s)	Structured and Available
SIT.EN.19	SIT Readiness	Test Scripts loaded into ALM	Planned execution dates / criteria for reporting complete
SIT.EN.20	SIT Readiness	Reporting Requirements implemented and report structures available	SIT reports available
SIT.EN.21	SIT Readiness	Testing Support - Triage Support - Release Management Support - Test Management / Governance Support	Available
SIT.EN.22	Device Readiness	CSP CH's on SIT-B	Available for each CH variant
SIT.EN.23	Device Readiness	Smart Meter Emulators (for ESME, GSME, ESME Twin, E3Phmeter, IHD, PPMID & HCALCs) PPMID /IHD/HHT real devices if required by DCC)	Available
SIT.EN.24	Device Readiness	Independent Emulator Assurance	Independent Assurance report agreed and signed off by DCC for SiLabs emulator Note that for CSP-N SIT this exercise will complete after commencement of SIT the assurance will be complete prior to commencement for CSP-C/S. Independent Assurance will also take place for the NXP which will be introduced during SIT
SIT.EN.25	Define SIT Exit	Determine if Iterative or full exit is required	This is defined in the SVTAD and SITAD
SIT.EN.26	Define SIT Exit	Agreed the progression route for the SBCH and DBCH Releases	This is defined in the SVTAD and SITAD
SIT.EN.27	Define SIT Exit	Agreed the defect mask for individual SBCH and DBCH Releases	This is defined in the SVTAD and SITAD
SIT.EN.28	Define SIT Exit	Agreed the work-off period for SBCH and DBCH	This is defined in the SVTAD and SITAD

Table 4 - SIT Entry Criteria

### 8.3.2 Exit Criteria

Exit criteria will be at Release level (separate for SBCH and DBCH) as defined by entry criteria.

#	Exit Criteria	Success
SIT.EX.1	Functional SIT	Successful completion will be 100% of planned Tests, as part of Functional testing, have been executed, with an 85% pass rate. This will apply to all SIT tests other than the defined set covered within Exit Criteria 2 below relating to Regression.
SIT.EX.2	SIT Regression	Successful completion will be 100% of planned Tests, as part of Regression testing, have been executed, with an 100% pass rate. For the purposes of this exit criterion Regression Testing is as defined in Section 2.3.12 Regression Testing Exit Criteria
SIT.EX.3	Tests associated to the Release Scope and the EOC Regression listed in the Test Specification have been executed, or any exceptions documented and agreed with the DCC Licensee, and reported to the SEC Panel	Successful completion will be 100% of planned Tests, have been executed, with an 85% pass rate. (Regression as per above) Pre-Requisite Tests will not be counted in the execution statistics
SIT.EX.4	The levels of Test Issues for each Test Participant deemed to have exited is within the thresholds defined in SVTAD and SITAD	Agreed Defect Mask per R2.0 Testing Approach Document and applied per SP/Region
SIT.EX.5	Defects applicable to the Emulators themselves, are not included in the defect thresholds above. All Tests must pass against either an Emulator or the CSP Simulator	Reviewed and Signed Off
SIT.EX.6	Test results have been documented and evidence captured	Present in ALM
SIT.EX.7	A complete set of Test Issue logs have been produced	Present in ALM
SIT.EX.8	Full Test traceability as defined in the TTM has been fulfilled and proven via HP ALM generated reports demonstrating TTM coverage	Generated as Coverage Report
SIT.EX.9	Full Test traceability to the Heatmap	Test Assurance Reconciliation report to Heatmap
SIT.EX.10	The ST Stage Completion Report has been issued to the DCC Licensee and achieved TAB approval	TAB Approval
SIT.EX.11	A Test Stage Completion Certificate for the Solution Test Stage has been issued by the DCC Licensee and a Test assurance recommendation passed to TAB	Test Stage Certificate for SIT

Table 5 - SIT Exit Criteria

## 8.4 Quality Gates

A series of Quality Gate Reviews will be held between Test Stages within the PIT and SIT Phase, to confirm that the Exit Criteria of the preceding Test Stage and the Entry Criteria of the upcoming Test Stage have been met.

The following table describes these Quality Gate Reviews, and Quality Gate 3 is the Entry into SIT, and Quality Gates 4 and 5 are the Exit from SIT:

No.	Quality Gate Review	Chair	Approver	Attendees
1a	Between CSP Link and System Test	CSP	CSP	DCC Licensee
1b	Between DSP Link and System Test	DSP	DSP	DCC Licensee
1c	Between DCC Enterprise Link and System Test	DCC Enterprise	DCC Enterprise	DCC Licensee
2a	Between DSP System Test and FAT	DSP	DSP	DCC Licensee
2b	Between DCC Enterprise System Test and FAT	DCC Enterprise	DCC Enterprise	DSP, DCC Licensee
3	Between FAT and Solution Test	DSP	DCC Licensee	SPs
4	Between Solution Test and Service Provider UAT	DSP	DSP	SPs, DCC Licensee
5	Between Solution Test and Interface Test	DSP	DCC Licensee	SPs
6	Between OAT and go-live	DCC Licensee	DCC Licensee	SPs
7	Between TSP PIT and SRT Part 1	DSP	DSP	DCC Licensee, TSP
8	On completion of SIT	DCC Licensee	DCC Licensee	SPs

**Table 6 - Quality Gate Reviews**

The “Approver” of each Quality Gate Review Meeting will set the outcome as one of the following:

- Preceding Test Stage can close, upcoming Test Stage can start, only minor (if any) remedial actions required.
- Preceding Test Stage cannot close until remedial actions have been completed, upcoming Test Stage can start.
- Preceding Test Stage can close, upcoming Test Stage cannot start until remedial actions have been completed.
- Preceding Test Stage cannot close, upcoming Test Stage cannot start, until remedial actions have been completed.

The DCC Systems Integrator and the SIT Team will attend each SP’s Quality Gate 2.

Quality Gate Review 3 also covers the Exit of the PIT Phase and the Entry of the SIT Phase.

Quality Gate 4 will not be required as UAT is conducted in parallel to Solution Testing. However, UAT Entry Criteria need to be met at Quality Gate 3.

Quality Gate 5 covers the Exit of the SIT Phase and the Entry of the User Integration Phase.

Each Quality Gate Review meeting will be a short, checklist-driven event at which previously assembled and validated evidence relating to the Exit and Entry Criteria is

considered and decisions made to close the current Test Stage and start the next Test Stage. It is expected that Quality Gate Review meetings will be dry-run to enable issues to be identified and resolved in a timely manner, and thereby avoid impacting the start date for the upcoming Test Stage.

To facilitate the operation of Quality Gate Reviews and the timely achievement of Test Stage Entry Criteria within SIT, the SIT Team will publish weekly Test Readiness Reports for the Solution Test Stage and UAT Test Stage as described in the Joint Test Strategy.

The current Test Stage/Phase will complete (and achieve its Milestone) on attainment of its Exit Criteria for the Release (separate for SBCH and DBCH). The next Stage/Phase will commence (and achieve its Milestone) on attainment of its Entry Criteria for the Release (separate for SBCH and DBCH). The Quality Gate Review meeting will take place during the transition from the current to the next Test Stage/Phase.

When the SBCH Release exit the Test Phase (into UIT) the Upgrade Test Completion Report results will be included.

## 8.5 Test Issue Defect Mask

The following table lists the target thresholds for outstanding test issues.

