Data Communications Company

CSS External Testing Guidance

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Table of Contents

1.   Introduction

Central Switching Service (CSS) External Testing verifies a party's capability to act as users of CSS. The CSS External Testing scope will be defined by the CSS External Testing Scenarios and will be limited to proving the CSS interfaces only. The evidence of compliance is used by the Testing Participant to demonstrate the capability of that party to use the CSS in accordance with the user entry requirements within the REC (Retail Energy Code).

1.1. Purpose

This document provides all prospective Testing Participants with visibility of the scope and deliverables for CSS External Testing, as well as detailing the approach to test preparation and execution, including:

- Entry assessment requirements,

- Test coverage,

- Test management and

- Test planning.

1.1.1. Objective

This document shall provide a clear and consistent reference point for the management of CSS External Testing. It shall also define the interactions required and roles and responsibilities during testing as well as what Testing Participants are required to do to conduct CSS External Testing.

1.1.2. Out of Scope

This document does not cover Parties testing their internal interfaces.

2.   CSS External Testing

CSS External Testing verifies a party's capability to act as a user of CSS, it is mandatory testing that must be undertaken in the following scenarios[1]:

- All organisations seeking to become a CSS User, for either electricity or gas, must undertake testing prior to becoming eligible to connect to the CSS production environment.

- Existing CSS Users who wish to use optional functionality that was not part of their original solution and therefore not tested during their initial CSS External Testing.

    o For example, if a gas only supplier who had completed CSS External Testing against gas only test scenarios subsequently wished to use electricity functionality, they would need to complete CSS External Testing against electricity test scenarios as described in CSS External Testing Scenarios document, which is available on the REC Portal.

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[1] For information on which market roles need to undertake CSS External Testing, please see Service User Categorisation and Assessment Document which is available on the REC Portal.

- For a CSS User who has been directed by the Code Manager to carry out all or a subset of CSS External Testing as part of the maintenance of their REC qualification. For example, the CSS user wishes to change their systems to use another CSS Interface provider.

CSS External Testing may be required in the following scenario if directed to do so by the Code Manager:

- If additional functionality is added to CSS, then additional CSS External Testing may be required if directed by the Code Manager for existing CSS Users where they would need to test the new functionality prior to being eligible to use the functionality in production. It is expected that the scope of this testing would be agreed as part of the change proposal development. This additional functionality would be added to the scope of test scenarios, as described in the CSS External Testing Scenarios document.

3. CSS Interface Providers

Where a party is seeking to become a CSS User and they are using a CSS Interface Provider then it is possible that a CSS Interface Provider could undertake testing on their behalf or a reduction in test scope could be agreed. This is subject to agreement with the Code Manager.

Both CSS Interface Provider and a User who uses the CSS Interface Provider will need to achieve and maintain their own qualification. If the CSS Interface Provider is undertaking testing on a party's behalf, then the party looking to complete CSS External Testing will remain accountable for ensuring that the CSS Interface Provider satisfies the criteria to represent them, completes all actions assigned and provides all test deliverables within the required timelines. The Testing Participant looking to complete CSS External Testing may still have responsibility for completing some test deliverables or providing confirmation that entry and exit criteria have been successfully met.

3.1. Permissible Use Cases

This section details the contexts where it may be possible for a CSS Interface Provider to test on behalf of a party or for reduction in test scope to be agreed.

This section details the contexts where it may be possible for a CSS Interface Provider for the CSS Interface Provider to perform execution of proportion of the test scope on behalf of the Testing Participant, or for a reduce test scope to be agreed as reliance can be placed on an element of the previous CSS External Testing Test Scenario execution the CSS Interface Provider has already conducted. This is subject to Code Manager's agreement. Sufficient detail should be provided in the in the Business Solution Assessment process for the Code Manager to assess and the agreement reached should be reflected in the Test Plan submitted to the Switching Operator.

The high-level scenarios are:

- If a CSS Interface Provider has already successfully completed CSS External Testing, then a reduction in test scope could be agreed as reliance could be placed, on that testing previously completed, by a party looking to complete CSS External Testing for the first time.

- If the party is looking to use functionality that the CSS Interface Provider did not successfully test previously then the related test scenarios will need to be completed. For example, if a CSS Interface Provider did not test One Fail All Fail (OFAF) functionality as part of their initial testing and a subsequent party/Testing Participant were to use OFAF, then OFAF test scenarios would need to be successfully completed by the party seeking to become a CSS User.

If the CSS Interface Provider has tailored their system to support different Testing Participants, then test coverage must ensure these differences are tested. Sufficient detail should be provided in the in the Business Solution Assessment process for the Code Manager to assess and in Test Plan submitted for the Switching Operator to be able to confirm this criterion has been met.

3.2. Change of CSS Interface Provider

If a Testing Participant wishes to change their CSS Interface Provider, this would be considered a significant change. Testing Participant should engage with Code Manager as soon as possible. The Code Manager would work with Switching Operator to identify the specific assurance that is required, this is likely to include CSS External Testing.

4.   Roles and Responsibilities

All parties involved in CSS External Testing shall comply with the REC and follow "Good Industry Practice" when participating in CSS External Testing, i.e., have a 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.

