Testing Approach Document for November 2019 Release

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Document Control

Revision Date	Summary of Changes	Changes Marked	Version Number
16/04/18	Initial Draft	n/a	0.1
02/05/19	Amendments with DCC internal review comments	Y	0.2
16/05/19	Updated following ongoing review	N	0.3
21/05/19	Updated following ongoing review	N	0.4
21/05/19	Updated following ongoing review	N	0.5
26/06/19	Updated following consultation responses	Y	1.0
17/07/19	Update section 2 and added appendix for CR1056 following TAG review		1.1
02/08/19	Update to remove independent audit from emulators in SIT	Y	1.2

References

Table 1 – References

Ref	Title	Source	Date	Version
1	Glossary of Testing Terms	ISTQB	Mar 2016	3.1
2	Joint Test Strategy	DCC	Apr 2015	3.5
3	Testing Issue Resolution Process	DCC	Feb 2019	1.5
4	November 19 Release Implementation Document	SECAS	May 2019	1.1

Where this document references sections of the Smart Energy Code (SEC), those references shall be construed by reference to any intended future variations to those Sections (and the SEC Subsidiary Documents associated with those Sections) which are due to take effect at November 2019 Release Go Live.

Abbreviations & Acronyms

This document uses standard testing terminology. In addition, the meanings of abbreviations and acronyms specific to the Smart Energy Code and DCC services and systems are shown below.

This document uses standard testing terminology, a glossary of which can be found on the International Software Testing Qualification Board website www.istqb.org

Table 2 - Abbreviations & Acronyms

Abbreviation	Meaning
CH	Communications Hub
CHF	Communications Hub Function
CHTS	Communications Hub Technical Specification
CPA	Commercial Product Assurance
CPL	Central Products List
CR	Change Request
CRP	Change Resolution Proposal
CSP	Communications Service Provider
CSW	Critical Software (the Parse and Correlation Service Provider)
CTSD	Common Test Scenarios Document – Appendix R of the SEC
DCC	Data Communications Company
DSP	Data Service Provider
DUIS	DCC User Interface Specification
ESME	Electricity Smart Metering Equipment
ETAD	Enduring Test Approach Document – Appendix J of the SEC
FAT	Factory Acceptance Testing
FOC	Final Operating Capability
GBCS	Great Britain Companion Specification
GPF	Gas Proxy Function
GSME	Gas Smart Metering Equipment
HAN	Home Area Network
HCALCS	HAN Connected Auxiliary Load Control Switch
IOC	Initial Operating Capability
IRP	Issue Resolution Proposal
MMC	Message Mapping Catalogue
MOC	Middle Operating Capability

Abbreviation	Meaning
PIT	Pre-Integration Testing
PPMID	Pre-Payment Meter Interface Device
RDP	Registration Data Provider
SEC	Smart Energy Code (The Code)
SECAS	Smart Energy Code Administrator and Secretariat
SECMP	Smart Energy Code Modification Proposal
SI	System Integrator
SIT	Systems Integration Testing
SMETS	Smart Metering Equipment Technical Specifications
SMKI	Smart Meter Key Infrastructure
SM WAN	Smart Metering Wide Area Network
SP	DCC Service Provider
SP UAT	Service Provider User Acceptance Testing
TAB	DCC's Test Assurance Board
TAD	Testing Approach Document
TAG	SEC Panel's Testing Advisory Group
TTM	Test Traceability Matrix
TTO	Transition to Operations
UIT	User Integration Testing

Glossary

Table 3 defines only terms that are specifically not defined in Table 2.

Table 3 - Glossary

Term	Meaning
Communications Hubs	means a physical device that includes a Communications Hub Function together with a Gas Proxy Function
DCC Meter Protocol Emulators	Testing Stubs developed by DCC to emulate the functional aspects of smart metering Devices
Devices	means one of the following individual devices: (a) an Electricity Smart Meter; (b) a Gas Smart Meter; (c) a Communications Hub Function; (d) a Gas Proxy Function; (e) a Pre-Payment Meter Interface Device; (f) a HAN Connected Auxiliary Load Control Switch; and (g) any Type 2 Device.
Go Live	Deployment date of a change in production
Modified DCC System	Means the DCC System as modified in order to meet (or to be designed to meet) the DCC's obligations under the Code at the November 2019 Release Go Live, together with the Communications Hubs that form part of Enrolled Smart Metering Systems.
MM2	Meter Manufacturer 2 (related to Release 2.0 meter testing)
User	means a Party that has completed the User Entry Process (and, in respect of Services available in accordance with this Code to Users acting only in one or more User Roles, a Party that has completed the User Entry Process for that User Role).
Test Stubs	means Systems and actions which simulate the behaviour of Devices and User Systems

Approval of this Approach Document

DCC will submit the SEC Release Testing Approach Document for the November 2019 Release (this document) to the SEC Panel for review in accordance with D10.20 of the SEC.

Changes forecast for this Approach Document

At the time of producing this Test Approach Document, the exact scope of this release has yet to be determined. For the purposes of drafting this document, all pending changes targeted for this release have been included in assessing the test approach. Following the scope being finalised, this Test Approach Document will be reviewed and, where the changes are material, the content may be revised.

Table of Contents

1 Introduction

1.1 General

This is a Testing Approach document to cover the pending changes that are proposed for implementation in the November 2019 Release. This approach works in conjunction with the SEC Release Implementation Document for the November 2019 release, in accordance with Section D of the SEC.

The November 2019 Release includes 7 SEC modifications and 3 additional elements of scope added by DCC, which are DSP changes only or which do not impact DCC systems e.g. documentation only changes. The changes delivered in the November 2019 release are outlined in the Scope section of this document.

This document sets out the information required of the SEC Release Testing Approach Document, Section D10.18-D10.20 of the SEC, including the manner in which testing will be conducted by DCC for the November 2019 Release.

1.2 Approval of this Document

NB: Sections 1.2 and 1.3 confirm the SEC Panel as the authorising authority for this document and any subsequent material changes to it. Should delegated authority be given to the Panel's Test Assurance Group (TAG), these sections will be amended.

This document:

- Shall be produced by DCC and a draft provided to the Panel's TAG for their review;
- In parallel the draft document shall also be issued to SEC Parties for consultation. SEC Parties will have [10] working days to review and provide feedback via the DCC website. The link to this will also be provided on the SECAS website; DCC shall consider the feedback from these consultations and, where appropriate, will revise the draft document;
- The revised draft shall be presented to the Panel's TAG for recommendation to the SEC Panel;
- The SEC Panel shall consider the views of the TAG and shall either:
    - Approve the Test Approach Document;

    Or,

    - Reject the Test Approach Document and specify to the DCC the areas requiring further work.

1.3 Revision of this Document

Following approval of this document it:

- Shall be revised by DCC in accordance with any direction to do so made by the SEC Panel;
- May be revised by DCC following consultation with the Panel's TAG and, the Panel, provided that:
  - Prior to making any such revision, DCC must present to the SEC Panel a summary of the views of the Panel's TAG and an explanation of how the DCC has taken them into account; and
  - The document may not be revised to the extent that the SEC Panel directs otherwise; and
- It may be revised by DCC without consultation where the revision is of a minor typographical nature, or where the revision does not have any material effect on the rights or obligations of SEC Parties or any other person who is entitled to undertake testing in accordance with this document.

