Department of Energy & Climate Change

Smart Meters Programme
Schedule 6.2

(Testing and Acceptance) (CSP Central version)

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Amendment History		
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SCHEDULE 6.2
TESTING AND ACCEPTANCE

PURPOSE

This Schedule 6.2 (Testing and Acceptance) sets out the approach to Testing and the different Testing activities to be undertaken under this Agreement.

Unless otherwise specified by the DCC, the provisions of this Schedule 6.2 and Clauses 9 to 13 (inclusive) of this Agreement shall apply to all Testing activities undertaken under this Agreement from time to time (collectively "**Testing Activities**"), including in relation to the following:

(a) Implementation Testing; and

(b) Enduring Testing.

This Schedule 6.2 comprises the following parts:

Part	Scope
Part A	Overview
Part B	Test Documents
Part C	Testing
Part D	Outcome of Testing
Part E	Risk
Part F	Definitions
Appendix 1	Test Phase / Test Stage Complete Certificate
Appendix 2	Test Environments
Appendix 3	Test Phases
Appendix 4	Test Labs
Appendix 5	Initial versions of the Test Strategy and Pre-Integration Test Phase Test Approach
Appendix 6	Outline of UIT
Appendix 7	Enduring Testing

PART A – OVERVIEW

1. OVERVIEW OF TESTING

1.1 Without limiting the Contractor's obligations pursuant to Clauses 2.2 and 17.3, if there is any conflict between any of the following documents, the conflict shall be resolved in accordance with the following order of precedence (in descending order of precedence):

(a) this Schedule (and its Appendices and Annexes) and Schedule 6.1 (Implementation Planning) (and its Appendices and Annexes) (which shall rank equally in the order of precedence in accordance with Clause 2.2 of this Agreement);

(b) the Implementation Plan;

(c) the Test Strategy;

(d) each Test Approach;

(e) each Test Plan; and

(f) each Test Specification.

1.2 The Contractor Solution shall be Tested in accordance with the requirements set out in this Agreement.

1.3 Without prejudice to any circumstance that may amount to an Other Service Provider Cause, the DCC shall have no responsibility, liability or obligation in connection with any of:

(a) paragraphs 1.5 to 5 (inclusive) of Part B of this Schedule;

(b) paragraphs 3 to 12 (inclusive) of Part C of this Schedule;

(c) Appendix 2 of this Schedule;

(d) Appendix 3 of this Schedule;

(e) the Draft Test Strategy;

(f) the Draft PIT Test Approach;

(g) any part of any Test Document other than the part of a Test Strategy and/or Test Approach clearly headed "DCC Responsibilities"; and

(h) Appendix 6 (Outline of UIT) of this Schedule,

and Clauses 13 and 16 of this Agreement shall be construed accordingly and any performance or non-performance of any obligation referred to in any document or part of a document mentioned in this paragraph 1.3 shall NOT be a DCC Cause.

The provisions of this Schedule 6.2 shall (without prejudice to the above) otherwise be subject to the provisions of Part E of this Schedule.

1.4 The Contractor shall:

(a) ensure that no changes are made to any part(s) of the Contractor Solution (however remote the risk of any impact upon the DCC Services), other than Commodity Changes unless such changes have been subject to Testing in accordance with this Schedule 6.2 or the DCC otherwise elects in writing;

(b) remain liable for any adverse impact of any Commodity Changes or other changes to the Contractor Solution (and ensure the same have been rigorously tested prior to the change being made) regardless of whether or not these have been subject to Testing in accordance with this Schedule 6.2 or otherwise;

(c) support Testing of the Systems of the DCC and DCC Service Providers during the System Integration Test Phase in accordance with this Schedule 6.2; and

(d) support the Testing of the Systems of other DCC Service Providers and other DCC Eco-System Entities (including following any System Update) during UIT Testing and through Enduring Testing (including in Market Entry Testing) in accordance with this Schedule 6.2.

1.5 The Testing Activities shall comprise Implementation Testing and Enduring Testing.

Test Phases and Test Stages

1.6 Implementation Testing shall be divided into "**Test Phases**" and each Test Phase shall be divided into one or more "**Test Stages**" as follows:

(a) The **Pre-Integration** Test Phase comprising the following *Test Stages:*

(i) Unit Testing;

(ii) Link Testing;

(iii) System Testing; and

(iv) Factory Acceptance Testing (FAT);

(b) The **System Integration** Test Phase comprising the following *Test Stages*:

(i) Solution Testing (including Test Witnessing by the DCC of both functional and non-functional Tests); and

(ii) UAT; and

(c) The **User Integration** Test Phase comprising the following *Test Stages* as further described in paragraph 1.8 of this Part*:*

(i) User Interface Testing; and

(ii) End to End Testing.

The Contractor shall ensure that the Pre-Integration Test Phase and System Integration Test Phase shall provide for at least three (3) cycles of functional testing to be performed in each Test Stage. The Contractor shall undertake all three (3) such cycles of functional testing and a Test Stage shall not achieve its Stage Exit Criteria unless the relevant Test Success Criteria are met in the final test cycle.

1.7 The scope and requirements of each Implementation Testing Test Phase are set out in Appendix 3 to this Schedule 6.2.

UIT

1.8 The parties have agreed that:

(a) Enduring Testing including Market Entry Testing (in addition to UIT Testing) may commence during Implementation Testing but will endure for the remaining term of this Agreement; and

(b) unlike the System Integration and/or Pre-Integration Test Phases, the User Integration Test Phase (and UIT Testing, including the performance of Interface Testing and End to End Testing) shall in each case:

(i) NOT end on the completion of any Stage Exit Criteria and/or the issue of a Test Stage (or Test Phase) Complete Certificate;

(ii) continue for twelve (12) months from commencement of the User Integration Phase and for such further period as the DCC has confirmed that it shall continue to pay the relevant Testing Service Charges in arrears (as further described in Schedule 7.1) (Charges and Payment) (a "**UIT Extension Period**")); and

(iii) there shall be no UIT Phase Exit Criteria or UIT Phase Complete Certificate issued (since UIT shall complete in accordance with paragraph 1.8(b)(ii) of this Part immediately above);

(c) during any UIT Extension Period:

(i) the Contractor shall not withhold consent to the testing of DCC Service Users (including any that did not form part of the Core UIT Group) ("**Subsequent UIT Cohort(s)**") in Equivalent UIT Volumes;

(ii) "**Equivalent UIT Volumes**" means the numbers and types of DCC Service Users to participate in UIT Testing during the Extension Period calculated, to the extent appropriate, by reference to the First UIT Cohort (but taking into account that the profile of DCC Service User types in Subsequent UIT Cohort(s) may differ to that anticipated for the First UIT Cohort) as agreed by the parties acting reasonably (agreement of either party not to be unreasonably withheld or delayed); and

(iii) Market Entry Testing (and the associated Charges for the same) shall only apply to the Testing of DCC Service Users that cannot be accommodated as part of the Testing of the Core UIT Group or Subsequent UIT Cohort(s) in accordance with this Schedule 6.2;

(d) UIT Testing of each DCC Service User shall involve the Contractor undertaking both Interface Testing and (unless the DCC otherwise elects) End to End Testing with such DCC Service User and consequently:

(i) each set of Interface Testing with a DCC Service User or End to End Testing with a DCC Service User shall, save where the context otherwise requires, in each case be treated as if it were a separate Test Stage including that the Contractor shall ensure the equivalent of those circumstances set out in paragraph 2.1 of Part C of this Schedule have been met (however, whilst the Test Success Criteria are to be met there shall be no Stage Exit Criteria or Stage Complete Certificates issued except as provided in paragraphs 1.8(d) (ii) (C) and 1.8(d) (iii) below);

(ii) the Contractor shall NOT be deemed to have achieved the relevant Test Success Criteria (or completed its obligations) in respect of any Interface Testing and/or End to End Testing with any DCC Service User unless and until:

(A) subject to sub-paragraph (C), the Contractor has complied with all obligations set out in paragraph 6.2 of Part D of this Schedule in respect of each such Interface Testing Tests or End to End Testing Tests (as appropriate) (as if references to Test Stage in Part D were references to such Test with the relevant DCC Service User and including the obligation to undertake of Work-off Plans in connection with Test Incidents); and

(B) all Work-off Plans relating to such Tests have been completed; but

(C) provided always that there shall be no requirement for the Test Stage Complete Certificates to be issued by the DCC except as provided in (iii) immediately below; and

(iii) solely in order to provide the Contractor with Test Stages in respect of which Test Stage Complete Certificates are issued (and hence in connection with which relevant Milestones may be Achieved in accordance with Schedule 6.1 (Implementation Planning)) Stage Exit Criteria for UIT have been established in respect of which Test Stage Complete Certificates shall be issued as set out below:

Item No.	Stage / Phase Exit Criteria	Circumstance in which Stage / Phase Exit Criteria achieved	Resulting Certificate
1	Interface Testing Stage Exit Criteria	• Test Success Criteria achieved in respect of Interface Testing with two (2) Large Supplier Parties in Great Britain; and • all other Stage Exit Criteria achieved and requirements in paragraph 1.8(d) (ii) met with respect to the Testing referred to in bullet immediately above.	Interface Testing – Test Stage Complete Certificate
2	End to End Testing Stage Exit Criteria	• Test Success Criteria achieved in respect of End to End Testing with one (1) Large Supplier Party in Great Britain; and • all other Stage Exit Criteria achieved and requirements in paragraph 1.8(d) (ii) met with respect to the Testing referred to in bullet immediately above.	End to End Testing – Test Stage Complete Certificate

(iv) following the issue of any Test Stage Complete Certificate referred to above, the Contractor shall continue to undertake and support Interface Testing and End to End Testing of DCC Service Users for so long as UIT Testing period continues (and, without prejudice to the generality of the foregoing, shall comply with obligations to Achieve remaining Interface Testing Test Stage and End to End Testing Test Stages); and

(e) unless otherwise agreed by the parties, it is anticipated that UIT Testing of the Core UIT Group shall be in accordance with Appendix 6 (Outline of UIT) and the Implementation Plan, Test Strategy and Test Approach shall be based on that Appendix.

1.9 Enduring Testing (which may also occur during UIT) shall consist of:

(a) Testing of System Updates (and potential System Updates and including new Communications Hubs) (excluding those referred to in paragraph 1.9(b)): in accordance with Appendix 7 (Enduring Testing);

(b) Testing of new SMS and potential new SMS (excluding Communications Hubs) in accordance with Appendix 7 (Enduring Testing);

(c) Market Entry Testing; and

(d) other Future Testing Activities as agreed by the parties from time to time under the Change Control Procedure.

1.10 Unless specifically stated otherwise (or requested by the DCC), all Testing in each Test Phase must cover all Contractor Systems and all interfaces to or from each Contractor System that comprise the Contractor Solution.

1.11 Unless otherwise agreed each series of connected Enduring Tests shall form a single Test Phase comprised of one Test Stage, including that:

(a) each related series of System Update Testing to which paragraph 1.9(a) of this Part applies shall be one Test Phase comprised of one Test Stage; and

(b) each related series of System Update Testing to which paragraph 1.9(b) of this Part applies shall be one Test Phase comprised of one Test Stage; and

(c) each set of Market Entry Testing (including interface and end to end testing) with a DCC Service User shall be one Test Phase comprised of one Test Stage.

Test Requirements

1.12 This Agreement (including this Schedule and its Appendices) sets out a number of requirements ("**Test Requirements**") that shall apply to Testing Activities and how they are to be conducted, including:

(a) Phase Entry Criteria;

(b) Stage Entry Criteria;

(c) the types of Test that are relevant;

(d) Stage Exit Criteria; and

(e) Phase Exit Criteria.

1.13 The Contractor shall conduct all Tests in accordance with the Test Documents (as explained further in Part B of this Schedule 6.2). In addition to complying with its other obligations under this Agreement, the Contractor shall (unless otherwise agreed by the DCC and Contractor in writing) at all times ensure that:

(a) all Tests conducted under this Agreement; and

(b) all Contractor's Test Documents,

each comply with all applicable Test Requirements.

1.14 Not used.

1.15 The Contractor shall ensure all System Updates made during the Pre-Integration and/or System Integration Test Phases are promptly tested (including Regression Testing) in accordance with paragraph 1.4 of Part A of this Schedule and its other obligations under this Agreement. All costs of Testing required in connection with any System Updates that take place during the Pre-Integration and/or System Integration Test Phases (or earlier) (including System Updates to Other ESP Solutions) shall be borne by the

Contractor. System Updates during the UIT or Enduring Phase shall be addressed in accordance with paragraph 1.9 of Part A.

2. OVERVIEW OF CONDUCT OF TESTING

2.1 Where any Testing is identified in the Test Documents as being executed by the DCC or another DCC Service Provider, the Contractor shall provide all technical support and assistance to the DCC or such DCC Service Provider required to verify the results of such Tests if requested by the DCC and as agreed in the applicable Test Plan.

2.2 Where the Contractor requires support from the DCC (as opposed to any Prime DSP or Prime CSP) as part of the execution of its own Testing, the Contractor shall seek the agreement of the DCC to include such support as part of the DCC Responsibilities in the Test Strategy or relevant Test Approach.

2.3 Unless the DCC otherwise elects in writing, the execution of Testing:

(a) in respect of each Test Phase shall not be started until all Phase Entry Criteria have been met;

(b) in respect of each individual Test Stage within a Test Phase shall not be started until the Phase Entry Criteria and all Stage Entry Criteria for that Test Stage have been met,

and the provisions of paragraph 6 of Part D of this Schedule 6.2 shall apply.

The Contractor may run: (i) the Unit Testing Test Stage and Link Testing Test Stage in parallel; (ii) any Interface Testing and End to End Testing Test Stages in parallel and; (iii) any Enduring Testing Tests in parallel, but may not parallel run any other Test Stages and/or Test Phases unless the DCC agrees in its absolute discretion.

2.4 Not used.

2.5 The parties shall (subject to paragraph 1.3 of Part A and 1.9 to 1.12 (inclusive) of Part B) comply with their respective obligations, and may exercise their respective rights under the Appendices of this Schedule.

Future Testing Activities

2.6 Testing in connection with Changes (including Additional Services)) ("**Future Testing Activities**") shall be phased and staged as set out in the Test Strategy and relevant Test Approach.

3. OUT OF SCOPE

3.1 For the avoidance of doubt, the Services described in this Schedule are distinct from the Communications Hub Testing and Accreditation Service as further described in Part B of Schedule 2.7 (Catalogue Services).