Organisation	Responsibilities
Switching Operator	• Management and delivery of the testing service which allows Testing Participants to conduct their tests during CSS External Testing • Management of the Testing Issue resolution process and provide the testing issue management tool • Provision of test assurance activities • General administration • Switching Operator test infrastructure and environments • Provide reasonable assistance and support to the Testing Participant in resolving testing issues • Notifying Parties of outages and other matters affecting their testing • Support Parties undertaking the test activities detailed in this document. • Issue of test PKI certificates • Provision of resource to support Testing Participants' testing • Provision of resource to triage Testing Issues • Provision of Test Data Tool • Provision of Test Management Tool • Provision of Test data • Provision of Counterparty Simulator test tool
CSS Provider	• Supply the CSS component of the relevant test environment and related data • Provide support for CSS solution elements and CSS component of the relevant test environment • Supply fixes required in CSS solution elements

Organisation	Responsibilities
	• Supply resource to support Parties undertaking connectivity testing • Provide Retail Energy Location (REL) data • Provide support to the Switching Operator in assisting in the administration of testing • Provide resource to triage and fix Testing Issues
Testing Participants	• Provision of detailed test scripts for testing being undertaken • Provision of Testing Participant test environment and related data • Provision of resource to carry out testing • Provision of resource to triage and re-test testing issues • Provision of any fixes required in Testing Participants' systems • Ensuring appropriate level of information is provided when raising a testing issue • Provision of connectivity to Enduring Test environment • Provision of Test Evidence • Provision of Test Artefacts and Test Deliverables • Ensure there is appropriate controls to manage test data assigned to them
Code Manager	• Confirming a Testing Participant has completed applicable pre-requisite activities as such as internal testing • Agreeing the extent to which a CSS Interface Provider could test on behalf of a Testing Participation or agreeing if a reduction in test scope is acceptable • Confirming if a Testing Participant has successfully completed the qualification process • Confirming that a suspension in testing is reasonable course of action if this is proposed by either Testing Participant or Switching Operator • Resolving a dispute between Testing Participant and Switching Operator if there is disagreement on whether a Testing Participant has successfully met, or not met, an Entry or Exit Criteria

Table 1 Roles and Responsibilities

5. Test Environments

The CSS UIT (User Integrated Testing) environments would support the following testing services:

- Connectivity testing and
- CSS External Testing.

CSS External Testing will take place in the CSS UIT-A environment.

Test PKI (Public Key Infrastructure) certificates will be used in these environments. Testing Participants will need to obtain Test PKI certificates in accordance with the process described in the CSS Schedule and via the Switching Portal.

The, below, table provides a summary of the functionality provide in CSS UIT Environments.

Functionality Provided	Functionality Not Provided
Processing of CSS messages	Switching Portal *Please note, this refers to an UIT instance of the Switching Portal. Testing Participants will need access to the production instance to support the management of their testing.*
CSS to DSP (Data Service Provider) interface *Please note, testing between the CSS UIT and Smart Metering DSP UIT environments will not be supported as this is not within the scope of CSS External Testing. Test data for CSS External Testing will not be shared with the Smart Metering DSP UIT environments.*	CSS to Gas Registration Data Agent (GRDA) interface,
	CSS to Electricity Registration Data Agent (ERDA) interface
	CSS-to Gas Enquiry Service interface
	CSS to Electricity Enquiry Service interface

Table 2 CSS UIT Environments Functionality

Each Testing Participant will host their own environment in-line with their hosting arrangements and follow the CSS Schedule.

5.1. Support Hours

The Switching Operator will make the test environments available and provide a test support service from 09:00 to 17:00 on each working day. The test environment may be used for testing outside these hours but will be unsupported. Should an issue occur during the night or weekend, then work to resolve it will not commence before 09:00 on the following working day. Any outages or planned maintenance will be communicated with as much notice as possible via the Switching Portal.

6. Test Data

At go live registration data that will be made available for CSS External Testing is the same as that used by the Switching programme to support user testing phases. This data set was a cut of live data and therefore represents historical live customer data, as such Testing Participants should ensure they have suitable controls in place to ensure the test data is appropriately managed and handled. The CSS Provider and Code Manager will work together to refresh this data when required, for example after significant changes to the system.

The test data for the CSS External Testing is comprised of:

- Registrable Measurement Point and Registration Data,

- Retail Energy Location (REL) generated against the data cut defined for the Switching programme UEPT and E2E test phases,

- Switching domain data and

- Market Domain Data.

6.1. Test Data Allocation

Testing Participants will be allocated test data to support their testing which will be shared via the Test Data Tool. On receipt of test data, Testing Participants should review the data and inform the Switching Operator of any feedback on the data allocated via the Test Data Tool.

The allocation of the test data shall be provisioned using the base principles, set out below:

Test Data Base Principles
Co-ordination/segregation of data usage between Testing Participant testing during the same period will be managed by Switching Operator.
Any test data supplied must only be used for the purposes of testing and is subject to the confidentiality and security obligations in the REC.
The data a Testing Participant uses for testing will not be revealed to another Testing Participant; a Testing Participant will have exclusive use of its allocated data.
The MPxNs assigned to CSS testing will be segregated from MPxNs assigned to support SMETS (Smart Metering Equipment Technical Specifications) testing with Smart Metering DSP UIT environments. The MPxNs assigned to CSS External Testing will not be loaded into the Smart Metering DSP UIT environments as standard.
Each Testing Participant will be allocated data to support their testing.
Test data will be provided to Testing Participants via the Test Data tool.

Test data will be segregated into separate sets of MPxNs:
 	
    • for new market entrants undertaking CSS External Testing; and
 	
    • reserved for Switching Operator use (for regression testing and resolving Testing Issues).

The MPxNs a Testing Participant uses for External CSS Testing will be assigned by the Switching Operator. This will be a small data set but sufficient for their test scope and to facilitate any Defect re-tests that are required.
Testing Participants that are new entrants to the market will have MPxNs allocated by the Switching Operator taken from the existing data set.
To support losing supplier test scenarios, a part of the Testing Participant's test data allocation will have supplier ownership modified to that of a dummy supplier. The dummy supplier will allow integration with the Counterparty Simulator and these changes will be loaded into domain data, CSS and shared with other systems as applicable

> The allocated CSS External Testing test data will be shared via the Test Data tool and will allow Testing Participants to view their allocated data. Initially, the test data will have a status of 'allocated' (to indicate it is available) and after download via the data test tool it will be set to 'download'. The test data tool, not the user will update the status from allocated to downloaded.