2 Scope

The November 2019 Release will modify the DCC System to accommodate the changes detailed in Table 4.

Table 4 Testing Scope for November 2019 Release

CR #	SEC Modification #	CRP/IRP#	Implementing Parties	Description
CR229	SECMP0023	N/A	DSP	Correct Units of Measure for Uncontrolled Gas Flow Rate
CR243	SECMP0025	N/A	DSP	Electricity network party access to Load Switching information
CR305	SECMP0039	N/A	DSP	Communications Hub returns notification mechanism for Other SEC Parties
CR1022	SECMP0060	N/A	DSP	Amend Requirements to remove "Pending" devices from SMI
CR1066	SECMP0062	N/A	DSP	Northbound Application Traffic Management-Alert Storm Protection
CR228	SECMP0018	N/A	DSP	Standards Electricity Distributor Configurations Settings (Document changes only)
N/A	SECMP0055	N/A	DSP	Incorporation of multiple Issue Resolution Proposals into the SEC (Document changes only)
CR292	N/A	N/A	DSP	Amendments to Anomaly Detection Attributes
CR1055	N/A	N/A	DSP	Suppression of duplicate Power Outage Alerts generated by the DCC solution
CR1056	N/A	N/A	DSP	Contract Change DSP Contract Schedule 2.1 - Separate I&C Retry Configuration Parameter – *see appendix for details*

SECMP0023, SECMP0025, SECMP0039 and SECMP0060 have been fully approved, the remaining SEC Modification scope item is pending and their inclusion in the November 19 Release is dependent on their approval by Change Board. This Test Approach Document will be reviewed and may be revised when the final scope is determined. Until this decision, all pending changes will be considered in scope. No additional changes shall be added to the scope set out above.

2.1 Documents for November 2019 Release

Table 5 lists the links to the SEC modification documents that were used to create this test approach document for the November 2019 Release. All non-SEC modification (additional CRs) documentation is stored within the DCC change management tool. These have been considered, but no link is available.

Table 5 Referenced Documents for November 2019 Release

SEC modification link	Number
https://smartenergycodecompany.co.uk/modifications/correct-units-of-measure-for-uncontrolled-gas-flow-rate/ ;	SECMP0023
https://smartenergycodecompany.co.uk/modifications/electricity-network-party-access-to-load-switching-information/	SECMP0025
https://smartenergycodecompany.co.uk/modifications/communication-hub-returns-notification-mechanism-for-other-sec-parties/	SECMP0039
https://smartenergycodecompany.co.uk/modifications/amend-requirements-to-remove-pending-devices-from-smi/	SECMP0060
https://smartenergycodecompany.co.uk/modifications/northbound-application-traffic-management-alert-storm-protection/	SECMP0062
https://smartenergycodecompany.co.uk/modifications/standard-electricity-distributor-configuration-settings/	SECMP0018
https://smartenergycodecompany.co.uk/modifications/incorporation-of-multiple-issue-resolution-proposals-into-the-sec/	SECMP0055

2.2 Joint Testing Strategy and other DCC Testing Approach Documents

Where relevant, or where there is an apparent conflict with the Joint Testing Strategy and, this Testing Approach Document November and any related Test Approach Documents developed for this Release, will take precedence.

Out of Scope

The following assurance activities are outside the scope of the testing approach for the November 2019 Release:

i. Testing of firmware for Meters and Other Devices (individual manufacturers are responsible for this activity);

ii. DCC is not responsible for proving Devices are compliant with SMETS2 requirements;

iii. Testing of the Home Area Network (HAN) except for:

   a. Its interaction with the Modified DCC System;

   b. Where the HAN is tested as part of System Integration Testing and User Integration Testing; and

iv. Testing the inter-changeability of Devices connected to the Home Area Network

v. HHT testing as there is no pertinent device or GBCS changes

3 Objectives of Testing

3.1 Testing Objectives

The following testing objectives shall apply:

i) Demonstrate that the changes brought into the DCC System by the in-scope items conform to the requirements and do not have any adverse impact on the DCC System
ii) Demonstrate that DCC and the component parts of the Modified DCC System and GBCS technical specifications operate and interoperate with each other, and with User Systems and to the extent necessary that DCC can comply with its obligations for Security and DCC Services
iii) Demonstrate the extent to which the Modified DCC System is capable of interoperating with agreed SMETS1 and SMETS2 devices that are in the CPL

iv) Enable (to the extent that it is reasonably practicable to do so for the November 2019 Release Go Live):

i. Users to test the interoperability of their User Systems with the Modified DCC System together with selected versions of SMETS1 and SMETS2 devices on the CPL;

ii. Users to test the interoperability of devices that comply with (or have been designed to comply with) the requirements of the November 2019 Release changes;

iii. Demonstrate that DUIS operate correctly for Users to facilitate communication to a mixed estate of devices operating to multiple different technical specifications with different functionality sets;

iv. Demonstrate that Users can continue to successfully install and commission and operate a number of devices in CPL using the Modified DCC System;

v) Demonstrate that the Modified DCC System can operate successfully within the wider Smart metering ecosystem comprised of multiple Devices operating to different technical specifications in a consistent manner;

vi) Test end-to-end communication from an authorised User device and back again for all technical specifications in operation, together with security modules;

vii) Verify that all other functional changes that are part of the November 2019 Release are functionally correct including consequential amendments (e.g. anomaly detection);

viii) Throughout the process, testing will be in accordance with Good Industry Practice, and with wider DCC objectives in Condition 5 of the DCC Licence;

ix) Wherever practicable, use of automated testing will be undertaken to improve the efficiency and lower the cost of testing;

x) Assure SMETS2 Single and Dual Band Communications Hubs against November 2019 Release changes;

xi) Ensure that the changes do not materially adversely impact the security risks associated with the Modified DCC System, and that any changes impacting security are identified, tested, and accepted. Consideration should be given to the security capabilities in the DCC security architecture including the protection of data and infrastructure;

xii) Assessment, of any DCC operational impacts and regression testing of the service to ensure continuity

xiii) Validation, of the end-to-end flows via the Modified DCC System (including reporting); and

xiv) SMETS2 CH variants in production will be subject to testing in the November 2019 release to evidence that:

i. The November 2019 Release development has not introduced any unintended issues to existing functional or non-functional behaviours, such that backward compatibility is assured;

ii. Modified functional or non-functional behaviour which is required for the Modified DCC System in order to meet the November 2019 Release requirements has been developed and implemented and are fit for purpose

xv) The testing objective may be met in parallel with meeting the testing objective of other changes to Modified DCC Systems and;

In respect of the testing objectives described above:

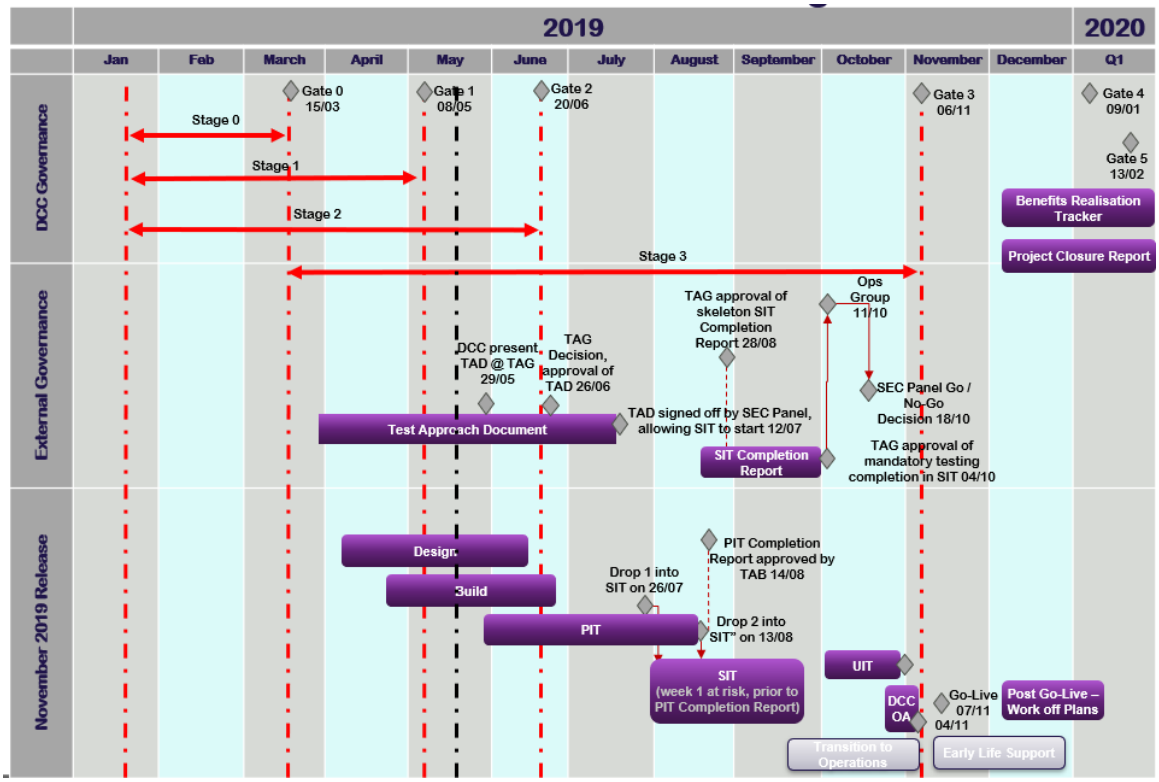
i) References to the Code shall be construed as a reference to the version of the Code (including any Subsidiary Documents) which are due to have effect with the November 2019 Release

4 Testing Approach

This section describes the testing approach for each testing phase, and then describe the common approach requirements that apply across the release.

4.1 High Level Plan

A high-level outline plan is shown below.



The elements below form the high-level areas of change which will be applied in the November 2019 release

- DUIS uplift to version 3.1
- MMC uplift to version 3.1
- Changed DSP functionality introduced as part of November 2019 release to support GBCS 3.2 with the exception of Comms Hub which will be aligned to 2.1. Some specific considerations for testing of November 2019 Release new functionalities include:
    - SRV 1.6 – Update payment mode Disablement Threshold Meter Balance Elec is lower a lower limit and should be an upper
    - SRV 6.13 Read Event or Security Log
    - SRV 7.7 Read Auxiliary Load Switch Data to enable them to read ALCS data

- SRV 6.14.2 Update device configuration (auxiliary load control scheduler) from ESME indicating change in the ALCS configuration
- SRV 8.14.3 Communications Hub Status Update – Fault Return
- SRV 8.14.4 Communications Hub Status Update – No Fault Return
- Regression of existing functionalities using both SMETS1 and SMETS2 devices.

The DCC shall recommend which of the existing devices that are in use in production shall be employed to test the November 19 Release against.

The DCC shall notify TAG which devices it recommends to test the November 19 Release against. Where TAG believe that a device has been wrongly excluded, they should notify the DCC within [3] working days setting out its reasons for objecting. The DCC shall respond to the objection within [3] working days. Should the DCC and TAG continue to disagree on the exclusion of a device, then the decision will be referred to the SEC Panel for determination. The SEC Panel decision will be binding.

4.2 Description of Test Phases

The November 2019 Release changes will be delivered using waterfall delivery methodology. The approach to testing of the November 2019 Release will include defined Test Phases. Table 6 contains the test phases / stages, mandatory / optional, organisations involved to deliver and environments to be used.

Table 6 – Glossary of Phases and Stages

Test Phase	Test Stages	Mandatory (Y/N)	Organisation Involved	Environment Used
PIT	System Test (to include FAT and Performance Test of individual systems)	Y	•DSP •DCC	PIT B
SIT	Solution Test (using Devices/Appropriate Firmware for devices)	Y	•DSP •CSP •DCC	SIT B
	Solution Test (using Emulators)	Where Devices/Appropriate Firmware devices are not available)	•DSP •CSP •DCC	SIT B
	SP UAT	Y	•DSP •CSP •DCC	SIT B
UIT	User Test	N	•Users •DCC	UIT B

The Test Phases are as follows:

- The Pre-Integration Test (PIT) phase covers the testing by DCC Service Providers, undertaken individually, to verify that the solution meets the requirements. In this case it will be the DSP only.

- Systems Integration Testing (SIT) confirms:

    - Solution Testing by DCC Service Providers collectively, to verify the end to end functionality using devices and where not available, emulators. It also confirms interoperability between the modified DCC System and existing devices in production.

    - Service Provider User Acceptance Testing (SP UAT) to initiate the Quality Gate Review for exiting the SIT phase.

- User Integration Testing (UIT) allows Users to test their systems and devices with the Modified DCC System before changes are made available in the production environment.

    - for the November 2019 Release, Users with devices deployed in Production will be invited to undertake testing of their DUIS systems against the Modified DCC Solution and to self-certify the results of this testing to the DCC. All such evidence will be collated and presented.

4.3 Delivery of Test Phases and Stages

The execution of the testing to support the November 2019 Release will be undertaken in appropriate test environments as per Table 6.

The testing phases and stages to support the November 2019 Release will be subject to the DCC quality gating process including the DCC Test Assurance Board (TAB).

The SI will manage the usage of environments (except DSP PIT). Should there be any contention in resources this will be escalated to the DCC for determination and any impact notified to test participants.

5 Test Phase Activity Description

This section of the November 2019 Release Testing Approach Document defines the testing activities and assurance requirements for individual Test Phases.

The provision of the testing deliverables detailed in section 7 shall ensure that these requirements and focus areas are suitably covered by each DCC Service Provider and each testing phase and are assured accordingly. All requirements and deliverables for each phase shall ensure that the test objective is met.

5.1 Requirements & Focus Areas for Pre-Integration Testing

The PIT phase for the November 2019 Release is required to provide assurance of the quality of the Service Provider solutions early in the development cycle.

As an overall requirement, any and all testing which can be reasonably and cost effectively undertaken prior to SIT should be undertaken in PIT.