Test Issue Severity	DSP	CSP N	CSP C/S	Other DCC SPs
1	0	0	0	0
2	0	0	0	0
3	15	15	15	15
4	30	30	30	30
5	60	60	60	60

Note that:

- The defect mask includes any security defects
- the Test Assurance Board, including industry representatives, may judge that the next Test Phase can start even if the target thresholds set in the Exit Criteria for the Test Phase Plan have not been achieved, provided that an agreed work off plan is in place

- If the Test Assurance Board, including industry representatives, believes that an exception for a Severity 2 issue at SIT exit should be considered, DCC will request an ex-committee review by the SEC Panel before confirming SIT exit

## 8.6 Work-Off Plans

The Work-Off Plan will be produced at SIT Solution Testing Complete for the Release at the end of the Solution Test Stage, detailing the defects that are outstanding and the plan for resolving them. The level of defects for each Service Provider must fall within thresholds agreed for the Release level with the DCC (separate for SBCH and DBCH).

Each Service Provider must resolve all the items within the work off plan within the following timescales;

- For Severity 3 defects, within 20 Working Days from the Quality Gate meeting
- For Severity 4 defects, within 40 Working Days from the Quality Gate meeting
- For Severity 5 defects, within 60 Working Days from the Quality Gate meeting

If the Work-Off Plan is not achieved, the Service Provider/Registration Data Provider will produce and agree a Correction Plan with the DCC.

Where SP UAT is run in parallel with Solution Test, the ST defect mask will apply to both stages as one.

Where SP UAT is run after Solution Test, there will be a separate UAT defect mask as agreed with the DCC. This can result in a separate UAT Work-Off Plan being generated.

## 9 Test Result Management & Reporting

### 9.1 Tracking

HP's ALM Test Management tool will be used to manage SIT testing and SIT Test Issues. The DSP(SIT) will establish, maintain and support a shared instance of this tool for local and remote use by SPs in support of SIT preparation and execution activities.

HP ALM will be used to maintain:

- Requirements
- Test Traceability Matrix (TTM)
- Test Scripts
- Execution details of each Test Script (e.g. when run, by whom)
- Evidence of system behaviour (e.g. screen shot, log file) observed during execution
- The result of execution (pass, fail)
- Defects raised for failed Tests (which will be linked to the failed Tests)

Please see Reference [19] for the design and use of HP ALM.

The outcome of each Test execution will be recorded by the testers as part of the SIT Team. In addition, the step-by-step execution results will be recorded in Test Lab within the ALM Project.

Test evidence will be taken of the actual result (e.g. screen shots, SQL results and stub log results) for each execution of the test.

A random sample of Test results will be checked by Test Leads / Test Managers for correctness of data against the intended scope and outcome of the Test.

Where Test Issues are found when the expected result criterion is not met, they will be recorded in HP ALM along with evidence of the Test Issues. When Test Issues are retested the evidence of the successful result will be recorded in HP ALM before closure of the Test Issue. The Test Issue process is described in the DCC Test Issue Resolution Process [20].

All Test steps will be attempted, i.e. the Test is not stopped at a failed step unless the failure renders the remaining Test steps to be non-executable.

The outcome of a Test is deemed to have failed if any of the steps within it fail with a Test Issue (excluding cosmetic issues). Tests can fail for observations such as Test Script errors, and these will be reported as a TDA defect. Any other Tests related to the failed Test will have a status of 'blocked' and will be linked to the original defect.

If, during Test execution, any Test Scripts or Test Step is not deemed relevant, the Test (or Test Step) will be marked as 'Not applicable'.

## 9.2 Reporting

Data held in HP ALM will be used to populate the following reports sent to the DCC

- Daily Test execution reports
- Weekly Test execution reports
- Test Completion reports

Significant Test failures (Severity 1 or 2) will be notified to the DCC once they have been confirmed.

The actual specification and frequency of these reports will be agreed with the DCC for the Release.

### 9.2.1 ALM Reports

The DCC will provide the SEC Panel and the Secretary of State with a copy of the weekly Test Execution Reports for information, with details of any Test Issues anonymised and redacted as required in accordance with Section H14.44 of SEC 4.2 [2].

The following table lists the reports that are generated out of ALM by SIT.

Name of the Report / Export	Description	Frequency Run
DCC SIT WEEKLY REPORT	Report produced for DCC, providing stats on Defects, Requirements and Test Execution (see Appendix 9)	Weekly
DAILY STATUS REPORT	Daily status report (see Appendix 9) providing a Glide Path, Execution Summary Stats for the Release, Defect Summary stats plus an historic view of open defects.	Daily
DAILY TEST ISSUE EXTRACT	ALM Extract reporting on all Defects	Daily
RUN EXECUTION EXTRACT	ALM Extract reporting on SIT Test Runs	Daily
REQUIREMENTS EXTRACT	ALM Extract reporting on ALM Requirements Coverage	Weekly

**Table 7 - SIT Test Reports**

To support the reporting defined in the table above, both the Status Report and the Test Issue Extract report will be run Monday to Friday.

### 9.2.2 Test Stage Completion Report

At the end of each Test Stage, the DSP(SIT) will provide the DCC Licensee with a Test Completion Report. Ten working days before the planned end of Test execution a draft version of the Test Stage Completion Report will be submitted to the DCC Licensee. This will contain a summary of the Test status to that date. The contents of

the report are listed in the Testing Approach Document for R2.0[13] [1]. The final version of the document will be submitted on completion of Test execution.

## 10 Testing Issue Management

### 10.1 Logging and triage of Testing Issues

All Testing Issues relating to the DCC solution will be logged in HP ALM by the person executing the test, against the relevant Test step at the time each issue is identified, complete with all mandated and relevant data associated to the testing issue. Full details will be recorded in HP ALM to enable speedy resolution. New Testing Issues will be reviewed at least daily by the Defect Test Manager, who will:

- Classify them as one of:
  - Testing Issue:
    - that prevents execution of a Test or
    - that causes an unexplained or unexpected outcome or response to a test
  - Not a Testing Issue (e.g. a misunderstanding)
  - Duplicate
  - Change
  - Need more information
- Set their Severity and Priority (see Section 10.2 below for definitions)
- Assign the Testing issue to the relevant resolver group. Should this lie outside the SP's organisation, the Test Issue will be assigned to the DSP Test Issue Manager.