4. MANUFACTURER VERSIONS

4.1 The parties have agreed that the Contractor shall:

(a) use two manufacturers to make both Communications Hub variants (being (1) Cellular; and (2) Cellular and Mesh) to a common design for each variant (each variant made by a different manufacturer being a "**Manufacturer Version"** for the purposes of this paragraph);

(b) test both Communications Hub variants (i.e. Cellular plus Cellular and Mesh) in connection with each Contractor Milestone and associated Test Stages but only using one Manufacturer Version of each variant for such testing (and the Contractor is not required to test all Manufacturer Versions of each variant by the Milestone Dates); and

(c) in any event, carry out testing on all Manufacturer Versions (at its own cost and in accordance with paragraph 1 of Appendix 7 of Schedule 6.2):

(i) at least equivalent to that testing undertaken in respect of the Manufacturer Versions to which sub-paragraph (b) above relates; and

(ii) otherwise in accordance with its obligations to the DCC,

prior to making each Manufacturer Version available for delivery for any DCC Eco-System Entity.

PART B – TEST DOCUMENTS

1. TEST DOCUMENTS

1.1 The Contractor shall develop and maintain the Contractor's Test Documents (and provide all assistance and support required by the Prime DSP in the development and maintenance of Test Documents) in accordance with the provisions of this Part B for each Test Phase and Test Stage. The Contractor shall comply (and ensure all Testing complies) with all Test Documents.

1.2 The parties have agreed:

1.2.1 the Prime DSP shall develop the initial version and updates from time to time of each of the Test Strategy (as further described in paragraph 2 of this Part and covering all Implementation Phases and Enduring Testing) and the other Joint Test Documents, provided that:

1.2.1.1 such documents do not conflict with the requirements of this Schedule 6.2 or (if any) the Co-operation Agreement with the Prime DSP;

1.2.1.2 the Prime DSP acts in accordance with any processes and requirements agreed in the Co-operation Agreement with the Prime DSP; and

1.2.1.3 such documents shall take effect under this Agreement, and the Contractor shall comply with such documents, once (and only if) approved by the DCC; and

1.2.2 the Contractor shall promptly provide resources, information and other assistance to the Prime DSP in connection with the development and maintenance of the Test Strategy and other Joint Test Documents in accordance with its obligations under this Agreement and the Co-operation Agreement with the Prime DSP.

1.3 Given the DCC Service's dependency on multiple stakeholders, the Contractor recognises the importance of the Contractor's Test Documents complying at all times with the Test Strategy and shall ensure such compliance.

1.4 Where versions of the Test Strategy are produced at different times the Contractor shall note where elements in the later document supersede content in the earlier counterpart document.

1.5 The Contractor shall ensure that the following Test Documents shall be produced (in each case as approved by the DCC) by the dates specified (and "final" in this paragraph 1.5 shall be construed accordingly):

(a) for the Pre-Integration Test Phase:

(i) the Contractor shall develop for their solution <u>final</u> versions of:

(A) **Pre-Integration Test Phase Test Approach**: no later than forty (40) Working Days before the

commencement of any test in connection with the Pre-Integration Test Phase;

(B) **Unit Testing Test Plan**: no later than thirty (30) Working Days before the commencement of the first of any tests in connection with Unit Testing;

(C) **Link Testing Test Plan**: no later than thirty (30) Working Days before the commencement of the first Link Testing Test;

(D) **System Test Plan**: no later than thirty (30) Working Days before the commencement of the first System Test; and

(E) **FAT Test Plan**: no later than thirty (30) Working Days before the commencement of the first FAT Test;

(b) for the System Integration Test Phase:

(i) the Prime DSP shall be responsible for the development and maintenance of:

(A) **System Integration Test Phase Test Approach**: with the final version no later than forty (40) Working Days before the commencement of the first Solution Testing Test;

(B) **Solution Test Plan:** with the final version no later than thirty (30) Working Days before the commencement of the first Solution Testing Test; and

(C) **UAT Test Plan:** with the final version no later than thirty (30) Working Days before the commencement of the first UAT Test;

(c) for UIT Testing:

(i) the Prime DSP shall be responsible for the development and maintenance of:

(A) **User Integration Test Phase Test Approach**: with the final version no later than forty (40) Working Days before the commencement of the first UIT Testing;

(B) **User Interface Testing Stage Test Plan for each set of Tests with a DCC Service User**: with the final version no later than thirty (30) Working Days before the commencement of the first Tests; and

(C) **End to End Testing Stage Test Plan for each set of Tests with a DCC Service User:** with the final version no later than thirty (30) Working Days

before the commencement of such End to End Testing;

(d) for the Enduring Testing the Prime DSP shall be responsible for the development and maintenance of the following documents (and shall ensure the same are based upon equivalent Test Documents prepared in connection with UIT Testing to the extent possible in accordance with the remainder of its obligations under this Agreement):

(i) of the **Enduring Testing Test Approach** (for the End-to-end Smart Metering System (including the DCC Interfaces & Gateways) and relevant Smart Appliances) with the final version no later than (60) days before the commencement of the System Integration Test Phase and addressing all Testing that may take place during Enduring Testing except Market Entry Testing;

(ii) an updated **Enduring Testing Test Approach** (for the End-to-end Smart Metering System (including the DCC Interfaces & Gateways) and relevant Smart Appliances) addressing all Testing that may take place during Enduring Testing (including in respect of Market Entry Testing) with the final version at least forty (40) Working Days before the commencement of the first UIT Testing;

(iii) without limiting the generality of any other obligations, a further updated **Enduring Testing Test Approach** (for the End-to-end Smart Metering System (including the DCC Interfaces & Gateways) and relevant Smart Appliances) and addressing all Testing that may take place during Enduring Testing (including in respect of Market Entry Testing)) with the final version at least sixty (60) days prior to the end of UIT Testing; and

(iv) provide an **Enduring Testing Test Plan** (for each Test Stage in accordance with paragraph 1.11 of Part A) with the final version by no later than thirty (30) Working Days before the start date for such Testing and in any event in sufficient time for the DCC and any other third parties to plan to provide any required resources and in addition:

(A) the final version of **a pro-forma Test Plan for System Updates referred to in paragraph 1.9(a)** of Part A must be provided no later than thirty (30) Working Days before the commencement of the System Integration Test Phase;

(B) the final version of a **pro-forma Test Plan for System Updates referred to in paragraph 1.9(b)** of Part A must be provided no later than thirty (30) Working Days before the commencement of the System Integration Test Phase; and

(C) the final version of a **pro-forma Test Plan for Market Entry Testing** must be provided no later

than thirty (30) Working Days before the end of UIT Testing; and

(v) the final version of the Test Plan for any Enduring Testing Test Stage (e.g. Market Entry Testing with a DCC Service User) at least thirty (30) Working Days before such Testing is due to commence.

General

1.6 The dates given in paragraph 1.5 for the commencement of a Test refer to the date indicated for commencement of that Test in the Test Strategy and/or Implementation Plan. The Contractor shall ensure all final versions of the documents referred to above are up-to-date as at the date approved by the DCC. The Contractor recognises that the preparation of such Test Documents will require a considerable degree of co-operation and interaction with DCC Eco-System Entities and shall ensure it plans accordingly.

1.7 The Contractor recognises that its obligations to conduct UIT Testing (and Interface Testing and End to End Testing) shall continue throughout the User Integration Phase, including following the issue of any Stage Exit Criteria and/or Test Stage Complete Certificates in connection with any UIT Testing.

1.8 Not used.

1.9 The following are attached by reference in Parts A and B (respectively) of Appendix 5:

1.9.1 the Contractor's proposals for the Test Strategy (which, for the avoidance of doubt, is not the Test Strategy under this Agreement) (the "**Draft Test Strategy**"); and

1.9.2 an initial version of the Pre-Integration Test Phase Test Approach (which, for the avoidance of doubt, is the Pre-Integration Test Phase Test Approach as at the Effective Date) ("**Draft PIT Test Approach**").

1.10 The Contractor acknowledges that:

1.10.1 there is no Test Strategy as at the Effective Date – this shall be developed in accordance with paragraph 1.12 of this Part and the provisions of this Agreement;

1.10.2 subject to the provisions of paragraphs 1.10.3 and 1.11 of this Part (and without prejudice to the Contractor's other obligations under this Agreement) the Draft PIT Test Approach shall be the Pre-Integration Test Phase Test Approach as at the Effective Date; and

1.10.3 the Draft Test Strategy and Draft PIT Test Approach were developed without input by the DCC and that as such the DCC shall have no DCC Responsibilities or obligations under the Draft Test Strategy or Draft PIT Test Approach.

1.11 All dependencies, obligations or responsibilities express or implied to be on the DCC and all assumptions under the Draft Test Strategy and/or Draft PIT Test Approach shall not be binding on the DCC (or give rise to a DCC Cause)

save to the extent incorporated into a Test Strategy or a subsequent version of the Pre-Integration Test Phase Test Approach approved by the DCC in accordance with this Agreement.

1.12 The parties have agreed that:

1.12.1 the DCC and Contractor shall seek to agree an updated version of the Draft PIT Test Approach as soon as possible following the Effective Date (consent of either party not to be unreasonably withheld or delayed) under the process set out in paragraph 6 of this Part; and

1.12.2 the DCC shall bring the Draft Test Strategy to the attention of the Prime DSP in connection with the development of the document that shall become the first Test Strategy under this Agreement.

2. TEST STRATEGY

2.1 The Prime DSP shall develop and maintain the Test Strategy that shall describe, at a high-level, the Testing strategy and arrangements applicable to each and every testing activity to be conducted by the Prime DSP and each testing activity to be conducted by each Prime CSP in connection with their respective DCC Service Provider Contract (including in connection with Enduring Testing).

2.2 Not used.

2.3 The Contractor shall provide copies of the Test Strategy to the DCC promptly on request from time to time.

2.4 The Test Strategy developed by the Prime DSP is expected to include:

(a) an overview of each Test Phase and Test Stage;

(b) an overview of how Testing will be conducted;

(c) the Testing procedure including details, amongst other things, of the scope of each Test Phase in accordance with the Test Requirements;

(d) the process to be used to capture and record Test results and the categorisation of Test Incidents;

(e) the method for mapping the expected Test results to the Test Success Criteria;

(f) the procedure to be followed should the Test Success Criteria not be met or Test results fail to be as expected or any Stage Exit Criteria not be met, including any rectification procedure;

(g) the process for the production and maintenance of Test Reports and reporting, including (if applicable) templates for the Test Reports and the Contractor's Test Incident Management Log (or where appropriate the Prime DSP's Test Incident Management Log), and a sample plan to resolve Test Incidents;

(h) the names and contact details of the DCC's representatives (if applicable), relevant Other Service Providers' representatives and the Contractor's Test representatives;

(i) a high level identification of the resources required for Testing, including facilities, infrastructure, Test Stubs, Smart Metering Devices and other equipment, personnel and DCC and/or third party support for the conduct of the Tests;

(j) for the User Integration Test Phase and Enduring Testing a high level identification of the Prime DSP and Prime CSP resources required for DCC and DCC Service Users to plan and execute their testing and to support the analysis and resolution of Test Incidents;

(k) for all Test Phases, the extent of functional and non-functional testing;

(l) all high-level dependencies (including any DCC Responsibilities) for the applicable Phase;

(m) the technical environments required to support the Tests; and

(n) the sourcing of Test Data (including confirmation of agreement from the sourcing party where this is not the Prime DSP).

3. TEST APPROACH

3.1 The Contractor shall develop and maintain Test Approaches as listed in paragraph 1.5 of this Part B. The Contractor shall ensure such Test Approaches relate to all Test Activities in the applicable Test Phases and comply with all Test Requirements, DCC Requirements and the description of Test Phases at Appendix 3 to this Schedule 6.2. The Contractor shall ensure all Test Approaches that are Contractor's Test Documents comply with the Test Strategy. The Contractor recognises that Test Approaches developed by the Prime DSP are anticipated to include, as a minimum, details equivalent to those referred to in paragraph 3.4 of this Part.

3.2 The Contractor shall ensure each Test Approach that is a Contractor's Test Document contains a V-model diagram that details the relationship of the design baseline (including Contractor Solution Design Documents and Service Management Framework documents and relevant Communications Hub design documents) to the Test Stages.

3.3 The Contractor shall review and at all times keep up-to-date (in accordance with the process described in paragraph 6 of this Part B of this Schedule 6.2) each Test Approach it was required to develop and maintain in accordance with paragraph 1.5 of this Part B so as to ensure that they are kept fully up-to-date and accurately reflect the then current status of the relevant Testing Activities (including any arrangements in connection with Future Testing Activities) and otherwise continue to comply with the requirements of this Schedule 6.2.

3.4 Each Contractor's Test Approach shall include, as a minimum, the details set out below in relation to the applicable Test Phase:

(a) an overview of the Testing to be undertaken;

(b) the start date for the Testing;

(c) the Testing procedure, including the type of Test and the scope of the Test in accordance with Appendix 3;

(d) the Test objectives;

(e) a detailed list of dependencies the Contractor proposes the DCC consider for inclusion as DCC Responsibilities;

(f) the Stage Entry Criteria and Stage Exit Criteria for each Test Stage including the number of Test Incidents permitted listed by Test Incident Severity;

(g) the intended volume and management of Test Data, and the dates by which any externally provided Test Data are required by the Contractor;

(h) the timetable for each Test Phase;

(i) procedures for maintaining the Traceability Matrix;

(j) the approach to Regression Testing;

(k) the names of the relevant representatives from the DCC (if applicable) and the Contractor and relevant DCC Services Providers and the plan to make the resources available for Testing;

(l) identification of the resources required for Testing, including facilities, infrastructure, Test personnel, third party involvement, DCC involvement and the plan to make the resources available for Testing within the lead times;

(m) the environments (including the use of Test Labs) required to support the Test Approach;

(n) how the Test Stubs it intends to use will allow sufficiently accurate simulation of relevant SMETS equipment during testing at the volumes of devices to be tested using such Test Stubs (including Testing by other External Service Providers); and

(o) the procedure for managing the configuration of the Test Environments including the release management process.

4. TEST PLANS

4.1 The Contactor shall develop and maintain the Test Plans for each Test Stage as required by paragraph 1.5 of this Part B. The Contractor shall ensure all Test Plans that are Contractor's Test Documents comply with the Test Strategy and relevant Test Approach. The Contractor shall ensure each such Test Plan shall include, as a minimum, the details set out below in relation to the applicable Test Stage:

(a) details of the Testing, confirmation of any applicable Milestones to which the Testing may relate, the requirements being Tested and, for each Test, the specific Test Success Criteria to be met;

(b) a detailed procedure for the Tests to be carried out, including:

(i) the timetable for the Tests including start and end dates (in accordance with this Agreement and any applicable Implementation Plan);

(ii) a full list of the Test Specifications applicable to each Test Stage;

(iii) dates and methods by which the DCC can inspect Test results or witness the Tests in order to establish that the applicable Stage Exit Criteria and Test Success Criteria have been met;

(iv) dates agreed with the DCC to allow them to conduct identified acceptance activities;

(v) the mechanism for ensuring the quality, completeness and relevance of the Tests;

(vi) the format and an example of Test progress reports and the process with which the DCC accesses daily Test schedules;

(vii) the process with which the DCC will review Test Incidents and progress on a timely basis;

(viii) the schedule of Tests;

(ix) the specification of the Test Data, including its source, scope, volume and management, a request (if applicable) for relevant Test Data to be provided by another person (which may include the DCC acting on behalf of the DCC Service Users) with agreed dates at which it shall be provided and the extent to which it is equivalent to live operational data;

(x) the information required by paragraph 5.1(c) (under the heading Test Data) of Part C (Testing);

(xi) a plan to make the resources available for Testing including any environments, Test Labs, facilities, model offices, infrastructure, Test personnel, third party and/or DCC involvement;

(xii) the re-Test procedure, the timetable and the resources which would be required for re-Testing;

(xiii) a Traceability Matrix to map Test Specifications to DCC Requirements; and

(xiv) the decision making process for escalation from a re-test situation to specific remedial action to resolve the problem / Test Incident.