Table 7 PIT Requirements

Ref	Requirement
PIT.1	DCC Test Assurance will perform assurance activities in PIT across all activities except unit and link testing, as subsequent activities within PIT provide assurance of outputs from those tests
PIT.2	DCC Service Provider PIT shall include performance testing of the Modified DSP solution
PIT.3	DCC Service Provider PIT shall include security testing of the Modified DSP solution
PIT.4	DCC Test Assurance shall review the PIT test cases, where used, for appropriateness and suitable functionality coverage
PIT.5	DCC Service Provider PIT shall cover all functional areas impacted for testing the November 2019 Release
PIT.6	DCC Service Provider shall produce and maintain the PIT approach document, the System and FAT plan, test completion reports and Work Off Plans

5.2 Requirements & Focus Areas for Systems Integration Testing

SIT for the November 2019 Release shall be planned and based on successful testing in PIT. It shall confirm the successful integrated operation of the Service Provider solutions and shall support delivery of final, assured code for User testing. It shall comprise of Solution Testing and Service Provider User Acceptance Testing (SP UAT).

The SI shall produce a SIT Approach Document detailing the testing to be undertaken during this Test Phase. This document shall be approved by the DCC and shall be shared with the Panel's TAG for information.

5.2.1 Solution Testing in SIT

Table 8 SIT Requirements

Ref	Requirement
SIT.1	Continuous Integration Regression will be employed throughout the SIT phase
SIT.2	Forward and backward compatibility will test no adverse changes have occurred due to the new code and that new devices are fully operational
SIT.3	Continuous Integration Regression will be employed. Two end of cycle regression will be executed
SIT.4	SIT will be undertaken using scenario testing and will ensure that Service Requests are validated for the correctness and consistency of content, alongside the correctness of formatting
SIT.5	SIT coverage will be proved using a test traceability matrix. This will be used to report the SIT progress.
SIT.6	SIT will be designed to make use of automation where practicable to improve testing throughput rates
SIT.7	SIT will use agreed unique devices available in CPL to perform the Service Request testing
SIT.8	SIT will include exception test scenarios
SIT.9	SIT will include DBCH for Fylingdale as a specific device set
SIT.10	Testing of the integration with the SMKI for security testing
SIT.11	SIT will include verification of the correct operation of all interfaces in DCC Systems
SIT.12	SIT will include verification that the correct end-to-end data is contained in all relevant DCC enterprise system produced report feeds
SIT.13	Where SIT makes use of the DCC SIT and UIT Emulator, testing must include emulator configuration to provide valid data in a Service Response. A blank / null response cannot result in a passed test. The response must include valid data that can be successfully parsed and where relevant decrypted, to prove the response data received is as expected based on the emulator configuration for that test
SIT.14	SIT will ensure • Agreed selection of devices are installed and commissioned in the test environment prior to the deployment of the changes, then deploying the code and carrying out regression testing of the existing functionalities only for backwards compatibility. • Agreed selection of devices can be installed and commissioned and can operate as per the requirement using the changed code

5.2.2 Service Provider User Acceptance Testing in SIT

The SIT Phase includes the DCC Service Provider User Acceptance Testing (SP UAT) activity. This activity will operate concurrently with Solution Test and is undertaken to provide additional assurance.

SP UAT allows DCC to witness an agreed subset of the tests carried out in Solution Test. The subset of tests will be described in a SP UAT plan produced by the Service Provider.

Giving at least 2 Working Days' notice, but no later than 5 working days before the close of testing, the DCC Systems Integrator will provide DCC with a schedule of when and where tests will be executed and invite DCC to witness either on-site.

Witnessing of the test execution, or reviewing evidence of executed tests, will adhere to three key rules;

- There will be no deviation from test scripts
- There will be no hands-on execution by witnesses
- Where a gap in testing is witnessed, this will be recorded as an observation for further testing

SP UAT will report to DCC before SIT exit on test completion, test failures and test pass rate independently of Solution Test, in order to ensure that 100% coverage and other success criteria of SP UAT are met.

5.3 Requirements & Focus Areas for User Integration Testing

The provision of User Integration Testing (UIT) environments and associated services is part of DCC's ongoing activities, this section describes the specific requirements and focus areas for the November 2019 Release.

DCC shall provide a Testing Service (User Integration Testing) that allows Users to test the interoperability of its User Systems with the Modified DCC System (including via the Self-Service Interface), and to test simultaneously the interoperability of User Systems and Devices with the Modified DCC System. UIT shall be made available on the same basis as Testing Services under Section H14 (Testing Services), but subject to this Testing Approach Document.

There will be a period between the completion of SIT and promoting functionality to live operations where Users will be asked to volunteer to demonstrate that they can successfully operate the new November 2019 Release functionality prior to using it in production. Users can also carry out User Regression Testing to demonstrate that the November 2019 code does not adversely affect their existing production service.

The Enduring Test Approach Document (ETAD) and Common Test Scenarios Document (CTSD) will be reviewed and where necessary updated to address any specific November 2019 Release testing requirements.

Table 10 UIT Requirements

Ref	Requirement
UIT.1	UIT will enable Parties to test the November 2019 Release functionality
UIT.2	UIT will be planned for Parties to be able to test against their systems and devices ahead of the Release "Go Live"
UIT.3	The deployment of releases into UIT will be subject to specific entry criteria to ensure minimal risk of disruption to ongoing participant testing in the environment
UIT.4	UIT shall include the capability for Users to verify their end-to-end data is operating correctly over DUIS
UIT.5	Volunteer Users with Devices deployed in production are asked to confirm whether and what they intend to test during the UIT window [10] working days prior to its start and agree to complete testing within the time frame given. The findings will be provided at the end of the UIT window

It is noted that DCC maintains its obligations to provide and support an integrated environment for the purposes of user testing, which includes ongoing assurance of the provision of CSP and remote test labs used within UIT and demonstrating that the UIT environment is secure.

5.4 Requirements and Focus Areas for Transition to Operations Testing

The TTO Test Phase may include Business Acceptance, Operational Acceptance, and Security related requirements as focus areas to transition the November 2019 Release solution to operations. TTO Testing shall focus upon the service management processes as SIT will have tested technical end-to-end functionality. Support from the DCC Systems Integrator and CSPs is required to carry out internal and external testing as part of TTO Testing.