### 10.2 Testing Issue Severities and Priorities

The following table lists the standard Testing Issue Severities:

Issue Severity	Description
1	<p>An Issue which:</p> <ul style="list-style-type: none"><li>• prevents a DCC User or large group of DCC Users from using the DCC User Systems;</li><li>• has a critical adverse impact on the activities of the DCC Services or Users;</li><li>• could cause significant financial loss and/or disruption to the DCC services or DCC Users; or</li><li>• results in any material loss or corruption of Data.</li></ul> <p>Non-exhaustive examples:</p> <ul style="list-style-type: none"><li>• An Issue leading to Non-availability of the DCC Data Services;</li><li>• An Issue leading to Non-availability of the CSP Core solution element(s).</li></ul>

Issue Severity	Description
2	<p>An Issue which:</p> <ul style="list-style-type: none"> <li>• has a major (but not critical) adverse impact on the activities of the DCC but the service is still working at a reduced capacity; or</li> <li>• causes limited financial loss and/or disruption to the DCC Services or Users</li> </ul> <p>Non-exhaustive examples:</p> <ul style="list-style-type: none"> <li>• An Issue leading to Non-availability of the Network Management Centre;</li> <li>• An Issue leading to loss of resilience of the SMWAN Gateway;</li> <li>• Large areas of functionality will not be able to be tested.</li> </ul>
3	<p>An Issue which:</p> <ul style="list-style-type: none"> <li>• has a major adverse impact on the activities of the DCC but which can be reduced to a moderate adverse impact through a work around; or</li> <li>• has a moderate adverse impact on the activities of the DCC Services or Users.</li> </ul>
4	<p>An Issue which:</p> <ul style="list-style-type: none"> <li>• has a minor adverse impact on the activities of the DCC or DCC Users.</li> </ul> <p>Non-exhaustive examples:</p> <ul style="list-style-type: none"> <li>• Minor service interruptions in the business process or functionality of the DCC Systems and / or service.</li> </ul>
5	<p>An Issue which:</p> <ul style="list-style-type: none"> <li>• has minimal impact to the activities of the DCC or DCC Users.</li> </ul> <p>Non-exhaustive examples</p> <ul style="list-style-type: none"> <li>• Trivial issues with workarounds which are noted for future releases but minimal impact of running existing services.</li> </ul>

**Table 8 - Testing Issue Severities**

The following table lists the standard Testing Issue Priorities:

Issue Priority	Description
1	<p>Has a severe impact on testing. Must be fixed immediately.</p> <p>A critical set of functionality scoped to be tested cannot be completed and needs this issue fixed before testing can continue.</p>
2	<p>Has a major impact on testing. Should be fixed within a day of the issue being logged.</p> <p>A major set of functionality can only be tested by use of a complicated workaround which is slowing down test progress.</p>
3	<p>Has a medium impact on testing. The issue could be fixed before release of the current version is in development.</p>

Issue Priority	Description
	Incident affects pass success on some tests but the issue can be by-passed for other tests by means of a simple workaround.
4	Has a minor impact on testing. The issue would be fixed if there is time, but it could be deferred until another build release.  The issue is normally cosmetic in nature and does not affect the key delivery of the business requirements.

Table 9 - Testing Issue Priorities

### 10.3 Resolution of Test Issues

The SIT Issue Manager will:

- Regularly review all outstanding Testing Issues to ensure that they are resolved at the requisite speed.
- Agree with the relevant SP Test Managers the defect fixes to be included in each Release to the SIT environment.
- Report progress directly to stakeholders.

Target response times for Testing Issues are documented in the Joint Test Strategy, Reference [1].

### 10.4 Assurance and Disputes

#### 10.4.1 Assurance

The SI Defect Management Review Meeting, comprising of the Defect Manager, System Test/UIT Managers/Lead, DCC, Fix Organisation Leads e.g. (DSP, Arqiva, Telefonica, Fusion), CGI Service Management, Critical Software, SI Triage, SI Release Management, and chaired by the Defect Manager, will meet daily (and on demand for urgent Testing Issues which are delaying testing) to:

- Resolve cases where the ownership of a Testing Issue is disputed;
- Confirm, by a process of sampling, that Testing Issues are being given the correct Severity by the local triage process; and
- Confirm, by a process of sampling, that Priority 1 and 2 defects are being resolved at the requisite speed.

#### 10.4.2 DCC Dispute

The severity of unresolved Testing Issues will be agreed with the DCC. When disputed severities are not resolved in the first instance with SI Defect Management, the Issue Resolution Procedure, as defined in the SEC, will be followed. This process can occur at any given time during the execution process.

## 10.5 Reporting of Testing Issues

Information on the status of Testing Issues will be reported by the SIT Issue Manager to the DCC Licensee daily.

DCC will report information regarding Testing Issues that have the potential to impact testing undertaken by Testing Participant during UIT, or later stages.

## 10.6 Testing Issue Management Process

The detailed Testing Issue Management process is documented in Reference [20].

Defect reporting will be on the severity of defects into 4 'hops' as shown in the following diagram:

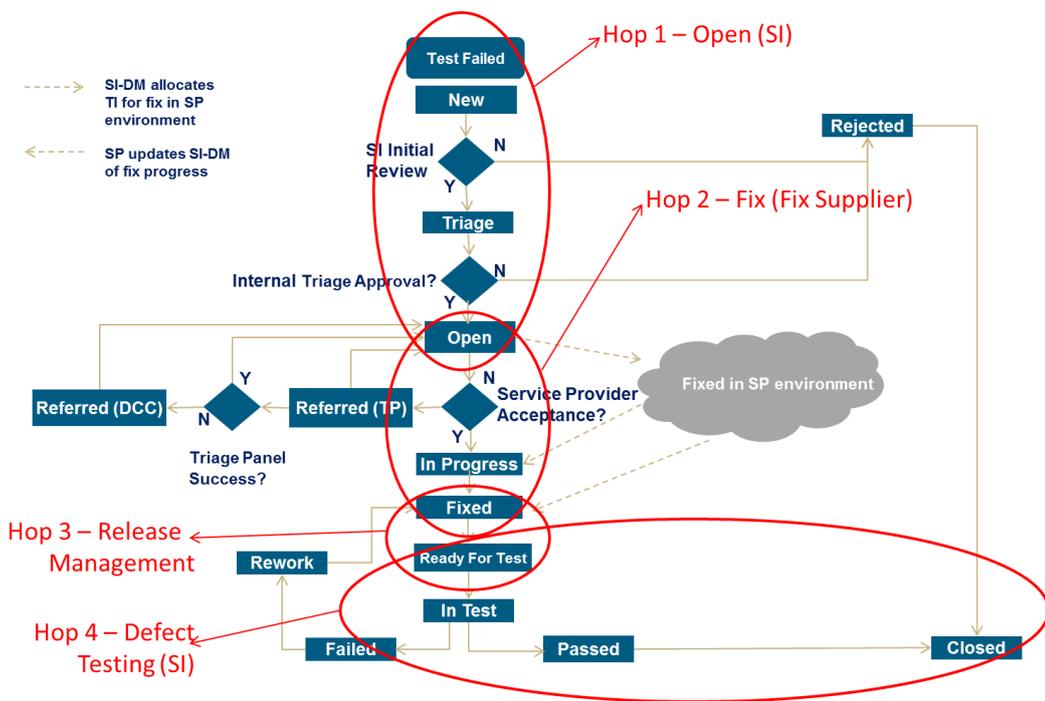


Figure 6: Defect 'Hop' Definitions

- **Hop 1 – Open:** The initial creating of a testing issue until it is passed on to a fixing organisation is entirely delivered by SIT, although separate teams are involved
- **Hop 2 – Fix:** This will be measured from the point the testing issue is passed on to a fix organisation to when the defect is confirmed as fixed and on a release
- **Hop 3 – Release Management:** Once a testing issue is on a release, we would expect this time to be varied based on where testing issue fixes are required. For example, it maybe that we delay certain fixes for tactical programme reasons. This hop is measured from when the issue is confirmed as fixed and on a release to when it is deployed on an SIT environment

- **Hop 4 – Defect Testing:** Once a testing issue is available to test on the SIT environment, the hop measures SIT's activities through to closure on ALM (where the fix passes first time).

The Level4 Plan will take into account average 'hop' fix times from previous releases.