Table 3 Test Data Base Principles

7. Tooling

The following test tools will be provided to support the testing services:

- Switching Portal (production instance),
- Test Management and issue management tool,
- Counterparty Simulator test tool and
- Test data tool.

More information on the test tools, detailed below. is available via knowledge articles on the switching portal.

7.1. Switching Portal

Testing Participants will need to have access to the production instance of the Switching Portal. The portal will be the main mechanism for managing the progress and preparation of CSS External Testing. Testing Participant will need to submit the CSS External Test Preparation Request, via the Switching Portal, to initiate the preparation steps with the Switching Operator.

Please note, this is production instance of the Switching Portal. A test instance of the Switching Portal will not be available in the UIT environments as this is not in the scope of CSS External Testing.

7.2. Test Management and Testing Issue Management Tool

The Switching Operator will make available a Testing Issue Management Tool to Testing Participants. This will be used to managed test scenarios and execution, (as described in Section 11 of this document) and testing issues (as described in Section 18).

7.2.1. Access to the Test Management Tool

Credentials will be created for the names provided to the Switching Operator by the Code Manager in the request to inform the Switching Operator that an organisation wishes to undertake CSS External Testing.

7.3. Counterparty Simulator Test Tool

The Counterparty Simulator (CPS) Test Tool will be used during CSS External Testing. The simulator will act as a second Testing Participant and be used to co-ordinate the inbound and outbound message interactions between the Testing Participant, CSS, and other parties. The simulator will capture messages that would normally have been routed to a losing Testing Participant and their agents or will act to initiate a switch away from the Testing Participant. A dummy MPID (Market Participant Identifier) and associated dummy agents will be configured within all systems under test to ensure that the CSS validates and routes messages correctly to the simulator. The simulator provides an interface against which to send messages

and to log capabilities to capture interactions. If a Testing Participant has more than one MPID they might not need to use the counter party simulator functionality.

The CPS and Test Data Tool work in conjunction, as the data from the Test Data Tool feeds into the testing process supported by the CPS.

7.4. Test Data Tool

Test allocation and dissemination of test data will be supported by the Test Data Tool. This Test Data Tool enables the management, allocation and download of test data across the Testing Participants, in a secure manner. The Test Data Tool will provide secure role-based access to a WebApp front-end which Testing Participants will register to use for the search and download of their data allocations, in a CSV (Comma Separated Values) format.

The Test Data Tool provides the following functionality:

- Provides a tool for users to select data to support testing in CSS External Testing.

- Disseminates allocated test data for the purposes of UIT, which can then be downloaded.

- Allows Testing Participants to upload feedback on data which has been allocated to them.

8. Pre-Requisites

There are number of pre-requisites activities outside of the CSS External Testing process that need to have been completed prior to significant stages of the life cycle. Information on these activities is available on the REC Portal and/or the Switching Portal.

8.1. Intention to Test Pre-Requisites

Before Code Manager can submit the notification that a Testing Participant wishes to under CSS External Testing, the Business Assessment stage of the entry process must have successfully completed. Testing Participant must have been assigned an MPID and the Code Manager has initiated the DCC Onboarding Process.

8.2. Test Preparation Pre-Requisites

Testing Participants must have requested and obtained access to the production instance of the Switching Portal. The Switching Portal will be the main mechanism for managing the progress and preparation of CSS External Testing. Testing Participants will need to submit a Switching Portal request to commence test preparation activities. Please note, this is the production instance of the Switching Portal. A test instance of the Switching Portal will not be available in the UIT environments as this is not in the scope of CSS External Testing.

8.3. Test Execution Pre-Requisites

Testing Participant must have received the required test security credentials in accordance with the CSS Schedule. If the applicant is not subsequently qualified, then access to the CSS will be withdrawn.

Testing Participants must have completed the any internal testing as described in the Qualification and Maintenance schedule. The scope of internal testing will be agreed between the Testing Participant and Code Manager. There should be no open issues at the end of internal testing that may impact the execution

of CSS External Testing. The status of this will be tracked via the Entry Self Certification Pack that is submitted by the Testing Participant.

Testing Participants must have completed the information security and data protection assessment as described in the Qualification and Maintenance schedule. The scope of assessment will be agreed between the Testing Participant and Code Manager. There should be no open issues at the end of information security and data protection assessment that may impact the execution of CSS External Testing. The status of this will be tracked via the Entry Self Certification Pack that is submitted by the Testing Participant.

9.   Connectivity Testing

Connectivity testing will be performed by the Testing Participants ahead of CSS External Testing execution to validate that the environment and test data are in place. Switching Operator will schedule Connectivity Testing with the Testing Participant as part of test preparation.

The connectivity test, will prove that Testing Participants can:

- Connect into the UIT environment via the firewalls to the core system URLs
- Validate certificates
- Validate authentication details

The connectivity testing scenarios are broken down into four phases. Phases 1, 2 and 3 are the pre-requisite phases which will confirm that parties have provisioned and implemented sufficient technology to support messaging which will be tested in the Phase 4 message testing.

- Phase 1: Environment built and ready, firewall config, DNS (Domain Name System) registered
- Phase 2: DNS lookup
- Phase 3: PKI Certificates installed and tested, webhooks registered
- Phase 4: Data load and message exchange/connectivity testing

The Phase 4 message testing with CSS Provider will be scheduled into arranged time slots and will be scheduled

For the Testing Participants to connect securely to the UIT Test Environment they need to obtain PKI security certificates. Details on how to request the security certificates can be found in the Central Switching Service Schedule, which is available on the REC Portal. Once the certificates have been obtained, they need to be installed onto the Testing Participant's systems they intend to connect to CSS from.