The above TTO activities will be tracked by the Service Transition Manager who will be responsible for ensuring they are completed as part of the Operational Acceptance activities, supported by specific Service Acceptance Criteria specified by the impacted Operations team. Where the delivery of TTO activities sit outside of Operations, the Service Transition Manager will work with the programme to identify the Accountable person for delivering the required level of assurance that the TTO activities have been completed to the required level of satisfaction. The Service Transition Manager will track and ensure the activities are completed in line with the agreed Service Acceptance Criteria as documented in order to meet Operational Assurance

6 Test Activities

For each mandatory Test Phase, the following activities will be performed;

- Prepare and maintain a Test Phase Approach document
- Implementation of the testing infrastructure
- Test Phase planning
- Identification of appropriate test scenarios
- Design of test scripts
- Produce a test specification document
- Produce a test traceability matrix, or equivalent
- Design and preparation of test Data, including loading of test Data into the test environment
- Preparation of a test execution schedule
- Execution of testing
- Performance quality gate reviews
- Test issue management
- Test issue resolution
- Release management
- Configuration management
- Test Progress reporting
- Production of a Test Phase Completion Report
- Test assurance of third-party components
- Definition and execution of a Work Off plan
- Test metrics collected for test execution time, triage cycle time and daily volume

6.1 Test Method

For the November 2019 release, DCC is seeking to further improve testing throughput. By making more effective use of automation in SIT we are now able to perform multiple types of regression testing in parallel with the main body of SIT tests, and this approach has been successfully used for SMETS1. DCC shall also seek to measure the effectiveness of the use of automation in SIT by collecting metrics that quantify both the level of automation present in a test pack as well as test execution time and triage cycle time. DCC will require the systems integrator to provide the detail of how we shall achieve this in the SIT approach document, including reporting to establish a baseline of automation effectiveness as well as reporting to demonstrate that expectations around the use of automation have been met.

For manual and automated testing, DCC shall use scenarios that based on user journeys. The supporting test phase approach documents will specify the detailed testing methodologies employed in each test phase.

Test design for November 2019 release will have the following critical areas for testing.

- Devices are installed and commissioned in the test environment prior to the deployment of the changes, then deploying the code and carrying out regression testing of the existing functionalities only for backwards compatibility
- Devices can be installed and commissioned and can operate as per the requirement using the changed code
- Changes introduced as part of the November 2019 release are working as per the requirement

Priority, within the design of testing for the November 2019 Release, shall be on the changes introduced by the scope of the Release, and on the functionality and Service Requests that are considered to be of highest risk to Users in the production system and on validating there is no adverse effect on the existing devices in the DCC system. These will be derived from the heat map and the TTM.

Testing will cover both functional and non-functional aspects of the dynamic interaction between solution elements and shall cover, to an agreed level, of the DCC service request variables – user role, command variant and mode of operation. Where a changed interface is to be tested, all associated or impacted interfaces shall also be tested. Similarly, testing should account for all elements of the Modified DCC System, for example the internal DCC-Enterprise components that support billing and reporting.

In general, testing with combinations of real devices will form the basis of a default test setup. Testing with emulators in SIT shall in general only be conducted where devices are unavailable to be tested. Where testing makes use of the SIT emulator necessary, testing shall include emulator configuration to provide valid data in a service response. Where new emulator functionality is required, the device will be subject to testing and assurance.

In relation to the design of testing for SIT, consideration has been given to the coverage of DUIS and how testing between regression and new elements is balanced across the interfaces and Communications Hubs types and CHTS versions.

6.2 Test Scenarios

Test scenarios may, within the context of the individual Test Phases, be represented by defined sequences of Service Requests and/or other relevant activities.

Each Test Phase will define test scenarios as a deliverable as appropriate, but as a minimum the definition of test scenarios will include:

- Description;
- Responsibility for development;
- Type (Normal, Exception, Alternative);
- Prerequisites;
- Test conditions;
- Verification method;
- Traceability to requirements (or use case for DSP PIT); and
- Test variations – User Roles, Communications Hub, mode of operation, Command variant, Device, DUIS and GBCS versions

The definition of Test Scenarios for SIT shall include and consider:

- Key common scenarios that will be experienced by the Parties in production: and
- A relevant subset of scenarios (or Service Request sequences) to reflect Network Operator Party use cases

DCC will review the proposed Test Scenarios, or sequences of Service Requests, for SIT with Parties at the DCC monthly testing forum – the Testing Design and Execution Group (TDEG).

Test Scenarios may be updated to take account of activities from live operation, subject to suitable change controls.

Test scenarios must cover exercising all interfaces in DCC Systems in an end-to-end manner verifying functionality as well as that data is reported correctly.

Where emulators are needed to be used, test scripts should define the required emulator configuration to provide valid data in a Service Response.

6.3 Regression Testing

All new releases of any element of the solution from every DCC Service Providers will be subject to completion of a successful regression test prior to being accepted into subsequent Testing Phases and environments.

The following requirements for regression testing shall apply:

- A Test Coverage approach will be produced and assured to gain maximum test coverage with minimal testing effort
- Wherever practicable, regression testing will be automated;

- Regression testing will be an ongoing activity;
- All regression testing must include security testing– even if that element has not been changed[1];
- The regression test approach for each phase will be described in each Test Phase Approach Document;
- The scope of regression, where appropriate, is permitted to be risk-based with regard for combinations of User Role, command variant etc. The exact scope of regression shall be defined in the Test Phase Approach Document for each phase;
- If risk-based regression testing is used within a Test Phase, as a minimum it should include key Service Requests. The key Service Requests will be derived from the heat map and TTM. This will then be discussed and agreed between DCC and Users;
- The Regression Test Pack (test scripts, test data and documentation) will be available to the DCC during the test phase within ALM, with any agreed omissions being rectified promptly;
- Regression testing for SIT shall be completed using devices in production and in CPL.

[1] Not in scope for PIT

7 Deliverables

DCC will follow the testing documentation practices established for earlier releases. These are described at a high level in this section, and specific enhancements and requirements for the November 2019 Release are highlighted.

7.1 By Test Phase

Various deliverables will be produced for each Test Phase. The Test Phase Approach Documents will detail the deliverables required for the individual Test Phase.

The author for individual Test Phases will create the deliverable, which will be subject to the established governance processes. Below is a list of responsible teams for various test phases.

- PIT – DSP
- SIT – DCC Systems Integrator
- TTO – DCC

The table below describes the generic content and anticipated timing of the deliverables that may be required to be produced for each Test Phase.

Table 11 – Deliverables

Deliverable	Description	Timing
Test Phase Approach Documents	Describes the relevant test phase: the activities, participants, resources, roles and responsibilities, assurance requirements, reporting, success criteria, and other information relating to the execution of the Test Phase. Where relevant, the Test Phase Approach Documents shall also define the entry and exit criteria, and the basis of any risk for regression	Following any review cycles, a final version shall be submitted to DCC by the relevant DCC Service Provider no later than [10] Working Days before the commencement of test execution.
Test Plan and Test Schedule	Details the scope of the testing to be carried out and the responsibilities of DCC Service Providers and other Parties	Final approved version to be provided to DCC by DCC Service Providers no later than [10] Working Days before the commencement of test execution
Test Specifications	For example Requirements Traceability Matrix, Test Scenarios and Heatmap	To be provided to DCC by DCC Service Providers no later than [10] days before the commencement of test execution
Test Results	Details may vary by Test Phase – report content and frequency will be defined by the Test Phase Approach Document	Made available by DCC Service Providers for review by DCC throughout test execution

Deliverable	Description	Timing
Test Issue Log	Outstanding Testing Issues	Made available by DCC Service Providers for review by DCC throughout test execution
Regression Test Pack	A Regression Test pack is a set of test cases run to ensure the core product remains unaffected by new feature additions.	Access granted to DCC by DCC Service provider to review beforehand and monitor throughout
Test Phase Completion Report	Will follow the format and content established for earlier DCC releases, and will include; • Overview of testing undertaken • Actual number of tests run, passed, failed, and not run • Explanation of any tests not run • Test issue I.D. detail for failed tests • Number of test issues outstanding, split by severity • Number and severity of test issues raised • Specification of test environment used • Recommendations for tests to be included in the next Test Phase • Lessons learnt during the Test Phase	Draft version to be provided to DCC by DCC Service Providers no later than 10 Working Days before the planned end of test execution Final version to be provided to DCC by DCC Service Providers within [3] Working Days of the completion of test execution
Test Scenarios	Shall comprise of planned and sequenced series of Service Requests.	To be available from DCC Service Providers at the same time as the finalised Test Phase Approach Document.
Work Off Plan	A plan to resolve (fix, retest and close) outstanding issues. Once the fix is made available, retesting of the issue should be completed within [5] Working Days.	To be provided to DCC by DCC Service Providers with the final Test Stage Completion Report.