Defect Operational Level Indicators based on defect priority is represented as follows:

	Priority 1	Priority 2	Priority 3	Priority 4
Hop 1 – Open	Up to 6 working hours	Up to 1 working day	Up to 2 working days	Up to 2 working days
Hop 2 – Fix	Up to 1 working day	Up to 4 working day	Up to 8 working day	Up to 15 working day
Hop 3 – Release Management	Up to 4 working hours	<i>Up to 5 working day</i>	<i>Up to 5 working day</i>	<i>Up to 5 working day</i>
Hop 4 – Defect Testing	Up to 4 working hours	Up to 1 working day	Up to 2 working day	Up to 2 working day

**Figure 7: Defect Operational Level Indicators**

## 11 Test Resources

### 11.1 Test Team

The Test Team roles are as follows:

- Integration Test and Acceptance Manager:
  - Responsible for all DSP Integration Test activities, including User Integration Testing.
- SP Test Managers
  - Responsible for PIT testing of their solution elements (DSP only)
  - Single point of contact for all design, development and technical queries on their solution elements
  - Provides “local” management of preparation and execution for SIT Tests within their agreed Test boundary
- Security Architect
  - Responsible for advising on all Security aspects of testing
- Configuration Manager
  - Owns the master Configuration Plan which defines a) the Configuration Items (CIs) comprising the Smart Meter eco-system and b) the inter-dependencies between these CIs
  - Responsible for configuration management of DSP CIs
- Release Manager
  - Owns the master Release Schedule which shows a) when the various SP Releases are deployed to the SIT environments and b) the inter-dependencies between these releases
  - Responsible for releases of DSP solution elements
- Environment Manager
  - Owns the master Environment Plan which shows a) the architecture of the various SP SIT environments and b) the communications links between these environments
  - Responsible for the DSP SIT environment
- Test Issue Manager
  - Responsible for chairing the Triage Panel, expediting the resolution of outstanding Test Issues, agreeing which defect fixes go into which SIT Releases, and reporting progress to stakeholders
- Test Architect
  - Responsible for designing Integration Test Scenarios and Test data, supporting Integration Test Planning, designing and assuring Integration Test Procedures

- SIT Manager
  - Responsible for planning and control of SIT
  - SI representative on the SIOB (refer Section 14)
- Test Preparation Lead
  - Responsible for designing and building SIT Scripts
- Test Execution Lead
  - Responsible for execution of SIT Scripts
- Test Analysts
  - Responsible for writing and executing SIT Scripts
  - Sourced from each SP to work on Tests within their agreed Test boundary
  - Numbers and profile to be determined as part of the “Estimating and Scheduling” activity shown on the High-Level Plan in Section 7.2.0.

## **11.2 Ways of Working**

The following sections detail the ways of working.

### **11.2.1 Expert People**

SIT testing will be supported by several Expert People, who will have expertise in specific functional areas. Normally, Expert People would have representation from all teams including TSP, Critical Software, CSPN, CSP C/S, DSP, DCC SI and DCC. CSPs will engage Communications Hub manufacturers and DCC will engage other device manufacturers as required.

The Systems Integrator will coordinate the allocation of members to the Expert People for the Release. Additional teams/members may be added as required. For the Expert People, there will be roles and responsibilities defined for the members of that group. The Expert People will be made up of design authority and other experts.

SIT and the SP's will allocate the SME's into the Expert People.

Design Authority experts may cover more than one role (not 1 to 1 mapping).

The actual resource allocation into the roles for the Expert People will be part of the entry criteria for Quality Gate 3 for SIT.

An Expert will be responsible for:

- Providing expert knowledge which is required to ensure smooth execution, or assessment of issues that are encountered.
- Providing detailed information to the Triage team in support of any testing issues found to help issues be dealt with promptly, and to re-create Issue Conditions if required.
- Be available to the SIT Team for the required duration of the Tests.
- .

- DCC members may also have the responsibility of witnessing as part of UAT.
- Supporting SIT Teams within SIT.

#### 11.2.2 SIT Teams

The DSP SIT Team will be responsible for:

- Daily and 5 Day Plan for the testing to be produced by the SIT Manager. The 5 Day planning will be discussed at the weekly SIT Meeting, and the location of the testing will be collaboratively agreed. Both the 5 day and the daily plan will contain the Tests required to be executed by the SIT Team.
- Daily plans are sent as emails to the SIT participants and key stakeholders.
- Ensuring Test data is identified and available for the Tests that will be executed by the SIT Team.
- Ensuring that the Device Asset Log is up to date, where relevant.
- Ensuring the Test Scripts are ready and scheduled on ALM into a Test Set. This will include any rework to Test Scripts identified as Test execution happens.
- Ensuring the correct Test process is maintained (ALM / Evidence Capture etc.)
- Consolidating the information required for a daily progress report
- Scheduling a daily 'stand up' meeting to include the Expert People
- Ensuring testing activities meet DCC criteria with regard to items such as Test Result recording, defect monitoring.
- Planning delivery of fixes
- Escalating issues appropriately and track to resolution
- Scheduling UAT witnessing as required

The SIT Teams will be resourced with enough people to execute the Tests to the planned schedule.

#### 11.2.3 Test Execution Logistics

SIT execution will be Monday to Friday (not including Bank Holidays) with Saturday as contingency. Saturday working can only be requested by the DCC and will be considered at the discretion of the SIT Manager.

A SIT Execution Day will run from 08:00 through to 18:00, and will be for each week day. It is assumed that the organisations involved in SIT will ensure resources are available to support SIT during these times.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
08:00	Stand Up SANITY	Stand Up SANITY	Stand Up SANITY	Stand Up SANITY	Stand Up SANITY	Contingency	
08:30							
09:00							
09:30					SIT		
10:00					MTG		
10:30							
11:00							
11:30							
12:00	DRM	DRM	DRM	DRM	DRM		
12:30							
13:00	Hot Spot	Hot Spot	Hot Spot	Hot Spot	Hot Spot		
13:30							
14:00							
14:30							
15:00	(e)CRB	(e)CRB	(e)CRB	(e)CRB	(e)CRB		
15:30							
16:00							
16:30							
17:00	EOD	EOD	EOD	EOD	EOD		
17:30							
18:00	Deployment Slots (if required)						
18:30							
19:00							
19:30							
20:00							
20:30							
21:00							
21:30	Smoke Testing (if required)						
22:00							

Figure 8: SIT Execution Day

The following lists out the key meetings and activities required for SIT execution:

1. Morning sanity testing – run by SI. This can be manual or automation, and usually takes 15 minutes to complete.
2. Daily Scrum Call per SIT Team – these will be scheduled by the SI, and will start at 08:00. It is assumed that UAT experts will attend the daily scrum call.
3. SIT Hot Spot Call – run by the DCC at 13:00. This is a DCC run governance call. The SIT Manager will attend this call, and will feedback any changes that need to be reflected into the test schedule. This call will be held once a week – the frequency may change on agreement with DCC.
4. Following the SIT Team Scrum Call, the Test execution for the day will start, and will continue through to 18:00.
5. There will be a cutoff point at 17:00 each working day from which the information for the EOD report will be generated. It will be the responsibility of the Release Test Manager to provide this information.
6. The SIT Team will produce the daily plan for the next working day, for each SIT Team, and based upon the cutoff point at 17:00.
7. The SIT Team will produce a 5 day ahead plan (next working week) for each of the SIT Teams by EOD on Thursday

8. There will be a SIT Meeting at 09:30 every Friday, and the main objective will be to agree and confirm the 5-day plan for each SIT Team.
9. Weekend contingency will be planned for on the Wednesday Hot Spot Call. The 13:00 Hot Spot Call on Friday will determine whether weekend work is required by SIT.
10. The SIT Team will be ready to support for weekend working, and align the required Service Provider support to support this activity as required.
11. Saturday working will be invoked as contingency as agreed between SIT and the DCC.