4.2 The Contractor shall review and at all times keep up-to-date (in accordance with the process described in paragraph 6 of this Part B of this Schedule 6.2) each Test Plan it was required to develop and maintain in accordance with this Agreement so as to ensure that they are kept fully up-to-date and accurately reflect the then current status of the relevant Testing Activities (including any arrangements in connection with Future Testing Activities) and otherwise continue to comply with the requirements of this Schedule 6.2.

4.3 The Contractor recognises that Test Plans developed by the Prime DSP are anticipated to include, as a minimum, details equivalent to those referred to in paragraph 4.1 of this Part.

5. TEST SPECIFICATIONS

5.1 The Contractor shall produce a Test Specification for each Test and shall ensure this complies with the relevant Test Plan for the relevant Test Stage.

5.2 The Contractor shall provide all relevant Test Specifications required for each Test Stage by no later than twenty (20) Working Days before the start date for any Testing for the relevant Test Stage to which such Stage relates (as set out in the Implementation Plan, Test Plan or otherwise agreed pursuant to this Agreement). Each Test Specification shall then be agreed with the DCC in accordance with the process set out in paragraph 6 immediately below. The Contractor shall consider the ability of the DCC to review a large volume of Test Specifications at one time and agree with the DCC a detailed plan to bundle Test Specifications up so as to allow effective review.

5.3 Save as otherwise agreed:

(a) the Contractor shall be responsible for creating Test Specifications showing traceability of Tests to the functional and the non-functional requirements as set out in this Agreement and the Contractor Solution Design Documents and Service Management Framework and Communications Hub Documents as defined in Schedule 6.3;

(b) there shall be Test Specifications for each Test Stage (and each Test); and

(c) Tests Specifications shall contain, as a minimum, the following;

(i) objective(s) and description of the relevant Test;

(ii) Test reference ID;

(iii) the date the Test Specification was created;

(iv) traceability of the Test Specification to specific Requirements via the Traceability Matrix;

(v) the Smart Metering Devices and other equipment and / or Test Stubs to be used in the Test;

(vi) execution status including a record of all dates the Test Specification was run;

(vii) details of the testing conditions including pre-requisites;

(viii) Test execution steps, including negative tests of exception and error conditions;

(ix) expected Test results;

(x) the Test Success Criteria; and

(xi) tester name or identifier.

6. APPROVAL OF THE CONTRACTOR'S TEST DOCUMENTS

6.1 Within ten (10) Working Days after receipt of a draft (or updated draft) of a Contractor's Test Document from the Contractor, the DCC shall notify the Contractor if it (acting reasonably) considers that the draft Contractor's Test Document:

(a) is inconsistent with the Test Strategy;

(b) in the case of a Test Plan (or other Test Document other than the Test Strategy) is inconsistent with the relevant Test Approach;

(c) in the case of any other Test Document (other than the Test Strategy or Test Approach) is inconsistent with the relevant Test Plan;

(d) is insufficiently detailed to be properly evaluated;

(e) does not comply with any of the requirements set out in this Agreement (including Schedule 6.2); or

(f) is otherwise not sufficient to ensure Testing will result in the achievement of all relevant Stage Exit Criteria (and in respect of the Contractor's Test Strategy / Test Approach, the Phase Exit Criteria)

(each, for the purposes of this paragraph 6, a "**non-conformity**").

6.2 By no later than ten (10) Working Days after receipt of a notice from the DCC under paragraph 6.1 above, the Contractor shall:

(a) make any amendments to the draft Contractor's Test Document that are necessary to address the non-conformities notified by the DCC under paragraph 6.1 above; and

(b) re-submit the revised draft Contractor's Test Document to the DCC.

6.3 Within five (5) Working Days after receipt of the revised draft Contractor's Test Document from the Contractor pursuant to paragraph 6.2 above, the DCC shall notify the Contractor of any new or outstanding non-conformities.

6.4 The process in this paragraph 6 will then be repeated until the DCC notifies the Contractor that the relevant Contractor's Test Document is (subject always to Clause 2.4 of this Agreement) approved. Any dispute relating to the existence of non-conformities in a draft Contractor's Test Document shall be referred to the Dispute Resolution Procedure.

6.5 The Contractor recognises that approval by the DCC of any Joint Test Document to be prepared by the Prime DSP shall be subject to substantially

similar terms as set out in the preceding sub-paragraphs of this paragraph 6 and shall:

(a) ensure that it provides the Prime DSP with all information reasonably required by the Prime DSP in connection with the production of any Joint Test Document; and

(b) be responsible (as between the parties) for ensuring that there is no non-conformity (as described in paragraph 6.1 above) in any Joint Test Document submitted to the DCC by the Prime DSP in so far as such Joint Test Document relates to testing of the Contractor Solution and/or as a result of any inaccuracy or incompleteness (or delay in provisions of) any information or assistance provided or to be provided by the Contractor to the Prime DSP.

PART C – TESTING

1. PRE-TESTING OBLIGATIONS OF THE CONTRACTOR

1.1 The Contractor shall submit the relevant Deliverables, the Contractor Solution or (in either case) any relevant part for Testing (or, where applicable, re-Testing) by or before the date set out in the Implementation Plan, Test Plan (or otherwise agreed pursuant to this Agreement) for the commencement of Testing in respect of the relevant Test Stage.

1.2 Before submitting any Deliverable, the Contractor Solution or (in either case) any relevant part for Testing under this Schedule 6.2, the Contractor shall subject the relevant Deliverables, the Contractor Solution or (in either case) any relevant part to its own internal quality control measures.

1.3 Any Test Incidents found by the Contractor during operational acceptance testing shall be added to the Test Incidents at UAT and shall be counted in determining whether the number of Test Incidents for UAT are within acceptable thresholds (as described in paragraph 6 of Part D of this Schedule 6.2) for the UAT Test Success Criteria and/or Stage Exit Criteria to be achieved.

2. ENTRY CRITERIA AND REQUIREMENTS TO BE SATISFIED PRIOR TO TESTING

2.1 The Contractor shall not submit any Deliverables, the Contractor Solution or (in either case) any relevant part for Testing under this Schedule 6.2:

(a) until the parties have agreed the Contractor's Test Documents relating to the Deliverables, the Contractor Solution or (in either case) any relevant part (and the DCC has approved any Joint Test Documents with which such Contractor's Test Documents must comply);

(b) unless it is confident (acting reasonably) that they will successfully satisfy all relevant Stage Exit Criteria; and

(c) unless it has provided the DCC with at least ten (10) Working Days' advance notice in writing, certifying that the relevant Deliverable, the Contractor Solution or (in either case) any relevant part is ready for Testing under this Schedule 6.2.

2.2 Unless otherwise expressly stated the Phase Entry Criteria for each Test Phase (including for the avoidance of doubt all Test Stages forming part of any Implementation Testing) shall include:

(a) the relevant Test Approach for the relevant Test Phase having been agreed by the DCC in accordance with this Agreement; and

(b) Test Phase Complete Certificates having been issued by the DCC in respect of the preceding Test Phases.

2.3 Unless otherwise expressly stated the Stage Entry Criteria for each Test Phase (including for the avoidance of doubt all Test Stages forming part of any Implementation Test Phase) shall include:

(a) the relevant Test Plans (and all other Test Documents) for the relevant Test Stage having been agreed by the DCC in accordance with this Agreement and which comply with the Test Strategy;

(b) Test Specifications having been prepared for the Test Stage with traceability to design specifications and functional and non-functional DCC Requirements as described in the Traceability Matrix;

(c) Test Labs, Smart Metering Devices (and Smart Metering Systems), Test Stubs, Test Environments and Test Data being ready (and populated in the relevant Test Environments) for all Test Stages of the relevant Test Phase; and

(d) the DCC and all relevant third parties to be involved in the Test Stage having confirmed they have resources to support (and are otherwise ready to commence) the Test Stage.

2.4 The Contractor shall ensure that Contractor Personnel and personnel of the DCC and/or any other relevant DCC Service Provider participating in a Test (including as Test Witnesses) have all training (e.g. in the use of Test Tools), information, access to equipment and other resources necessary to ensure it can design, execute and verify all Testing as agreed in the applicable Test Plan.

3. TEST ENVIRONMENTS

3.1 The Contractor's Test Environments shall be as described in Appendix 2 (Test Environments) and shall meet the requirements of the Test Strategy, Test Approach and the User Integration Performance Measures.

3.2 Unless specifically agreed otherwise with the DCC, the Contractor shall for (and in advance of) each Test Stage:

(a) establish and provide all relevant Test Labs, Test Stubs, Test Environments and Test Data needed to execute the specific Test Specifications (this will include the load and configuration of software code and the creation of databases and transaction files);

(b) specify and build all such Test Labs, Test Stubs, Test Environments for the Contractor Solution in time for each of the relevant Tests as set out in the Test Approach, including procuring and/or installing such Communications Hubs and/or other smart metering or other Hardware as may be required;

(c) provide the number of Test Environments required in order to complete all necessary Testing within the timetable agreed between the parties (including that defined in the Implementation Plan or Test Plan);

(d) provide all reasonably required assistance to the DCC and all other DCC Service Providers in the analysis and resolution of Test Incidents during the System Integration Test Phase; and

(e) provide all reasonably required assistance to all relevant DCC Eco-System Entities (including DCC Service Users) and any other parties

participating in User Integration Testing, in the analysis and resolution of Test Incidents during the User Integration Test Phase.

3.3 The Contractor shall comply with maintenance and release management policies and instructions in respect of its Test Environment (other than any Test Environment used solely in the Pre-Integration Test Phase) specified by the Prime DSP from time to time provided such policies and instructions are consistent with the relevant provisions of the Co-operation Agreement entered into with the Prime DSP.

4. TEST STUBS

4.1 Wherever possible the Contractor shall use production units of Smart Metering Systems (provided that the Contractor shall provide all Communications Hubs) supplied by the DCC in the System Integration Test Phase and User Integration Test Phase. Where production units are not available the Contractor shall use pre-production or prototype units. Where production, pre-production or prototype units are not available the Contractor shall use Test Stubs. The Contractor shall be responsible for supplying all Communications Hubs required in connection with any obligation under this Agreement.

4.2 Unless otherwise agreed (including as expressly set out in the Test Strategy) the Contractor shall be responsible for developing and utilising Test Stubs wherever such stubs are appropriate mechanisms to simulate functions performed by systems, services or equipment that are external to the Contractor Systems that are not being developed or provided by the Contractor or the DCC.

4.3 The Contractor shall comply with its obligations to design, develop and support (including at all times maintaining) the Test Stubs listed in the Test Strategy.

4.4 The Contractor shall create the Test Stubs identified in the Test Strategy early in the build stage and make them available to applicable parties in reasonable time to allow that party to conduct testing.

4.5 The Contractor shall support (including at all times maintaining) the Test Stubs for the period indicated in the Test Strategy.

5. TEST DATA

5.1 Unless otherwise agreed (including as expressly set out in the Test Strategy):

(a) the Contractor shall utilise software tools to generate “realistic” Test Data for the purposes of Testing;

(b) for UIT Testing and Enduring Testing, Test Data shall be derived from live-like data, provided by DCC Service Users, that has been anonymised and randomised for testing purposes by the party responsible for the preparation of Test Data for that Test Stage as identified in the Test Strategy;

(c) the Contractor shall inform the DCC as soon as it has identified the need for DCC Service Users or other parties (other than the Prime CSPs/DSP (which the Contractor shall manage under relevant Co-

operation Agreements)) to provide Test Data and in sufficient time to allow the DCC to liaise with the applicable party to provide said data;

(d) subject to (b) and (c) above, it shall be the responsibility of the Contractor to generate or procure, prepare and create Test Data whenever it is required for Testing; and

(e) the Contractor shall ensure that all necessary Test Data is prepared and ready to populate each Test Environment in time for each of the Tests as set out in the Contractor's Test Approach.

6. TEST MANAGEMENT TOOL

6.1 The Contractor shall provide a Test Management Tool for use by the Contractor, DCC and other DCC Service Providers for the purposes of holding and recording all Test Documents, the Traceability Matrix, Test Data, test scripts, guides, results and outcomes throughout the Pre-Integration Test Phase and as described in the Test Strategy and Test Approaches. The Contractor shall ensure the Test Management Tool holds, manages and permits and controls access to the Traceability Matrix.

6.2 Not used.

6.3 The Contractor shall use the Test Management Tool as specified by the Prime DSP in the System Integration Test Phase, User Integration Test Phase and any Enduring Testing.

7. TEST LABS

7.1 The Contractor shall provide Test Labs as described in Appendix 4 (Test Labs). The Contractor acknowledges and agrees that:

(a) except in the Pre-Integration Test Phase and System Integration Test Phase any testing to be conducted by or on behalf of the Contractor in respect of the Contractor Solution or any part thereof (including any Communications Hub) at the Contractor's own cost shall not be conducted in the Test Labs (unless the DCC otherwise agrees); and

(b) during UIT the Contractor shall make the Test Labs available to DCC Service Users and those acting on their behalf :

(i) for the performance of Interface Testing Tests; and

(ii) End to End Testing Tests (if required); and

(c) during the Enduring Phase the Contractor shall make the Test Labs available to DCC Service Users (and those acting on their behalf) for Market Entry Testing and in connection with Testing of System Updates as required by the DCC from time to time.

7.2 The Contractor shall ensure that all Communications Hubs used in their Test Labs (and in any Tests) are suitable for Testing and:

(a) include the correct versions of firmware; and

(b) have been ZigBee Certified, Security Certified and DLMS/ COSEM Certified in accordance with paragraph 19 of Schedule 11.

7.3 The Contractor shall install Smart Metering Systems and Test Stubs supplied by or on behalf of the DCC such that the operational state of such equipment and Test Stubs can be monitored during the execution of Tests.

7.4 The Contractor shall, on request of the DCC via the Catalogue Services, scale the size of their Test Labs.

7.5 The Contractor shall operate their Test Labs to support the Test Activities of all parties (including the DCC Service Users) as agreed in the applicable Test Documents.

