

# Part 3: External Costs

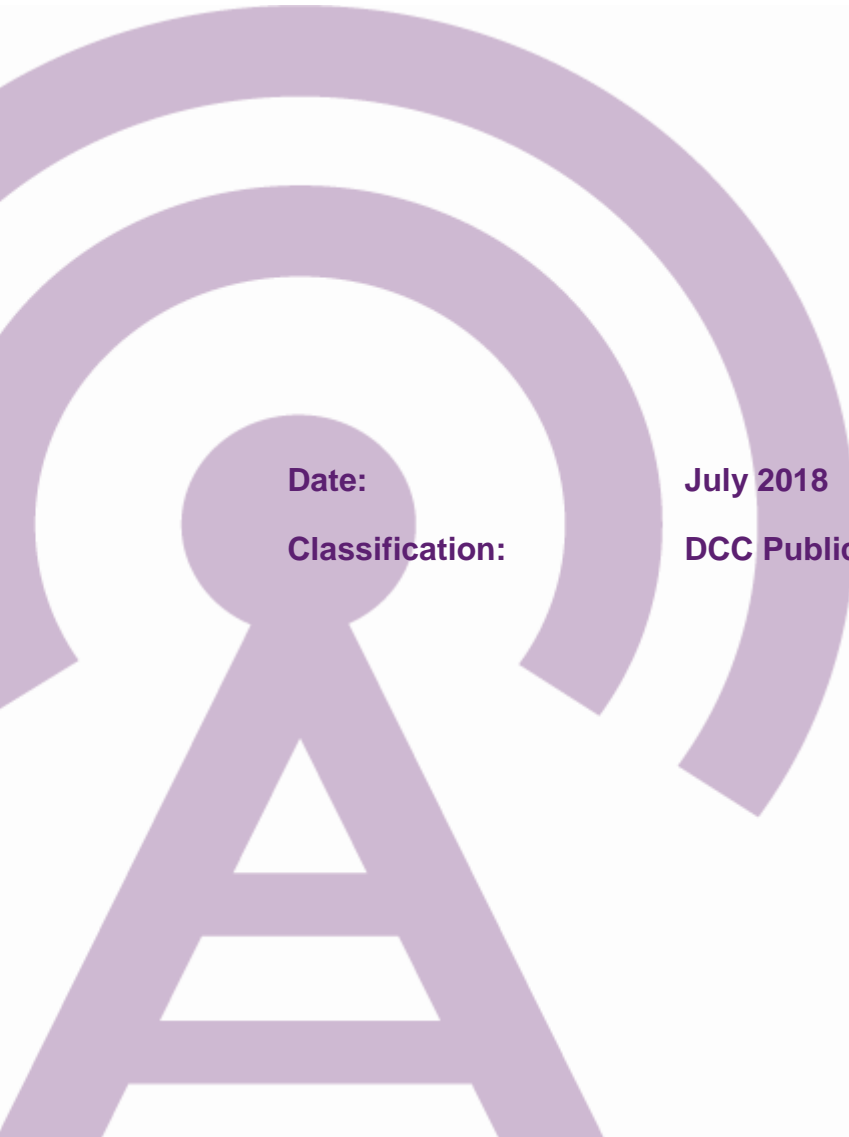
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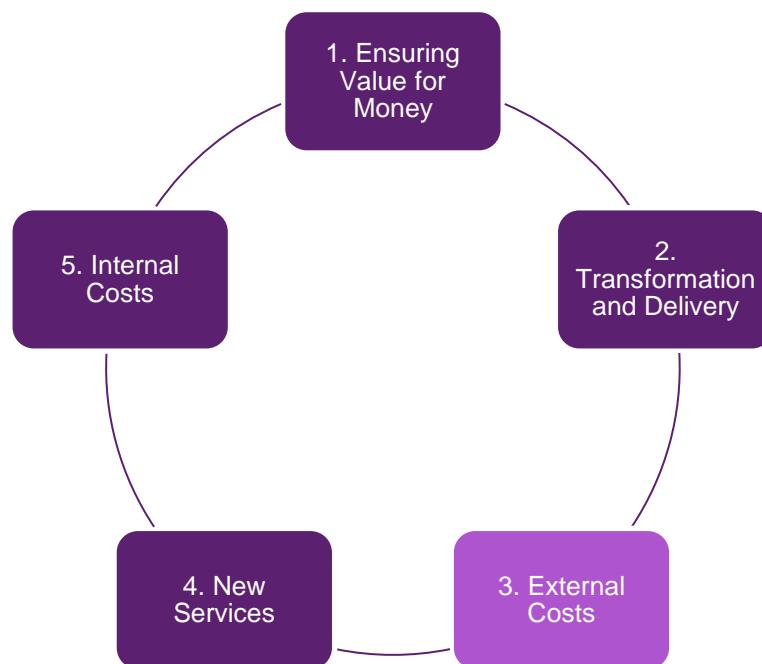
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# 1 Introduction to Part 3: External Costs

## 1.1 Orientation and Purpose

This document is the third in a suite of five documents which comprise the RY2017/18 Price Control submission.

The purpose of Part 3 is to provide both narrative and the necessary justification for costs incurred by our External Service Providers. These comprise the Change Requests and Projects which allow our Service Providers to undertake delivery of additional components of the SMETS2 programme and integration of the SMETS1 solution which were not part of their baseline contract in 2013.



**Figure 1-1: Price Control submission structure**

In Part 3 we report on the following:

- The historical context for variances incurred by the two CSPs in relation to the delivery of Release 1.2 and 1.3;
- Tactical Environments for the delivery of testing activities required to deliver DCC programmes;
- Updates to the DSP Systems to support the delivery of Release 1.4 and changes to SMKI Recovery Testing Procedure;
- The Project and Change Requests required to deliver the core functionality and testing of Release 2.0 (R2.0) including the Dual Band Communication Hubs: CR184, CR194, CR218, CR253 & CR274
- The design of solutions by the DSP to commence enrolment of existing SMETS1 meters into the DCC's infrastructure

## 2 Summary of External Costs

Tables 2-1 and 2-2 below provide a summary of all of the Change Requests and Project Requests that are included in this year's submission. This should aid the reader in understanding how each of these relate to each of DCC's programmes that are reported under Parts 2 and 4 of this submission.

**Table 2-1: Summary of all Change Requests and Project Requests in Part 3**

CR / PR	Description	DCC Programme / Activity	Area of Submission
CR160	<p>Delay Costs for Release 1.2 &amp; 1.3</p> <p>The CSPs incurred costs relating to the late delivery of Releases 1.2 and 1.3 that are compensated for under this CR.</p> <p>Service Providers Impacted: <b>CSP(N) and CSP(C&amp;S)</b></p>	DCC Go-Live (Release 1.2 & 1.3)	Price Control submission for RY1617
CR208	<p>Tactical Environments for Enduring Operations</p> <p>To ensure the efficient use of testing environments which supports the development and timely rollout of Release 1.4, Release 2.0 and DBCH, and SMETS1</p> <p>Service Providers Impacted: <b>DSP / CSP(N) / CSP(C&amp;S)</b></p>	Releases 1.4 & 2.0 and SMETS1	Parts 2 and 4
CR255	<p>Release 1.4 as Individual Iterations</p> <p>Provides the functionality required to deliver Release 1.4, which includes the use of the "Delivery Train" and "Feature Toggling"</p> <p>Service Providers Impacted: <b>DSP</b></p>	Release 1.4	Part 2
CR260	<p>SMKI SRT</p> <p>Provides for the testing of Part 3b and Part 4 SIT &amp; UIT of the SMKI and Repository Testing Approach as required under the SEC</p> <p>Service Providers Impacted: <b>DSP</b></p>	SMKI and SRT	Part 2
CR184	<p>Dual Band Communication Hub HAN Variants</p> <p>To enable both CSP North and CSP Central &amp; South to begin to develop the Dual Band Communication Hubs which are core to delivery of the overall Release 2.0 programme. This is a BEIS mandated initiative and was formally initiated in early 2016.</p> <p>Service Providers Impacted: <b>CSP(N) and CSP(C&amp;S)</b></p>	Release 2.0 and DBCH	Part 2
CR194	<p>Updated SEC Technical Specifications</p> <p>To update the DCC solution to take account of the BEIS-led changes to GBCS and SEC. This ensures the DCC remains compliant with all regulatory and technical requirements.</p> <p>Service Providers Impacted: <b>CSP(N) and CSP(C&amp;S)</b></p>	Release 2.0 and DBCH	Part 2
CR218	<p>Dual Band Communications Hub DSP Impact</p> <p>This CR was raised alongside CR184 and CR194 to allow the DSP to plan for System Integration of the Release 2.0 solution.</p> <p>Service Providers Impacted: <b>DSP</b></p>	Release 2.0 and DBCH	Part 2

CR / PR	Description	DCC Programme / Activity	Area of Submission
CR253 & PR62	<p>System Integration Testing (SIT) &amp; Device Integration Testing (DIT)</p> <p>To allow Service Providers to commence SIT and DIT testing of both SBCH and DBCH.</p> <p>Service Providers Impacted<sup>1</sup>: <b>DSP and CSP(N)</b></p>	Release 2.0 & DBCH	Part 2
CR274 & PR80	<p>User Integration Testing (UIT)</p> <p>To provide the environment for DCC Users to begin to test the R2.0 solution with their individual systems.</p> <p>Service Providers Impacted: <b>CSP(N)</b></p>	Release 2.0 and DBCH	Part 2
PR52	<p>SMETS1 E&amp;A DSP Implementation</p> <p>To allow the DSP to provide solutions on how to being to adopt and enrol the existing 10m+ SMETS1 meters into the DCC infrastructure and to ensure they can interoperate with each other.</p> <p>Service Providers Impacted: <b>DSP</b></p>	SMETS1	Part 4

**Table 2-2: Summary of all Costs for Material CRs / PRs by External Service Provider**

DSP	CSP (N)	CSP (C&S)
[REDACTED]	[REDACTED]	[REDACTED]
Total Material Justification = £66.0m	Total Material Justification = £65.7m	Total Material Justification = £115.1m

<sup>1</sup> Arqiva and Telefonica are also impacted however at the time of submission of the annual price control document, the final "Change Authorisation Notice" (CAN) has yet to be agreed and signed.

### 3 Delivery of CR160

In this section we review the historical context for variances incurred by the two CSPs in relation to the R1.2 and R1.3 releases.

#### 3.1 Historical review

In this sub-section, we re-cap briefly on the content of our RY2016/17 submission before summarising the costs which we are evidencing in RY2017/18.

On 18 December 2015, the Secretary of State (SoS) formally agreed to our plan for a multiple release strategy pursuant to Condition 13 of our licence. This included delivery of live operations (R1.2) by 20 July 2016 and the delivery of R1.3. by 26 September 2016.

[REDACTED]

In the RY2016/17 submission we evidenced a particular variance of [REDACTED] in CSP(N)'s incurred costs. This was because of the delay experienced by CSP (N) to R1.2. The delay costs incurred by CSP(N) in respect of R1.3 began in RY 2016/17 and continued into RY 2017/18 when commercial settlement was reached. It is only this component of the costs which are justified in this year's submission. [REDACTED]

At the end of RY2016/17, the equivalent costs for CSP (S&C) for the delay to R1.2 and R1.3 had neither been incurred nor agreed. Consequently, these costs did not appear in last year's submission. However, there were ongoing discussions with CSP (S&C) which were framed by the principles which had already been established with CSP (N). In RY2017/18, DCC reached a settlement on the costs incurred by CSP (S&C) for the delay to both R1.2 and R1.3. It is only these costs which are justified in this year's submission.

The background to CR160, its drivers, costs and the extensive due diligence applied by DCC was covered in Part 3 of the RY2016/17 submission. Ofgem determined that all costs in respect of this CR had been efficiently incurred. Further to this, the table below shows what principles and costs had been submitted to Ofgem's last year and were allowed (greyed out format). It also shows the costs which have been incurred in RY2017/18 and which are evidenced here for Ofgem's determination.

**Table 3-1: Scope of the RY2017/18 submission versus the RY 2016/17**

Submission		CSP (N)	CSP (S&C)
RY 2016/17	Principles	The principles of the agreement for compensating FSPs for economically and efficiently incurred costs due to external delays to the programme.	
	Quantum of cost and due diligence	[REDACTED]	Nil
RY 2017/18	Principles	See 2016/17 submission	
	Quantum of cost and due diligence.	[REDACTED]	[REDACTED]



## 3.2 Due diligence principles in CR160 delay costs

### 3.2.1 Introduction

Delay costs are not paid automatically to the FSPs; (for example, triggered by monthly contractual milestones). Rather, CSP(N) and CSP (S&C) were required to submit a formal claim which was then subject to extensive due diligence by DCC.

In this section we explain the key principles of due diligence which applied to both CSPs.

### 3.2.2 Due diligence principles

The basis of the claims submitted by both CSP's was the difference in cost and scope between what was contractually agreed in CR160 and what was expended.

DCC's approach to evaluating the claims received was, as usual, to first review the evidence. Having established that the correct contract rates were being applied, DCC then tasked the relevant DCC project director with analysing the claim in detail. The project director would provide assurance that the claim was justified in terms of effort expended and tasks completed.