7.2 Specific Deliverables

DCC will publish the following documents.

Table 12 – DCC Deliverables

Deliverable	Description	Timing
ETAD & CTSD Update	DCC will propose changes to update the ETAD and CTSD, where applicable, to reflect the changes for the November 2019 Release	DCC will consult on the updates to the ETAD and CTSD following confirmation of this Testing Approach Document

7.3 Requirements Traceability

The DSP will use their own tools to manage their requirements and demonstrate traceability to both the solution design and the Pre-Integration Tests. The DSP will provide DCC with a PIT Requirement Traceability Matrix (RTM), extracted from these separate tools.

The scope of testing will be validated by use of TTM, setting out how each requirement within the scope of the release is met. The TTM supersedes the RTM developed and used within PIT.

The TTM will be prepared by the SI, based on the updates to the specifications listed in section 2.1, and will consider the resulting impact of those changes and resulting coexistence of enrolled devices operating to different variations of versions of those specifications as well as current version of those specifications. Production of the TTM is a requirement for SIT to commence.

At the completion of SIT, any additional tests which have been created during SIT will be added to the TTM.

The TTM will be used by DCC and form a key element of the independent SIT audit, to demonstrate the completion of SIT, alongside the heat map.

8 Test Procedure

This section describes the requirements for the testing process to prove the solution for November 2019 Release.

The Test Phase Approach Documents will define specific Entry and Exit Criteria for the individual Test Phases, with generic requirements for these described below.

The Test Phase Approach Documents will also define specific entry and exit criteria for individual Test Phases, the governance process relating to the approval of the criteria, and the evaluation of success against them.

8.1 Generic Entry and Exit Criteria

Progression through Testing Phases for the November 2019 Release will be gated using generic and specific Entry and Exit Criteria.

The Test Phase Approach Documents will provide detail of the evidence to be gathered in the form of an evidence pack.

8.1.1 Generic Entry Criteria

The following generic Entry Criteria will gate the entry to all Test Phases, except for UIT which shall have no Test Plan, or Test Specification:

- Test Phase Approach Document for Test Phase signed off;
- Test Plan signed off;
- Test Phase Completion Certificate for preceding Test Phase issued, unless advanced agreement that Test Phases may overlap;
- Test Specification prepared, including traceability to Requirements / Design documents;
- Test labs, Devices, tools, stubs, environments, and data are assured and accepted as fit for purpose, including external assurance;
- Regression test pack has been prepared or updated;
- DCC and all relevant Service Providers have confirmed they have resources with the requisite skills and access available to support the Test Phase; and
- Approval to proceed certificate issued by DCC, unless the plan states that Test Phases may overlap;

8.1.2 Generic Exit Criteria

The following generic Exit Criteria will gate the exit of all Test Phases except UIT:

- For PIT all tests run, or any exceptions documented and agreed by TAB;
- For SIT all tests run, or any exceptions documented and agreed by TAG;
- All test success criteria achieved, or any exceptions documented and agreed by TAB;
- The number and severity of any outstanding Test Issues is at or below the target thresholds, or any exceptions documented and agreed by TAB;
- Test results documented, and evidence captured;
- Set of test issue logs have been produced;
- Regression testing successfully completed;
- Production of agreed Work Off Plans for any outstanding Test Issues that have been identified during the Test Phase;
- Work Off Plans from preceding Test Phases have been completed; and
- Test Phase Completion Reports have been produced and, where required, test Completion Certificates have been issued by DCC.

8.2 Specific Entry and Exit Criteria for Test Phases

Specific Entry and Exit criteria for individual Test Phases shall be detailed in the relevant Test Phase Approach Document.

8.2.1 Entry into SIT

The Entry Criteria for SIT shall include, among other things:

- DCC to ensure all required devices are available 1 month before commencement
- The remaining criteria is to be met 1 week before SIT commencement;
- A draft PIT completion report submitted
- Successful assurance of SIT test data

8.2.2 Exit from SIT

The Exit Criteria for SIT shall include, without limitation:

- A device selection process will be used to select a subset of Devices, from the CPL, to be used for testing. These devices will be used to successfully complete SIT.

8.2.3 Entry into UIT

The Entry Criteria for UIT shall include, inter alia:

- Successful completion of testing, assurance and DCC governance of the SIT phase for the functionality to be promoted into UIT.

8.3 Acceptance Process Following SIT Completion

Following the completion of SIT, DCC will notify the Panel and Parties that SIT has ended.

DCC will provide the Panel with copies of the SIT Completion Report(s) along with a list of those sections of such reports that it considers should be redacted.

DCC will review the documentation and evidence to support the relevant Entry and Exit Criteria with the Panel's TAG to inform the Panel to enable their decision regarding the completion of SIT.

On direction from the Panel, DCC will provide the Parties and Service Providers with copies of the Test Completion Report(s) having first redacted any sections specified by the Panel.

8.4 Test Phase Success Criteria

For SIT and the testing for SP UAT the following Test Success Criteria will be included in the Exit Criteria:

- 100% of tests listed in the Test Specifications have been executed, or any exceptions documented and agreed with TAB, and subsequently reported to the Panel's TAG, and to the Panel;

- at least 90% of the tests executed relating to the new functionality have been passed, and all failures are documented, and defects related to failures are as per the agreed defect threshold in Section 8.5 of this document

- regression testing in SIT achieves a 100% pass rate

8.5 Testing Issues Threshold

Table 13 lists the standard thresholds for outstanding testing issues in each test phase. These shall be calculated by Service Provider.

Table 13 – Threshold

Test Issue Severity	PIT	SIT
1	0	0
2	0	0
3	15	15
4	30	30
5	60	60

Note that:

- The defect thresholds are applied as part of the Exit Criteria for relevant Test Phases and apply cumulatively if there are iterative deliveries within a Test Phase. For example, there will never be more than 15 Severity 3 defects per Service Provider at an exit gate.
- Meter manufacturer defects shall not be included in the testing Issues mask. Evidence will be sought that the meter manufacturer has accepted the Testing Issue
- The defect thresholds shall include any security defects within the relevant Testing Phase
- TAB may judge that the SIT Phase can start even if the thresholds set in the PIT Exit Criteria have been exceeded, provided that an agreed Work Off Plan is in place. This decision will be reported to the Panel's TAG and Panel, but is not subject to their agreement
- As part of confirming the completion of SIT the DCC shall present all extant Severity 3 defects identified during the November 19 Release testing to the Panel's TAG to confirm that the correct Severity has been assigned
- Where the DCC and the Panel's TAG cannot agree on the Severity of a Testing Issue identified in SIT or UIT, and this matter impacts achievement of a Test Phase Defect threshold, the DCC may refer the matter to the Panel for its determination, which shall be final.