7.6 The Contractor shall provide connectivity of the SMWAN and supply Communications Hubs to test labs of third parties in accordance with Schedule 2.7 (Catalogue Services).

7.7 The Contractor shall provide connectivity and Communications Hubs to other locations and third parties (including other Prime CSPs, DCC Service Users, DCC Service Providers and other persons) on request of the DCC via the Catalogue Services.

7.8 The Contractor shall at all times provide a full set of (and storage space for) all Communications Hubs in the Test Labs for each SMWAN technology used in the Contractor Solution and HAN variant in a quantity (in each case) at least equal to the number of SMS Test Sets to be provided in the Test Lab from time to time (for example, if the Contractor is obliged to provide 50 SMS Test Sets in accordance with this Agreement, then the Contractor shall have 50 copies of each SMWAN technology Communications Hub variant and 50 copies of each HAN variant Communications Hub) (collectively, "**Comms Kit**"). Where the Contractor uses different manufacturers to make Comms Kit, the Contractor's obligations to keep Comms Kit shall apply to each version from a different manufacturer. For example if the number of SMS Test Sets obliged to be provided was 50 and there were two SMWAN technologies manufactured by two different manufacturers then the Contractor shall provide and store 200 Communications Hubs to satisfy this paragraph 7.8 in respect of the different SMWAN technology variants and manufacturer versions (and shall in addition do likewise for HAN variants).

7.9 The Contractor shall ensure that the Test Labs shall simulate electricity and gas load being applied to meters for each SMS Test Set.

7.10 In addition and without prejudice to its other obligations, the Contractor shall provide appropriate facilities for the storage and preparation of all Smart Metering Devices and associated equipment provided by or on behalf of the DCC for use in the Test Labs for a period not exceeding thirty (30) days before and thirty (30) days after each Test in which such Smart Metering Systems and associated equipment might be expected to be used.

7.11 The Contractor shall:

(a) provide the DCC and DCC Service Users (and potential DCC Service Users) (and those acting on their behalf, including in connection with Test Witnessing) with access to the Test Labs and associated

equipment as requested by the DCC during the hours of 08.00 to 20.00 local time Monday to Saturday (and as otherwise agreed);

(b) ensure a sufficient number of support and technical staff are provided to ensure the Test Labs at all times operate in accordance with this Agreement;

(c) provide reasonable facilities for all staff of DCC Eco-System Entities attending, participating in and/or undertaking any Testing at the Test Labs (including reasonable break-out space, space for eating food, drinking facilities and access to a reasonable number of toilets and washing facilities);

(d) keep all Smart Metering Devices stored in connection with Test Labs safe and secure at all times;

(e) provide all assistance reasonably required by any DCC Eco-System Entity in connection with the delivery or pick-up of any Smart Metering Devices or related equipment, including that the Contractor shall ensure the prompt loading and offloading of such equipment (and provide adequate facilities and staff to ensure the same);

(f) be liable to the DCC for any Smart Metering Devices or equipment of any DCC Eco-System Entity that are lost, damaged (except fair wear and tear) or stolen whilst in a Contractor Entity's possession or control or at any Site (except to the extent such loss, damage or theft has resulted from any breach by the DCC of its obligations under this Agreement);

(g) ensure the Test Labs are of sufficient size to comfortably accommodate those attending or participating in Testing at Test Labs (and such that Testing on one SMS Test Set shall not cause disruption to any Tests conducted on another SMS Test Set);

(h) ensure that the Test Labs are fully configured and set-up (including appropriately configured Smart Meter System set-ups and loading of all Test Data and Test Stubs) for the relevant Test(s) in advance of the planned start time of any Tests; and

(i) ensure the Test Labs are securely, confidentially and thoroughly cleaned at the end of each day.

7.12 For the purpose of this Agreement a "**SMS Test Set**" means rackspace and workspace to allow Testing to be conducted on one Smart Metering System (comprised of a gas and electricity meter and all Smart Metering Devices that may form a part of such Smart Metering System (including IHD, PPMIDs and auxiliary load control devices)).

7.13 Each of the configurations of Smart Metering Systems used in SMS Test Sets during System Integration Test Phase Testing shall be an "**SIT SMS Set**". The Contractor shall at all times provide (subject to the DCC providing all Smart Metering Devices other than the Communications Hub and HAN variants (which shall in each case be the Contractor's responsibility)) a number of **each type of** SIT SMS Set (and appropriate storage for the same

when not used in connection with the SMS Test Sets) equal to the total number of SMS Test Sets to be provided by the Contractor from time to time.

8. CONDUCT OF TESTING

8.1 For each Test Stage the External Service Provider who develops and maintains the applicable Test Approach shall manage all Testing associated with that Test Stage (and shall be the "**Lead Contractor**").

8.2 Tests may be witnessed by the Test Witnesses in accordance with paragraph 2 of Part D of this Schedule 6.2.

8.3 The Lead Contractor shall notify the DCC, at least ten (10) Working Days (or such other period as the parties may agree) in advance of the relevant date for Testing (as agreed, including as specified in the applicable Test Plan) of the exact time and location of the relevant Tests and the DCC shall have the responsibility of ensuring that the Test Witnesses attend the Tests if the DCC requires such Test Witnesses to be present.

8.4 The Contractor shall carry out all Tests identified in the Test Plan for that Stage and record the results as described in paragraph 9 of this Part C (a "**Test Cycle**").

8.5 Where the number of Test Incidents recorded by Test Incident Severity exceeds the Stage Exit Criteria for a Test Stage the Contractor shall remedy the defects to the Contractor Solution and run a new Test Cycle including any Regression Testing as required. The Contractor shall repeat this process until the number of Test Incidents recorded by Test Incident Severity is equal to or less than the Stage Exit Criteria for that Test Stage.

8.6 Where Test Incidents are identified with Smart Metering Devices or Test Stubs supplied by the DCC or a Prime CSP, the Contractor shall provide all assistance required by the DCC and the parties responsible for such equipment to diagnose the cause of such Test Incidents.

9. TEST RESULTS

9.1 Unless otherwise agreed:

(a) the Contractor shall document all Test results with suitable evidence (including screen shots, file dumps, message prints, images of data sets and evidence of the state of devices e.g. logs and photographs) to demonstrate that the relevant Test has been Achieved;

(b) where the Contractor is not the Lead Contractor, the Contractor shall pass the documents listed in paragraph 9.1(a) above to the Lead Contractor; and

(c) the Lead Contractor shall record the outcome of the Tests conducted during that day and shall notify the DCC in writing of the success or failure of each Test, the Test Incident Severity of any Test Incidents, and the status and age of all open Test Incidents (if applicable) as part of the Test execution reports in accordance with paragraph 9.3(a).

9.2 Without prejudice to paragraphs 9.1 or 9.3, the Contactor shall also notify the DCC (and the Prime DSP, where the Contractor is not the Lead Contractor) as

soon as reasonably practicable of any failures or errors (other than those that have no material effect on the Testing, the Contractor Solution and/or the Services) of which the Contractor or any Contractor Person becomes aware during the course of any Test. Upon receipt of any such notice of a failure or error, the DCC may inspect the element of the Contractor Solution and/or the Services to which the failure or error relates (including any associated Software and/or underlying materials) at such time as it shall require.

9.3 Throughout (and in respect of) each Test Stage, the Lead Contractor shall:

(a) provide Test execution reports as follows:

(i) in respect of Unit Testing and/or Link Testing, provide a weekly progress report to the DCC summarising the outcome of tests planned and undertaken during that week; and

(ii) in respect of any Testing other than of Unit Testing and/or Link Testing (both of which take place in the Pre-Integration Test Phase) provide a daily progress report to the DCC summarising the outcome of tests planned and undertaken during that week;

(b) provide a weekly readiness report for each Test Stage(s) (starting twenty (20) Working Days prior to the date on which the Test Phase to which such Test Stage(s) relate is due to occur);

(c) ensure that a fault management process is documented and implemented for resolving Test Incidents prior to the start of further Testing and that this is followed throughout such Testing; and

(d) maintain risk, assumptions, issues and dependencies logs.

10. REGRESSION TESTING

10.1 The Contractor shall ensure that Regression Testing forms an integral part of all Test Plans (and all Test Stages for which it is responsible for developing Test Plans).

10.2 The Contractor shall establish a Regression Test method, Regression Test Packs (including Test Data and Test results) and implement a detailed approach for ensuring continued delivery of quality systems.

10.3 The Contractor shall carry out Regression Testing for all Deliverables, the Contractor Solution or (in either case) any relevant part where functionality is delivered in stages and as agreed under the Change Control Procedure.

10.4 A full Regression Test Pack shall be run by the Contractor each and every time a change is applied to the Contractor Solution and before delivery to the DCC or into live operation. The DCC shall agree with the Contractor which changes (including security patches and emergency changes) may be subject to a fast-track process.

10.5 The Contractor shall produce and deliver to the DCC (and the Lead Contractor where the Contractor is not the Lead Contractor) by the end of each Test Stage a Regression Test Pack for the Contractor Solution and keep it updated throughout all subsequent Testing (such Regression Test Packs will be

utilised, amongst others, by the Prime DSP and DCC on an on-going basis). Where reasonably practical the Contractor shall provide that these Regression Test Packs shall be automated.

10.6 The Contractor shall promptly (and in any event within two (2) Working Days) rectify any omissions in any Regression Test Pack in the event that the receiving party (i.e. the DCC or Prime DSP) identifies any faults or omissions.

11. TEST REPORTS

11.1 Not less than ten (10) Working Days (or such other period as the parties may agree) prior to the date on which any Tests relating to a Test Stage are planned to end (including as set out in the applicable Implementation Plan or Test Plan), the Lead Contractor shall provide the DCC with a draft Test Report.

11.2 On completion of all Testing relating to a Test Stage, the Lead Contractor shall provide the DCC with the final Test Report for the applicable Test Stage.

11.3 Each Test Report shall provide a full report on the Testing conducted in respect of the relevant Deliverables and/or the Contractor(s) Solution(s) or (in either case) any relevant part, including:

(a) an overview of the Testing conducted;

(b) identification of the relevant Stage Exit Criteria that have been satisfied;

(c) identification of the relevant Stage Exit Criteria that have not been satisfied together with the Contractor's explanation of why those Stage Exit Criteria have not been met;

(d) the Tests that were not completed together with the Contractor's explanation of why those Tests were not completed;

(e) the Tests that passed, failed or which were not tested, and any other relevant categories, in each case grouped by Test Incident Severity in accordance with paragraph 12 below;

(f) a complete Test Incident Management Log together with a plan for resolution of all Test Incidents; and

(g) the specification for any Hardware and software used throughout the Testing and any changes (or other System Updates) that were applied to that Hardware and/or software during the Testing.

12. TEST INCIDENTS

12.1 Where a Test Report identifies a Test Incident, the parties shall agree the classification of the Test Incident using the following criteria for Test Incident Severity:

Test Incident Severity	Description

Test Incident Severity	Description
Test Incident Severity 1	An Incident which: • would prevent a DCC Service User from using the DCC Service User Systems and/or any DCC Services; • would have a critical adverse impact on the activities of the DCC; • would cause significant financial loss and/or disruption to the DCC Services; or • would result in any material loss or corruption of Data. Non-exhaustive examples: • an Incident leading to non-availability of the Services, the DCC Services, the DCC Data Services or the SMWAN; or • all Test progress is blocked.
Test Incident Severity 2	An Incident which: • would have a major (but not critical) adverse impact on the activities of the DCC but the service is still working at a reduced capacity; or • would cause limited financial loss and/or disruption to the DCC. Non-exhaustive examples: • an Incident leading to non-availability of or to loss of resilience of a material part of the Services (such as a Prime CSP's network management centre, the DSP's security operations centre, the SMWAN, or any of the DCC Interfaces & Gateways); • large areas of functionality will not be able to be tested; or • Testing not completely blocked but has been significantly impacted.
Test Incident Severity 3	An Incident which: • would have a major adverse impact on the activities of the DCC but which can be reduced to a moderate adverse impact through a work-around; or • would have a moderate adverse impact on the activities of the DCC. Non-exhaustive examples: • Testing can progress but the work-around will impact Test progress.

Test Incident Severity	Description
Test Incident Severity 4	An Incident which: • would have a minor adverse impact on the activities of the DCC. Non-exhaustive examples: • minor service interruptions in the business process; or • minor service interruptions in the functionality of the DCC Environment and / or DCC Services.
Test Incident Severity 5	An Incident which: • would have minimal impact on the activities of the DCC. Non-exhaustive examples: • trivial incidents with work-arounds which are noted for future releases but minimal impact of running existing Services; or • Tests can still pass but there are cosmetic issues.
Note: In respect of Services that are not yet in live use with DCC Service Users at volume following the Commencement of Initial Operational Services (e.g. at design stage), the references to impacts or Incidents and the like above shall include any Incidents or impacts or the like that the DCC (acting reasonably) believes may have occurred in the live Service (or DCC Service) when operating at full volumes.	

12.2 Unless otherwise agreed:

(a) the Contractor's Test Incident Management Log shall log Test Incidents to reflect the Test Incident Severity classifications allocated to each Test Incident pursuant to paragraph 12.1 above;

(b) the Contractor shall be responsible for maintaining the Contractor's Test Incident Management Log and for ensuring that its contents accurately represent the current status of each Test Incident at all relevant times; and

(c) the Contractor shall make the Contractor's Test Incident Management Log available to the DCC (and to the Lead Contractor where the Contractor is not the Lead Contractor) upon request.

12.3 The DCC shall confirm the classification of any Test Incident unresolved at the end of a Test in consultation with the Lead Contractor. If the parties are unable to agree the classification of any unresolved Test Incident, the matter shall be dealt with in accordance with the Dispute Resolution Procedure.

12.4 Prior to the issue of a Certificate, the DCC shall be entitled to review the relevant Test Reports and all relevant Test Incident Management Log(s).

PART D – OUTCOME OF TESTING

1. ACCEPTANCE ACTIVITIES

1.1 For each Test Stage the Test Strategy shall set out the Stage Entry Criteria and Stage Exit Criteria and acceptance procedures. This may be subject to elaboration in the specific Contractor's Test Approaches and Contractor's Test Plans.

1.2 Unless expressly agreed otherwise, the DCC's acceptance methods shall include Test Witnessing, a full or partial Testing Quality Audit, a Product Inspection and/or Document Review of all Document Deliverables (the "**Acceptance Activities**").

2. TEST WITNESSING

2.1 The DCC may, in its sole discretion, require the attendance at any Test in respect of any of the Test Stages of one or more Test Witnesses. Test Witnesses will be selected by the DCC, each of whom will have appropriate skills to fulfil the role of a Test Witness.

2.2 The Contractor shall give the Test Witnesses access to any documentation and Test Environments reasonably necessary and requested by the Test Witnesses to perform their role as a Test Witness in respect of the Tests for the relevant Test Stage.