A further level of analysis was whether all the activity being claimed for was in fact justifiable under the terms of Clause 13A as being caused by the delay to testing. In making this analysis, DCC was looking to disallow from the claim any cost for activity that would have been incurred even if the SIT period had not been extended. An example of the type of disallowance would be time spent correcting defects that arose from the original CR160 development and which should have been identified in PIT. There is a matter of judgement on this latter point because. It was open to the CSP to argue that some defects can only be identified in SIT and the extended time of SIT affected its cost of maintaining a fix team, for example.

[REDACTED]

## 3.3 CSP (N) – CR160 delay costs

Table 3-2: Summary variance table for CSP(N) – CR160 (delay costs)

CR160: Delay Costs of Release 1.2 & 1.3													
Change		DSP		CSP (N)		CSP (S&C)		TSP		CRI / other			
<b>Total cost</b>				[REDACTED]									
Breakdown of cost (£m)													
<b>IA cost:</b> [REDACTED]			<b>Set-up Charges:</b> [REDACTED]			<b>Ops. charges:</b> [REDACTED]			<b>Other charges:</b> [REDACTED]				
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026*	
					[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]		
<b>RIGs Ref</b>		[REDACTED]											
<b>Driver</b>		The delayed implementation of R1.2 and R1.3											

### 3.3.1 Drivers of change

The drivers for change for CR160 were discussed in Part 3 of the RY 2016/17 submission. This included the requirement to agree with CSP(N) a framework to recompense it for delays to R1.2 and R1.3.

### 3.3.2 Consideration of options and chosen scope

[REDACTED]

### 3.3.3 Due diligence

The following table sets out the key changes in price as a function of the review of CSP (N)'s contract.

**Table 3-3: Due diligence for CR160 (delay costs) – CSP(N)**

Date	Activity	Total CSP (N) Claim	DCC offer
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	

[REDACTED]

### 3.3.4 Adherence to Change Process

The change process as applied to CR160 was discussed in the RY2016/17 submission.

## 3.4 CSP(C&S): CR160 (delay costs)

**Table 3-4 - Summary variance table for CSP(S&C) – CR160 (delay costs)**

CR160 Delay Costs of Release 1.2 & 1.3					
Change	DSP	CSP (N)	CSP (S&C)	TSP	CRI / other
<b>Total Cost</b>			[REDACTED]		
Breakdown of cost (£m)					
<b>IA cost:</b>	<b>Set-up Charges:</b>		<b>Ops. charges:</b>	<b>Other charges:</b>	

CR160 Delay Costs of Release 1.2 & 1.3													
[REDACTED]				[REDACTED]				[REDACTED]				[REDACTED]	
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	
-	-	-	-	-	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	-
<b>RIGS Ref</b>		[REDACTED]											
<b>Driver</b>		Implementation of Releases 1.2 & 1.3											

### 3.4.1 Drivers of change

The drivers for change for CR160 were discussed in Part 3 of the RY 2016/17 submission. This included the requirement to agree with CSP(S&C) a framework to recompense it for delays to R1.2 and R1.3.

### 3.4.2 Consideration of options and chosen scope

[REDACTED]

### 3.4.3 Due diligence

[REDACTED]

**Table 3-5: Summary of costs for CSP(S&C)**

All monies in £m	R1.2	R1.3	Total	Comment
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
	[REDACTED]	[REDACTED]	[REDACTED]	
				[REDACTED]
<b>Final Agreed</b>			[REDACTED]	

**Table 3-6 – CSP(S&C) claim and counter-claim breakdown**

A snapshot of the negotiations which took place between DCC & CSP(N) is provided in Table below:

**Table 3-6: Due diligence assessment of CR160 costs**

Date	Activity	Total CSP (N) Claim	DCC offer
17/08/2017	[REDACTED]	[REDACTED]	[REDACTED]
08/09/2017	[REDACTED]		
20/10/2017	[REDACTED]		
20/11/2017	[REDACTED]		
21/11/2017	[REDACTED]		
1/12/2017	[REDACTED]	[REDACTED]	[REDACTED]
21/12/2017	[REDACTED]	[REDACTED]	

Date	Activity	Total CSP (N) Claim	DCC offer
		2	

[REDACTED]

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<sup>2</sup> CR160TEF1

## 4 Tactical Environments for Enduring Operations

### 4.1 Introduction

In the RY2016/17 price control submission, we described how the wider CR160 change request also included changes to test environments architecture. The change we described permitted R1.2 to be delivered in short timescales. However, the baseline for test environments established by CR160 was insufficient to deliver R1.3 and beyond.

The subsequent change request CR208 is focussed entirely on the test environments. It describes the change required to uplift the technology environments architecture to test and develop multiple releases of code in parallel – and to deliver R1.4 and R2.0.

In this overview section, we describe the elements of our approach which apply equally to all three service providers. Then, under separate sections, we describe the specifics of the change as applied to each of DSP, CSP (N) and CSP (S&C).

The structure of this section is described in the table below

- **Background to the CR208 change request** - Recapping the 2016 decisions that led to the environments baseline that was established by CR160.
- **Rationale for the change** – this sets out DCC’s tactical and strategic objectives in respect of its test environments. We then set out the capability gap between the requirements and the CR160 environments baseline. Addressing this gap establishes the rationale for the change.
- **Consideration of options and chosen scope** - We describe the decision not to build an ‘asset heavy’ strategic solution. Instead a tactical solution is developed that can postpone further investment until an alternative is produced that delivers greater value for money. The tactical solutions for each service provider must be assessed objectively and we introduce the assessment framework.

#### 4.1.1 Background to the CR208 change request

Test environments are required for DCC, Service Providers, and Customers to assure changes to the DCC infrastructure before they are placed in the ‘Live’ environment (Production). Service Providers (SPs) design, build, assure and support their own stream of test environments. The below table details the core environment types and the role that they play in the Joint Test Strategy:

- **PIT (Pre-Integration Testing)** - This is the first part of DCC Readiness Testing. FSPs test their individual solutions within their own boundaries.
- **SIT (System Integration Testing)** – FSPs’ individual solutions are integrated and tested together, along with the Registration Data Provider (RDP) systems and Devices.
- **UIT (User Integration Testing)** - The interoperability of the DCC solution and Service User (Customer) systems is tested.

At licence award, the DCC solution was contracted as a single release. Consequently, only a single stream of environments for each service provider, known as ‘Stream A’ environments, was required for testing.

Last year we reported on the scope and cost of CR160. We also described how DCC split the first release into two parts; R1.2 and R1.3. The single suite of ‘A environments’ was insufficient to deliver the simultaneous development and testing of the two releases R1.2 and R1.3. This was because of the following;

- Each release requires its own respective stream of dedicated environments for each test phase. Environments must be decoupled to prevent dependency between releases.

- For 1.2 and R1.3, DCC was required to deliver two releases within 12 months of each other. The length of testing within most test phases is 6 months. Multiple releases in a single year therefore require multiple environments for each test phase
- A dedicated stream of environments is required to resolve incidents found in the 'Live' environment. This is called "fix on fail" support. Where issues are identified in the 'Live' environment, Service Providers cannot simply fix code that is operating in the live environment. Instead, fixes must be tested in the same way as are required to propagate fixes through the same test phase sequence that releases go through before they are put in to Production, e.g. PIT→SIT→UIT. A stream of environments that mirror the Production release is therefore required to ensure that defect fixes can be tested against a stable baseline.

To ensure these requirements were satisfied beyond R1.2, the following environments were commissioned under CR 160 in early 2016: This was called 'test Stream B'.

- The implementation of an additional SIT for DSP, and additional SIT for Arqiva
- The implementation of an additional PIT for DSP, and an additional PIT for Telefonica

The below graphic outlines the environment landscape since changes under CR160 were implemented.

**Figure 4-1 – The test environments post CR160**

	PIT	SIT	UIT
DSP	<div style="background-color: green; padding: 2px; margin-bottom: 2px;">PIT-A</div> <div style="background-color: green; padding: 2px;">PIT-B</div>	<div style="background-color: yellow; padding: 2px; margin-bottom: 2px;">SIT-A</div> <div style="background-color: yellow; padding: 2px;">SIT-B</div>	<div style="background-color: yellow; padding: 2px;">UIT-A</div>
ARQ	<div style="background-color: green; padding: 2px; margin-bottom: 2px;">PIT-A</div> <div style="background-color: yellow; padding: 2px;">ASML</div>	<div style="background-color: green; padding: 2px; margin-bottom: 2px;">SIT-A</div> <div style="background-color: green; padding: 2px;">SIT-B</div>	<div style="background-color: green; padding: 2px;">UIT-A</div>
TEF	<div style="background-color: green; padding: 2px; margin-bottom: 2px;">PIT-A (REF1)</div> <div style="background-color: yellow; padding: 2px;">Ref 0</div>	<div style="background-color: yellow; padding: 2px;">Ref 2</div>	<div style="background-color: yellow; padding: 2px;">UIT-A</div>

Key  Fully functional  Functional with constraints

## 4.2 Driver for the CR208 change

The DCC solution has continued to mature in the 18 months since CR160 was implemented. This means that the requirements for DCC’s test environments have become more certain. DCC’s customers, who are engaged in testing with DCC, have also been consulted and have informed DCC’s requirements. There is also a gap between DCC’s requirements and the capability of the current test infrastructure.

In this section we identify the driver of CR208 as the need to for DCC to address the constraints in its test environments so that it can deliver the GB programme within the timescales laid down by BEIS.

In consultation with customers and service providers, DCC developed a set of requirements for its test environments. These were later separated into strategic and tactical elements because of high initial cost estimates which were given by service providers.

The tactical requirements were required to deliver R1.3, R1.4 and R2.0. The strategic requirements described an environments strategy that met all of DCC’s future needs, including pre-production environments, SMETS1 and switching.

**Table 4-1 – Requirements, constraints and the proposed tactical solution to the test environments**

Tactical Requirements	Strategic Requirements	Constraints	Solution
<p><b>For current releases</b></p> <p>Users need to be able to test their systems outside of the operational environment for the lifetime of the release</p> <p>DCC needs to be able to correct defects and test the fixes outside of the operational environment for the lifetime of the release</p>	<p>DCC also developed a list of strategic requirements for the service providers to consider. They included alignment with DCC’s strategy around developing in the ‘cloud’ and its strategy to build plan for pre-production environments.</p>	<p>The baseline CR160, architecture was built with shared components and included constraints to minimise total cost and expedite delivery but which preclude fix and fail and testing of new releases.</p>	<p>The solution is a targeted development of the test environments.</p>
<p><b>For future releases</b></p> <p>Users need to be able to test their systems <b>against the next release.</b></p>			



## 4.3 Consideration of options and chosen scope

In this section we describe the following;

- **Options for the solution**– We describe the major choices in scope for CR2008 as the decision to proceed with the costing and implementation of a tactical solution – whilst continuing to design an enduring solution.
- **Each service provider’s tactical solution** – DCC has addressed the constraints posed by the CR160 baseline for each of the service providers and proposed customised solutions for each.
- **The solution assessment framework** – The solutions must be assessed objectively and DCC has developed a framework to examine each service providers solution and to drive the investment decision.

### 4.3.1 Options for the solution

#### Tactical versus strategic hardware solution

In October 2016 the DCC requested that Service Providers develop proposals for an environment landscape that would meet the strategic requirements, through the commissioning of CR208.

Initial rough order of magnitude (ROM) costs submitted by service providers at the start of 2017 indicated that circa [REDACTED] would be required to implement the full scope ‘strategic solution’ for CR208, including operational support for the infrastructure. DCC’s considered the strategic solution to be unacceptable because

- **Asset heavy and expensive hardware solution** - In general, service providers’ strategic solutions were ‘asset heavy’, requiring significant up-front investment in parallel server infrastructure that would exist “on DCC FSP premises” and carry a long-term support agreement. For example, CSP (S&C) specified four PIT, three SIT, two UIT and a pre-production environment.
- **Potential availability of cheaper solutions in the future** - DCC considered that the wider technology landscape was insufficiently stable to make such a long-term commitment. The rise of the public and private cloud services had the potential to offer much greater value for money.

In light of the above, DCC agreed with service providers to develop a tactical alternative that would satisfy the immediate delivery and customer requirements for supporting planned releases (R1.3, R1.4 and R2.0). This was based on building additional capability to establish two just two parallel streams; Stream A and Stream B. DCC specified a support contract of three years.

It was also agreed that further consideration of an enduring solution landscape would progress in parallel to the tactical business case. This solution may not meet all the strategic requirements but DCC SMEs believed that further capability could be extracted from just two streams of environments by applying a novel operating regime.

### 4.3.2 Describing each service provider’s proposed tactical solution

The table below lists the architecture component, the constraint that imposes and DCC’s solution for overcoming the constraint.

1. **Left hand column** - Identify the service provider and the **component of the architecture** in question
2. **Middle column** - Describe the current **constraint** to the architecture which must be addressed
3. **Right hand column** - Show the potential **solution** to the constraint

## Tactical solution across all FSPs

Table 4-2 – Constraints and solutions across all FSPs

Service provider & CR160 Environment		Constraint	Solution to address the constraint
DSP, CSP (N), CSP (S&C)	UIT	<b>Cannot test upcoming release</b> - The provision of only one UIT means that customers are currently unable to test an upcoming release whilst retaining the capability to validate defect fixes found in the live environment.	<b>An integrated UIT-B</b> - This is required to enable customers to test the current release and the next release in parallel. Investment in this second UIT has received backing from customers, as it would de-risk customer testing processes.