8.6 Work Off Plans

Work off plans, shall be produced detailing the defects that are outstanding and a plan for resolving them.

As this is a DSP change only, they shall resolve all 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

The resolution of a test issue will require the Service Provider to fix, retest and close the Testing Issue.

If the timescales for the Work Off plan are not going to be met, the Service Provider shall promptly produce and agree a correction plan with DCC.

If a Test Phase Complete Certificate has been issued subject to completion of a Work Off plan, and the Work Off plan has not been completed within the applicable time period, then DCC shall revoke the Test Phase Complete Certificate unless the failure relates solely to Severity 5 test issues.

9 Test Result Management & Reporting

Test Result Management and Reporting is to be provided to DCC by the DSP for PIT and the SI with input from SPs SIT and UIT Test phases, as relevant, on a frequency to be detailed in the Test Phase Approach Documents.

9.1 Tracking & Reporting

HP's Application Lifecycle Management (ALM) Test Management tool will be used to manage testing and testing issues[2].

All requirements, scripts, tests, execution results and defects are to be maintained in ALM. Connectivity between requirements, tests and defects is to be maintained for traceability and reporting purposes.

Overall responsibility of maintaining traceability of test and defects lies with the SI for all Test Phases.

The SI shall provide enhanced visibility and reporting of the progress, completion, and coverage of testing for SIT across a number of parameters. This should include test automatic metrics.

9.2 SIT Completion Reports

DCC will produce its own Test Completion Reports when it considers that the Exit Criteria required by the SIT Phase Approach Documents have been met. The report will provide evidence of the testing undertaken, the results of testing and how the Exit Criteria have been met.

This report, together with any relevant independent assurance reports, will be provided to the TAB, Panel's TAG and the Panel.

[2] Except where not applicable for PIT

10 Acceptance and Test Assurance

DCC has established processes for the acceptance of testing activity completion – these will continue for the November 2019 Release. The TAB will conduct quality gate meetings and review testing completion reports before issuing Test Completion and Approval to Proceed Certificates.

10.1 Service Provider Self Assurance

Service Providers will continue to assure their own PIT activities against this Testing Approach Document and their specific PIT Phase and Test Plan. Service Providers will also continue to make their relevant testing deliverables available to the other Service Providers and exchange constructive comments to ensure solution and testing compatibility.

10.2 Test Assurance by DCC

DCC will continue to assure Service Provider testing using the processes and activities established for earlier releases, and will include the following methods, at times determined by the individual Test Phase Approach Documents:

- Test Assurance Board quality gates;
- Test Witnessing;
- Test observation;
- Test Quality Audits;
- Product Inspections; and
- Document Review;

10.2.1 Quality Gating and the Test Assurance Board

DCC will continue to operate the Quality Gating process developed for prior Releases and enhanced through experience.

The Quality Gate process provides:

- Controlled entry of functionality into subsequent Test Phases;
- Confirmation that the scope of tests shall provide adequate assurance of the changes introduced to the DCC System;
- Formal and objective evidence that test criteria have been met for a stage / Phase;
- Transparency of test activities and outcomes to facilitate DCC Test Assurance;
- Formal evidence for signoff of Service Provider test milestones and/or associated payments;

- A mechanism for managing remedial work associated with closure of test stages / Phase;

The Quality Gates from PIT into SIT and exiting SIT are operated as TAB gates.

10.2.2 Test Witnessing

DCC will agree, in advance, with the SPs which tests it wants to witness during Factory Acceptance Testing (FAT) and SP UAT. Details of these tests (which will be a subset of System Tests for FAT and a subset of Solution Tests for SP UAT) will be described in the FAT and SP UAT plans. The SPs will provide DCC with a schedule of when the tests will be executed and invite DCC to witness on-site. The witness will have the skills required to fulfil the role. The SP will provide the witness with relevant documentation and access.

For the November 2019 Release DCC Test Assurance must be given full access to attend and witness such testing.

Execution of the agreed set of tests will be performed by the relevant SP 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
- Where a gap in testing is witnessed, this will be recorded as an observation for further testing

Test issues raised during witnessing will be entered in to the relevant Test Issue Management tool and progressed through the Test Issue Management process.

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 (SMEs). A wash-up session will be convened at the end of the witnessing period to discuss the outcome of witnessing and to agree any outstanding queries and issues.

10.2.3 Test Observation

With prior agreement with the SPs on the timing, duration, and scope, DCC staff may observe test execution and test issue management activities during System Testing and Solution Testing in order to familiarise themselves with SP processes and the systems under test. The DCC observers will have the skills required to fulfil the role.

11 Testing Issue Management

The process defined in the Testing Issues Resolution Process covers SIT testing. However, there are small variations that arise due to the requirement to interact with User Testing Participants. The Testing Issues Resolution Process will be reviewed and updated where appropriate.

12 Test Resources

This document will not provide detail of the DCC internal teams or the Service Providers who will be undertaking the actual testing but does provide details of the DCC Test Assurance Team who are responsible for assuring compliance with this Testing Approach Document.

This section also describes the Testing Stubs which will be used, and the other Testing Tools.

12.1 DCC

Notwithstanding, any organisational change at DCC affecting the structure of the team, dedicated DCC resources will support the assurance of testing described in this document.

The functions and services delivered by the DCC Test Assurance Team shall include:

i) Test Assurance – responsible for assuring the progress of testing, including witnessing, and observing testing within PIT, SIT, and TTO; reviewing test plans, scripts, and scenarios; co-ordinating with Product and Design teams to provide Device assurance; providing evidence and documents into the TAB meetings; assuring reporting by Service Providers.

ii) Issue Management – responsible for operating the issue management process; including chairing the Issue Resolution Board and reporting on issues for all test phases except PIT. Responsible for producing reports on testing issues, including providing regular reporting to DCC problem management on issues potentially affecting the DCC production solution

iii) Test Assurance Management – responsible for reporting progress to industry; point of escalation for testing participants; conducting TAB meetings; managing independent audit and assurance providers; maintaining this Testing Approach Document; submitting evidence and reporting to Panel and the Secretary of State as required

iv) Industry Test Team – responsible for supporting user testing and managing relationships with Testing Participants; reporting on user testing.

12.2 Test Stubs

This Testing Approach Document allows for the use of Testing Stubs, where appropriate, across each of the Testing Phases to support entry into and completion of those phases. Individual Service Providers, DCC and Testing Participants may utilise Testing Stubs to

simulate or emulate elements of the solution which are either not available or practical for use in the relevant test phase.

For example, within SIT, a User Simulator will be used to act in the role of a DCC User.

DCC has developed a Meter Protocol Emulator, capable of acting as an Electricity or Gas meter, or as a PPMID or HCALCS Device. Whilst the intention is to test with real devices, the emulator will be used should devices not be available.