2.3 The Test Witnesses may actively review the Contractor's Test Documentation and will attend the execution of the Tests on behalf of the DCC so as to enable the DCC to gain an informed view of whether a Test Incident may be closed or whether the relevant component should be re-Tested.

2.4 The Test Witnesses may be required to verify that the Contractor has conducted the Tests in accordance with the Test Specifications and other relevant Test Documents for the relevant Test Stage.

2.5 The Test Witnesses may produce and deliver their own, independent reports on Testing, which may be used by the DCC to assess whether the Tests have been Achieved.

2.6 The Test Witnesses may raise (and close) Test Incidents on the Contractor's Test Incident Management Log in respect of any Test Stage.

2.7 The Test Witnesses may require the Contractor to demonstrate the modifications made to any defective Deliverables and/or (part of) the Contractor Solution before a Test Incident is closed.

3. TESTING QUALITY AUDIT

3.1 Without prejudice to its rights pursuant to Clause 37 (Audits), the DCC may perform on-going quality audits in respect of any part of Testing (each a "**Testing Quality Audit**").

3.2 The focus of the Testing Quality Audits will be on:

(a) adherence to an agreed methodology;

(b) adherence to the agreed Testing process;

(c) review of status and key development issues; and

(d) identification of key risk areas.

3.3 The Contractor shall allow sufficient time in each Test Plan it is required to produce under paragraph 1.5 of Part B for each applicable Test Stage to ensure that adequate responses to a Testing Quality Audit can be provided.

3.4 The DCC will give the Contractor at least ten (10) Working Days' written notice of the DCC's intention to undertake a Testing Quality Audit and the Contractor may request, following receipt of that notice, that any Testing Quality Audit be delayed by a reasonable time period, not to exceed ten (10) Working Days, if in the Contractor's reasonable opinion, the carrying out of a Testing Quality Audit at the time specified by the DCC will materially and adversely impact the Contractor's Test Plan.

3.5 A Testing Quality Audit may involve Document Reviews, interviews with the Contractor Personnel involved in or monitoring the activities being undertaken pursuant to this Schedule 6.2, the DCC witnessing Tests and demonstrations of the relevant Deliverables, the Contractor Solution or (in either case) any relevant part to the DCC. Any Testing Quality Audit shall be limited in duration to a maximum time to be agreed between the Contractor and the DCC on a case by case basis (such agreement not to be unreasonably withheld or delayed). The Contractor shall provide all reasonable necessary assistance and access to all relevant documentation required by the DCC to enable it to carry out the Testing Quality Audit.

3.6 If the Testing Quality Audit gives the DCC concern in respect of the Testing procedures or any Test, the DCC will discuss the outcome of the Testing Quality Audit with the Contractor, giving the Contractor the opportunity to provide feedback in relation to specific activities, and subsequently prepare a written report for the Contractor detailing the same to which the Contractor shall, within a reasonable timeframe, respond in writing.

3.7 In the event of an inadequate response to the written report from the Contractor, the DCC (acting reasonably) may withhold the granting of the applicable Certificate until the issues in the report have been addressed to the reasonable satisfaction of the DCC.

4. PRODUCT INSPECTION

4.1 The DCC may require Product Inspection of the Contractor Solution as one of the Acceptance Activities for any Test Stage.

4.2 The Contractor shall permit the Product Inspectors to visit any applicable location at which relevant physical work is or has taken place (or any part of the Contractor Solution is located) in order to conduct Product Inspection at any time on reasonable prior notice by the DCC.

4.3 The Contractor shall give the Product Inspectors access to any documentation, Contractor Personnel and/or Contractor Systems reasonably necessary and requested by the Product Inspectors to perform their role as Product Inspectors in respect of the Contractor Solution.

4.4 The Contractor shall give the Product Inspectors access to any Contractor Personnel involved in the build of the Contractor Solution and all other assistance to allow the compliance with the DCC Requirements and the Contractor Solution Design Documents, Service Management Framework documents and Communications Hub Documents to be checked including:

(a) confirming that infrastructure has been ordered to meet the Design Documents;

(b) confirming that delivery notes exist in relation to the ordered infrastructure and other Contractor Systems;

(c) establishing that build scripts have been developed and tested according to the Contractor Solution Design Documents, Service Management Framework documents, Communications Hub Documents and applicable Test Documents;

(d) confirming that each element of infrastructure and Contractor Systems has been built according to the relevant build script by suitably trained and experienced staff;

(e) confirming that a process for assurance has been followed including the tracking of faults and their correction;

(f) where relevant, confirming that the configuration of Hardware, software and applications matches the Contractor Solution Design Documents, Service Management Framework documents and Communications Hub Documents by observing a trained member of staff access a representative sample of devices;

(g) confirming that Good Industry Practice has been followed for asset tagging, cabling and racking; and

(h) confirming that relevant information has been captured for transfer to the Contractor CMDB.

4.5 The Product Inspectors may produce and deliver their own, independent reports on the Contractor Solution, which may be used by the DCC to assess whether the Test Stage is complete.

4.6 The Product Inspectors may raise (and close) Test Incidents on the Test Incident Management Log in respect of any Product Inspection of any of the Contractor Solution. For the avoidance of doubt Product Inspection is not a substitute for the Contractor's own assurance processes.

5. DOCUMENT REVIEW

5.1 The DCC may require Document Review of any documents (including in particular design documents) to be delivered as part of the Services to which any Test Stage relates to form one of the Acceptance Activities for each Test Stage ("**Document Deliverables**").

5.2 The Contractor shall ensure that the Implementation Plans and Test Plans allow sufficient time for the DCC to carry out its review and for re-work, re-submission and re-review of Document Deliverables.

5.3 The Contractor shall provide the relevant Document Deliverable to the DCC in reasonable time.

6. OUTCOME OF TESTING

6.1 On receipt of a final Test Report for a Test Stage in accordance with this Agreement, the DCC will review the Test Report not more than ten (10) Working Days after receipt of the Test Report (or within any such other timeframe as may be expressly agreed by the parties in writing).

Completion of Test Stages

6.2 Unless otherwise agreed by the parties in writing, the Stage Exit Criteria for each Test Stage undertaken in connection with any Testing shall include:

(a) compliance with all DCC Requirements;

(b) all Tests in the relevant Test Stage have been run and all Test Success Criteria achieved and with the number of Test Incidents being within pre-defined acceptable thresholds which shall be (unless otherwise agreed by the DCC in writing):

(i) zero (0) Test Incident Severity 1 or Test Incident Severity 2;

(ii) except in respect of Testing to which paragraph 6.2(b)(iii) applies, such number of Test Incident Severity 3 or Test Incident Severity 4 or Test Incident Severity 5 as set out in the Test Strategy; and

(iii) in respect of Testing in connection with the Pre-Integration Test Phase, SIT or UIT as follows:

Test Incident Thresholds for Pre-Integration, SIT and UIT

Pre-Integration Test Phase				SIT		UIT	
Unit	Link	System	FAT	Solution Testing*	UAT*	Interface Testing**	End to End Testing**
No S1 or S2		No S1 or S2	No S1 or S2	No S1 or S2	No S1 or S2	No S1 or S2	No S1 or S2
S3 > TBC***		S3 > TBC***	S3 > TBC***	S3 > TBC***	S3 > TBC***	S3 > TBC***	S3 > TBC***
S4 > TBC***		S4 > TBC***	S4 > TBC***	S4 > TBC***	S4 > TBC***	S4 > TBC***	S4 > TBC***
S5 > 60		S5 > 60	S5 > 60	S5 > 65	S5 > 65	S5 > 30	S5 > 30

Note "S1", "S2", "S3", "S4" or "S5" in the above indicates Test Incident Severity (i.e. Testing Incident Severity 1,2,3,4 or 5 as appropriate)

* for Prime DSP, SIT Test Incidents are to be counted by each Prime CSP for each Test Stage (although some Test Incidents may have the potential to impact multiple Prime CSPs, these are only counted in each Test Stage in which they actually occur)

**UIT Test Incidents are for each set of tests with a DCC Service User (as further explained in paragraph 1.8 of Part A of this Schedule). Whilst some Test Incidents might impact on multiple DCC Service Users these shall only be counted as they actually occur in seperate testing.

TBC***: Number of Test Incidents to be agreed with the DCC in the Test Strategy (both parties acting reasonably).

The "**Implementation Phase Work-off Deadline(s)**" are as follows for any Work-off Plan relating to the Pre-Integration Test Phase, SIT or UIT:

Test Incident Severity 3 = within 20 Working Days of completion of the execution of the relevant Test Stage giving rise to the Work-off Plan

Test Incident Severity 4 = within 40 Working Days of completion of the execution of the relevant Test Stage giving rise to the Work-off Plan

Test Incident Severity 5 = As agreed with DCC (agreement of either party not to be unreasonably withheld or delayed)

(c) test results documented and evidence captured, including:

(i) traceability to design specification and functional & non-functional Test Requirements; and

(ii) documentation of suitable evidence (including screen shots, file dumps, message prints, images of data sets and evidence of the state of devices e.g. logs and photographs) to show that

the test condition has demonstrated that actual results are as expected;

(d) a complete set of fault and issue logs applicable to the relevant Test Stage have been produced and provided to the DCC;

(e) Regression Testing completed (having confirmed that the existing functionality of the Contractor Solution and any other System within the scope of such Testing is not affected by the addition of new and/or modified functionality);

(f) a Regression Test Pack has been prepared and stored for future use;

(g) a plan for prompt resolution of outstanding Test Incidents that is agreed by the parties (acting reasonably) (a "**Work-off Plan**") and which shall include the Contractor repeating all relevant tests (or such similar Testing Activities as the DCC may reasonably elect) in respect of the Test Incident at its own cost to prove (to the DCC's reasonable satisfaction) that such Test Incidents have been resolved and that such Work-off Plan shall be completed (and all Test Incidents resolved) within a reasonable time period as agreed in the Work-off Plan (and in any event within (i) sixty (60) Working Days of the agreement of the Work-off Plan; (ii) the date set in the Implementation Plan for completion of the relevant Test Phase; or (iii) any applicable Implementation Phase Work-off Deadline (as defined in paragraph 6.2 (b) (iii) of this Part), whichever the earlier, unless the DCC otherwise agrees in its absolute discretion); and

(h) an appropriate Test Stage Complete Certificate issued by the DCC.

6.3 The relevant Test Stage shall only be completed when all relevant Stage Exit Criteria have been achieved. When the relevant Test Stage has been completed (but for the issuing by the DCC of a Test Stage Complete Certificate), the DCC shall issue a Test Stage Complete Certificate in accordance with this paragraph 6 for the Test Stage.

6.4 Where a Test Stage has been completed and there is only one Stage for the relevant Test Phase (or all the other relevant Stages have been completed), the DCC may instead issue one Test Phase Complete Certificate pursuant to paragraph 6.6 (which in such circumstances shall also be deemed to be the Test Stage Complete Certificate for the relevant Test Stage).

6.5 If a Test Stage Complete Certificate has been issued subject to completion of a Work-off Plan and such Work-off Plan has not been completed within the applicable time period, then unless such failure solely relates to Test Incident Severity 5 items:

(a) any such Test Stage Complete Certificate shall be revoked together with any other Certificate or Achievement of any Milestone that was (directly or indirectly) issued on the basis that any of the foregoing had been issued or Achieved (and 'revoked', in each case, shall mean (as between the parties) as if the foregoing had never been issued or Achieved);

(b) the Contractor shall not be entitled and the DCC shall not be obliged to pay any further Charges associated with any Milestone that has so been revoked until such time that such Milestone is actually Achieved (but the Contractor shall not be required to repay any Charges already paid);

(c) the DCC may require the Contractor to prepare a Correction Plan at the Contractor's sole cost and expense in accordance with Clause 12; and

(d) without prejudice to the DCC's other rights and remedies, the Contractor shall be liable to the DCC for any additional costs incurred by the DCC in arranging any support and/or assistance from third parties required for the Contractor to comply with such Correction Plan (including in connection with the costs of repeating any Test Stage).

Completion of Test Phases

6.6 Unless otherwise agreed, the Phase Exit Criteria for each Test Phase undertaken in connection with any Testing shall include:

(a) completion of all Work-off Plans relating to any Test Incidents that occurred in connection with such Test Phase in accordance with their terms (and resolution of all circumstances that gave rise to such Test Incidents);

(b) compliance with DCC Requirements and Test Requirements; and

(c) Test Stage Complete Certificates issued by the DCC in respect of all Test Stages that form part of that Test Phase and appropriate Test Phase Complete Certificate issued by DCC.

6.7 The relevant Test Phase will only be complete when all applicable Phase Exit Criteria for the Test Phase have been achieved.

6.8 When the relevant Test Phase has been completed (but for the issuing of a Test Phase Complete Certificate by the DCC), the DCC shall issue a Test Phase Complete Certificate in accordance with this paragraph for the relevant Test Phase as soon as reasonably practicable and in any event within five (5) Working Days.

6.9 Without prejudice to any other rights or remedies, if the Deliverable, the Contractor Solution or (in either case) any relevant part does not meet any relevant Stage Exit Criteria:

(a) the DCC may reject the Test Report and shall provide its reasons for such rejection in writing to the Lead Contractor within five (5) Working Days following the receipt by the DCC of the relevant final Test Report; and

(b) the DCC may refuse to issue the relevant Certificates.

6.10 In the event that the DCC rejects the Test Report pursuant to paragraph 6.9 above, the Contractor shall review and amend (or procure the review and amending) of the Test Report within five (5) Working Days following receipt

of the DCC's reasons for rejection and the parties shall use all reasonable endeavours to agree the relevant Test Report within ten (10) Working Days following the receipt by the DCC of the relevant Test Report.

The ability to overlap Test Phases

6.11 Unless otherwise agreed in writing with the DCC (including in any agreed Implementation Plan) or specifically permitted in Schedule 6.1, the Contractor shall only overlap Test Phases as follows:

(a) System Integration Test Phase Testing with different Prime CSPs may be started at different times;

(b) the Prime DSP shall consider and propose as part of the System Integration Strategy (see Schedule 6.3 (Development Process)) ways in which System Integration Test Phase Testing may be commenced as early as practicable without adding risk or unduly adding cost to the Implementation of the Contractor Solution and/or DCC Services;

(c) Market Entry Testing may take place during UIT; and

(d) the Prime DSP shall provide all reasonable assistance required by the DCC to establish the earliest practical date at which any ready DCC Services Users may proceed to UIT Testing with a minimum (or other subset) of the full functionality via Commencement of Early User Integration (as further described in Schedule 6.1 (Implementation Planning)), subject to agreement under the Change Control Procedure.

Submission of Test Assets to the DCC

6.12 At the completion of each Test Phase the Contractor shall provide the DCC with a full copy of all functional and non-functional Test Specifications, Regression Test Packs, all Test Documents, evidence of test-runs, environment smoke-test packs, logs of Test Incidents and their resolution and any other materials produced in the performance of Testing (the "**Test Assets**").