## Tactical solution for DSP

Table 4-3 – Constraints and solutions in DSP

Service provider & CR160 Environment		Constraint	Solution to address the constraint
DSP	SIT-A, SIT-B, UIT-A	<b>Components are shared</b> - There are shared components between these environments, such as Edge Firewall and Data power, that means outages to one environment impacts the availability of the others.	<b>Separation of critical shared components</b> – Separation is required between DSP SIT-A, SIT-B and UIT-A is required to deliver production fix on fail and future release testing independently of one another.
	PIT	<b>Two PITs are insufficient to test future releases in parallel with fix and fail</b> - The DSP currently has two PITs, one dedicated to fix on fail, and the other dedicated to PIT testing the next release (R1.4 at this point in time). Having only two PITs prevents the DSP from PIT testing two future releases in parallel. For example, delays to PIT testing of R1.4 will have day to day delays for PIT testing of R2.0 as they will need to use the same environment.	<b>A new DSP PIT is required</b> – This will enable the DSP to develop and test two future releases at the same time, whilst maintaining a dedicated PIT environment for fix on fail support of Production. This requirement has been brought about because of the parallel development of R1.4 and R2.0.

## Tactical solution for CSP (N)

Table 4-4 – Constraints and solutions in CSP(N)

Service provider & CR160 Environment		Constraint	Solution to address the constraint
ARQ	PIT-B	<b>No dedicated PIT</b> - Arqiva is currently using its IT test environment to conduct Pre-Integration testing for future releases. Planned maintenances for their IT test	<b>An additional PIT</b> - This is required to enable the provision of fix on fail support for Production and the testing of at least one future release in parallel.

	environment risks delivery of future releases.	
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## Tactical solution for CSP (S&C) environments

Table 4-5: Constraints and solutions in CSP (S&C)

Service provider & CR160 Environment		Constraint	Solution to address the constraint
TEF	SIT	Telefonica currently have one SIT that switches between the DSP SIT-A and SIT-B to test releases. The absence of a second SIT will mean that Telefonica are unable to provide fix on fail support for the Live release and SIT test the next release concurrently. Where there is an environment usage conflict, Telefonica will need to switch between the two activities, which will risk the resolution of Live defects within SLAs.	<b>An additional SIT, and upgrades to TEF's existing SIT</b> - These are required to enable one full stream of environments dedicated to Production fix on fail support; and a second stream of environments to support the delivery of planned future releases
	REF0	This environment has limited functionality, such as no service management or reporting. REF 0 is TEF's reference to its own environment.	
	UIT-A	Telefonica's existing UIT environment is joined to Production, meaning that an upgrade to UIT will also require the same upgrade to Production. This prevents the existing UIT from being upgraded to the next release ahead of its deployment in to Production.	

## Summary

To aid clarity, we have summarised the solutions for each service provider in the table below.

Table 4-6 – Proposed solutions for assessment by service provider

Service Provider	Proposed solution
DSP	<ul style="list-style-type: none"> <li>• <b>An integrated UIT B</b></li> <li>• <b>Separation of critical shared components</b> – Separation is required between DSP SIT-A, SIT-B and UIT-A.</li> <li>• <b>A new DSP PIT is required</b> – This will enable the DSP to develop and test two future releases at the same time, whilst maintaining a dedicated PIT environment for fix on fail support of Production.</li> </ul>
CSP (N)	<ul style="list-style-type: none"> <li>• <b>An integrated UIT B</b></li> <li>• <b>An additional PIT</b> - This is required to enable the provision of fix on fail support for Production and the testing of at least one future release in parallel</li> </ul>

Service Provider	Proposed solution
CSP (S&C)	<ul style="list-style-type: none"> <li>• <b>An integrated UIT B</b></li> <li>• <b>An additional SIT, and upgrades to TEF's existing SIT</b> - These are required to enable one full stream of environments dedicated to Production fix on fail support; and a second stream of environments to support the delivery of planned future releases</li> </ul>

The next phase is to assess the solutions against objective criteria

### 4.3.3 Introducing the solution assessment framework

The environments were assessed against a set of target outcomes aligned to DCCs strategic themes. This is to demonstrate how well each investment supports the wider DCC strategy. Supporting information provided by Customers, Service Providers and internal DCC staff has been assessed against measures assigned to each target outcome to determine the overall justification for investment in each environment.

The table below shows the strategic theme, the target outcomes and the corresponding objective measure. It was informed by consultation with customers<sup>3</sup>.

**Table 4-7 – Evaluation framework**

Strategic Theme	Target outcomes	Measure
Customer Benefit	Customer testing risks are mitigated	Demonstrates capability to prevent delays to customer testing
	Support levels for live service are increased	Demonstrates capability to provide Production fix on fail support within agreed SLAs
Value for Money	Regrettable spend is limited	Demonstrates consistency with proposals for enduring solution
	Purchased assets are sufficiently utilised	Demonstrates appropriate level of usage from existing and planned delivery commitments
	Costs have been optimised	Demonstrates cost consistency with similar solutions
Delivery Assurance	Delivery commitment risks are mitigated	Demonstrates capability to prevent delays or cost increases to current release schedule
	Independent Systems Integrator role and remit is supported	Demonstrates consistency with the environment governance requirements of the SI.

The assessment framework is applied for each service provider in each of the dedicated sections commencing in future Release 3.0.

### 4.3.4 Assessing the Integrated UIT-B

#### Proposed Solutions

The three proposed solutions are reproduced below. Only the UIT solution across all service providers is highlighted for consideration here.

<sup>3</sup> CR208DSP\_8 (appendix)

### Assessment of solution

An integrated UIT-B environment is required to enable customers to test the current release and the next release in parallel. Investment in an additional UIT environment has received backing from the customer test forum, as it would de-risk their own testing processes by providing a dedicated fix on fail service via the existing UIT environment.

The below evidence has been provided by customers, service providers, and DCC internal staff. Customers have been particularly vocal about the need for a second UIT in order to de-risk their testing activities. A request for a second UIT was communicated to DCC by the customer community over 2 years ago. Written evidence of their support has been provided in evidence<sup>4</sup>.

**Table 4-8 – Integrated UIT-B: Customer benefit assessment**

Integrated UIT-B - Customer Benefit assessment		
Measure	Evidence	Justification
Demonstrates capability to prevent delays to user testing	<p>The absence of a second UIT means that customers have a very short period to test releases before they are put in to production – currently 1 month. A second UIT will enable customers dedicated access to future releases well in advance of them being put in to Production, increasing the length of time that they can conduct testing.</p> <p>A second UIT will also mitigate the disruption caused by deployment outages. Currently, customers have extended periods without the use of UIT, whilst it is updated to the next release. The SEC panel have stated that extended periods without user access to UIT will not be permitted for releases beyond R1.3.</p>	<b>Strong</b>
Demonstrates increased capability to provide Production fix on fail support within agreed SLAs	<p>Testing with a single UIT means that code is sometimes overlapped to enable users to test for the lifetime of the code that is in Production. However, this makes it difficult to determine if a defect is within the code or created from merging different code bases. A second UIT will remove this risk by allowing customers to test sequential releases in dedicated environments.</p>	<b>Strong</b>

**Table 4-9 – Integrated UIT-B: Value for money benefit assessment**

Integrated UIT-B - Value for Money assessment		
Measure	Evidence	Justification
Demonstrates consistency with proposals for enduring solution	<p>The volume of outstanding SEC modifications means that future releases are more than likely. The DCCs assumption is that there will be a next release in development for the foreseeable future and the requirement for two UITs will therefore remain – one UIT for fix on fail of the current production release, and a second UIT for UIT testing the next production release. Investment in UIT B does therefore not represent any negative spend.</p>	<b>Strong</b>
Demonstrates appropriate level of usage from existing and planned delivery commitments	<p>The R2.0 plan is targeting at least an 8 month window for UIT and E2E testing, 3 months of which will occur before R2.0 is in Production.</p>	<b>Strong</b>

<sup>4</sup> CR208DSP\_8

Demonstrates cost consistency with similar solutions	There is a wide variation between the SP costs for UIT-B. Materials costs range from £2.6m (DSP) to £1.1m (Arq): Build costs range from £4.5m (DSP) to £1.5m (TEF) and support costs range from £4.4m (DSP) to £700k (ARQ).	<b>Weak</b>
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**Table 4-10 – Integrated UIT-B: Delivery assurance benefit assessment**

Integrated UIT-B - Delivery Assurance assessment		
Measure	Evidence	Justification
Demonstrates capability to prevent delays or cost increases to current release schedule	The plan for R2.0 includes a UIT phase of 3 months before it is promoted into Production. Constraints within the current environment landscape means that testing may be interrupted by the need to re-test defects found in the Live code base (R1.4 by that point). A second UIT will provide dedicated test access for UIT.	<b>Strong</b>
Demonstrates consistency with the environment governance requirements of the SI.	UIT is an integrated environment controlled by the SI to deliver releases. The SI has included UIT-B as a requirement within their current environment planning schedule.	<b>Strong</b>

**Table 4-11 – Integrated UIT-B: Overall assessment**

Integrated UIT-B - Overall case for investment	
An integrated UIT-B demonstrates a <b>strong</b> justification against the target outcomes for investment. Particular regard has been given to the level of customer support for the environment, further evidence of which is provided in CR208DSP_8	<b>Strong</b>

Following the assessment, it was decided to implement the integrated UIT-B. The due diligence for this activity is integrated into DC's assessment of each individual service provider.

## 4.4 Due diligence and design assurance

Due diligence is best characterised as a process undertaken between the finalisation of the change request and the last iteration of the final Impact Assessment (IA). The main purpose of this process is to enable DCC fully to understand the FSP proposal.

With this understanding DCC is then able to validate and agree the technical content and assumptions that underpin the proposed solution. Following this, DCC is able to confirm or challenge the cost estimates in order to arrive at an agreed price.

In this section we place the due diligence process in the context of the wider change process and identify a number of key activities which were undertaken.

### 4.4.1 Due diligence activities

#### Comparison between CSPs in CR208

The third opportunity for comparison is to examine the relative effort expended by each of the two CSPs on activities that are common to both and to require justification for any difference. Although the two CSPs are

providing the same service, but within different regions, their approach across a range of tasks can sometimes be fundamentally different.

### Bottom-up assessment

In the bottom-up line by line approach, we took a line by line view of the resource requirements for each activity and used this as the basis for discussion. The commercial model, which was supplied by the DSP, builds labour costs on a role by role basis. We were able to use the architecture of the model and carry out our own analysis based on different assumptions, for example the FTE days required by each role. DCC used its own analysis on how the DSP justified the amount of effort allocated to each role.

### Top-down assessment

In the top-down approach, we took a holistic view of what resources we would expect each FSP to deploy given the activities that they were performing. The resulting estimate leveraged the experience and judgement of our own SMEs. This estimate was used as the starting point to challenge the assumptions of our FSPs.

### Bill of materials assessment

One of the key techniques used in CR2008 was the bill of materials market assessment. In this exercise, DCC was able to obtain a detailed bill of materials, down to the part number of the environment infrastructure for each service provider. DCC was then able to challenge the cost of each component by finding its equivalent in the open market.

## 4.4.2 Design assurance activities

In parallel with the assurance activity, DCC developed an operating regime which called the ‘Delivery Train’ which would extract the most value from the investments in physical hardware. DCC’s current assumption is that by using this innovative technique it is possible to more highly utilise the test environments. The Delivery Train is discussed extensively in Part 2 and in the CR255 – which was the enabling change request for R1.4.

## 4.5 CR208 (DSP)

Table 4-12 – Summary variance table for DSP – CR208

CR208: Environment for Enduring Operations												
Change	DSP			CSP (N)			CSP (S&C)			TSP		CRI / other
Total Cost	[REDACTED]											
Breakdown of cost (£m)												
IA cost:				Set-up Charges:				Ops. charges:				Other charges:
[REDACTED]				[REDACTED]				[REDACTED]				[REDACTED]
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
-	-	-	-	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	-	-	-	-

CR208: Environment for Enduring Operations	
RIGS Ref	Tab: 7a / IA: Column C, Row 48 / Column C, Row 148
Driver	[REDACTED]

#### 4.5.1 Introduction to CR208

This is covered in Section 4.1 of the Part.