#### 11.2.4 SIT Team

DCC will provide Test assurance for SIT using the Heatmap, which will define the scope of the Tests for the Release. This is generated by the SIT Team and agreed with DCC.

The SIT Manager will attend all required governance sessions as requested by the DCC.

SIT will provide Test management and Test governance activities to ensure the correct schedule and sequencing of testing via the SIT Teams. Test governance will ensure that Test reporting is produced and Test artefact integrity is maintained.

SIT will provide a Test Execution Manager, who will be responsible for allocating Tests to their SIT Teams, will organise the daily stand up calls and will be an escalation for any unresolved testing issues arising from the SIT Teams. In addition, SIT will provide a test SME for each SIT Team. SIT will provide a number of Testers per SIT Team, and these will be allocated by the Test Execution Manager.

The SIT Team will also provide Test Design resources whose focus will be Test preparation and Test coverage against TTM Requirements.

The SIT Team will provide the Test execution support team, who will track and monitor progress against the Heatmap.

The SIT Testing activities will make use of Test support functions such as Release Management and Defect Management [20].

#### 11.2.5 Location(s)

SIT Teams will be located where it is most practical. For DSP SIT and the CSP Labs, this will be focused in CGI Reading location, but some DSP SIT members will be located in CGI Leatherhead.

The SIT Execution manager(s) will allow SIT resources to be co-located in the SIT Test Labs for periods of time if required. Location of resources will be an agenda item on the SIT weekly call.

### 11.3 Test Tools

This Section describes the Test tools to be used in SIT where these are relevant across more than one SP.

### 11.3.1 Functional

#### CSP Simulator

The CSP Simulator provides the ability to receive Service Requests and return Service Responses from/to the CSP Gateway. The CSP Simulator can handle the CSPN web service protocol and CSP C/S UDP protocol. The CSP Simulator provides the ability for the user to receive/send Service Requests/Responses from/to Service Users without any CSPs.

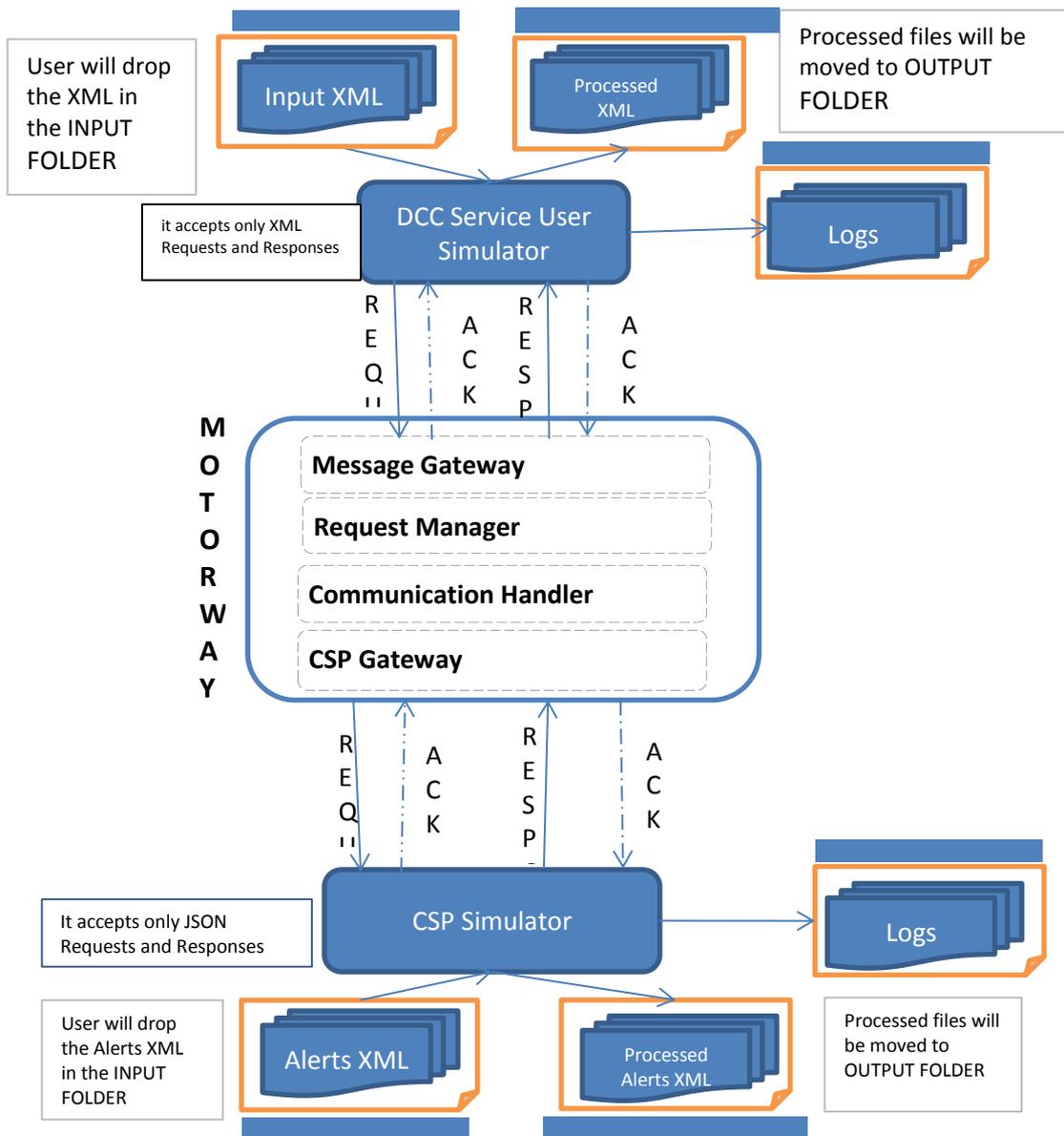


Figure 9: CSP Simulator

For further information regarding the CSP Simulator refer to 'DB.0183 CSP Simulator Functionality and User Guide' [23].

The following Test tools will also be used by the SIT Team to create, manipulate and inject Test data into the SIT environment.

#### Device Emulators

DCC Device Protocol Emulator - a developed emulator to simulate a real device (ESME, GSME, PPMID or HCALCS).

#### FileZilla

This is cross-platform FTP application software, consisting of FileZilla Client and FileZilla Server. It supports FTP, SFTP, and FTPS (FTP over SSL/TLS). Support for SFTP (SSH File Transfer Protocol) is not implemented in FileZilla Server. This will be used to move files from one location to another.

#### Jenkins

This is an open source continuous integration tool written in Java. Jenkins provides continuous integration services for software development. It is a server-based system running in a servlet container such as Apache Tomcat.

#### NotePad

This tool will be used to view the log files to track journey and defects.

#### Putty

This is an open-source terminal emulator; serial console and network file transfer application. It supports several network protocols, including SCP, SSH, Telnet, rlogin, and raw socket connection. Putty will be used to check access to the UNIX server and run UNIX shell scripts and to bounce the server when necessary.