6.13 The Contractor shall ensure that updated Test Assets are provided to the DCC on each anniversary of the completion of UIT Testing.

6.14 The Contractor shall ensure that all updated Test Assets are provided to the DCC as part of Exit.

PART E – RISK

1. RISK

1.1 Subject to Schedule 3 (DCC Responsibilities), risk in the development and implementation of the Deliverables, the Contractor Solution or (in either case) any relevant part and/or the provision of the Services shall remain with the Contractor.

1.2 Failure of the Contractor to comply with any of its obligations set out in this Schedule 6.2 (including those set out in any Contractor's Test Plan), and/or any resultant Dispute, shall be referred to the Dispute Resolution Procedure.

1.3 The issue of a Certificate shall not operate to transfer any risk that the Deliverables, the Contractor Solution or (in either case) any relevant part will meet and/or satisfy the DCC's Requirements or that the relevant Milestone is complete or that it will satisfy the DCC's requirements for that Milestone.

1.4 Consequently, the grant of a Certificate shall not affect the DCC's right subsequently to reject:

(a) all or any element of the Deliverables, the Contractor Solution or (in either case) any relevant part to which a Certificate relates; or

(b) any Certificate.

1.5 The Contractor shall comply with its obligations under Appendix 6 (Outline of UIT).

PART F – DEFINITIONS

DEFINITIONS & INTERPRETATION:

In this Schedule 6.2 (including the definitions below) references to any Test Plan, Test Approach, Test Strategy, Test Specification or other Test Document shall, unless the context otherwise requires (including the provisions of paragraphs 1.9 to 1.12 of Part B relating to the Draft PIT Test Approach), refer to the latest such document approved by the DCC from time to time and the above and following terms shall otherwise have the meanings given below:

"**Acceptance Activities**"	has the meaning given in paragraph 1.2 of Part D of this Schedule 6.2;
"**Certificate**"	means (as appropriate) a Test Phase Complete Certificate, a Test Stage Complete Certificate or a Milestone Achievement Certificate;
"**Commodity Change**"	means a change that is solely an Operational Change that: (i) relates to a part of the Contractor Solution that is a Non-Exclusive Asset; and (ii) could not have any impact on the security of the Contractor Solution or End-to-end Smart Metering System or any Smart Appliance;
"**Contractor's Test Documents**"	means the Test Documents to be provided by the Contractor as set out in Part B of this Schedule 6.2;
"Core UIT Group"	has the meaning given in Appendix 6 (Outline of UIT) of this Schedule 6.2;
"**Deliverable**"	has the meaning given in Schedule 1;
"**Document Deliverable**"	has the meaning given in paragraph 5 of Part D of this Schedule 6.2;
"**Document Review**"	means a review of documentation by or on behalf of the DCC;
"Draft PIT Test Approach"	has the meaning given in paragraph 1.9 of Part B of this Schedule 6.2;
"Draft Test Strategy"	has the meaning given in paragraph 1.9 of Part B of this Schedule 6.2;
"**Enduring Testing**"	means any Testing activities described in paragraph 1.9 of Part A of this Schedule 6.2;
"Equivalent UIT Volumes"	has the meaning given in paragraph 1.8 of Part A of this Schedule 6.2;
"**First UIT Cohort**"	has the meaning given in Appendix 6 (Outline of UIT) of this Schedule;

"**Future Testing Activities**"	has the meaning given in paragraph 2.6 of Part A of this Schedule 6.2;
"**High Complexity**"	has the meaning given in Appendix 6 (Outline of UIT) of this Schedule;
"**Implementation Phase Work-off Deadline(s)**"	has the meaning given in paragraph 6.2(b)(iii) of Part D of this Schedule 6.2;
"**Implementation Testing**"	means any Testing Activities described in paragraph 1.6 of Part A of this Schedule 6.2;
"**Joint Test Document**"	means the Test Strategy and the other Test Documents listed in paragraphs 1.5(b) to (d) (inclusive) of Part B of this Schedule 6.2;
"**Lead Contractor**"	has the meaning given in paragraph 8.1 of Part C of this Schedule 6.2;
"**Market Entry Testing**"	means the Testing process that New Market Entrants and any DCC Service Users that do not enter via UIT Testing go through to test their processes and as described in this Schedule 6.2;
"**Material Test Incident**"	means a Test Incident with a Test Incident Severity of levels 1 and 2, the criteria for which are set out in paragraph 12 of Part C of this Schedule 6.2;
"**New Market Entrant**"	means a potential DCC Service User that wishes to begin using the DCC Services following Market Entry Testing;
"**Phase Entry Criteria**"	means the criteria that must be satisfied before any Test Phase can commence (with regard to Implementation Testing, one such criteria will always be successful completion of all relevant Stage Exit Criteria for all relevant Test Stages forming part of any previous Test Phase and the issue of a Test Phase Complete Certificate for each such previous Test Phase unless otherwise agreed in writing by the DCC);
"**Phase Exit Criteria**"	means the criteria that must be satisfied before any Test Phase is successfully complete (one such criteria will always be successful completion of all relevant Stage Exit Criteria for all relevant Test Stages unless otherwise agreed in writing with the DCC);
"**Product Inspection**"	shall be construed in accordance with paragraph 4 of Part D of this Schedule 6.2;
"**Product Inspector(s)**"	means each person(s) appointed by the DCC to conduct a Product Inspection from time to time;
"**Regression Testing**"	means Testing (including both functional and non-functional testing) to ensure that any existing

	functionality is not negatively affected by the addition of new and/or modified functionality (or any other change to any related part of any System) introduced at any point in the Service Period, including that the Contractor Solution shall continue to perform in accordance with all obligations under this Agreement (and "**Regression Test**" shall be construed accordingly);
"**Regression Test Pack**"	means a set of tools, configuration information, scripts and data to allow a set of tests to be re-run at a later date;
"**Second UIT Cohort**"	has the meaning given in Appendix 6 (Outline of UIT) of this Schedule;
"**SIT SMS Set(s)**"	has the meaning given in paragraph 7 of Part C of this Schedule;
"**SMS Test Set(s)"**	has the meaning given in paragraph 7 of Part C of this Schedule;
"**Stage Entry Criteria**"	means the criteria that must be satisfied before any Test Stage can commence;
"**Stage Exit Criteria**"	means the criteria that must be satisfied before any Test Stage is successfully complete (one such criteria will always be zero (0) Material Test Incidents);
"**Subsequent UIT Cohort(s)**"	has the meaning given in paragraph 1.8 of Part A of this Schedule;
"**System Update**"	means any proposed or actual change (or series of connected changes, including any change or proposed change in any configuration) in or in part(s) of any of: • the Consumer Access Devices and/or End-to-end Smart Metering System; or • the Systems used by any DCC Service User to interface or interact with any part of the End-to-end Smart Metering System, including any changes (or proposed changes) to any software or Hardware or other Systems (or any part, code or element of them) and new SMS. System Updates will include the use of new System(s), use of new versions of any System(s) and maintenance release or replacements of Systems (including those to correct faults, add functionality or otherwise amend or upgrade any part of such Systems);
"**Test**"	means any test required to be carried out in accordance with this Schedule 6.2 (including Product Inspection and Document Review), and "**Testing**" and "**Tested**" shall be construed accordingly;

"**Test Approach**"	means the latest version from time to time of a document approved by the DCC describing how the Tests listed in the Test Strategy shall be conducted (and as further described in paragraph 3 of Part B of this Schedule 6.2);
"**Test Assets**"	has the meaning given in paragraph 6.12 of Part D of this Schedule 6.2;
"**Test Cycle**"	has the meaning given in paragraph 8.4 of Part C of this Schedule 6.2;
"**Test Data**"	means that data required for Testing as described in paragraph 5 of Part C of this Schedule 6.2;
"**Test Document(s)**"	means the Test Strategy and each Test Approach, Test Plan and Test Specification (including each Joint Test Document) and such variations to such Test Documents or additional test documentation as may be developed from time to time in accordance with this Agreement;
"**Test Environment**"	means the Systems against which a given Testing Activity is executed as further defined in paragraph 3 of Part C of this Schedule 6.2 and in Appendix 2 (Test Environments) of this Schedule 6.2;
"**Test Incident**"	means any variance or non-conformity of a Deliverable and/or Contractor Solution or (in either case) any relevant part from its requirements as set out in the relevant Test Success Criteria;
"**Test Incident Management Log**"	means a log for the recording of Test Incidents as described further in paragraph 12.2 of Part C of this Schedule 6.2;
"**Test Incident Severity**"	means the severity of a Test Incident categorized in accordance with paragraph 12.1 of Part C of this Schedule 6.2;
"**Testing Activities**"	has the meaning given in the section entitled "Purpose" of this Schedule 6.2;
"**Testing Quality Audit**"	has the meaning given in paragraph 3.1 of Part D of this Schedule 6.2;
"**Test Lab**"	means a location used for Testing (which may include Testing of Communications Hubs) as further described in paragraph 7 of Part C of this Schedule 6.2;
"**Test Management Tool**"	means a test management tool that has the ability to log and track Test Incidents, store test cases, map tests to requirements, enable test execution and track test progress as further described in paragraph 6 of

	Part C of this Schedule 6.2;
"**Test Phase**"	means each test phase as described in paragraph 1 of Part A of this Schedule 6.2;
"**Test Phase Complete Certificate**"	means a certificate substantially in the form set out in Appendix 1 issued pursuant to paragraph 6.8 of Part D (Outcome of Testing);
"**Test Plan**"	means a the latest version of a document approved by the DCC from time to time explaining when, where and with what resources the Testing will happen in a stage or phase (and as described in paragraph 4 of Part B of Schedule 6.2);
"**Test Report**"	means a report setting out the results of any Tests which shall include without limitation the information set out in paragraph 11.3 of Part C of this Schedule 6.2;
"**Test Requirements**"	has the meaning given in paragraph 1.12 of Part A of this Schedule 6.2;
"**Test Specification**"	means the latest version of a detailed set of steps and requirements (documenting how each specific test will be conducted and the outcomes expected for each step against which the success shall be measured in order to determine if the Test Success Criteria have been satisfied, which shall include without limitation the information set out in paragraph 5 of Part B of this Schedule 6.2) that has been approved by the DCC;
"**Test Stage**"	means the latest version of each test stage as described in paragraph 1 of Part A of this Schedule 6.2 approved by the DCC;
"**Test Stage Complete Certificate**"	means a certificate substantially in the form set out in Appendix 1 issued pursuant to paragraph 6.3 of Part D (Outcome of Testing) of this Schedule 6.2;
"**Test Strategy**"	means the latest version from time to time approved by the DCC of the document of that name (as further described in paragraph 2 of Part B of this Schedule 6.2) developed and maintained by the Prime DSP describing what Testing shall be conducted in a Test Phase;
"**Test Stub**"	means a system used to simulate another system for the purposes of Testing and as further described in paragraph 4 of Part C of this Schedule 6.2;
"**Test Success Criteria**"	means, in relation to a Test Specification, the criteria to be applied to determine whether the Test has passed or failed and as used to determine the Test Incident Severity as applicable;

"**Test Witness**"	means any person appointed by the DCC pursuant to paragraph 2.1 of Part D of this Schedule 6.2;
"**Traceability Matrix**"	has the meaning given in Schedule 6.3;
"**UIT Extension Period**"	has the meaning given in paragraph 1.8 of Part A of this Schedule;
"**UIT Testing**"	means the Testing processes during the User Integration Test Phase that (a subset) of DCC Service Users go through to test their processes and systems. This includes an Interface Testing Test Stage and End to End Testing Test Stage as are described in this Schedule 6.2; and
"**Work-off Plan**"	has the meaning given in paragraph 6.2 of Part D of this Schedule 6.2.

APPENDIX 1:

Test Phase / Test Stage Complete Certificate

To: [CONTRACTOR]

From: [DCC]

[Date]

Dear Sirs

[TEST PHASE] [TEST STAGE] COMPLETE CERTIFICATE

[TEST PHASE] [TEST STAGE]: [***insert description***]

We refer to the Agreement relating to the provision of ICT Services to the DCC ("**Agreement**") between [#] ("**DCC**") and [#] ("**Contractor**") dated [#].

[**TEST STAGE COMPLETE:** We confirm that the relevant parts of the [Contractor Solution] have been tested in accordance with the relevant Test Documents. Subject to completion of any relevant Work-off Plan(s) for this Test Stage, we confirm that the relevant Stage Exit Criteria have been achieved.]

[**TEST PHASE COMPLETE:** We confirm that the relevant parts of the [Contractor Solution] have been tested in accordance with the relevant Test Documents. We confirm that the relevant Stage Exit Criteria for each relevant Stage have been achieved and that the relevant Phase Exit Criteria for the Phase have also been achieved.]

The Contractor's Work-off Plan for this Test Stage is attached as an annex to this Test Stage Complete Certificate.

Accordingly, the Contractor is entitled to proceed on the basis of this Test [Phase / Stage] Complete Certificate in respect of the above mentioned Test [Phase / Stage] in accordance with our Agreement.

Please note that the granting by the DCC of this Certificate shall not result in a transfer of risk to the DCC in respect of any part of the Contractor Solution and the Services.

Yours faithfully

[Name]

[Position]

acting on behalf of the DCC

APPENDIX 2: Test Environments

The Contractor shall ensure each Test Environment is at all times scaled and capable of handling volumes of DCC Service Users and Transactional Data (and other throughputs) in accordance with the Test Strategy.