#### 4.5.2 Drivers of change

This is covered in Section 4.2 of this part

#### 4.5.3 Consideration of options and chosen scope

##### Proposed Solutions

The three proposed solutions described in Table are reproduced below. Please note that the UIT B solution has been greyed out because this was described in Section 4.3.4

Table 4-13 – Proposed solution for DSP

Service Provider	Proposed solution
DSP	<ul style="list-style-type: none"> <li>• <b>An integrated UIT B</b></li> <li>• <b>Separation of critical shared components</b> – Separation is required between DSP SIT-A, SIT-B and UIT-A.</li> <li>• <b>A new DSP PIT is required</b> – This will enable the DSP to develop and test two future releases at the same time, whilst maintaining a dedicated PIT environment for fix on fail support of Production.</li> </ul>



**Assessment of solution**

[REDACTED]

**Table 4-14 – Assessment of proposed solution for DSP**

Strategic Theme	Target outcomes	Separation of shared critical components	A new DSP PIT is required
Customer Benefit	Customer testing risks are mitigated	[REDACTED]	[REDACTED]
	Support levels for live service are increased	[REDACTED]	[REDACTED]
Value for Money	Regrettable spend is limited	[REDACTED]	[REDACTED]
	Purchased assets are sufficiently utilised	[REDACTED]	[REDACTED]
	Costs have been optimised	[REDACTED]	[REDACTED]
Delivery Assurance	Delivery commitment risks are mitigated	[REDACTED]	[REDACTED]
	Independent Systems Integrator role and remit is supported	[REDACTED]	[REDACTED]
Overall Assessment	<b>Separation of shared critical components</b> <i>There is a strong case for the separation of DSP SIT-A, SIT-B and UIT-B due to the likely customer benefit of having an independent UIT, and the overall benefits for delivery assurance of having independent SIT environments</i>	[REDACTED]	[REDACTED]
	<b>A new DSP PIT is required</b> <i>The evidence provided above demonstrates a strong case for investment as it would de-risk the delivery of planned releases, mostly R2.0, and would provide</i>	[REDACTED]	[REDACTED]

	<i>benefit for support of the Live service.</i>		
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#### 4.5.4 Due diligence

##### Introduction and overview of the due diligence

[REDACTED]

##### Pre FIA due diligence

[REDACTED]

##### Post FIA due diligence

[REDACTED]

### 4.6 CR208 (CSP (N))

Table 4-15 – Summary variance table for CSP(N) – CR208

CR208: Environment for Enduring Operations															
Change	DSP			CSP (N)			CSP (S&C)			TSP		CRI / other			
Total Cost				[REDACTED]											
Breakdown of cost (£m)															
IA cost:				Set-up Charges:				Ops. charges:				Other charges:			
[REDACTED]				[REDACTED]				[REDACTED]				[REDACTED]			
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026			
-	-	-	-	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	-		
RIGS Ref	[REDACTED]														
Driver	Release 2.0 and DCC Testing Approach Document														

#### 4.6.1 Introduction to CR208

[REDACTED]

#### 4.6.2 Drivers of change

[REDACTED]

#### 4.6.3 Consideration of options and chosen scope

##### Proposed Solutions

The three proposed solutions described in Table are reproduced below. Please note that the UIT B solution has been greyed out because this was described in Section 4.3.4

Table 4-17: Proposed solution for CSP(N)

Service Provider	Proposed solution
CSP (N)	<ul style="list-style-type: none"> <li>• An integrated UIT B</li> <li>• <b>An additional PIT</b> - This is required to enable the provision of fix on fail support for Production and the testing of at least one future release in parallel</li> </ul>

**Assessment of solution**

[REDACTED]

**Table 4-18 – Solution assessment**

Strategic Theme	Target outcomes	An additional PIT
Customer Benefit	Customer testing risks are mitigated	[REDACTED]
	Support levels for live service are increased	[REDACTED]
Value for Money	Regrettable spend is limited	[REDACTED]
	Purchased assets are sufficiently utilised	[REDACTED]
	Costs have been optimised	[REDACTED]
Delivery Assurance	Delivery commitment risks are mitigated	[REDACTED]
	Independent Systems Integrator role and remit is supported	[REDACTED]
Overall Assessment	<b><i>An additional PIT</i></b> <i>Whilst implementing an Arqiva PIT-B would de-risk the delivery of planned releases, mostly R2.0, the evidence provided above demonstrates only a moderate case for investment only, due to its high cost and existing alternative.</i>	[REDACTED]

**4.6.4 Due diligence**

[REDACTED]

Figure 4-2: Evolution of Costs following DCC Review and Challenge (UIT)

[REDACTED]

Figure 4-3: Evolution of Costs following DCC Review and Challenge (PIT-B)

[REDACTED]

## 4.7 CSP (S&C)

Table 4-20 - Summary variance table for CSP(S&C) – CR208

CR208												
Change		DSP		CSP (N)		CSP (C&S)		TSP		CRI / other		
Total cost						[REDACTED]						
Breakdown of cost (£m)												
IA cost: [REDACTED]			Set-up Charges: [REDACTED]			Ops. charges: [REDACTED]			Other charges: [REDACTED]			
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
				[REDACTED]								
RIGs Ref		[REDACTED]										
Driver		GBCS IRPs, SEC Changes										

### 4.7.1 Introduction to CR208

This is covered in section 2.1 of this part.

### 4.7.2 Drivers of change

This is covered in section 2.1 of this part.

### 4.7.3 Consideration of options and chosen scope

#### Proposed Solutions

The three proposed solutions described in Table are reproduced below. Please note that the UIT B solution has been greyed out because this was described in Section 4.3.4

Table 4-21: Proposed solution for CSP (S&C)

Service Provider	Proposed solution
CSP (S&C)	<ul style="list-style-type: none"> <li>• An integrated UIT B</li> <li>• <b>An additional SIT, and upgrades to TEF's existing SIT</b> - These are required to enable one full stream of environments dedicated to Production fix on fail support; and a second stream of environments to support the delivery of planned future releases</li> </ul>

**Assessment of solution**

[REDACTED]

**Table 4-22 – Solution assessment**

Strategic Theme	Target outcomes	Additional SIT, and upgrades to CSP(S&C)'s existing SIT
Customer Benefit	Customer testing risks are mitigated	[REDACTED]
	Support levels for live service are increased	[REDACTED]
Value for Money	Regrettable spend is limited	[REDACTED]
	Purchased assets are sufficiently utilised	[REDACTED]
	Costs have been optimised	[REDACTED]
Delivery Assurance	Delivery commitment risks are mitigated	[REDACTED]
	Independent Systems Integrator role and remit is supported	[REDACTED]
Overall Assessment	<p><b><i>An additional SIT, and upgrades to TEF's existing SIT</i></b></p> <p><i>The evidence provided above demonstrates a strong case for investment as it would de-risk the delivery of planned releases, mostly R2.0, and would provide benefit for support of the Live service.</i></p>	[REDACTED]

#### 4.7.4 Due diligence

[REDACTED]

##### Historical overview

[REDACTED]

**Figure 4-3 – Price change as a function of event for CR280 (CSP(S&C))**

[REDACTED]

In the table below, we summarise the due diligence that underpins each stage of the commercial process.

**Table 4-23 – Due diligence for CR280 (CSP(S&C))**

Reference	Event	Amount	Description
[REDACTED]	PIA Received	[REDACTED]	[REDACTED]
[REDACTED]	Post PIA May 17 received	[REDACTED]	[REDACTED]
[REDACTED]	Due Diligence conducted	[REDACTED]	[REDACTED]
[REDACTED]	Post PIA and due diligence	[REDACTED]	[REDACTED]
[REDACTED]	CSP(S&C) error correction	[REDACTED]	[REDACTED]
[REDACTED]	PIA August 17	[REDACTED]	[REDACTED]
[REDACTED]	Due Diligence	REDUCTION of £0.8m	[REDACTED]



Reference	Event	Amount	Description
[REDACTED]	IA August 17	[REDACTED]	[REDACTED]
[REDACTED]	Due Diligence	[REDACTED]	[REDACTED]
[REDACTED]	Due Diligence	[REDACTED]	[REDACTED]
[REDACTED]	Final IA	[REDACTED]	[REDACTED]

**Escalation to BEIS and executive-level management in CSP(S&C)**

[REDACTED]

**Table 4-24: Points made in the letter of escalation to BEIS<sup>5</sup>**

Subject	Points made in escalation
<b>Pricing and delivery timeframe</b>	[REDACTED]
<b>Bill of materials</b>	[REDACTED]

<sup>5</sup> Confidential – available upon request

## 5 SMKI SRT and Delivery Train

### 5.1 DSP – CR255

Table 5-1 –Summary variance table for DSP – CR255

CR255 - R1.4 Release as Individual Iterations												
Change	DSP			CSP (N)			CSP (S&C)		TSP		CRI / other	
Total Cost	[REDACTED]											
Breakdown of cost (£m)												
IA cost:				Set-up Charges:				Ops. charges:			Other charges:	
[REDACTED]				[REDACTED]				[REDACTED]			[REDACTED]	
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
-	-	-	-	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	-	-	-	-
RIGS Ref	[REDACTED]											
Driver	BEIS Direction and SEC obligations											

#### 5.1.1 Introduction

CR255 was the vehicle for delivering Release 1.4, the first post DCC Live (i.e. Release 1.2 and Release 1.3) Release. It provided DCC Users with new functionality. It also included changes targeted at resolving SEC Transitional Variations, along with additional security enhancements requested by the SEC Security Sub Committee.

R1.4 was a ‘container’ for the critical change requests that were required to deliver the functionality described above. However, the delays to R1.3 and the associated environment constraints added significant risk to the baselined R1.4 plan. DCC was at commensurate risk of being non-compliant with the SEC.

In this section we describe how R1.4 was planned and developed over time. We begin by describing CR237, the change request which was the initial vehicle for delivery of R1.4. This CR was later abandoned as a new and de-risked approach to delivery was required. This was because DCC faced the twin challenges of managing high volumes of change (R2.0 R1.4 and SMETS1 enrolment and Adoption) through highly constrained test environments.

The DCC Executive Board (DEB) required that the components of R1.4 were separated and R1.4 de-risked. Workshops were held with DSP and the CR255 change request was formally raised. DSP’s full Impact Assessment, dated 26 July 2017, formally proposed an innovative ‘Delivery Train’ approach. This was based on software “Feature Toggles” that allow different components of the R1.4 functionality to be developed together in a common code-base but which can be separated for the purposes of testing in an agile and flexible way.

### 5.1.2 Drivers of CR255

The delays to R1.3 and the associated environment constraints added significant risk to the baselined R1.4 plan. This put at risk the delivery of the entire scope of R1.4 by the plan deadline of 2 November 2017. At the time, DCC was operating under Transitional Variances (time limited derogations from the SEC). Were R1.4 to slip beyond 2 November 2017 then DCC would have potentially been non-compliant with the SEC and with its license.

In June 2017, the DCC Executive Board (DEB and later became ExCo) considered several options to resolve the issue. To de-risk R1.4, DEB considered that the release should be split into individual deliverable components. DCC raised a change request (CR255) in order to de-risk the delivery of R1.4 and to continue the programme along BEIS's planning timescales.

### 5.1.3 Scope

R1.4 was originally going to be released by implementing CR237. The benefit of CR237 was that it integrated the component CRs which together would have individually delivered the functionality required by the SEC. The benefit of this approach is that integrating change requests within the same release is often significantly more efficient than implementing them separately.

CR237 would have delivered SMKI repository and recovery testing (SRT). However, this functionality was later placed into CR260 and delivered separately. CR260 is a material adverse variance for DCC for RY 2017/18. It is therefore explained elsewhere in Part 3.

When it became clear that a more flexible approach to R1.4 was required, CR237 was terminated. The development work which went into CR237 was transferred into CR255. The final scope of CR255 is described in the table below. Note that the CRs in the left column release to the component change requests which deliver the required functionality. The specific reference to the part of the SEC which is driving the change is also given.

**Table 5-2 – The scope of CR255 with SEC drivers specified**

CR193:	<b>EUI64 Identifiers:</b>	Multiple EUI identifiers per SEC party were not supported as part of Releases 1.2 & 1.3 and were introduced in this release. NB Feature toggle enabled	SEC H1.5
CR195:	<b>Self Interface Changes as</b> <b>Service (SSI)</b>	Legal text had been added to the SEC which required the SSI to provide access for all Users to the Service Audit Trail entries for Read Profile Data and Retrieve Daily Consumption Log Service Requests.	<b>SEC H8.16c</b>
CR205	<b>Anomaly Detection SMETS Object Limits:</b>	The DCC solution's data value (attribute limit) Anomaly detection process was enhanced to support an additional set of four data values to be checked as part of Service Request processing.  These changes support a request made by the Security Sub Committee in relation to the Anomaly Detection SMETS Object Limits. They accommodate four new data value checks based on SMETS objects for Signed Pre-Commands received by the DCC Systems for the following data items: Calorific Value; Conversion	<b>SEC Security Sub-committee</b>

		Factor; Uncontrolled Gas Flow Rate; and Randomised Offset Limit	
	<b>Software Platform Technology Upgrades:</b>	Certain of the underlying DSP software platforms were updated in order to improve the maintenance and supportability of the Systems and reduce/mitigate the risk of operating unsupported and older versions of software platforms over time.	

### 5.1.4 Consideration of options and chosen scope

#### Options for Change

DCC prepared a draft business case with three options

- **No change** - DCC would continue to operate in a serial / waterfall delivery process. Release 2.0 would enter SIT first, ahead of E&A. The E&A programme would be blocked from entering SIT Phase until late 2018; its Production delivery date would likely be pushed out to 2019.
- **Delivery Train** (favoured) - Utilise “feature toggling” to separate the source code into discrete blocks which each provide a tightly scoped amount of functionality (such as the delivery of anomaly detection). The Release 2.0 and E&A delivery programmes can then be developed within the same source code and in parallel. Those features which are sufficiently developed to test can then be independently passed to the appropriate test environment after they are “switched on”. A problem encountered with one feature would not therefore impact other features. Without feature toggling, Release 2.0 and E&A would each have to be developed and tested in their entirety and delivered as separate releases. So, if a significant problem was found within a small part of the code of either release the entire release and all its constituent functionality would be jeopardized.
- **More Environments** - Introduce an additional stream of environments for PIT, SIT and UIT per programme.