Further information on Connectivity Testing is available via the Switching Portal as knowledge articles.

10. Test Scope/Coverage

CSS External Testing is conducted by the Testing Participants via a supported Testing Service provided by the Switching Operator.

The boundaries of the CSS External Testing scope will be defined by the CSS External Testing Scenarios and will be limited to proving the CSS interfaces only. The CSS External Testing Test Scenarios allow for the variances in customer types that each Testing Participant supports, e.g., Suppliers of Gas or Electricity only (or both), Domestic or Non-domestic only (or both). There will be a mandatory set of Test Scenarios

and Test Scripts that each Testing Participant for Gas, Electricity and Dual Fuel must execute based on their customer profile.

Testing Participants will need to prove integration to the CSS in accordance with the Scenarios and use Data loaded within the Testing Participant's own UIT Test environment. Testing Participants will need to execute the Test Scripts and record the test outcomes including raising any Testing Issues in Test Management and the Test Issue Management Tool. If Testing Participants have more than one component i.e., two separately built CSS Interfaces, each component that interfaces with CSS will need to be treated and tested independently.

Each Testing Participant will need to perform all connectivity testing from the component that directly interfaces with CSS prior to entering CSS External Testing.

11. Test Scenarios

The Test Scenarios are documented in CSS External Testing Test Scenarios document and are derived from the REC BSC Joint Storyboards document.

Test Scenarios may be added to if directed to do so by the Code Manager following information from the REC Performance Assurance Board (PAB) on the specific risks that the PAB wants to be mitigated and assured through CSS External Testing.

A Testing Participant may need to execute several iterations of test scenarios depending on the application suites that will interface directly with CSS. This will be agreed with the Code Manager after the Business Solution Architecture evaluation process.

Testing Participants will need to evaluate their profiles and a range of applications that support their business to ensure that all the message attributes are tested to provide the required test coverage. Items to be considered are the following:

- Fuel Type: gas/electricity/dual

- Domestic/Non-Domestic

- One Fail All Fail (OFAF)

- Related MPxNs

All Test Scenarios for a Testing Participant role and profile will need to be executed. Unless, the Code Manager has agreed that reliance can be placed on a CSS Interface Provider, in which case the Test Scenarios to be executed would be based on the level of reliance that has been agreed can be placed. If a Testing Participant is not executing Test Scenarios due to their profile this needs to be agreed with the Code Manager and the Switching Operator and detailed in their Test Plan.

Once the Testing Participant's CSS External Testing Test Scenario and Test Cases have been loaded into the Test Management Tool, the Switching Operator, along with its Service Providers, working closely with the Testing Participant, will agree the required updates to the CSS External Testing Test Scenarios and Test Cases with regards to the Test Steps that are specific to their systems/applications. Testing Participants must identify and update the relevant Test Steps in the Test Management Tool, including details of expected results, planned execution date and where it is required to upload evidence of successful execution of the Test Step.

The Test Step marked to upload evidence must have the 'Evidence Required' field set in the Test Management Tool. Setting the planned execution date will allow the Switching Operator to produce accurate reports. Once the updates have been completed, the CSS External Testing Test Scenario and Test Cases will be reviewed by the Switching Operator.

12. Test Scheduling & Execution

The test schedule and the scheduling of the execution of the CSS External Testing Test Scenarios will be managed by the Testing Participants with support from the Switching Operator. To execute the test scenarios and test scripts correctly, it is required that they are executed in a specific order. Any pre-requisites required and the order of executing these test scenarios and test scripts are detailed within the test scenarios. Where applicable, the test script will identify any pre-requisites and the preceding test script that needs to be executed. Testing Participants will be running the test scenarios and test scripts in the Test Management Tool. Testing Participants shall keep the Switching Operator up to date with their progress against their Test Plan and test schedule via the Test Management Tool. This should be done daily.

13. Test Deliverables

The Switching Operator and Testing Participants will be required to produce and maintain documents, and reports, during the testing lifecycle. The following artefacts, described in the table below, will be produced by either the Testing Participant or Switching Operator during the CSS External Testing. Switching Operator will provide templates for the test deliverables which will be made available via the Switching Portal as knowledge articles.

Artefact or Deliveable	Party Responsible to Produce Document	Testing Participants Activity	Comment	Approver
Notification of intent to undertake Testing	Code Manager	Provide Code Manager with information needed, inculding information on who will need access to Test Management Tool and other tooling	Code Manager will notify the Switching Operator that there is an organisation wishing to undertaking CSS External Testing via a Switching Portal Request.	Switching Operator
Entry Self Certfication Pack – Interim and Final	Testing Participant	Produce	An interim and final report must be provided to Switching Operator by the Testing Participant. The interim report must be provided 45 Working Days prior to the start of Testing and the final 10 Working Days prior. The report will cover Testing Participants progress to complete any prerequisites and meeting entry criteria.	Switching Operator
Test Plan	Testing Participant	Produce	The plant must be provided to Switching Operator by the Testing Participant 40 Working Days prior to the start of Testing and will include:	Switching Operator

Artefact or Deliveable	Party Responsible to Produce Document	Testing Activity Participants	Comment	Approver
			• Scope of testing, including test scenarios they wish to descope due to their profile along with the rationale for the request to descope, • Any items out of scope of testing, • Features to be tested, • Approach to testing, • Test Schedule to include tests planned for each day and • Confirmation of resources available.	
Test Execution Reporting	Testing Participant	Via Updates Test Management Tool	Testing Participant's progress will be monitored via the Test Management Tool as such the tool should be updated by the Party daily once testing commences, or per an alternative schedule agreed with Switching Operator.	n/a
Test Evidence	Testing Participant	Via Updates Test Management Tool	Testing Participants must provide evidence for significant Test Steps. The Test Steps where test evidence is expected is documented in CSS External Testing Test Scenarios. Test evidence will be shared via the Test Management Tool	Switching Operator
Test Completion Report	Testing Participant	Produce	Testing Participants should produce a Test Completion Report and submit a draft to Switching Operator prior to the estimated test completion date. The finalised version of the Test Completion Report will be submitted to Switching Operator on completion of test execution activity. The report will include: • Summary of how the testing completed aligned with the original scope and any exceptions, • Details of any updates made to the test environment during the course of testing, • Testing Participant Summary of the Test Results, and • Details of all issues encountered during testing with details for fixed and outstanding ones.	Switching Operator