Test Environment	Relevant Test Activities	Responsible	Related dependencies on other persons	Period to be maintained	Used by	Requirements/ description of (including performance requirements if relevant)
END-TO-END ENVIRONMENTS						

Pre-Prod 1 Pre-Integration	System Testing
	Regression Testing
	FAT
	Testing of defect verification and regression prior to delivery of software to later phases
		Contractor	Prime DSP to provide DSP Gateway Stub	Pre-Integration Then used throughout System Integration Phase, User Integration Phase and Initial and Mass Roll Out Phases	Contractor, Contractor partners: Elster, WNC, Connode Access provided to the DCC for FAT	This environment needs to include all components (or test stubs as agreed in the applicable Test Strategy) of the end-to-end Contractor Solution, across Zones A, B and C, and a stub for the Prime DSP/ Contractor interface gateway
						
						It will be used and made available in accordance with this Agreement, including to test requirements in Schedule 2.1 from the following Parts and Sections:
						• SMWAN
						  ○ SMWAN functionality;
						  ○ Power outage management;
						  ○ The DCC WAN Gateway and the DCC WAN Gateway

Test Environment	Relevant Test Activities	Responsible	Related dependencies on other persons	Period to be maintained	Used by	Requirements/ description of (including performance requirements if relevant)
						Interface Specification; ○ The network management centre; and ○ Coverage requirements. • Communications Hub ○ Communications Hub Installation Requirements; ○ Communications Hub Maintenance Requirements; and ○ Training. • Service management ○ Service management system interface; ○ Service portfolio management; ○ Service catalogue management; ○ Service level management; ○ Audit trail management; ○ Operational change management; ○ Release management; ○ Knowledge management;

Test Environment	Relevant Test Activities	Responsible	Related dependencies on other persons	Period to be maintained	Used by	Requirements/ description of (including performance requirements if relevant)
						○ Event management; ○ Incident management; ○ Major incident management; ○ Request fulfilment; ○ Problem management; ○ Access management; ○ Service measurement; and ○ Service reporting. • Solution security: ○ General; ○ Physical security; ○ Platform security; ○ Software security; ○ Authentication; ○ Access controls; ○ Integrity and content validation; ○ Audit trails; ○ Alerts and notifications; ○ Privacy; and ○ Cryptography. It will be to test requirements in Annex C to Appendix 2.1 to Schedule 11 (ICHIS requirements)

Test Environment	Relevant Test Activities	Responsible	Related dependencies on other persons	Period to be maintained	Used by	Requirements/ description of (including performance requirements if relevant)
						from the following Parts and Sections: • General Interface Requirements; • Physical Interface Requirements; • Electrical Interface Requirements; and • Data Interface Requirements. It will be used to validate that we can meet the relevant Performance Measures in Schedule 2.2. It will also be used and made available in accordance with this Agreement, including to test requirements in Schedule 11 from the following Parts and Sections: • Certification and Testing of Communications Hubs: ○ CE Marking requirements; and ○ Certification requirements.

Test Environment	Relevant Test Activities	Responsible	Related dependencies on other persons	Period to be maintained	Used by	Requirements/ description of (including performance requirements if relevant)
Pre-Prod 2 Integration	SIT Solution Testing UAT	Contractor	Prime DSP to provide Prime DSP gateway, as agreed	System Integration Phase until User Integration Testing Phase	Contractor, Prime DSP	This environment needs to include all components of the End-to-end Smart Metering System, including across the Contractor Solution and Prime DSP parts. It will be used and made available in accordance with this Agreement , including to test requirements in Schedule 2.1 from the following Parts and Sections: • SMWAN ○ SMWAN functionality; ○ Power outage management; ○ The DCC SMWAN Gateway and the DCC SMWAN Gateway Interface Specification; ○ The network management centre; and ○ Coverage requirements. • Communications Hub ○ Communications Hub

Test Environment	Relevant Test Activities	Responsible	Related dependencies on other persons	Period to be maintained	Used by	Requirements/ description of (including performance requirements if relevant)
						Installation Requirements; ○ Communications Hub Maintenance Requirements; and ○ Training. • Service management ○ Service management system interface; ○ Service portfolio management; ○ Service catalogue management; ○ Service level management; ○ Audit trail management; ○ Operational change management; ○ Release management; ○ Knowledge management; ○ Event management; ○ Incident management; ○ Major incident management; ○ Request fulfilment; ○ Problem management; ○ Access management;

Test Environment	Relevant Test Activities	Responsible	Related dependencies on other persons	Period to be maintained	Used by	Requirements/ description of (including performance requirements if relevant)
						○ Service measurement; and ○ Service reporting. • Solution security: ○ General; ○ Physical security; ○ Platform security; ○ Software security; ○ Authentication; ○ Access controls; ○ Integrity and content validation; ○ Audit trails; ○ Alerts and notifications; ○ Privacy; and ○ Cryptography.
Pre-Prod 2 UIT/ Enduring Phase	UIT and remainder of Service Period	Contractor	Prime DSP to provide Prime DSP gateway, as agreed DCC to provide connectivity to DCC Service Users	User Integration Phase through remainder of Service Period	Contractor, Prime DSP, DCC, DCC Service Users	This environment needs to include all components of the End-to-end Smart Metering System, across the CSP and DSP parts. It will be used and made available in accordance with this Agreement, including for testing

Test Environment	Relevant Test Activities	Responsible	Related dependencies on other persons	Period to be maintained	Used by	Requirements/ description of (including performance requirements if relevant)

						and use by DCC Eco-System Entities (including System Updates) including to test requirements in Schedule 2.1 from the following Parts and Sections:
						• SMWAN
						  ○ SMWAN functionality;
						  ○ Power outage management;
						  ○ The DCC SMWAN Gateway and the DCC SMWAN Gateway Interface Specification;
						  ○ The network management centre; and
						  ○ Coverage requirements.
						• Communications Hub
						  ○ Communications Hub Installation Requirements;
						  ○ Communications Hub Maintenance Requirements; and
						  ○ Training.
						• Service management

Test Environment	Relevant Test Activities	Responsible	Related dependencies on other persons	Period to be maintained	Used by	Requirements/ description of (including performance requirements if relevant)
						○ Service management system interface; ○ Service portfolio management; ○ Service catalogue management; ○ Service level management; ○ Audit trail management; ○ Operational change management; ○ Release management; ○ Knowledge management; ○ Event management; ○ Incident management; ○ Major incident management; ○ Request fulfilment; ○ Problem management; ○ Access management; ○ Service measurement; and ○ Service reporting. • Solution security: ○ General; ○ Physical security; ○ Platform security;

Test Environment	Relevant Test Activities	Responsible	Related dependencies on other persons	Period to be maintained	Used by	Requirements/ description of (including performance requirements if relevant)
						○ Software security; ○ Authentication; ○ Access controls; ○ Integrity and content validation; ○ Audit trails; ○ Alerts and notifications; ○ Privacy; and ○ Cryptography.
Performance Environment	Service Integration	Contractor	DSP to provide DSP gateway, as agreed DCC to provide connectivity to DCC Service Users	Service Integration and beyond if required by DCC	Contractor, Prime DSP, DCC, DCC Service Users	This environment needs to include all components (or test stubs as agreed in the applicable Test Strategy) of the End-to-end Smart Metering System, across the CSP and DSP parts. It needs to be a scaled version of production, with a known scale factor, so that performance results can be extrapolated. It will be used in accordance with this Agreement, including for testing and use by DCC Eco-System Entities to test requirements in Schedule 2.1

Test Environment	Relevant Test Activities	Responsible	Related dependencies on other persons	Period to be maintained	Used by	Requirements/ description of (including performance requirements if relevant)

						from the following Parts and Sections:
						• SMWAN
						  ○ SMWAN functionality;
						  ○ Power outage management;
						  ○ The DCC SMWAN Gateway and the DCC SMWAN Gateway Interface Specification;
						  ○ The network management centre; and
						  ○ Coverage requirements.
						• Service management
						  ○ Service measurement; and
						  ○ Service reporting.

APPENDIX 3: Test Phases

Pre-Integration Test Phase	
Purpose	• The purpose of the Pre-Integration Test Phase is to allow the Contractor to demonstrate that its Contractor Solution complies with the applicable DCC Requirements, prior to being integrated with the solutions of other External Service Providers, DCC, DCC Service Users or with SMETS equipment or other Smart Metering Systems.

Scope	• Pre-Integration Test Phase Tests will cover the individual Contractor Solution of the Contractor:
	  ○ for the Prime DSP the scope is from the DCC User Gateway to the DCC SMWAN Gateway, including systems which DCC will employ to support DCC Service Users activities and/or provide the DCC Services; and
	  ○ for Prime CSPs the scope is from the DCC SMWAN Gateway Interface up to and including the Communications Hub HAN interface.
	• Pre-Integration Test Phase Tests will cover all functional and non-functional Test Requirements.

Requirements: Use of Equipment and Test Environments	• **Smart Metering Systems**: the Contractor will test each part of the Contractor Solution (including each variant of their Communications Hubs in such form and state of complete manufacture as it would be when installed in a Consumer Premises during the Mass Roll Out Phase) using Test Stubs built or procured by them. Each Prime CSP shall Test all variants of their Communications Hubs with their complete integrated Contractor Solution (for the further avoidance of doubt such Testing shall be without use of Test Stubs; it is only integration with the Prime DSP and integration with Smart Meters that may be Tested with Test Stubs). • **Communications Hubs**: Prime CSPs will test their solutions using prototypes or production units (all variants must be included if the CSP is deploying multiple communications technologies and each in such form and state of complete manufacture as it would be when installed in a Consumer Premises during the Mass Roll Out Phase) and in accordance with paragraph 20 of Part C (Certification and Testing of Communications Hubs) of Schedule 11 (Communications Hubs). Each Prime CSP shall ensure during the Pre-Integration Test Phase that (and, it shall be one of the Phase Exit Criteria that the Pre-Integration Test Phase shall not be completed until) all variants of its Communications Hubs shall be ZigBee and DLMS/COSEM protocol certified in accordance with paragraph 19 of Part C (Certification and Testing of Communications Hubs) of Schedule 11 (Communications Hubs). • **Test Labs**: Each Prime CSP will provide a Test Lab in which their

Pre-Integration Test Phase	
	Communications Hubs will be installed. • **DCC SMWAN Gateway**: the Prime DSP and Prime CSPs shall work collaboratively to design and build DCC SMWAN Gateway stubs for the Pre-Integration Test Phase. The Contractor shall as between the Contractor and DCC be responsible for ensuring the DCC SMWAN Gateway stubs for the Pre-Integration Test Phase are prepared for the Pre-Integration Test Phase. • **Test facilities**: the Contractor shall be responsible for providing all Systems, networks, software and other facilities required to construct Test Environments for their Pre-Integration Test Phase. • **Test Environments**: the Contractor shall specify the required number of Test Environments in the Test Approach (and in accordance with their obligations under this Agreement, including Appendix 2 of this Schedule) and provide such Test Environments in time for the commencement of Testing.
Requirements: Use of Test Data	• The Contractor shall provide all Test Data required to support all Test Activities during the Pre-Integration Test Phase. Such Test Data must: o not contain any information relating to genuine Consumers (or any other Personal Data); and o support, be consistent with and permit the successful execution of all test scripts.
Requirements: Entry and Exit Criteria	• The Contractor shall ensure the Pre-Integration Test Phase Test Approach defines (in a manner consistent with the Contractor's obligations under this Agreement) the Stage Entry Criteria and Stage Exit Criteria for the following Test Stages: o Unit Testing; o Link Testing; and o System Testing. • The Contractor shall comply with the Stage Entry Criteria and Stage Exit Criteria agreed with the DCC and documented in the Test Strategy and relevant Test Documents for the following Test Stage: o FAT (this includes both functional and non-functional testing and involves independent, scripted testing at the Site(s) using a factory acceptance testing environment made available by the Contractor and prepared test cases and Test Data (as agreed in the relevant Test Documents)).

System Integration Test Phase	
Purpose	• The purpose of the System Integration Test Phase is to test that, when integrated with each other's Systems, the DCC Environment and with Smart Metering Systems, the Contractor Solution and Other ESP Solutions will combine to deliver operationally effective DCC Services.

Scope	• The System Integration Test Phase will cover all components of the End-to-end Smart Metering System.
	• The scope will include DCC's operational systems (e.g. its user support systems and Parse and Correlate Solution).
	• Solution Testing and UAT will cover all functional and non-functional Test Requirements and will include:
	  ○ security testing: to test that the Security Requirements have been met (and this testing will include penetration testing);
	  ○ volume and performance testing: to test that the Contractor Solution can support the volume and performance levels set out in this Agreement; and
	  ○ service management solution testing: to test that the DCC Service Management System operates in accordance with all relevant requirements, including in accordance with the Service Management Framework.
	• All types of Service Response and Service Request and other DCC Services in the DCC Gateway Catalogue and also all DCC User Service types shall be tested (unless the DCC otherwise elects).

Requirements: Use of Equipment and Test Environments	• **Smart Metering Systems**: the DCC will procure SMETS 2 Smart Metering Systems to be used in the System Integration Test Phase. Such equipment must be acquired from a minimum of two meter manufacturers for all SMETS2 devices (subject to product availability) and the Contractor shall ensure such equipment shall be manufactured by a manufacturer (and manufacturing group) different from (and not Affiliated with) the Communications Hub manufacturer and shall promptly notify the DCC if the DCC supplies or proposes to supply any equipment that would conflict with such requirement. • **Communications Hubs**: All variants of Communications Hubs will be tested (in such form and state of complete manufacture as it would be when installed in a Consumer Premises during the Mass Roll Out Phase) and the Contractor shall comply with paragraph 20 of Part C (Certification and Testing of Communications Hubs) of Schedule 11 (Communications Hubs). • **Test Labs**: Each Prime CSP will provide Test Labs in which their Communications Hubs and the Smart Metering System equipment supplied by the DCC will be installed. • **DCC SMWAN Gateway**: all Tests during the System Integration Test Phase will be undertaken on and passed across the DCC SMWAN Gateway between the Prime DSP and relevant Prime CSP(s) (i.e. as opposed to using a localised mock-up system or network instead of the SMWAN that is to be used in the Production Environment). • **DSP interfaces**: the Contractor shall design and build Test Stubs

System Integration Test Phase	
	to substitute for DCC User Gateway data flows with DCC Service Users. All other Prime DSP interfaces (including all DCC Interfaces & Gateways) will be included within the scope of the System Integration Test Phase. • **Test facilities**: the Contractor shall be responsible for providing all Systems, networks, software and other facilities required to construct testing environments for the System Integration Test Phase. This may include the installation of Prime CSP's network equipment in the Prime DSP's data centre(s). • **Test Environments**: the Contractor shall provide the number of Test Environments set out in the Test Strategy in time for the commencement of Testing. Test Environments will be representative (including in respect of Systems, premises, infrastructure, data and controls) of the planned End-to-end Smart Metering System live environment.
Requirements: Use of Test Data	Test Data shall comply with paragraph 5 of Part C of this Schedule 6.2. The Contractor shall ensure that Test Data shall support, be consistent with and permit the successful execution of all Test Scripts.
Requirements: Entry and Exit Criteria	• The Contractor shall ensure that the Test Strategy and Test Approach and other relevant Test Documents for the System Integration Test Phase shall (in a manner consistent with its obligations under this Agreement) define the Stage Entry Criteria and Stage Exit Criteria for the following System Integration Test stages: o Solution Testing; and o UAT.