The Meter Protocol Emulator will, if required, be updated to enable its use to complete testing for the November 2019 Release including the addition of acting as an In-Home Display and will be subject to an independent assurance activity. These changes will be subject to testing, assurance, to confirm that the devices are suitable for testing with.

12.3 Test Laboratories

The DCC will provide a test lab facility and supporting services to enable Parties to test with their own Devices and DCC Communications Hubs and SM WAN infrastructure in the User Integration Testing environment.

13 Roles and Responsibilities

All parties involved in the November 2019 Release testing shall:

- Follow Good Industry Practice, as define in the SEC
- Take all reasonable steps to facilitate achievement of the testing objectives
- Ensure that all testing issues are evaluated for the potential impact on the DCC production solution, at the point of raising the issue or during triage, and recorded as such on the test management tool

13.1 DCC Systems Integrator

DCC shall ensure that the SI will manage SIT and be responsible for the following activities:

i) Producing and maintaining the SIT testing Approach document, the Solution Test Plan, and the SP UAT Plan;

ii) Ensuring that SIT activities are carried out in accordance with the SIT Approach, the Solution Test Plan, and the SP UAT Plan;

iii) Overall planning and control of SIT, including chairing entry Quality Gates between FAT and Solution Test, and between Solution Test and User Interface Testing

iv) Maintaining Risk, Assumption, Issue, and Dependency Logs for SIT

v) Leading the design and creation of test scenarios, test scripts, test data and test environments for SIT

vi) Preparing test execution and environment usage schedules for SIT

vii) Supporting the other SPs in their assigned test preparation and execution activities within SIT

viii) Managing test issue resolution, and supporting SPs in the resolution process for selective test phases

ix) Producing the Test Stage Plans, Test Specifications, Test Traceability Matrices, Progress Reports, and Test Completion Reports for SIT

x) Operating the master Configuration Management Plan

xi) Operating the master Release Schedule

xii) Operating the Environment Plan

xiii) Support the Interoperability Test Events

13.2 DCC Service Providers

DCC shall ensure that the Service Providers (including DCC in its role as provider of Enterprise Systems) shall:

i) Support the Systems Integrator in:

- Planning and control of test phases;
- Design and creation of test scenarios, test scripts, test data and test environments;
- Preparing test execution and environment usage schedules;
- Diagnosing test issues;
- Producing Test Plans, Test Specifications, TTM, Progress Reports, and Test Completion Reports;
- Contributing to the master Configuration Plan;
- Contributing to the master Release Schedule;
- Contributing to the Environment Plan;
- Establish, maintain, and control their own test environments, in terms of software / hardware configuration and access control;

For tests within their agreed test boundary, under the direction of the Systems Integrator;

- Execute and monitor test scripts;
- Capture evidence;
- Report progress;

Resolve test issues for their solution elements and undertake PIT testing (including regression testing) of any fixes required

13.3 DCC

DCC shall:

i) Comply with its obligations under this Testing Approach Document (this document);

ii) Ensure that activities attributed to Service Providers that are described in this document are undertaken;

iii) Use its reasonable endeavours to ensure that SIT is completed as soon as is reasonably practicable to do so;

iv) Enter into agreements with Device manufacturers to provide and support Devices for use in SIT, following appropriate qualification or selection activity;

v) Support the DCC Systems Integrator in the planning, control, and operation of testing;

vi) Assure planning, preparation and execution activities undertaken by the DCC Systems Integrator and Service Providers as detailed in this document and through the Test Traceability Matrix;

vii) Operate and Chair the DCC TAB process to review and approve the relevant Test Documents and issue the Approval to Proceed certificates, including the approval of test phase Completion Reports;

viii) Participate in Quality Gate Reviews;

ix) Agree with the DCC Systems Integrator and Service Providers the subsets of Solution Tests to be witnessed in the SP UAT stage;

x) Witness the execution of SP UAT;

xi) Specify, procure, provide, and maintain the DCC Meter Protocol Emulator Devices and Service; and

xii) Appoint and manage the independent audit and assurance activities described in this document.

14 Environments

The November 2019 Release will use the appropriate DCC environments.

These environments will be available as required by the overall plan for the November 2019 Release. Specific deliverables relating to the management and use of environments, particularly co-existing with other programmes, shall be published by DCC. This will clarify the approaches to usage of the environments by the November 2019 Release and SMETS1 MOC and FOC capabilities and MM2.

14.1 Code Management

DCC will operate a process to merge code changes into the test environments used by the November 2019 Release. The SIT Approach Document will provide detail of the frequency of the operation of this process.

15 Appendix

15.1 CR1056

This change is to introduce a separate Install and Commission retry configuration that will only be invoked during the Install and Commission process. The change will modify the DSP system such that:

a. On successfully adding a GSME device to the HAN, the DSP shall record that the device has been “installed” and shall treat the device as being under the Install and Commission process for a period of time after installation. This period shall be configurable as a single system parameter;
b. A separate Install and Commission retry configuration shall be available for GSME devices. If a GSME is currently marked as being under the Install and Commission process (see above), then the Install and Commission retry configuration shall be applied;
c. The Install and Commission retry configuration is optional on a per SRV basis. If no Install and Commission retry configuration is defined for an SRV then the standard short retry configuration for that SRV shall be used. The Install and Commission retry configuration may be defined differently for each SRV;
d. Once the GSME is no longer marked as being under the Install and Commission process, then the standard short retry configuration shall be used.
e. This is an internal DSP only change and does not affect any of the external interfaces. However, the DSP implementation should be protected behind a service feature switch to allow flexibility to enable the functionality in production.

How we will be testing this in SIT ?

- SIT will have a dedicated device set to test this CR across both the CSPs covering 3 variants of Comms Hub: ARQ – EDMI , TEF – TOSH & TEF – WNC .
- GSME will be joined to HAN (SR 8.11 _Add) , once GSME is in INC state i.e. Installed but not Commissioned state ; the new GSME I&C Retry window (1hr) kicks in as part CR 1056.
- Issue Supplier Cert to GSME/GPF via SR 6.21 .
- Once successful, GSME will be made unresponsive by switching it off.
- Here on, DSP uses the GSME new I&C retry configuration parameters (340:340:340) around 5.40 mins interval of 3 retry totaling to 17 mins duration.
- Once the first retry time is over – the GSME will be switched on to process the SR. Like this 4 I&C related SR will be tested (SR 8.1.1. / SR 8.7.2 / SR 6.20.1 /SR 1.1.1)
- All this testing will have to be completed within 1-hour window
- Once the I&C max time is reached, GSME will use normal DSP Short Retry mechanism to deliver SR to GSME.

- To prove the above point; after 1-hour window, GSME will be switched off again and SR 2.1 will be process to check the normal short retry window of 1840 secs still kicks off.
- To ensure within SIT, most of the key I&C SRs are covered – there will be a GSME exchange within the same set to cover the remaining key I&C SRs like SR 2.1/1.6 in a reverse order.

User Testing

DCC has re-confirmed that customers are not required to test CR1056. (If customers wish to do so, DCC can arrange associated SI testing support in UIT)