Artefact or Deliveable	Party Responsible to Produce Document	Testing Activity	Participants	Comment	Approver
Test Completion Report for Code Manager	Switching Operator	For Information		Test Completion Report for Code Manager will be issued to the Testing Participant and the Code Manager within 10 Working Days of the exit quality gate identifying whether the applicant has successfully completed all aspects of CSS External Testing.	Code Manager

Table 4 Expected Test Artefacts or Deliverables

14. Entry and Exit Criteria

The below section details the entry and exit criteria that Testing Participants will need to meet and evidence for CSS External Testing.

14.1.1. Entry Criteria

Each Party wishing to undertake CSS External Testing must comply with (and provide evidence of complying with) the following criteria prior to entry into CSS External Testing:

ID	CSS External Testing Entry Criteria
1	The Testing Participant must have identified the User Roles for which it wishes to undertake CSS External Testing
2	All relevant test artefacts must have been produced by the Testing Participant and approved by Switching Operator
3	If a CSS Interface Provider is testing on behalf on a Testing Participant this has been approved by the Code Manager with no outstanding queries and documented in the test plan
4	If a reduction in test scope has been requested this has been approved by the Code Manager and document in the test plan
5	The Testing Participant has provided evidence to Switching Operator that an appropriate level of resource is available to support the CSS External Testing process
6	The Testing Participant has provided confirmation that the Security Requirements set out in REC have been met
7	The Testing Participant has successfully exited their Internal Testing for the components that directly interface to CSS, and this has been reviewed and approved by the Code Manager, and there are no open issues which would impact the schedule for CSS External Testing.
8	The Testing Participant has successfully exited their Information Security and Data Protection assessment stage, and this has been reviewed and approved by the Code Manager, and there are no open issues which would impact the schedule for CSS External Testing.

9	The Testing Participant has successfully completed connectivity testing and there are no open issues which would impact the schedule for CSS External Testing.
10	Test data is in place and has been made available to the Testing Participant. Test data is synchronised across Testing Participant UIT environments and is verified by the Testing Participant
11	All required Test Tooling is in place and has been made available to the Testing Participant as needed
12	Testing Participants has identified and updated the relevant Test Steps in the Test Management Tool, including details of expected results, planned execution date and where it is required to upload evidence of successful execution of the Test Step.
14	An Entry Quality Gate Review meeting has been held between the Testing Participant and Switching Operator, with progress approved by Switching Operator

Table 5 CSS External Testing Entry Criteria

Where Switching Operator considers that the Testing Participant has not met the Entry Criteria for the User Role for which it is seeking to undertake testing, Switching Operator may:

- Prevent the Testing Participant from undertaking CSS External Testing for a particular User Role until such time as Switching Operator is satisfied that the Testing Participant meets the Entry Criteria.

- Reschedule the test start date for the Testing Participant for that User Role. In so doing, Switching Operator shall provide the earliest practicable alternative date; or

- Provide provisional approval of the Test Readiness Report (and approval to proceed) with an understanding that the outstanding documentation shall be provided before the start of testing, otherwise testing will not commence.

Where Switching Operator is not satisfied that a Testing Participant meets the Entry Criteria to commence testing, the Testing Participant may refer the matter to the Code Manager should they believe they have met the criteria. Where the Code Manager determines that the Testing Participant has met the entry criteria, Switching Operator shall schedule the start of testing as soon as reasonably practicable.

14.1.2. Exit Criteria

The following Exit Criteria are to be met prior to a Testing Participant's completion of and exit from CSS External Testing:

ID	CSS External Testing Exit Criteria
1	All Tests have been executed and results have been documented by the Testing Participant and meets the pass rate percentage specified by the Code Manger
2	All test evidence captured and made available to Switching Operator via the Test Management Tool
3	Switching Operator has completed the review of test evidence supplied and all issues identified have been rectified and evidence supplied has been deemed as appropriate.

4	All testing issues identified during the Testing Participant's test execution have been recorded in the Test Management Tool and is under the Test Issues Thresholds levels specified by the Code Manager
5	All Testing Issues are either: • The Testing Issue generated by the Testing Participant has been fixed and verified by retest; or • Where outstanding, the Testing Issue has been reviewed and documented, and been included as part of a work off plan (which is part of the test completion report) that outlines the next steps to be taken, including estimated timescales required to resolve each of the outstanding Testing Issues
6	A Test Completion Report has been created by the Testing Participant and approved by Switching Operator.
7	An Exit Quality Gate Review meeting has been held between the Testing Participant and Switching Operator, with progress approved by Switching Operator

Table 6 CSS External Testing Exit Criteria

Upon completion of the criteria, above, a Test Report will be issued to the Testing Participant and the Code Manager within 10 Working Days identifying any findings or observations the Code Manger should be aware of as well as whether the Testing Participant has successfully completed all aspects of CSS External Testing.

The Code Manager will review the Test Report and raise any questions within 10 Working Days of receiving the report. Testing Participants will be required to resolve issues, and this may require the applicant to demonstrate compliance by re-running certain tests. The Testing Participant will need to reschedule testing with Switching Operator subject to the availability of the Switching Operator test environment.