User Integration Test Phase	
Purpose	• The purpose of UIT is to test that, when integrated with Smart Metering Systems, DCC and DCC Service Users, the Contractor Solution and Other ESP Solutions will combine to deliver operationally effective DCC Services. As the DCC & Contractor Systems will have been tested during the System Integration Test Phase, the focus of UIT is to ensure that DCC Service Users can integrate their systems and equipment with DCC.
Scope	• UIT will cover all components of the End-to-end Smart Metering System and DCC User Gateway and DCC User Gateway Interface from DCC Service Users to Smart Metering Systems and the DCC Service Management System and all DCC Interfaces & Gateways. • The scope will include Other Energy Industry Systems, the End-to-end Smart Metering System and equipment provided by DCC and Energy Suppliers. • UIT will cover functional and non-functional Test Requirements (including penetration testing). • All types of Service Response and Service Request and other DCC Services in the DCC Gateway Catalogue and also all DCC User Service types shall be tested (unless the DCC otherwise elects).
Requirements: Use of Equipment and Test Environments	• **Smart Metering Systems**: equipment provided by DCC and used in the System Integration Test Phase may also be used in UIT. In addition Energy Suppliers will provide Smart Metering Devices (not including Comms Hubs) to be used in UIT. All SMETS2 SMS devices may be included in the testing, subject to product availability. • **Communications Hubs**: all variants of Communications Hubs will be tested and the Contractor shall comply with paragraph 21 of Part C (Certification and Testing of Communications Hubs) of Schedule 11 (Communications Hubs). • **Test Labs**: Prime CSPs will provide Test Labs in which their Communications Hubs and Smart Metering Systems supplied by the DCC and Energy Suppliers will be installed. • **DCC SMWAN Gateway**: all Tests during UIT will be undertaken on and passed across the DCC SMWAN Gateway between the Prime DSP and relevant Prime CSP(s) (i.e. as opposed to using a localised mock-up system or network instead of the SMWAN that is to be used in the Production Environment). • **DSP interfaces**: all Prime DSP interfaces (including all DCC Interfaces & Gateways) will be included within the scope of UIT, including the DCC User Gateway. • **Test facilities**: The Contractor shall be responsible for providing all Systems, networks, software and other facilities required to construct testing environments for UIT. This may include the installation of the Prime CSP's network equipment in the Prime DSP's data centre. • **Test Environments**: The Contractor shall provide the number of Test Environments set out in the Test Strategy in time for the commencement of Testing. The Contractor shall ensure the Test Environments shall be representative of the planned Production

User Integration Test Phase	
	Environment. A minimum of two Test Environments will be required: ○ one for Interface Testing; and ○ one for End to End Testing.
Requirements: Use of Test Data	Test Data shall comply with paragraph 5 of Part C of this Schedule 6.2. The Contractor shall ensure that Test Data shall support, be consistent with and permit the successful execution of all Test Scripts.
Requirements: Entry and Exit Criteria	• The Contractor shall comply with the Stage Entry Criteria and Stage Exit Criteria in the Test Strategy and relevant Test Documents for the User Integration Test Phase.

Enduring Testing	
Purpose	The purpose of the Enduring Testing is to: • allow new DCC Service Users and New Market Entrants to test their Systems with the DCC Services (as further explained in paragraph 1.9(c) of Part A of this Schedule); • support the DCC Eco-System Entities in the Testing of new or updated Smart Metering Systems (as further explained in paragraph 1.9(b) of Part A of this Schedule); and • support the DCC Eco-System Entities in the Testing of System Updates and test System Updates to the Contractor's Systems (as further explained in paragraph 1.9(a) of Part A of this Schedule).
Scope	• All DCC Services and related functions and Systems may be covered by Enduring Testing.
Requirements: Use of Equipment and Test Environments	• **Test Labs and Equipment**: Prime CSPs will provide a Test Lab in which their Communications Hubs and those Smart Metering Devices supplied by the DCC and Energy Suppliers will be installed. • **DCC SMWAN Gateway**: all Tests during Enduring Testing shall be undertaken on and passed across the DCC SMWAN Gateway between the Prime DSP and relevant Prime CSP(s) (i.e. as opposed to using a localised mock-up system or network instead of the SMWAN that is to be used in the Production Environment). • **DSP interfaces**: all Prime DSP interfaces (including all DCC Interfaces & Gateways) will be included within the scope of Enduring Testing, including the DCC User Gateway. • **Test facilities**: the Contractor shall be responsible for providing all Systems, networks, software and other facilities required to construct testing environments for Enduring Testing. This may include the installation of the Prime CSP's network equipment in the DSP's data centre. • **Test Environments**: The Contractor shall provide the number of Test Environments set out in the Test Strategy in time for the commencement of any Testing. The Contractor shall ensure the Test Environment for Enduring Testing shall be representative of the Production Environment.
Requirements: Use of Test Data	Test Data shall comply with paragraph 5 of Part C of this Schedule 6.2. The Contractor shall ensure that Test Data shall support, be consistent with and permit the successful execution of all Test Scripts.
Requirements: Entry and Exit Criteria	• The Contractor shall comply with the Stage Entry Criteria and Stage Exit Criteria documented in the Test Strategy and relevant Test Documents for Enduring Testing.

APPENDIX 4:
Test Labs

Test Lab	Location	Facilities provided	Minimum Capacity	Period to be maintained	Access to be provided to
CSP Test Lab Facility	On-Shore Territory	Without limiting the generality of the Contractor's obligations under paragraph 7 (Test Labs) of Part C (Testing) of this Schedule 6.2 the Contractor shall provide within the Test Labs: • storage space for at least two different types of: (i) SMETS2 gas smart meters; (ii) SMETS 2 electricity meters; and (iii) IHDs; • Test Stubs where the number of meters or IHDs referred to above are not available; • storage space for at least one version of: all available PPMIDs and HAN connected load control devices;	At Contractor discretion. The Contractor shall ensure sufficient capacity to comply with its obligations under this Agreement.	Pre-Integration Test Phase	Access provided to: • CSPs • DCC

Test Lab	Location	Facilities provided	Minimum Capacity	Period to be maintained	Access to be provided to
		• Smart Meter Wide Area Network (SMWAN) connectivity; and • facilities to allow monitoring of the behaviour and state of Smart Metering Devices and to simulate energy flows across meters. For the avoidance of doubt for electricity meters, the Contractor need only simulate load through the use of phantom load generators.			
CSP Test Lab Facility	On-Shore Territory	Without limiting the generality of the Contractor's obligations under paragraph 7 (Test Labs) of Part C (Testing) of this Schedule 6.2 the Contractor shall provide within the Test Labs: • storage space for at least two different types of: (i) SMETS2 gas smart meters; (ii) SMETS 2 electricity meters; (iii) IHDs;	50 SMS Test Sets	System Integration Test Phase	Access provided to: • CSPs • DSPs • DCC • Equipment manufacturers where required by DCC

Test Lab	Location	Facilities provided	Minimum Capacity	Period to be maintained	Access to be provided to
		• the Contractor shall provide Test Stubs where the number of meters or IHDs referred to above are not available; • storage space for at least one version of: all available PPMIDs and HAN connected load control devices; • Smart Meter Wide Area Network (SMWAN) connectivity; and • facilities to allow monitoring of the behaviour and state of Smart Metering Devices and to simulate energy flows across meters. For the avoidance of doubt for electricity meters, the Contractor need only simulate load through the use of phantom load generators.	Space to accommodate up to 100 SMS Test Sets in increments of 25 SMS Test Sets (increments to be called off by DCC).		

Test Lab	Location	Facilities provided	Minimum Capacity	Period to be maintained	Access to be provided to
CSP Test Lab Facility	On-Shore Territory	Without limiting the generality of the Contractor's obligations under paragraph 7 (Test Labs) of Part C (Testing) of this Schedule 6.2 the Contractor shall provide within the Test Labs: • storage space for at least one version of: all available variants of SMETS2 electricity meters, all available variants of SMETS2 gas meters, all available SMETS2 Smart Metering Systems (including IHDs, PPMID, HAN connected load control devices); • Smart Meter Wide Area Network (SMWAN) connectivity; and • facilities to allow monitoring of the behaviour and state of Smart Metering Devices and to simulate energy flows across meters. For the avoidance of doubt for electricity meters, the Contractor need only simulate load through the use of phantom load generators.	• 50 SMS Test Sets (primarily for UIT but may be used for Enduring Testing or System Update Test if DCC so elects); and • 25 SMS Test Sets configured with SIT SMS Sets (primarily for System Update Testing but may be used for Enduring Testing or UIT if DCC so elects); and • Space to accommodate up to 125 SMS Test Sets in increments of 25 SMS Test Sets (increments to be called off by DCC). The parties shall discuss the appropriateness of the number of SMS Test Sets for System Update Testing following the end of the Design Stage.	User Integration Test Phase	Access provided to: • CSPs • DSPs • DCC • DCC Service Users • Equipment manufacturers where required by DCC

Test Lab	Location	Facilities provided	Minimum Capacity	Period to be maintained	Access to be provided to
CSP Test Lab Facility	On-Shore Territory	Without limiting the generality of the Contractor's obligations under paragraph 7 (Test Labs) of Part C (Testing) of this Schedule 6.2 the Contractor shall provide within the Test Labs: • storage space for at least one version of: all available variants of SMETS2 electricity meters, all available variants of SMETS2 gas meters, all available SMETS2 Smart Metering Systems (including IHDs, PPMID, HAN connected load control devices); • Smart Meter Wide Area Network (SMWAN) connectivity; and • facilities to allow monitoring of the behaviour and state of Smart Metering Devices and to simulate energy flows across meters. For the avoidance of doubt for electricity meters, the Contractor need only simulate load through the use of phantom load generators.	• 50 SMS Test Sets (primarily for Market Entry Testing but may be used for other Enduring Testing or System Update Tests if DCC so elects); and • 25 SMS Test Sets configured with SIT SMS Sets (primarily for System Update Testing but may be used for Market Entry Testing or other Enduring Testing if DCC so elects); and • Space to accommodate up to 125 SMS Test Sets in increments of 25 SMS Test Sets (increments to be called off by DCC). The parties shall discuss the appropriateness of the number of SMS Test Sets for System Update Testing following the end of the Design Stage.	Enduring Test Phase	Access provided to: • CSPs • DSPs • DCC • DCC Service Users Equipment manufacturers where required by DCC

APPENDIX 5:
Initial Versions of the Test Strategy and Pre-Integration Test Phase Test Approach

Part A: Draft Test Strategy

1. The parties have agreed that the Signature Date Draft Test Strategy (as referred to in schedule 12 (completion documents)) is incorporated and attached here by reference (as the Draft Test Strategy).

Part B: Draft PIT Test Approach

2. The parties have agreed that the Signature Date Draft PIT Test Approach (as referred to in schedule 12 (completion documents)) is incorporated and attached here by reference (as the Draft PIT Test Approach).

APPENDIX 6:
Outline of UIT

1. The table immediately below outlines the anticipated scope of UIT Testing, including the number and types of DCC Service Users expected to be included within UIT Testing and, in paragraph 2, further detail of the nature of such Testing.

User Type	DCC Service Users		Total DCC Service Users having successfully passed UIT within 12 months of commencement of the User Integration Phase
	DCC Service Users commencing UIT on or around the date of commencement of the User Integration Phase and to have passed UIT within six (6) months of such date (the "**First UIT Cohort**")	DCC Service Users commencing UIT on or around the six (6) month anniversary of commencement of the User Integration Phase and to have passed UIT within a further six (6) months (the "**Second UIT Cohort**")	
Energy Suppliers	8	18	26
Network Operators	20	12	32
Other SEC Parties	1	0	1
Providers of Energy Registration Services	20	0	20
Total	**49**	**30**	**79**

The profile of the First UIT Cohort and Second UIT Cohort set out in the table above shall be the "**Core UIT Group**" for the purposes of this Schedule 6.2.

2. It is anticipated that:

   (a) there will be a total of two hundred (200) test scenarios (for each DCC Service User), of which:

      (i) a hundred and twenty (120) will be Low Complexity (meaning any Testing that is not High Complexity as defined below);

(ii) eighty (80) will be "**High Complexity**", meaning that testing is:

(A) reasonably considered highly complex to execute;

(B) reasonably requires actions from four DCC Eco-System Entities or more;

(C) includes potentially multiple execution paths (variations);

(D) total number of Test Specification steps reasonably and necessarily exceeds 400;

(E) multi-party data sets are required;

(F) source Test Data cannot easily be sought out/created through existing channels to fully execute the complete process;

(G) time travel actions are required to progress test through a specified time period; or

(H) at any one stage of test execution, requires non-standard equipment not currently recognised by the DCC as part of the design of the End-to-end Smart Metering System and/or Other Energy Industry Systems.

(b) each Test Scenario will be undertaken three (3) times by each DCC Service User save to the extent further Testing is required as a result of the Contractor being in breach of this Agreement;

(c) each of the eighty-eight (88) types of Service Requests will be tested through UIT, where:

(i) sixty-four (64) Service Request types are solely for Energy Suppliers;

(ii) five (5) Service Request types are solely for Network Operators; and

(iii) thirteen (13) Service Request types are used by both Energy Suppliers and Network Operators;

(d) 70% of test scenarios will need to be repeated for any second or subsequent WAN variant of Communications Hub save to the extent further Testing is required as a result of the Contractor being in breach of this Agreement; and

(e) the following number of test scenarios shall be required for each type of DCC Service User:

User Type	Test Scenarios per DCC Service User		
	High Complexity	**Low Complexity**	**Total**
Energy Suppliers	80	120	200
Network Operators	20	30	50
Other SEC Parties	4	6	10
Providers of Energy Registration Services	4	6	10

APPENDIX 7:
Enduring Testing

1. System Updates to Contractor Solution

1.1 If the Contractor Solution (including any Comms Hubs) is (or is to be) subject to a System Update and this results in System Update Testing of the Contractor Solution pursuant to this Agreement (including any Testing of Comms Hubs) and/or the DCC to seek testing of other parts of the End-to-end Smart Metering System, Consumer Access Devices or Other Energy Industry Systems in connection with the System Update, then (except to the extent the DCC is obliged to pay for the Contractor for the costs of Testing of a Change pursuant to Schedule 8.2 (Change Control), in which case the DCC may elect that such Testing proceed under paragraph 2 of this Appendix (in this Appendix, a "**Para 1 Exception**")):

(a) the Contractor shall promptly undertake all Testing of and/or with the Contractor Solution and in accordance with its obligations under this Agreement (without reducing the availability, capability or capacity of any Test Environment(s) or Test Lab resources to be made available to the DCC under this Agreement);

(b) the Contractor shall undertake such Testing in accordance with any reasonable instructions of the DCC; and

(c) the Contractor shall perform all such Tests (and all related activities) at its own cost.

2. Testing with System Updates to other Systems

2.1 If:

(a) a System Update is made or to be made to the End-to-end Smart Metering System not forming part of the Contractor Solution or to any part(s) of any Other Energy Industry System(s), Consumer Access Devices or any other System(s) or device(s) the Contractor Solution interoperates with; or

(b) the DCC elects to use the resources referred to below in connection with a Para 1 Exception,

then the Contractor shall make available the Test Environments and Test Labs to be provided in connection with this Agreement for use in connection with Testing of those System Updates and in accordance with its obligations under this Agreement.

The Contractor shall perform its obligations under paragraph 2 of this Appendix at no cost to the DCC except that all Capability Transactions transmitted over the SMWAN shall be Chargeable as Transactional Charges in accordance with Schedule 7.1 (Charges and Payment).