#### SVN

SVN a software versioning and revision control system distributed as free software under the Apache License. Developers use Subversion to maintain current and historical versions of files such as source code, web pages, and documentation. Its goal is to be a mostly compatible successor to the widely used Concurrent Versions System (CVS).

#### Terminal Server

This is the virtual machine to access the secure network. Access will be required to perform to perform testing in the DSP SIT environment. The TS is a secure environment and data cannot be passed between TS and non-TS areas and no printing is permitted.

#### In-house Automation Tools

In-house automation tools are developed using Bespoke Java & TestNG framework to test the Services Requests and Responses of the Motorway components

### 11.3.2 Test Management

#### ALM

ALM will be used for the Test Management of SIT, this will include:

- Test Requirements, these are the TTM and Heatmap Requirements, and are loaded into the Requirements Tab in ALM.

- Test Plan, this will hold the individual Test Scripts that cover the Test Conditions for SIT. These Test Scripts will be mapped to Test Requirements.
- Test Lab, this will hold the Test Sets, each Test Set will be a sequence of Test Scripts.
- Defects, this will hold all Testing issues raised in SIT.

The ALM tool will be situated in the secure DSP environment where it will be co-located with the DSP SIT environment to ensure appropriate security. Access by parties other than DSP will be across the DCCWAN by DCC Gateway Connection. Access credentials will vary from party to party with only the DCC Licensee and DSP having access to all parts of the tool. Other parties will be restricted to those Requirements they are responsible for testing and Test Issues they have raised or have (ever) been assigned.

The following table lists the other Test tools that may be used in SIT.

Tool	Type	Service Provider
Jmeter	Performance	DSP
Selenium	Automation	DSP
Bespoke tools from Sensus	Performance	CSP N
Bespoke tools from Sensus	Automation	CSP N
SilkPerformer	Performance	CSP C/S
LoadRunner	Performance	CSP C/S
Jmeter	Performance	CSP C/S
QuickTestPro	Automation	CSP C/S
Selenium	Automation	CSP C/S
Thucydides	Automation	TSP
Jira	Collaboration	DCC Enterprise
Selenium	Automation	DCC Enterprise
Pragmatic Testrunner	Automation	DCC Enterprise
Lettuce	Automation	DCC Enterprise

Table 10 - Test Tools

### 11.3.3 Test Stubs and Prototypes

The following table lists the Test Stubs and prototypes that will be used in SIT, along with the organisations that are responsible for their design and for their development.

Test Stub	Design responsibility	Development responsibility	Comment
Service User Test Stub – functional	DSP	DSP	The DSP PIT Test Stub will act as the basis, but will need to be enhanced (e.g. to deal with SMKI). The real Parse & Correlate software will be used

Test Stub	Design responsibility	Development responsibility	Comment
Smart Meter CSP Simulator	CSPs	CSPs	The CSP PIT Test Stubs could act as the basis, but will need significant enhancement (e.g. to deal with SMKI)
Protocol-certified Communications Hub prototype	CSPs	CSPs	

**Table 11 - Test Stubs and Prototypes**

## 12 Roles & Responsibilities

### 12.1 General

All parties involved in SIT are expected to:

- Follow the SEC guidelines for “Good Industry Practice”, i.e. the exercise of that degree of skill, diligence, prudence and foresight which would reasonably and ordinarily be expected from a skilled and experienced person engaged in a similar type of undertaking as that Party under the same or similar circumstances.
- Take all reasonable steps to facilitate achievement of the SIT Objective.

### 12.2 The SIT Team

The SIT Team will manage SIT and is responsible for the following activities:

- Producing and maintaining the SIT Approach, the Solution Test Plans and the UAT Test Plans.
- Provide the TTM documents as required, for the Release, split by SBCH and DBCH.
- Ensuring that SIT activities are carried out in line with the SIT Approach, the Solution Test Plans and the UAT Test Plans;
- Overall planning and control of SIT and contributing to Quality Gates 3 (between FAT and Solution Test) and 5 (between Solution Test and Interface Test), which are chaired by the SI.
- Producing and maintaining Test Execution Plans, Test Specifications, Mapping to the TTM, Heatmap Requirements, Progress Reports and Test Completion Reports;
- During Test execution, maintaining Test execution Glide Paths for the Release Release;
- Maintaining Risk, Assumption, Issue and Dependency Logs for the Release;
- Leading the design and creation of Test Scenarios, Test Scripts, Test data and Test Environments for Release;
- Producing and maintaining Test Environment documents for the Release;
- Preparing Test Execution and Environment usage schedules for the Release;
- Supporting the other SPs in their assigned Test preparation and execution activities for the Release;
- Managing Test Issue resolution, and supporting SPs in the resolution process for the Release;
- Resolving Test Issues for their solution elements (including Regression testing of any fixes required) for the Release;

- Producing the Test Specifications, Test Traceability Matrices, Progress Reports and Test Completion Reports for the Release;

### 12.3 The DCC SI Team

The DCC SI Team is responsible for the following activities:

- Chairing Quality Gates 3 (between FAT and Solution Test) and 5 (between Solution Test and Interface Test).
- Chairing and providing secretarial support for the SIOB.
- Operating the master Configuration Management Plan (see Section 10.1);
- Operating the master Release Schedule (see Section 10.1); and
- Operating the Environment Plan (see Section 10.1).
- Emulator assurance – share between DCC and SI

#### 12.4 Service Providers

The SPs will support the SIT Team, their responsibilities being to:

- Establish, maintain and control their own Test Labs.
- Procure and install Communications Hubs in their Test Labs.
- Install sets of Smart Metering equipment in their Test Labs.
- Procure, install, maintain and support Communications Hub Emulators and Smart Meter Emulators (if required).
- Obtain Communications Hub certifications (in conjunction with their Communications Hub manufacturers) from the relevant authorities.

#### 12.5 DCC-E Service Provider

DCC-E SP's will support the SIT Team during the Functional and Regression Cycles of each Release, their responsibilities being;

- Provision of DCC-ITES and DCC-GRIS Test Environment
- Preparation of DCC-ITES and DCC-GRIS Test Scripts
- Execution of DCC-ITES and DCC-GRIS Tests
- Recording of Test Results in ALM

#### 12.6 DCC

The DCC will:

- Comply with its obligations under the approved SIT Approach (this document).
- Ensure that activities attributed to Service Providers that are described in this document are undertaken.
- Verify the TTM Requirements.
- Verify the Heatmap Requirements.
- Use its reasonable endeavours to ensure that SIT is completed as soon as is reasonably practicable to do so.
- Obtain Emulators for use in SIT.
- Support the SIT Team in the planning, control and operation of SIT.
- Assure SIT planning, preparation and execution activities undertaken by the SIT Team and Service Providers as detailed in the Joint Test Strategy and through the Test Traceability Matrix.
- Review and approve the relevant Test Documents, and issue the 'Approval to Proceed' certificates as described in Schedule 6.2 ([7] [8] [9]). This includes the need to approve the SIT Phase and Stage Completion Reports promptly.

- Participate in Quality Gate Reviews as described in Section 8.4.
- Chairs and facilitates the TABs for exit from PIT and SIT.
- Agree with the DSP and other Service Providers, a subset of the Solution Tests to be witnessed in the UAT stage.
- Witness the execution of these Tests in UAT.
- Define and implement a process to audit the achievement of SIT Exit Criteria including engagement, procurement and utilisation of an independent SIT auditor.
- Produce and issue the DCC Licensee Business Processes; and
- Perform the role of Service Provider for DCC Enterprise systems such as Billing and BI/MI.