Where Switching Operator considers that a Party has not met the Exit Criteria, that Party may refer the matter to the Code Manager for its determination. Where the Party disagrees with any such determination of the Code Manager, then the Party may refer the matter to the PAB for its determination.

Where a dispute arises regarding whether a Testing Participant has met the CSS External Testing exit criteria, the completion process will not resume while the dispute is heard by the Code Manager or until the relevant Exit Criteria have been met by the Testing Participant. The completion process would resume at the same point once the dispute had been resolved.

14.2. Suspension of Testing

During the execution of tests, Switching Operator or the Testing Participant each have the right to suspend testing where it has been discussed with the Code Manager and it has been agreed to be a reasonable course of action. Testing will only resume when agreed by both Switching Operator and the Testing Participant.

15. Process Steps

The below table details the process steps for initiating, executing, and exit of CSS External Testing.

Ref	When	Action	From	To	Description	Method
15.1	Within 3 days of the submission of Entry Assessment Application Form	Code Manager to hold an Entry Planning Meeting with Testing Participant, Switching Operator, and other testing providers	Code Manager	Testing Participant Switching Operator	Entry Planning Meeting will develop an initial entry assessment plan for activities a Testing Participant needs to complete as part of the qualification. This would include CSS External Testing.	Meeting
15.2	Post the completion of the BSA process and at least 60 Working days before intended start date	Code Manager to notify of Testing Participant's intent to undertake CSS External Testing	Code Manager	Switching Operator	Code Manager will raise a Switching Portal request to notify the Switching Operator of Testing Participant's intent to undertake CSS External Testing. Request to include Organisation Name, start date, roles to be tested and if reliance is being place. Details of users of who need access to Test Data Tool and Test Management Tool will need to be provided.	Switching Portal
15.3	Withing 5 working days of 15.2	Switching Operator to hold an initiation meeting with Testing Participant	Switching Operator	Testing Participant	Initiation meeting will explain the CSS External Testing process, timelines including any actions or deliverables that the Testing Participant will need to complete and to answer any questions	Meeting
15.4	Following 15.2	Set up access to test management tool	Switching Operator	Testing Participant	Access to test management tool and test tools will be provided to names provided in 15.1	Switching Portal / Email/ Test Management Tool
15.5	Following 15.4 Within 45 days of start date	Submission of Switching Portal request to start CSS External Test preparation and submission of interim entry self-certification pack and review	Testing Participant	Switching Operator	This should use the template provided, which is available on the Switching Portal. Switching Operator will review and feedback and comments.	Switching Portal / Email

Ref	When	Action	From	To	Description	Method
15. 6	Following 15.5 and within 40 days of start date	Submission of Test plan	Testing Participant	Switching Operator	This should use the template provided, which is available on the Switching Portal. Switching Operator will review and feedback and comments. This should detail any test scenarios that will not be executed and rationale.	Switching Portal / Email
15.7	Following 15.6	Test scenarios and test steps added to test management tool and verified	Switching Operator	Testing Participant	The Testing Participant's CSS External Testing Test Scenario and Test Cases will be loaded into Test Management Tool, the Switching Operator along with Service Providers, working closely with the Testing Participant, will agree the required updates to the CSS External Testing Test Scenarios and Test Cases with regards to the Test Steps that are specific to the Testing Participant's systems/applications. Testing Participants must identify and update the relevant Test Steps in Test Management Tool, including details of expected results, planned execution date and where it is required to upload evidence of successful execution of the Test Step.	Test Management Tool /Switching Portal
15.8	Following 15.7	Access to the Test Data Tool	Testing Participant	Switching Operator	Access provided to the Test Data Tool. Testing Participant will need to generate PKI certificate and test connectivity to the tool	Test Data Tool Test PKI certificates requested via Switching Portal
15.9	Following 15.8	Test data allocated, shared, and verified	Switching Operator	Testing Participant	Sufficient Test data will be allocated to cover the test scenarios. Testing Participants should verify data is as expected and send feedback via the test data tool.	Test Data Tool
15.10	Following 15.9	Connectivity testing	Testing Participant	Switching Operator	Testing Participant to conduct connectivity testing on the agreed date with support from Switching Operator and Service Providers	
15.11	Following 15.10 and within 10 days of start date	Submission of final entry self-certification pack and review	Testing Participant	Switching Operator	This should use the template provided. Switching Operator will review and feedback any comments. This will be used to support Testing Participant Entry Verification.	Switching Portal /Email

Ref	When	Action	From	To	Description	Method
15.12	Within 5 days of start date	Testing participant's entry verification	Testing Participant	Switching Operator	This will verify that entry criteria have been met and Testing Participant can proceed with test execution.	Entry quality gate meeting
15.13	Following 15.12	Test execution	Testing Participant	Switching Operator	Testing Participant should update the Test Management Tool daily if test have passed or failed	Test Management Tool
15.14	Daily during Test Execution	Test progress reporting	Testing Participant	Switching Operator	Testing Participant should update the Test Management Tool daily so progress can be tracked. Switching Operator will provide updates on the Testing Participant's progress to the Code Manager via the Switching Portal	Test Management Tool for Testing Participant Progress updates / Switching Portal for progress update to Code Manager
15.15	Following 15.14	Test evidence provided	Testing Participant	Switching Operator	Test evidence should be uploaded to Test Management Tool.	Test Management Tool
15.16	Following 15.15	Test evidence reviewed	Switching Operator	Testing Participant	Switching Operator will review the test evidence provided and feedback any comments.	Switching Portal / Email
5.17	Within 5 days of Test Execution completion	Test completion report	Testing Participant	Switching Operator	This should use the template provided, which is available on the switching portal. Switching Operator will review and feedback and comments. This will be used to support Testing Participant Exit Verification.	Switching Portal / Email
15.18	Within 5 Day of Test Completion Report submission	Testing Participant's Exit Verification	Switching Operator	Testing Participant	This will verify that exit criteria have been met and Switching Operator can proceed with submitting Test Completion for Code Manager	Exit quality gate meeting
15.19	Within 10 days of Exit Quality Gate	Switching Operator to send Test Completion for Code Manager to Code Manager and Testing Participant	Switching Operator	Code Manager Testing Participant	Switching Operator to submit a report to Code Manager to state whether the applicant has successfully completed all aspects of CSS External Testing, and its recommendation in relation to CSS access.	Switching Portal