Each option was assessed using a Strengths, Weaknesses, Opportunities and Threats (SWOT) matrix. This is summarized in the table below:

**Table 5-3 - Options for change to the delivery programme**

OPTION	STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
<b>NO CHANGE</b>	Solves the problem without business change and using tried and tested methods	Inflexible, complex and limited to big bang releases – “shut for business”	DCC transformation embeds more successfully as there are no multiple programmes in flight	Insufficient environments to support parallel delivery and my require re-scope / cancellation of R1.4
<b>DELIVERY TRAIN</b>	Flexible solution which optimises existing resources and which removes	Steep learning curve and difficulty in prioritisation and	Increased probability of 2018 delivery for both R2.0 and SMETS1.	Requires stronger governance against too much development change

	need for new environments	configuration management		Pollution of code sets between multiple programmes testing DSP functionality in the same environment
<b>MORE ENVIRONMENTS</b>	More enduring environments. Minimal business change and proven development and test approach within DCC	Expensive and complicated to procure if following traditional contracting approach. Expensive to run and retains the same complexity of code branching (as option one), reduced business hours and still dependent on rigid deployment order	More environments provide the opportunity to parallel more testing without risk of data set or test result pollution. Could Accelerate testing	Unlikely (highly) to achieve 2018 delivery plan  R1.4 in danger of cancellation – as a mitigation to R2.0/E&A being

### 5.1.5 Due diligence

#### Overview

R1.4 developed from a series of individually delivered change requests, through to a wholly integrated approach and then through to features which could be turned on as appropriate, Consequently, the R1.4 narrative on due diligence covers the following stages of development.

1. **R1.4 as the sum of component CRs** – Release 1.4 was originally specified as a combination of individually scoped change requests, individually priced, in order to deliver the full functionality of the release. DCC obtained an indicative price from DSP for implementing this ‘sum of the parts’ scope. The due diligence reported here is limited to obtaining an indicative price for delivery of [REDACTED].
2. **CR237: R1.4 delivered as one integrated bundle of change requests** - was the pre-cursor for CR255. It specified the plan to integrate the separate component CRs comprising R1.4 and conduct both SIT and PIT testing. Consequently, DCC due diligence began with a thorough investigation of the scope and costs of CR237. In its PIA, DSP estimated the single price of between [REDACTED] and [REDACTED].
3. **CR255: R1.4 delivered as a one bundle of change but with the ability to switch on features for testing-** To implement the new feature toggling approach, CR237 was terminated in favour of CR255. The scope of CR255 included PIT, SIT and UIT testing and feature toggling but did not include SMKI repository and recovery testing (which became CR260). [REDACTED]

The SMKI repository testing, which was originally part of the CR237 scope, did not form part of the scope for CR255. However, CR255 did include the development of feature toggling. The important inference from the description above is that the final CR255 costs fell within the original CR237 PIA price range. Consequently, from the perspective of just CR255 and CR237 there was a low marginal cost of developing feature toggling.

did not progress into the CR255 scope (later delivered through CR260) and CR255 included feature toggling When viewed from this perspective, the marginal cost of implementing feature toggling

#### R1.4 as the sum of component parts

**Table 5-4 – The DSP view of the ‘sum of the parts’ delivery of the constituent change request to CR237.**

Date	Description	Evidence
November 2016	[REDACTED]	CR255_1

### Due diligence on CR237:

Table 5-5 – Due diligence on CR237

Date	Description	Evidence
03/17	This initial presentation shows the assumptions that support the first PIA price for an <b>integrated delivery</b> of R1.4's component change requests.  [REDACTED]	CR255_2
03/02/17	The Change request submitted by DCC for CR237	CR255_4
23/02/17	This is the formal preliminary assessment of CR237 in response to the change request which was raised by DCC.	CR255_3
02/17	<p>Our SME commented extensively on the scope and content of the PIA. These were in the form of hand-written annotations to the PIA which were then sent to DSP for consideration. The comments included the following</p> <ul style="list-style-type: none"> <li>▪ The PIA was not a fixed price but based on Time and Materials contrary to what DCC was expecting</li> <li>▪ DSP was planning for a significant number of defects judging by the high price attributed testing and bug fixing</li> <li>▪ PIT was to be 'handed over', yet PIT was expected to have been documented well.</li> <li>▪ The absence of CSP and meter simulators from the plan</li> <li>▪ Incorrect date assumptions in the plan</li> <li>▪ Inadequate detail on CSP requirements</li> <li>▪ The absence of other service providers from the plan</li> <li>▪ Noting and seeking more detail on the DSP's view that the change would require more time to implement than the standard 4 hour maintenance window</li> <li>▪ The need to carry out penetration tests and why this assertion needed to be picked out in the design phase</li> </ul>	CR255_5

### Due diligence on CR255

Table 5-6 – Due diligence on CR255

Date	Description	Evidence
16/06/17	[REDACTED]	[REDACTED]
27/06/17	[REDACTED]	[REDACTED]
June 2017	[REDACTED]	[REDACTED]
28/07/18	[REDACTED]	[REDACTED]
03/08/18	[REDACTED]	[REDACTED]
14/08/18	[REDACTED]	[REDACTED]

During the implementation phase, DCC established a 'lessons learned' activity. The CR was successfully delivered in November 2019 as evidenced by the Testing Advisory Board' Recommendation reports. This is evidenced in CR260\_3 and CR260\_1 respectively.

## 5.2 DSP – CR260

Table 5-7 – Summary variance table for DSP – CR260

CR260 – SRT Part 3b and Part 4 SIT & UIT												
Change	DSP		CSP (N)		CSP (S&C)		TSP		CRI / other			
Total Cost	[REDACTED]											
Breakdown of cost (£m)												
IA cost:			Set-up Charges:			Ops. charges:			Other charges:			
[REDACTED]			[REDACTED]			[REDACTED]			[REDACTED]			
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026

**CR260 – SRT Part 3b and Part 4 SIT & UIT**

-	-	-	-	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]				
<b>RIGS Ref</b>	[REDACTED]											
<b>Driver</b>	SRTA											

### 5.2.1 Introduction

The Smart Metering Key Infrastructure (SMKI) service provides how Parties to the Smart Energy Code (SEC) establish trust across the DCC network. SMKI Certificates secure messages between SEC Parties and Devices by providing assurance of the identity of each entity. They are also used to sign DCC User Interface (DUIS) commands sent to DCC.

To gain access to SMKI Interfaces, credentials are issued to Authorised Responsible Officers to authenticate to those SMKI Interfaces. These credentials are issued under the Infrastructure Key Infrastructure (IKI) Certificate Policy and are used to authenticate the interfaces to the SMKI Service and SMKI Repository

SMKI and Repository Testing (SRT) tests the capability of the DCC and the component parts of the DCC Systems to interoperate with User Systems and RDP Systems. In this section we describe how CR260 is the vehicle for delivering the capability to support an increase in SRT testing scope.

This was the first time that SRT had been tested on real meter hardware by supporting real customers on real meters rather than using emulators. Much valuable learning was obtained. For example, different SMETS2 meters were found to exhibit different behaviours'. The observations were used to populate a meter defects log to the benefit of industry.

### 5.2.2 Drivers to CR260

The driver for this change request is a SEC requirement.

On 12 July 2017, the SEC Panel approved DCC's completion of Part 3a SRT following consultation with Parties and the SMKI PMA. The Panel directed DCC to publish this Test Completion Report in accordance with SEC T5.21(c).

In September 2017 we consulted on changes to the SMKI and the Repository Testing Approach Document. The updated document provides details of parts 3b and 4 of the SRT Approach (SRTA).<sup>6</sup>

- Part 3b tests the SMKI recovery environment with User SMKI recovery systems and processes in the End to End Testing that occurred after R1.3;
- Part 4 tests the SMKI recovery environment on ability to re-instate communications to Devices should the SMKI PMA decide that use of the Recovery environment is not necessary or appropriate.

DCC must be able to recover compromised devices and this is a critical service which is provided to industry. Delaying testing of this service would have undermined market confidence in the GB smart programme. Potential adverse outcomes would be delays to deployment caused by reticent energy suppliers and the erosion of the business case.

<sup>6</sup> CR260\_2



### 5.2.3 Scope

The scope of the change includes the delivery of the capability to test SMKI recovery against SEC requirements. The scope is not to deliver the capability per se.

### 5.2.4 Consideration of options and chosen scope

The following options were considered

- **Do nothing or postpone** (discarded) - CR260 was designed to deliver the capability to fulfil an obligation under the SEC (in the SRTA) to test SMKI recovery.
- **Raise a change request (favoured)** - DCC raised a change request to the FSPs. The only material change request for RY2017/18 is for DSP

The scope of CR260 is to build capability to support DCC testing of SMKI recovery against the requirements set out in the SEC through the SRTA. The requirements are summarized and explained in the table below for information.

**Table 5-8 – High level requirements for CR260**

Requirement to test	High-level explanation of requirement
“Recovery by Recovery”	This refers to the DCC’s ability to recover from the compromise of another key; e.g. an organisation private key or a recovery private key.
Annual Standing up of a Recovery Test Environment	Only UIT and Business process review
Ability to Reinstate Communications to Devices	There is evidence that a device has been compromised then it can be disconnected. This capability allows the device to be reconnected again if the PMA deems it appropriate.
Generation of filtered versions of Notification and Progress files	If population of devices is compromised then a report is generated called a compromise notification file. It is necessary to notify energy suppliers of which devices are compromised. To preserve commercial confidentiality, a bespoke report is required for each supplier.
Additional report (a report that lists all devices that remain in the recovery state)	This report is just for DCC’s use.
Issue #1: Intention to Use ‘Method 1’	DCC is required by SEC to notify Responsible Suppliers of a subscriber’s (subscriber is a SEC party that uses SMKI services) intention to use Method 1 to recover devices. Currently DCC has no method for doing this and DSP does not have a role in Method 1 Recovery incidents.
Issue #2	The SMKI Recovery Procedure requires that a Method 3 recovery incident can be carried out in a two-stage process whereby the replacement certificates are specified later after the incident has been notified.

The implementation of DCC SMKI recovery capability is likely to be a ‘one off event’. However, the lasting benefit has been to create a process that can be used to help support customers in their UIT testing.

### 5.2.5 Due diligence

There was extensive due diligence undertaken on CR260. However, the focus was technical scope and labour costs as there was no hardware component for the CR. Moreover, whilst this CR builds lasting capability, the facility to undertake SRT is only available for a specified period each year.

**Table 5-9 – Account of due diligence of costs and scope for CR260**

Date	Description	Evidence
	[REDACTED]	[REDACTED]
October 2017	[REDACTED]	[REDACTED]

**Table 5-10 – Account of due diligence of costs and scope for CR260**

During the implementation phase, DCC established a ‘lessons learned’ activity. The CR was successfully delivered in 2018/19 as evidenced by the Testing Advisory Board’ Recommendation reports on both 3b and 4. This is evidenced in CR260\_3 and CR260\_1 respectively.

## 6 Changes to Support the Development & Implementation of Release 2.0 and DBCH

In Part 2 of the submission we provided information on the scope and timeline of Release 2.0 (R2.0) and Dual Band Communications Hub. This included the drivers of major cost related to the programme and can be found on Part 2.

In this section we provide further detail of the Project and Change Requests required to support development and implementation of the programme. This includes information on the costs of the Project and Change Requests, as well as the due diligence and negotiation which ensures that the final price for each of these Project and Change Requests provide value for money.

A summary of each of these CRs and PRs is provided in Table 1 below:

**Table 6-1: Release 2 change requests**

CR / PR	Description	Total Cost
CR184	<p>Dual Band Communication Hub HAN Variants</p> <p>To enable both CSP North and CSP Central &amp; South to begin to develop the Dual Band Communication Hubs which are core to delivery of the overall Release 2.0 programme. This is a BEIS mandated initiative and was formally initiated in early 2016.</p> <p>Service Providers Impacted: <b>CSP(N) and CSP(C&amp;S)</b></p>	[REDACTED]
CR194	<p>Updated SEC Technical Specifications</p> <p>To update the DCC solution to take account of the BEIS-led changes to GBCS and SEC. This ensures the DCC remains compliant with all regulatory and technical requirements.</p> <p>Service Providers Impacted: <b>CSP(N) and CSP(C&amp;S)</b></p>	[REDACTED]
CR218	<p>Dual Band Communications Hub DSP Impact</p> <p>This CR was raised alongside CR184 and CR194 to allow the DSP to plan for System Integration of the Release 2.0 solution.</p> <p>Service Providers Impacted: <b>DSP</b></p>	[REDACTED]
CR253 & PR62	<p>System Integration Testing (SIT) &amp; Device Integration Testing (DIT)</p> <p>To allow Service Providers to commence SIT and DIT testing of both SBCH and DBCH.</p> <p>Service Providers Impacted<sup>7</sup>: <b>DSP and CSP(N)</b></p>	[REDACTED]
CR274 & PR80	<p>User Integration Testing (UIT)</p>	[REDACTED]

<sup>7</sup> Arqiva and Telefonica are also impacted however at the time of submission of the annual price control document, the final "Change Authorisation Notice" (CAN) has yet to be agreed and signed.

CR / PR	Description	Total Cost
	To provide the environment for DCC Users to begin to test the R2.0 solution with their individual systems.	