## 13 Environments and Labs

### 13.1 Environments

Each SP is responsible for establishing, maintaining and controlling its own Test Environments.

Note that planning of environment usage continues in the Solution Test Stage.

### 13.2 Test Labs

The DSP will provide a Test Lab for SIT.

Each CSP will provide a Test Lab housing Emulators, Communications Hubs and Smart Metering equipment for use during EOC Regression.

#### 13.2.1 CSP N

CSP N will use the Internal Arqiva Test Lab for SIT.

The Internal Test Lab will provide an environment that smart devices such as the Communications Hub and meters may be tested with the SMWAN Infrastructure. It will be possible to configure each Communications Hub separately so that it connects to a specific Access Network base station, and Access Networks for each Test Environment that will be within radio range of the Test Labs.

This will allow flexibility in the number of Devices connected within each Test Environment.

The Internal Test Lab will provide two mechanisms for loading metering Devices within the facility. A limited number of metering Devices will be connected to adjustable loads, which will allow the power consumption of the metering Device to be varied to a preconfigured setting. The remaining metering Devices will be connected to static loads.

#### 13.2.2 CSP C/S

Telefonica's Test Lab will host various Smart Metering equipment sets. These equipment sets will be configurable in order that various environments can be connected and the configuration for dual fuel, single fuel, Communications Hubs variants etc. can all be amended as necessary for any combination required for testing. Note that once set up for a given environment, these sets of equipment cannot be switched between environments.

## 14 Governance & Reporting

SIT is 'governed' through a process of Reporting and Governance. The DCC Governance framework is through a Release Board, with escalation to the DCC Programme Board, meeting weekly on Wednesdays. The ToR for these governance bodies can be provided by DCC PMO.

The DCC SI Operations Board (SIOB) is the main escalation point for SIT Issues. The SIOB ToR can be found in Appendix 15.4. The SIOB sits within this DCC governance framework and an example of the SIT weekly 'cadence' is shown in the figure below.

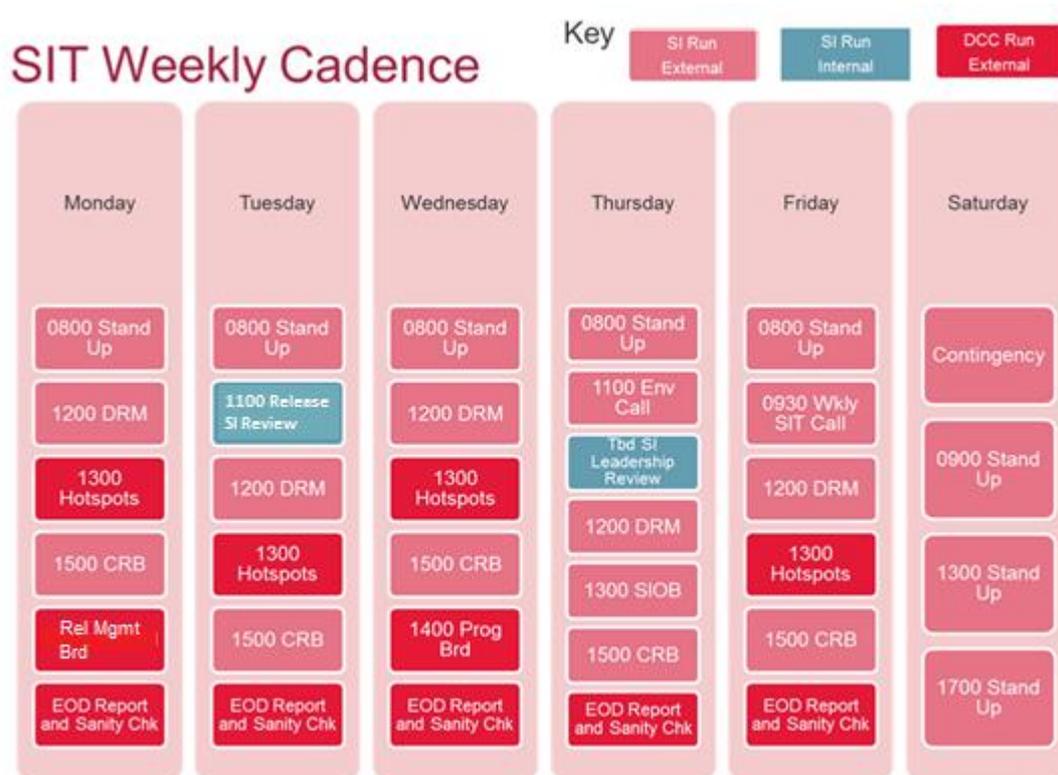


Figure 10:: Typical SIT Weekly Cadence

The meeting schedule could be changed in the future with agreement from DCC.

For Test execution and logistics and weekly meetings refer to the following sections in this document:

- Section 11.2.3 (Test Execution Logistic) details the key meetings and activities of a typical SIT Execution day.
- Appendix 15.20 (ToR SIT meetings) details the membership, frequency and objectives for both the SIT Stand Up Call and SIT Weekly Planning Meeting.

### 14.1.1 Operational level (within DCC / SP partners)

The reports the SIT team will produce are described in Section 9.2.

The DCC may choose to take extracts from SIT generated reports for onward reporting for external parties.

## 15 Appendices

### 15.1 Appendix 1: Terminology & Abbreviations

In this document the term “Service Provider” includes all the following:

- The DSP;
- Both CSPs;
- The Trusted Service Provider (TSP), supplier of the SMKI solution element;
- The DCC-E (DCC Enterprise Service Provider), i.e. the DCC Licensee in its role as supplier of Enterprise systems:
  - ITES providing the FTP and BIMl solutions
  - Capita Group Systems providing the Billing solution
- The Parse and Correlate Service Provider

The term “User Integration Testing” (UIT) refers to the Test phase that comprises Interface Testing and End to End Testing.

The term “Test Stub” means systems and actions which simulate the behaviour of Devices and systems external to the solution (e.g. User systems). Test Stubs are used for testing along with the meters and the User Systems.

Where the Service Provider systems functionality has not been available in an initial release that functionality may be stubbed until all the functionality is available, which will be before the end of SIT. Before an area of functionality, normally scoped by a Change request, can exit SIT, it must have met its SIT Exit Criteria.

The term “Testing Issue” means in respect of any Tests (a) anything that is preventing the execution of the Test or (b) once commenced or executed, the Test has an unexpected or unexplained outcome or response.

For the purposes of this document, the term “protocol-certified Communications Hub (Communications Hub)” means a Communications Hub which has a ZigBee Alliance Assurance Certificate.

The term “fully-certified Communications Hub” means a Communications Hub which has a ZigBee Alliance Assurance Certificate and a CPA Certificate.

The term “Registration Data Provider (RDP)” means:

- (a) in respect of each Electricity Distributor, the person nominated in writing to the DCC from time to time by that Electricity Distributor; or
- (b) in respect of each Gas Transporter, the person nominated in writing to the DCC from time to time by that Gas Transporter

On the basis that more than one Party may specify the same Registration Data Provider, and that the Electricity Distributor or the Gas Transporter shall be deemed to have so nominated itself in the absence of any other nomination.