Ref	When	Action	From	To	Description	Method
15.20	Within 10 days of 15.19	Code Manager to confirm if they have issues with the Test Completion for Code Manager or the testing undertaken	Code Manager	Switching Operator	Code Manager will evaluate all CSS External Testing results and raise any questions	Switching Portal
15.21	Following 15.21	If needed, Switching Operator and /or Testing Participant to address issues raised by Code Manager	Switching Operator Testing Participant	Code Manager	Testing Participants may be required to resolve issues, and this may require the applicant to demonstrate compliance by re-running certain tests	Switching Portal

Table 7 CSS External Testing Process Steps

16. Meetings

To support a Testing Participant's progress there will be a regular sequence of meetings as follows:

- Entry Planning Meeting
- Initiation meeting,
- Entry quality gate meeting,
- Regular process and Testing Issue management meetings and
- Exit quality gate.

Ad hoc meetings may be scheduled as needed to support resolution of a Testing Issue or any other issues.

16.1. Entry Planning Meeting

Code Manager will arrange an Entry Planning Meeting with a Testing Participant, post a Testing Participant's submission of their Entry Assessment Application Form. This is meeting would include the Code Manger, Testing Participants and relevant testing providers including the Switching Operator and has the aim of agreeing initial entry assessment plan.

16.2. Initiation meeting

An initiation meeting will be set up between the Switching Operator, the Testing Participant and Service Providers. This will be arranged after the Switching Operator has received notification from Code Manager that a Testing Participant intends to undertake CSS External Testing. This is a separate meeting to the Entry Planning Meeting.

The purpose of the initiation meeting is to:

- introduce the Testing Participant to the team members who will be supporting them through CSS External Testing,
- explain the CSS External Testing process in more detail than would be covered in the Entry Planning Meeting,
- explain the timelines including any actions or deliverables that the Testing Participant will need to complete; and
- to answer any questions.

16.3. Entry Quality Gate

The Switching Operator will schedule a quality gate with the Testing Participant to confirm that the entry criteria have been successfully met and sufficient evidence provided for the Testing Participant to proceed into CSS External Testing. The quality gate will normally be scheduled at least 5 working days before the Testing Participant is due to commence CSS External Testing.

Once the quality gate for CSS External Testing has been successfully completed, the Switching Operator will then issue a recommendation for the Testing Participant to enter CSS External Testing.

16.4. Regular progress/Testing Issue meetings

The Switching Operator will schedule regular meetings to discuss progress and Testing Issues with the Testing Participant and Service Providers, if required.

The progress element of the meeting will discuss:

- testing progress to date,

- planned testing; and

- any changes required to scheduled testing, e.g., for blocking Testing Issues.

The Testing Issue element, of the meeting, will review Severity or Priority 1, 2 and 3 Testing Issues, focussing on:

- Impact on testing progress,

- Any exceptional Testing Issues where special consideration is required; and

- Alignment to the release schedule.

16.5. Exit Quality Gate

The Switching Operator will schedule an exit quality gate with the Testing Participant to confirm that the exit criteria have been successfully met and sufficient evidence has been provided by the Testing Participant to exit CSS External Testing. The quality gate will normally be scheduled at least 5 working days after the Switching Operator has confirmed their review of test evidence has completed and the Testing Participant has submitted their Test Completion Report.

Once the quality gate for CSS External Testing has been successfully completed, the Switching Operator will then complete and issue a Test Report to the Code Manager and Testing Participant recommending that the Code Manager confirms the Testing Participant has successfully completed CSS External Testing.

17. Assurance of CSS External Testing

The Switching Operator will assure entry, progress, and exit of a Testing Participant's CSS External Testing.

17.1. Testing Participant Readiness Verification

The Switching Operator will review evidence and test artefacts provided by Testing Participants and confirm that all relevant entry criteria have been met prior to commencement of testing. This will be confirmed at the entry quality gate meeting.

17.2. Testing Participant Exit Verification

The Switching Operator will review the test evidence provided by Testing Participants and confirm that all relevant test scenarios have successfully been executed and the exit criteria has been met prior to issuing a Test Completion Report to the Code Manager. Where possible, Testing Participants should upload test evidence to the Test Management Tool throughout their test execution to aid the Switching Operator in their review and speed up the test exit process.

17.2.1. Test Evidence

The Testing Participant will execute all relevant Test Scenarios and Test Scripts in scope of their CSS External Testing Test Plan. It is required that the Testing Participant will capture sufficient evidence for each test that is executed. The Test Evidence is to be uploaded to the Test Management Tool. This evidence must clearly show that the test step has met its objective when the test step passes or clear supporting evidence when the test step fails.

All test steps could have associated Test Evidence loaded into the Test Management Tool, however, it is recognised from a pragmatic perspective, to have Test Evidence only for significant test steps. The test steps that require test evidence is included in the CSS External Testing Test Scenarios document.

A copy of the CSS message triggered by executing the test step should be captured as a log file, or text file, and uploaded to the Test Management Tool. To support this activity, it is recommended that the system/application is run with logging enabled and the Testing Participant's IT support team is made available to support the test resources executing CSS External Testing.