## 6.1 CR184 & CR194: CSP (N) & CSP (C&S)

Table 6-2: – Summary variance table for CSP(N)– CR184

CR184 – Provision of DBCH Han Variants												
Change	DSP		CSP (N)		CSP (S&C)		TSP		CRI / other			
<b>Total Cost</b>			[REDACTED]									
Breakdown of cost (£m)												
<b>IA cost:</b>			<b>Set-up Charges:</b>				<b>Ops. charges:</b>			<b>Other charges:</b>		
[REDACTED]			[REDACTED]				[REDACTED]			[REDACTED]		
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
-	-	-	-		[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
<b>RIGS Ref</b>		[REDACTED]										
<b>Driver</b>		R2.0										

Table 6-3: – Summary variance table for CSP(N)– CR194

CR194 – Updated SEC Technical Specifications												
Change	DSP		CSP (N)		CSP (S&C)		TSP		CRI / other			
<b>Total Cost</b>			[REDACTED]									
Breakdown of cost (£m)												
<b>IA cost:</b>			<b>Set-up Charges:</b>				<b>Ops. charges:</b>			<b>Other charges:</b>		
[REDACTED]			[REDACTED]				[REDACTED]			[REDACTED]		
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026

CR194 – Updated SEC Technical Specifications												
-	-	-	-		[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
<b>RIGS Ref</b>	[REDACTED]											
<b>Driver</b>	R2.0											

Table 6-4: – Summary variance table for CSP(S&C) – CR184

CR184 – Provision of DBCH Han Variants												
Change	DSP			CSP (N)			CSP (S&C)			TSP		CRI / other
<b>Total Cost</b>							[REDACTED]					
Breakdown of cost (£m)												
<b>IA cost:</b>				<b>Set-up Charges:</b>				<b>Ops. charges:</b>				<b>Other charges:</b>
[REDACTED]				[REDACTED]				[REDACTED]				[REDACTED]
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
-	-	-	-	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]
<b>RIGS Ref</b>	[REDACTED]											
<b>Driver</b>	R2.0											

Table 6-5 – Summary variance table for CSP(S&C) – CR194

CR194 – Updated SEC Technical Specifications												
Change	DSP			CSP (N)			CSP (S&C)			TSP		CRI / other
<b>Total Cost</b>							[REDACTED]					
Breakdown of cost (£m)												
<b>IA cost:</b>				<b>Set-up Charges:</b>				<b>Ops. charges:</b>				<b>Other charges:</b>
[REDACTED]				[REDACTED]				[REDACTED]				[REDACTED]

CR194 – Updated SEC Technical Specifications												
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
-	-	-	-	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	-	-
<b>RIGS Ref</b>	[REDACTED]											
<b>Driver</b>	R2.0											

### 6.1.1 Drivers to CR184 and CR194

The single band Communications Hub (SBCH) was delivered as part of R1.2. It is capable of operating a Home Area Network (HAN) radio in the 2.4GHz frequency range. Trials commissioned by the Department of Business, Energy and Industrial Strategy (BEIS) in 2012 suggested the 2.4GHz frequency should be suitable for establishing communications links between all smart metering equipment in approx. 70% of GB premises.<sup>8</sup>

Further BEIS trials in 2015<sup>9</sup> suggested the Sub-GHz (i.e. frequencies below 1000MHz) frequency range improves the propagation and range of the HAN and could be expected to provide increased coverage, suitable for establishing communications links between all smart metering equipment in up to 96.5% of GB premises.

In March 2015 BEIS directed DCC to conduct an impact assessment<sup>10</sup> for the DBCH and ultimately to secure delivery from the CSPs. In addition, BEIS consulted on the most appropriate solution to deliver additional HAN coverage. In December 2015, BEIS concluded policy that a Dual Band Communications Hub (DBCH) capable of operating a HAN radio at both 2.4GHz and Sub-GHz should be provided by DCC<sup>11</sup>.

### 6.1.2 Scope of DBCH project

The DBCH project is part of an overall package of change that BEIS has set out in TSG2.0 Draft 5<sup>12</sup>. This includes the hub, supporting infrastructure changes and testing.

#### Hub

- **Delivery of the new communications hub** - New HAN variant Communications Hub with an additional Sub-GHz HAN radio

#### Supporting infrastructure changes

- **CSP/DSP architecture** - Associated CSP system and DSP system changes to support DBCH and a series of other changes as set out in TSG2.0 Draft 5
- **DCC enterprise systems** - Associated changes to DCC's enterprise systems (billing and reporting)
- **Parse and correlate** - Associated changes to Critical Software's Parse and Correlate system to support DBCH and a series of other changes as set out in TSG2.0 Draft 5.

#### Testing

<sup>8</sup> (R2-DBCH-001).

<sup>9</sup> (R2-DBCH-002, R2-DBCH-003, R2-DBCH-004)

<sup>10</sup> (R2-DBCH-005)

<sup>11</sup> (R2-DBCH-006).

<sup>12</sup> (R2-DBCH-007)

- **DSP emulator** - An uplift to the GBCS Interface Testing for Industry (GFI) DSP emulator
- **Device emulators** - A set of device emulators for System Integration Testing (SIT) provided by SLS

The DBCH project team was responsible for working with BEIS and industry to define the technical specifications and requirements of the DBCH with all of these service providers in order to both determine the scope of change in R2.0 and negotiate modifications to existing contracts.

### 6.1.3 Strategic sourcing options

Contractually, CSPs have sole and exclusive rights to supply Communications Hubs in their regions.

[REDACTED]. It is important to ensure that the suppliers do not exploit this position and that value for money is maintained.

Throughout the lifetime of the DBCH project there have been a number of reviews of the sourcing approach to ensure that reputational, commercial and contractual pressures were maintained. These were:

- April 2016 sourcing assessment
- Strategic supply chain review
- RFP for communications hub technology options
- [REDACTED]

DCC also developed assessment criteria to inform its view of the relative merits of the options. These criteria are also described below.

#### SUCCESS CRITERIA FOR THE SOURCING OPTIONS

For DBCH and Release 2.0 to be successful DCC developed the following success criteria.

A solution that is effective, timely, economic and efficient:

- **Effective solution** - Delivery of a reliable solution that provides HAN coverage for a sizeable proportion (estimated to be 26.5%) of premises not served by the SBCH
- **Timely solution**- Delivery timescales which enable suppliers to complete rollout by end of 2020
- **Economic and efficient costs** - Costs of delivery are economic and efficient and represent value for money to the consumer

A solution in which there is confidence in delivery based in turn on confidence in the supply chain and in the management of dependencies.

- **Confidence in delivery** – A delivery plan which is sufficiently robust, realistic and stable to allow suppliers to plan with confidence
- **Confidence in supply chain** – A robust delivery plan is underpinned by confidence in the Communications Hub supply chain and in DCC's ability to effectively manage delivery by its Service Providers
- **Managed dependencies** - Dependencies with the wider Smart Metering Implementation Programme and Smart Energy Code are fully understood and managed

## APRIL 2016 SOURCING ASSESSMENT

DCC first assessed its due diligence and cost challenge strategy in April 2016 in a paper to DCC Board<sup>13</sup>. The following options for sourcing were identified:

Table 6-6: Commercial options

Due diligence option	DCC assessment – April 2016	DCC Actions – April 2016
<b>Competitive Tendering by DCC of DBCH with open tenders</b>	CSPs have exclusive rights to market Communications Hubs for their SMWAN solutions. Changing this would be very costly and disruptive to the programme and would undoubtedly involve paying compensation which would be poor value.	No further action taken
<b>Separate competitive tendering of design of Communications Hubs variant. Design would then be issued to CSP</b>	DCC consider this would fail to leverage existing CSP investment in Communications Hubs design. In addition, it introduces technical and commercial risk with no guarantee of cost saving. DCC also considers it is unlikely to be commercially acceptable to CSP	No further action taken
<b>Shadow procurement i.e. obtaining external quotes for comparison</b>	In April 2016 this was though infeasible as it was considered unlikely that it would yield valid comparison prices given that suppliers would consider that any procurement would not be a bona fide competition.	No further action taken
<b>Competitive tendering of Communications Hubs by CSP's</b>	Not possible for CSP(N) as it has extended exclusive rights to their supplier CSP(S&C) has this option but it will depend on CSP view as to whether value for money will be achieved.	No further action, however, reviewed in January 2017  CSP(S&C) has run a competitive procurement for DBCH within its supply chain

In this early review, a number of sourcing options were dismissed after analysis. However, work continued throughout 2017 to challenge the established supply chain.

## STRATEGIC SUPPLY CHAIN REVIEW

DCC undertook a deep assessment of the potential impact on the CSPs of new network and communications technologies and the commercial opportunities that could arise. In the period before the IA response, we wanted to be informed of pertinent advances in network technologies that may be a competitive threat to the CSPs. In addition, there were reports that one or either of CSP(S&C) and CSP(N) may be sold. DCC needed to consider the mitigations in the event of a major contractual or commercial issue with one or both CSPs.

DCC sought consultancy support for a small work package to undertake;

- **A 'new technology' assessment** - Undertake an assessment of the impact and commercial opportunities offered by new network and communications technologies.

<sup>13</sup> (R2-DBCH-050)



- **Contingency planning** - Draft contingency plans over and above the existing contract, if either of the CSPs hit difficulties preventing them from fulfilling their obligations.

The work was agreed as part of ICR 246<sup>14</sup>. [REDACTED]

#### **ISSUE RFP FOR TECHNOLOGY OPTIONS**

[REDACTED]

#### **Due diligence on the RFP responses**

[REDACTED]

#### **CSP(S&C) due diligence**

[REDACTED]

#### **DCC and BEIS decision**

[REDACTED]

#### **RFP FOCUSING ON CSP SERVICES**

[REDACTED]

### **6.1.4 An overview of due diligence for CR184 / CR194**

#### **BACKGROUND TO CR184 AND CR194**

There are two change requests and one project request within the scope of this section:

- **CR184** - DCC began drafting CR184 in January 2016. Following a round of CSP review comments, DCC raised CR184 in July 2016. At the time we acknowledged that SEC 1.4 and CHTS, SMETS and GBCS would need to be available before CSPs could commence substantive Impact Assessment work.
- **CR194** – This was raised on 4 August 2016. It followed the Technical and Business Design Group (TBDG) agreeing the first iteration of the Technical Specification Group (TSG) 2.0 – the suite of changes that would make up R2.0.
- **PR045** – This project provided the service providers with commercial cover to begin development work. Scope and due diligence are as per CR184/CR194.

#### **Table 6-7: summary of the scope of change requests within this report**

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<sup>14</sup> (R2-DBCH-099).

CR/PR	Title	Scope	Reference	Impacted Service Provider				
				CSP(N)	CSP (C&S)	DSP	Critical	Capita ITES
CR184	Provision of Dual Band Communications Hub HAN Variants	Provision of DBCH, including firmware design, CSP system changes, DBCH certification, testing (up to end of PIT) and manufacturing	<i>R2-DBCH-012</i>	x	x			
CR194	Updated SEC Technical Specifications	TSG2.0 Draft 5 supporting changes	<i>R2-DBCH-013</i>	x	x	x	x	
PR045	DBCH Programme Planning and Design	Initiate CSP work on CR184/194 prior to signing contracts	<i>R2-DBCH-018, R2-DBCH-019</i>	x	x			

The other material Project and Change Requests which fall within the scope of Release 2.0 are described in Part 3 of this submission.

### DUE DILIGENCE APPROACH

DCC applied rigorous processes to obtain value for money from the Service Providers for R2.0. For example, during RY2016/17, a dedicated DCC team was established covering Programme, Design and Assurance, Test Assurance, Finance and Commercial, Security, Operations and Regulation. The team clarified the scope of the DBCH project through the R2.0 Impact Assessments and engaged the service providers in commercial discussions.

Unlike the original BEIS CSP procurements, DCC was unable to conduct a fully competitive procurement for the DBCH. Instead DCC was reliant on the CSPs to negotiate competitive agreements through their supply chains. However, we have used a variety of approaches to encourage the CSPs to seek value for money including;

- **Hold clarification workshops** – Run Pre-Statement of Works/Impact Assessment clarification workshops to ensure CSPs are absolutely clear on the requirements for R2.0
- **Use a dedicated team** - Established a dedicated DBCH/R2.0 team to ensure that there is sufficient bandwidth and expertise to support the R2.0 Impact Assessments
- **Leverage expert support** - Engage consultancy support for technical and commercial assurance in those areas where we had identified gaps in our knowledge and expertise
- **Leverage BEIS’ support** - Used BEIS where appropriate to drive improved behaviours from the CSPs
- **Hold high-level meetings** - Held repeated top to top meetings to maintain CSP leadership focus
- **Use standard templates** – to facilitate comparisons between CSP costs and to require costs at the appropriate level of detail.
- **Communications Hub RFP** - Conducted a Communications Hub RFP to confirm the CSP(N) DBCH proposal represented value for money and to drive a lower price proposal from CSP(S&C) and investigate other technology options
- **Manage Sub GHz propagation issue** - Manage the outcome of technical due diligence on sub-GHz signal propagation in homes

These issues are explored in greater depth below.