This document uses standard Testing terminology, a glossary (Reference [3]) of which can be found on the International Software Testing Qualification Board website, [www.istqb.org](http://www.istqb.org).

Abbreviations / Acronyms used in this document are listed in the following table.

## Smart Metering Implementation Programme

### Systems Integration Test Approach

Abbreviation / Acronym	Meaning
BI	Business Intelligence
CHF	Communications Hub Function
CI	Configuration Item
CPA	Commercial Product Assurance
CSP	Communication Service Provider
CSR	Certificate Signing Request
DAB	Design Assurance Board
DCC	Data Communications Company
DCC-E ITES	DCC Enterprise FTP and BIMi Solution
DCC-E GRIS	DCC-E Capita Group Systems Billing Solution
DCC KI	DCC Key Infrastructure
DECC	Department of Energy and Climate Change
DLMS	Device Language Message Specification
DSM	Device Selection Methodology
DSMS	DCC Service Management System
DSP	Data Service Provider
DUGN	DCC User Gateway Network (also known as DCC Gateway)
ESI	Enterprise Systems Interface
ESME	Electricity Smart Metering Equipment
GBCS	Great Britain Companion Specification
GPF	Gas Proxy Function
GSME	Gas Smart Metering Equipment
HAN	Home Area Network
HP ALM	Hewlett Packard Application Lifecycle Management tool (aka Quality Center)
IHD	In Home Display
iGT	Independent Gas Transporter
IKI	Infrastructure Key Infrastructure
IRB	Issue Resolution Board (for Test Issues)
MI	Management Information
MPAN	Meter Point Administration Number
MPRS	Meter Point Registration System
MPRN	Meter Point Reference Number
PEP	Policy Enforcement Point
PIT	Pre-Integration Testing
RDP	Registration Data Provider
RTM	Requirements Traceability Matrix
SEC	Smart Energy Code

Abbreviation / Acronym	Meaning
SIT	Systems Integration Testing
SMKI	Smart Meter Key Infrastructure
SP	Service Provider
OVERALL TEST APPROACH DOCUMENT	SEC Variation Testing Approach Document
TAB	Test Assurance Board
TLS	Transport Layer Security
TSP	Trusted Service Provider
UAT	User Acceptance Testing
UIT	User Integration Testing

**Table 12 - Abbreviations**

## **15.2 Appendix 2: SIT Heatmap**

For latest SIT Heatmap please refer directly to ALM.

## 15.3 Appendix 3: ToR SIT Meetings

### 15.3.1 Terms of Reference – SIT Stand up Call

#### Chair

SIT Team

#### Membership

The membership is the Expert People and the SIT Team.

#### Meeting type

The meeting is a conference call.

#### Frequency

The call is daily at 8am for half an hour.

#### Objective

To provide the SIT Team with a daily plan of activities to complete and to ensure that any blockers are being resolved as quickly as possible to keep the ST Team on track. The call will run through each functional area of testing at a time with all members on the call.

#### Inputs

- End of day report

#### Outputs

- Daily Plan

### 15.3.2 Terms of Reference – SIT Weekly Plan Meeting

#### Chair

SIT Team

#### Membership

SIT Team Lead – Release SIT Manager

DCC Test Assurance Lead – nominated by DCC Test Assurance

Service Provider Test Lead – nominated by each SP

SP representative at discretion of SP Test Lead (covering plans and Rel Mgt etc.)

#### Meeting type

The meeting is a conference call/ face to face meeting in CGI office in Reading.

#### Frequency

The call is weekly at 9.30am for one hour.

#### Objective

To review the SIT Team 5-day plan to ensure it is understood by all parties prior to being issued formally.

#### Inputs

- Proposed 5 day plan

#### Outputs

- Updated 5-day plan

#### Standing Agenda

1. The 5-day execution plan for the next week – Functional Testing
2. The next week's plan for Release Regression, once this starts
3. UAT (DCC Rep) to confirm which areas of testing they would like to witness for the following week
4. AOB – Any issue that any Test Manager wants to discuss.

## 15.4 Appendix 4: Terms of Reference –DCC SI Operations Board

### 15.4.1 Chair

**Systems Integration Programme Director**

### 15.4.2 Membership

Each Service Provider is represented by their Test Lead and Lead Technical Architect. Please note, the attendees of this board may change, in agreement with DCC.

SP	Test Lead	Lead Technical / Architect
Arqiva	Scott Broomhill	Gary Bailey
Telefonica	Stuart Pitcher	Rick Hanks
CGI (DSP)	Anindya Ghosh	Steve Bull
CGI (SI)	Brent Sharples	Richard Ascough (TBC)
DCC (Ent)	Jonathan Lloyd (TBC)	David Boafo (TBC)
BT	David Shapland	TBC
CSW	Ricardo Jesus	Dinis Paes

**Table 13 - SIOB Membership**

Plus...

- DCC SI Environments lead
- DCC represented by Test Assurance and Architects
- DCC SI to provide secretariat
- For the meeting to be deemed quorate there must be at least one representative from each Service Provider and DCC
- Other attendees may be invited for specific agenda items with the agreement of the Chair
- BT by invite especially for SMKI later in the Plan
- CSW by invitation as required

### 15.4.3 Objective

To provide the operational leadership for SIT across all SP's ensuring time and quality objectives are achieved.

### 15.4.4 Success Criteria

The success of this forum will be based on a sharing of plans and accurate status across all parties to ensure that as a group the Programme is able to act adequately in advance to avoid delays and resolve issues collaboratively.

### 15.4.5 Inputs

Weekly DCC SI Operations Board, inputs to include:

- Milestone & Dependency Trackers
- Test Metrics & actions to bring back on track

- Triage Metrics
- Operational Issues and resolutions
- Risks

#### **15.4.6 Decisions/Outputs**

- Risks, Actions, Issues and Decision (RAID) Log
- Items for escalation (when necessary)

#### **15.4.7 Standing Agenda**

- Review of progress against plans
  - Key Achievements
  - Key Issues and Actions taken
  - Review incoming dependencies on the SIT schedule by SP's and SIT Management
- Dependencies status
- Environment Schedule and Configuration Mgt of DI.0014
- Review of Test metrics against targets
- Review of Triage metrics against targets
- Actions to bring back on track (including invoking Saturday working etc., changes to plan etc.)
- Operational Issues (resourcing, etc.) and resolutions
- Risks (New; Proximity; Closed)
- Continuous Improvement – how can performance and pace be further improved.

#### **15.4.8 Escalation Routes**

The DCC SI Operation Board may escalate issues to the DCC Release Management Board for programme-wide issues

#### **15.4.9 Secretariat**

- DCC SI will be responsible for providing the secretariat for this board and will maintain and distribute the decisions and Actions Log/s
- The DCC SI Operations Board will take place every Thursday 1300 hrs to 1500 hrs at CGIs office in Reading Green Park, preferred with WebEx/ dial in details will be provided for those that are unable to attend in person.
- DCC SI to maintain a RAID Tracker – to be distributed within 24 hours (1 work day) of the meeting.

## 15.5 Appendix 5: ALM Data Model



ALM Functional  
Requirements Data M

## 15.6 Appendix 6: ALM Re-structure



ALM - Test Structure  
for STP V3 0.pptx

Please note: The ALM structure included here is the latest version at the time of issue of this document. For the latest updates to ALM structure, please refer directly to ALM.

## **15.7 Appendix 7: TTM Report**

This report will be produced manually.