An example of the steps that require evidence and the level of evidence from an energy Supplier-only perspective is given below:

Step Title	Step Description	Related System	Expected Testing Participant's Evidence
Switch Request initiated by Gaining Supplier	This step covers the functionality where the Gaining Supplier system initiates a switch request.	Gaining Supplier	Prior to triggering the switch: Screenshot of the Testing Participant's system/application showing meter is not part of the current portfolio. Trigger Switch CSS message sent
CSS receives Switch Request	The step covers the flow where CSS process the Switch Request as follows: - Validates Switch Request - Creates registration request - Sends Pending Notifications and Synchronisation messages	CSS	No evidence required.
Gaining Supplier receives Switch validation and Switch Pending Notifications	The test step is to verify that the Gaining Supplier has received the following messages for the submitted request - RegistrationValidationNotification - RegistrationPendingNotification	Gaining Supplier	CSS – RegistrationValidationNotification and – RegistrationPendingNotification message received. CSS Notifications received or Screenshot of the Testing Participant's system/application showing meter in pending state.

Step Title	Step Description	Related System	Expected Testing Participant's Evidence
Gaining Shipper receives Switch Pending Notifications	The test step is to verify that the Gaining Shipper has received the following messages – RegistrationPendingNotification	Gaining Shipper	No evidence required.
Losing Shipper receives relevant change notifications	The test step is to verify that the Losing Shipper has received the following messages – RegistrationChangeAnticipatedNotification	Losing Shipper	No evidence required.

Table 8 Example of the Test Steps that require Test Evidence

18. Testing Issue Management

Testing Issues will be managed in accordance with the defect management processes. Testing Issues related to the CSS must be logged in the Test Issue Management Tool by all Testing Participants to enable tracking and management to closure. The expectation is that Testing Participants will retest Testing Issues as soon as the Testing Issue fix has been deployed to the UIT environment(s) and the Testing Issue assigned back to them. Any Testing Issues that are part of the Testing Participants' downstream systems will be logged and managed by the Testing Participants' own Testing Issue tracking system. More information on the defect management process is available as knowledge articles on the switching portal.

19. Release Management

Releases of fixes and configuration changes will be scheduled according to the REC Service Management Schedule and follow the governance and approval routes as documented in the REC Service Management Schedule. Where possible, outages and planned maintenance will be communicated with as much notice as possible via the Switching Portal.

20. Appendix A – Glossary for Non-REC Defined Terms

This glossary defines non-REC defined terminology that is used within this document. Please refer to Schedule 1 - Interpretations and Definitions of the REC for REC defined terminology, which is available on the REC Portal.

Term	Acronym	Definition
Business Solution Assessment	BSA	Process described in section 5 of REC Schedule 9.
Comma Separated Values	CSV	A comma-separated values (CSV) file is a delimited text file that uses a comma to separate values.

Term	Acronym	Definition
Counter Party Simulator	CPS	A test tool that will act as a different party to the Testing Participant.
CSS External Testing		The process by which CSS Parties prove their interface connection to CSS. The process described in section 7 of REC Schedule 9.
CSS External Testing Scenarios		The defined scenarios that a CSS Party must test as part of CSS External Testing.
Data Communications Company	DCC	REC Party acting in the role of Switching Operator.
Domain Name System	DNS	The system by which internet domain names and addresses are tracked and regulated.
Data Service Provider	DSP	The company awarded a contract to be a service provider of data services to DCC.
Entry Assessment Requirements		A set of activities a Testing Participant must have completed to enter CSS External Testing.
Meter Point x Number	MPxN	A generic term to refer to both the electricity MPAN and gas MPRN.
Public Key Infrastructure	PKI	A public key infrastructure (PKI) is a system for the creation, storage, and distribution of digital certificates which are used to verify that a particular public key belongs to a certain entity.
Regression testing		A standard set of repeatable tests to ensure that an application still performs as expected after a code change.
Smart Metering DSP UIT Environment		The test environment used to test Smart Metering related changes
Synthetic data		Test registration data that has been artificially manufactured rather than an extract of real-world registration data.
Test Artefact		Are the set of documents that a Testing Participant are required to produce during CSS External Testing life cycle for example Test Plan.
Test Case		A set of preconditions, inputs, actions (where applicable), expected results and postconditions, developed based on test conditions.
Test Completion Report	TCR	A type of test report produced at completion milestones that provides an evaluation of the corresponding test items against exit criteria.
Test Coverage		The degree to which specified coverage items have been determined or have been exercised by a test suite expressed as a percentage.

Term	Acronym	Definition
Test Data Tool	TDT	An application used to provide test data to Testing Participants.
Test Deliverables		Is the wider set of products a Testing Participant needs to be produced by a certain milestone within the CSS External Testing lifecycle for example provision of test evidence and test progress updates
Test Evidence		Evidence from the testing that a Testing Participant has conducted.
Testing Issue		Means, in respect of any tests: (a) anything that is preventing the execution of the tests; or (b) once commenced or executed, the test has an unexpected or unexplained outcome or response.
Test Management		The planning, scheduling, estimating, monitoring, reporting, control, and completion of test activities.
Test Management Tool		An application provided by the Switching Operator used to store test defects, scenarios, and cases.
Testing Participant	TP	The party who is entitled to undertake CSS External Testing, as described in Section 5 of Schedule 9 of the REC, along with their CSS Interface Provider
Test Planning		The activity of establishing or updating a test plan.
Test Scenario		A set of test steps executed to achieve an expected business outcome.
Test Schedule		A list of activities, tasks, or events of the test process, identifying their intended start and finish dates and/or times, and interdependencies.
Test Script		A sequence of instructions for the execution of a test.
Test Step		A step in a test script.
Transport Layer Security	TLS	A protocol that provides communication security between client/server applications that communicate with each other over the Internet.
User Integration Test Environment	UIT	The environment where UIT testing occurs.
User Roles		The role a REC Party is performing CSS testing in.

Table 9 Glossary