### **Hold clarification workshops**

To assist the CSPs in the timely completion of the Statement of Works (SoW) / Impact Assessments, DCC held a series of clarification workshops with each CSP before the SoWs/IAs were due to be returned. These workshops helped to align the impact assessment proposals and DCC's view on PR023 and CR184, and provided a regular forum for CSPs to raise questions and seek clarifications.

Clarification workshops were held typically every one to two weeks with each Service Provider although, at times of intense activity, we held two or three workshops per week. For CR184, DCC held more than 10 workshops with CSPs in advance of the submission of the IAs.

### **Use a dedicated DCC team**

It became clear that the scale and complexity of DBCH would require a dedicated team in order to review the detailed and complex IAs and return comprehensive responses in short timescales.

As a result, DCC established a team comprising Communications Hub Subject Matter Experts (SMEs), commercial SMEs and Programme/Planning experts. As this team was dedicated to DBCH, it would be able to review each iteration of the SoWs/IAs within an accelerated timescale. Any questions, issues, actions and clarifications were recorded in detailed documents/logs.

### **Leverage expert support**

In April 2016 DCC identified that there were several technical and commercial areas where DCC had limited internal experience and expertise. As a result, it was determined that external consultancy support would be required.

### **Leverage BEIS support**

DCC worked collaboratively with BEIS to apply additional pressure to Service Providers as part of due diligence activities. This was split into two main types of interactions:

- Top to top meetings between senior BEIS officials, DCC and CSPs
- Involving BEIS in lower level clarification workshops

### **Hold high-level meetings**

Throughout the Impact Assessment period, DCC held regular meetings with senior staff from CSP(N) and CSP(S&C). These meetings ensured that Service Provider leadership would remain focussed on delivering the R2.0 Impact Assessments within the required cost, quality and timescales. These regular top to top meetings also offered a regular escalation route when required.

### **Conduct an RFP to drive a lower price proposal and investigate other technology options**

[REDACTED]

### **Use standard templates**

A key element of the due diligence was to compare the DBCH unit price against the 'should cost' models so as to ensure the proposed resourcing approach represented value for money. This approach required a consistent set of information from each CSP. A series of standardised templates<sup>15</sup> for the CSPs to complete were created. These covered their response to the impact assessment, the implementation plan and their

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<sup>15</sup> □ C.1 - General Impact Assessment Response Template (R2-DBCH-096)  
□ C.2 - Implementation Plan Impact Assessment Response Template (R2-DBCH-097)  
□ C.3 - Pricing and Charges Impact Assessment Response Template (R2-DBCH-098)

pricing and charges. Together, the templates required a detailed breakdown of the unit cost of the DBCH and the resource effort required to deliver.

### **Manage sub-GHz propagation issue**

The scope of PR023 to develop the dual band HAN version of the Communications Hub required the service providers to carry out testing in accordance with the Joint Testing Methodology (JTM). The purpose of the testing inter alia was to verify that the performance of the HAN at the existing 2.4 GHz frequency was not degraded relative to the single band unit and to measure the performance of the HAN operating at the sub-GHz frequency.

Through testing, it emerged that the Sub-GHz signal was not propagating as effectively as expected within buildings. Hence, the BEIS aspiration for an increase in building penetration (as compared to 2.4 GHz) was unlikely to be met. This would lead to a shortfall in the percentage of additional premises that were predicted to be served by the DBCH.

Operational HAN coverage performance was not a specific performance measure for the developed dual band communications hub. Indeed, HAN connectivity has never been a performance measure for any CSP under their contracts. However, this clearly had a negative impact on the business case for the dual band communications hub generally, as it would leave a larger than desired number of premises to be served by the Alt HAN arrangements or excluded altogether.

[REDACTED]

### **Due diligence outcomes**

As a result of DCC's concerted efforts, for CR184, CR194, CR218 and PR023, we reduced the overall Development and Operational Support charges from £167.369m to £137.623m, a reduction of £29.746m.

[REDACTED]

This reduction has been achieved against a backdrop of increasing scope – 14 additional IRPs and CRPs were added by BEIS from the initial Impact Assessment submissions to the current proposals. Moreover, we have had to remind the CSPs to include key scope elements which were missing from their original Impact Assessments. These included Instrumented Test Communications Hubs, Prototype Interoperability Devices and a CSP(S&C) DBCH Cellular+Mesh solution.

In the remainder of this section DCC describes the process we have gone through for R2.0 due diligence. It should be noted that this process is ongoing. The tables below show the cost reduction obtained via the due diligence process at the following levels of details:

- Summary
- CSP(N) – detailed position
- CSP(S&C) – detailed position
- DSP – detailed position

## **6.1.5 Due Diligence and Negotiation: CSP(N)**

### **PRELIMINARY ASSESSMENT**

[REDACTED]

## **PRE-INTERIM IMPACT ASSESSMENT CLARIFICATION WORKSHOPS**

[REDACTED]

## **REVIEWING INTERIM IMPACT ASSESSMENT**

[REDACTED]

## **REVIEWING FINAL IMPACT ASSESSMENT: SCOPE OPTIONS AND DECISIONS**

[REDACTED]

### ***Meeting Ministry of Defence Requirements for DBCH***

The Fylingdales region of North Yorkshire is home to RAF Fylingdales, a radar base and part of the Ballistic Missile Early Warning System. As such CSP(N) is required to use a different frequency for the SM WAN in the Fylingdales region to avoid interference from the radar station.

As a result, CSP(N) has developed a Communications Hub solution which has two SM WAN variants:

- **Standard 420** – the standard variant in the North region which operates an SMWAN at around 420MHz
- **Variant 450** – the variant used in the Fylingdales area which operates an SMWAN at around 450MHz

The Standard 420 has been implemented in in single band form (i.e. with a HAN operating at 2.4GHz) as part of Release 1.2. The Variant 450 was not in the scope of Release 1.2 nor 1.3 but would be required as part of the final solution.

[REDACTED]

### ***Inclusion of Programme Resources – CR225***

[REDACTED]

### ***Treatment of Foreign Exchange***

[REDACTED]

## **REVIEWING (FINAL) IMPACT ASSESSMENT – DUE DILIGENCE**

[REDACTED]

## **SUMMARY OF COST REDUCTION FOR CSP(N)**

[REDACTED]

## 6.1.6 Due Diligence and Negotiation - CSP(S&C)

### PRE-INTERIM IMPACT ASSESSMENT CLARIFICATION WORKSHOPS

[REDACTED]

### REVIEWING INTERIM IMPACT ASSESSMENT

[REDACTED]

### REVIEWING FINAL IMPACT ASSESSMENT: SCOPE OPTIONS AND DECISIONS

#### **Introduction**

On 10 February 2017, CSP(S&C) submitted the first iteration of the CR184 and CR194 Impact Assessments<sup>16</sup>. As with CSP(N), DCC launched a series of internal reviews, workshops and high-level meetings. A clarification log<sup>17</sup> was maintained throughout the Impact Assessment period. DCC used the log to track CSP(S&C)'s progress in addressing clarifications.

To allow DCC to easily filter clarifications, they were graded into area (Technical, Plan, Commercial or Other) and severity (Red, Amber, and Green). A separate clarification log was used with separate clarification workshops<sup>18</sup>.

Given the large number of clarifications, we have chosen to highlight the key areas of discussion and the key decisions.

- Single source versus dual sourcing of DBCH
- The mesh solution
- Treatment of foreign exchange
- Introduction of soft SIM

#### **Single source versus dual sourcing of DBCH**

CSP(S&C) dual-sources its single band communications hub from Toshiba and WNC. Whereas Toshiba provide a mesh solution communications hub variant, WNC only provides the cellular version. In this section we describe the key events leading up to de-scoping of Toshiba from the DBCH IA followed by its subsequent re-introduction.

##### **1. WNC single source procurement is recommended by CSP(C&S)**

For single band Communications Hubs CSP(S&C) use the following variant suppliers:

- Cellular only Communications Hub – Toshiba and WNC
- Cellular+Mesh Communications Hub – Toshiba

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<sup>16</sup> (R2-DBCH-140, R2-DBCH-141, R2-DBCH-142, R2-DBCH-143, R2-DBCH-144, R2-DBCH-145, R2-DBCH-146, R2-DBCH-147, R2-DBCH-148 and R2-DBCH-149)

<sup>17</sup> (R2-DBCH-50)

<sup>18</sup> (R2-DBCH-151)

- Special Installation Mesh Communications Hub (SIMCH) – Toshiba

[REDACTED]

**2. Toshiba cellular + mesh solution (Toshiba solution) is withdrawn from IA**

Toshiba is the only supplier of the Cellular+Mesh Communication Hub and the SIMCH. A move to WNC as the DBCH provider for Cellular+Mesh Communication Hub and the SIMCH might reduce cost, but it would require WNC to develop the two variant DBCHs from scratch.

[REDACTED]

**3. No WNC model could be provided**

[REDACTED]

**4. Toshiba costs were too high**

[REDACTED]

**5. Toshiba solution is re-introduced at a lower price**

[REDACTED]

**Treatment of Foreign Exchange**

[REDACTED]

**Soft SIM**

[REDACTED]

**REVIEWING (FINAL) IMPACT ASSESSMENT (DUE DILIGENCE)**

[REDACTED]

**SUMMARY OF COST REDUCTIONS FOR CSP(C&S)**

[REDACTED]

**6.2 DSP – CR218 (CGICAN064)**

Table 6-8: – Summary variance table for DSP – CR218

CR218 – Dual Band Communications Hub DSP Project					
Change	DSP	CSP (N)	CSP (S&C)	TSP	CRI / other
<b>Total Cost</b>	[REDACTED]				
Breakdown of cost (£m)					
<b>IA cost:</b>	<b>Set-up Charges:</b>		<b>Ops. charges:</b>		<b>Other charges:</b>
[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]

CR218 – Dual Band Communications Hub DSP Project												
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
-	-	-	-	-	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	-	-	-	-
<b>RIGS Ref</b>	[REDACTED]											
<b>Driver</b>	Release 2.0											

### 6.2.1 Drivers to CR218

The rationale for the requirements for a DBCH has been described in preceding sections.

CR218 was initiated to cover the updates to the DSP systems required to support the provision of DBCH.

### 6.2.2 Scope of the change

The DBCH DSP solution required delivery of the following milestones and planned delivery dates:

- **CR218.1** - Solution Design complete for CR218 – 18th August 2017
- **CR218.2** - PIT Exit for CR218 – 31st October 2017
- **CR218.3** – ESI Data Extracts and Reports – 28th November 2017

CR218.1 provides the core functionality required to deliver changes to the DSP systems to allow for delivery and integration of a DBCH into the wider DCC system architecture. CR218.2 involves testing of the overall solution to ensure it is fit for purpose prior to moving into the System Integration Testing (SIT) phase that will form part of the wider R2.0 programme. Therefore, a successful Pre-Integration Testing (PIT) exit will act as a pre-cursor for continual testing of DBCH and the overall R2.0 solution. CR218.3 supports the necessary assurance that the DSP solution is compatible with the proposed R2.0 solution.

### 6.2.3 Consideration of options and chosen scope

Appropriate amendments to the DSP solution were a mandatory if DBCH was to be supported.

### 6.2.4 Due diligence

DSP sent DCC the first iteration of the impact assessment in February 2017. As per the change process, DCC reviewed the initial draft and identified a series of comments, questions and challenges. This initial review was undertaken by the following:

- **Commercial Team** - as a mechanism to challenge resourcing and overall proposed cost by the DSP
- **Technical Team** - to review and examine whether the DSP had understood and met DCC's requirements and were capable of delivery within the agreed timescales.

DCC requested that the DSP provide additional assurance of value for money via its challenge process. This resulted in four iterations of the Final Impact Assessment being presented to DCC over five months between the period February to July 2017.

[REDACTED]



## 6.3 DSP – CR253 (CGICAN063)

Table 6-9: Summary variance table for DSP – CR253

CR253 – Release 2.0 SIT & DIT												
Change	DSP			CSP (N)			CSP (S&C)			TSP		CRI / other
Total Cost	[REDACTED]											
Breakdown of cost (£m)												
IA cost:				Set-up Charges:				Ops. charges:				Other charges:
[REDACTED]				[REDACTED]				[REDACTED]				[REDACTED]
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
-	-	-	-	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	-	-	-	-
RIGS Ref	[REDACTED]											
Driver	Release 2.0											

### 6.3.1 Drivers to CR253

This BEIS-led initiative relates to the provision of Systems Integration Testing (SIT) and Device Integration Testing (DIT) for Release 2.0 as defined in Schedule 6.2 and in line with the Testing Approach Document for Release 2.0 and the Joint Test Strategy.

### 6.3.2 Scope of the change / project

The scope of activities under CR253 can be summarised as follows:

- The DSP, in its role as Systems Integrator (SI), will design, plan and lead the R2.0 system integration phase for all environments including Production;
- The SI will support regression testing and system integration including triage and defect resolution for TSG2.0 and DBCH;
- The DSP, in its role as SI shall propose and cost the overall approach, design, plan and outcomes for R2.0 systems integration
- The DSP (and other FSPs), will support regression testing and system integration including triage and defect resolution activities for TSG2.0 and DBCH

SIT testing forms part of the overall testing of the R2.0 solution. Successful completion of the scope would mean that the overall R2.0 solution can move to User Integration Testing (UIT) phase and ensures that the

timeline agreed by this BEIS-mandated programme continues on track and as planned with industry and other stakeholders.

### 6.3.3 Consideration of options and chosen scope

DCC's requirements are clearly laid out in CR218 as issued to the DSP. These are as follows:

#### DCC Requirements of the DSP

1. Adopt a test method in line with the Release 2.0 Test Approach Document with specific reference to;
  - Risk based testing where testing is focussed on new and changed requirements or known changes to the DSP / CSPs systems or processes or most critical/high risk service requests and scenarios and not a blanket set of thousands of atomic tests
  - Scenario based testing which reflects how the service will actually be used, linking to Business Execution Pathways.
  - Regression testing to be focussed on during DIT using real devices and testing of new functionality to take place in SIT

Note: For DIT the test approach and test scenarios will be produced by DCC and agreed with the Service Providers

2. Increase the level of automation and provide a statement as to what level of automation (i.e. percentage of tests which will be automated) is being proposed and what testing is not practicable to automate, with reasons why. Consideration should be given as to whether a higher level of automation is possible with a definition of what would be required to achieve that. Reference should be made to the automation of test scenarios and not just atomic test cases.
3. Perform regression testing (for both SIT and DIT) and define what regression test packs will be used, with reference to the need to adopt scenario based testing and automation where practicable. The response to this IA should indicate how long it will take to run a regression test cycle noting that the expectation is that regression test packs should be possible to perform overnight.
4. Produce test documentation in accordance with Schedule 6.2 and the Release 2.0 Test Approach Document. For the avoidance of doubt, For SIT this shall include at least;
  - SIT Test Approach
  - SIT Test Schedule
  - SIT Test Scenarios
  - SIT Test Specifications (including requirements traceability matrix)
  - Solution Test Plan
  - Solution Test Readiness Report
  - Solution Test Report
  - UAT Test Plan
  - UAT Test Readiness Report
  - UAT Test Report
  - SIT Completion Report (including OCT completion)
  - SIT Test Results

- SIT Test Issue Log
- SIT Regression Test Pack
- SIT Work-off Plan

For DIT this shall include at least:

- DIT Test Schedule
- DIT Test Specifications (including requirements traceability matrix)
- DIT Test Plan
- DIT Test Readiness Report
- DIT Test Report
- DIT Completion Report (including OCT completion)
- DIT Test Results
- DIT Test Issue Log
- DIT Regression Test Pack
- DIT Work-off Plan

The SIT and DIT Traceability Matrix shall enable traceability to both detailed SEC requirements and Business Execution Pathways. SEC requirements traceability is only required for new and changed SEC requirements. The Systems Integrator should take account of the requirements traceability carried out during PIT.

5. Specify and build test labs for the SIT environment. It is expected that DIT will be conducted within the SIT environment. The response to this IA should include a specification of the uplift to SIT environment with particular reference to;
  - Additional space required in test labs
  - Number of new meter emulators and of what type
  - Details of number of meter emulators
  - Details of meter types proposed for DIT
  - Details of how new emulators and test stubs will be assured ahead of SIT including any dependencies on DCC
  - Timelines to uplift the SIT environment including assurance activities, provision of new lab space and early integration testing
  - Concurrent execution of SIT and DIT within the environment
  - All tests must be capable of being run in the SIT environment with no reliance on other environments (including decrypting of message payloads).
  - Risks associated with only using a single vendor Zigbee chipset emulator in SIT and recommended strategies to mitigate these risks
6. Carry out early integration testing which will comprise regression testing of the R1.3/1.4 functionality for backwards compatibility, plus testing of new DSP functionality to support a device estate operating to multiple different versions of technical specifications with a CSP Simulator

7. Propose how SIT / DIT can address issues of testing with multiple chipsets to mitigate the risk of incompatibilities between NXP and SiLabs chipsets within meters and communications hubs
8. Define how the testing of different communications hubs variants (e.g. Fylingdales, different SKUs from other manufacturers etc.) will be addressed within the current planned SIT window

Documents required from DSP

1. Updated project schedule (i.e. a detailed MSP schedule) showing activities and milestones to deliver SIT and DIT (as defined in the Release 2.0 Test Approach Document). The schedule should include tasks and milestones for all deliverables for DCC to review (e.g. document artefacts) and all inbound/outbound dependencies.
2. An updated Release 2.0 RAID document to detail any Risks, Assumptions, Issues and Dependencies associated with the schedule.
3. A fully costed commercial proposal including
  - Resource costs for Release 2.0 SIT and DIT phases – a full breakdown of roles, durations, rates etc. must be provided
  - Capital or infrastructure costs related to environments and test labs including a justification as to why an uplift to existing requirements is required
  - For Device Integration Testing, pricing should include a proposed mechanism to determine scaled pricing levels based on device availability
4. In line with the Release 2.0 Test Approach Document, the CSPs shall carry out Operational Confidence Testing, with support from the Systems Integrator and other Service Providers. The purpose of Operational Confidence Testing is to assure functionality and non-functional performance of the Communications Hubs including soak testing.
5. Clear reference to existing artefacts that shall need to be updated as a result of the change.

### 6.3.4 Due diligence

CGI sent DCC the first iteration of the impact assessment in June 2017. As per the change process, DCC reviewed the initial draft and identified a series of comments, questions and challenges. This initial review was undertaken by the following:

- Commercial Team - as a mechanism to challenge resourcing and overall proposed cost by the DSP
- Technical Team - to review and examine whether the DSP had understood and met DCC's requirements and were capable of delivery within the agreed timescales.

DCC requested that CGI provide additional assurance of value for money via its challenge process. This resulted in a revised version of the Impact Assessment being presented to DCC in October 2017.

[REDACTED]

## 6.4 CSP(N): PR062

Table 6-10: – Summary variance table for CSP(N) – PR062

PR062: Commercial Cover for CR253					
Change	DSP	CSP (N)	CSP (S&C)	TSP	CRI / other

PR062: Commercial Cover for CR253												
Total Cost				£6.703m								
Breakdown of cost (£m)												
IA cost:				Set-up Charges:				Ops. charges:			Other charges:	
£ -				6.703				£ -			£ -	
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
-	-	-	-	-	0.816	0.981	0.981	0.981	0.981	0.981	0.981	-
RIGS Ref		RIGs supplementary schedules Tab 8										
Driver		Release 2.0										

#### 6.4.1 Drivers to PR062

This Project Request related to a DCC requirement for the Contractor to commence System Integration Testing (SIT) and Device Integration Testing (DIT) testing of R2.0 as outlined in CR253 in advance of signature of a formal Change Authorisation Note (CAN) for this Change Request. The consequences of not issuing PR062 would mean that SIT and DIT testing could not commence on time – this would put the delivery of the R2.0 programme at risk.

#### 6.4.2 Scope of the change

CSP(N) was responsible for the provision of the following:

- SIT (System Integration Testing)
- DIT (Device Integration Testing)
- OCT (Operational Confidence Testing)
- UAT (User Acceptance Testing)
- OMS (Order Management System)

#### 6.4.3 Consideration of options and chosen scope

This Project Request was the optimal option to allow commencement of R2.0 SIT & DIT by CSP(N) but also to allow negotiations on the final price of CR253 to proceed in parallel. This ensured that DCC can mitigate against the risk of ensuring timely delivery of the SIT & DIT activities which support the overall implementation of the R2.0 solution. As is standard practice, the value of the Project Request is deducted from the final agreed price of CR253 on issuance of the CAN.

#### 6.4.4 Due diligence

At the time of submission, the negotiations on resources and cost, as well as assurance which support due diligence is currently being carried out. These will be reported on in next year's Price Control submission.

## 6.5 CSP(N): PR80

Table 6-11: – Summary variance table for CSP(N) – PR80

PR80: Advance work on CR274												
Change	DSP		CSP (N)			CSP (S&C)		TSP		CRI / other		
<b>Total Cost</b>			[REDACTED]									
Breakdown of cost (£m)												
<b>IA cost:</b>			<b>Set-up Charges:</b>				<b>Ops. charges:</b>			<b>Other charges:</b>		
[REDACTED]			[REDACTED]				[REDACTED]			[REDACTED]		
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
-	-	-	-	-	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	[REDACTED]	-
<b>RIGS Ref</b>	[REDACTED]											
<b>Driver</b>	Release 2.0											

### 6.5.1 Drivers to PR80

This Project Request relates to a DCC requirement for the Contractor to commence UIT testing of R2.0 as outlined in CR274 in advance of signature of a formal Change Authorisation Note (CAN) for this Change Request. The consequences of not issuing PR080 lead to a delay in UIT for R2.0 which would mean that DCC would not meet one its incentivised milestones for the BEIS R2.0 Incentives Scheme.

### 6.5.2 Scope of Change

CSP(N) is responsible for supporting and delivering UIT including (but not limited to) provision of test environments, test support, provision of remote test labs and instrumented test hubs (as detailed in CR184).

### 6.5.3 Consideration of options and chosen scope

This Project Request is the optimal option to allow commencement of R2.0 UIT by CSP(N) but also to allow negotiation on the final price of CR274. This ensures that DCC can mitigate against the risk of ensuring timely delivery of the UIT activities which support the overall implementation of the R2.0 solution. As is standard practice, the value of the Project Request will be deducted from the final agreed price of CR274 on issuance of the CAN.

### 6.5.4 Due diligence

At the time of submission, the negotiations on resources and cost, as well as assurance which support due diligence is currently being carried out. These will be reported on in next year's Price Control submission.

## 7 Supporting the Development of SMETS1

DCC is developing solutions to integrate the existing ten million plus SMETS1 meters into the overall DCC solution. This is a BEIS-mandated programme and will continue up until 2020.

In Part 4 of this submission we provide narrative around the programme, as well as justification on the use of internal resources to support development and delivery of the programme. In this document, the focus is on the Change and Project Requests that have been raised to support the DSP to deliver the initial functionality required

### DSP – PR052

Table 7-1: – Summary variance table for DSP – PR052

PR052 – SMETS1 E&A DSP Implementation												
Change	DSP			CSP (N)			CSP (S&C)			TSP		CRI / other
Total Cost	[REDACTED]											
Breakdown of cost (£m)												
IA cost: [REDACTED]				Set-up Charges: [REDACTED]				Ops. charges: [REDACTED]				Other charges: [REDACTED]
2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
-	-	-	-	[REDACTED]	£	£	£	£	£	£	£	£
RIGS Ref	[REDACTED]											
Driver	BEIS requirement to develop changes to DSP to support SMETS1											

#### 7.1.1 Drivers to PR052

Section N of the Smart Energy Code (SEC) includes the requirement that DCC prepare an Initial Enrolment Project Feasibility Report (IEPFR) to assess the options as to how SMETS1 meters could be brought under DCC management to achieve the benefits outlined in Government policy:

- Enable more efficient and effective switching for customers with SMETS1 meters
- Reduce the risk of meters being replaced before the end of their operating lives

DCC set up the Enrolment and Adoption Project to develop the IEPFR. The IEPFR consultation completed on 20 January 2017.

BEIS instructed DCC to mobilise the SMETS1 Programme to prepare for the delivery of the interoperable data and communications services for SMETS1 meters, with full implementation subject to receiving specific decisions and approvals from the Secretary of State. BEIS confirmed and further clarified DCC is running a programme of work that will enable integration of the existing deployed SMETS1 smart meters with the DCC SMETS2 based systems.

DCC raised CR250 on 13th April 2017. This change request outlined solutions for which the DSP had been asked to provide a Preliminary Impact Assessment. It additionally asked the DSP to provide suggested next steps for its input into the DCC design activity.

DCC identified technical options for delivery of a SMETS1 enrolment, as outlined in the Initial Enrolment Project Feasibility Report and was pursuing a number of these options in parallel through the early part of the Design, Build and Test phase. This was to fully inform the BEIS decision making process.

In support of those options, DCC asked CGI DSP to consider several scenarios under CR250, each of which was to be developed further through collaboration between DCC and CGI DSP on a project basis.

- **PR049** - The first step was to carry out a phase of High Level Design of the Interfaces, in particular looking at the SMETS1 interfaces between the CGI DSP, Service Users and SMETS1 Service Providers/SMSOs. This has been completed under PR049.
- **PR050** - The second step is to begin development of the other elements of the CGI DSP solution High Level Design stage, in support of both UI options set out in the PIA (CR250) using an agile development methodology. This is intended to be at least started under PR050.
- **PR052 (this project)** - This project request expands the scope of the SMETS1 work with the CGI DSP to cover the design, build and test of the solution through to completion of PIT, and enables the DCC to accelerate the SMETS1 Programme in advance of a Full Impact Assessment being prepared for the wider implementation of the change. His approach in its letter to DCC of 16-Jun-2017.

### 7.1.2 Scope of the change / project

The scope of PR052 was to design, build and test a solution through to the completion of Pre-Integration Testing (PIT). DCC specified that an iterative (“Agile”) methodology was to be used. The solution was to be based on BEIS decisions as to the operational model and also based on the evolving DCC product prioritisation and the CGI DSP elements of the SMETS1 solution. In particular;

- Delivery of product(s) suitable for release into Systems Integration Testing;
- Based on a mutually agreed readiness assessment check;
- Including but not limited to being free of any material defects as far as can reasonably be determined by CGI DSP, unless otherwise agreed by DCC.

### 7.1.3 Consideration of options and chosen scope

The scope was determined by the decision by DCC to select a specific implementation option. The options were to either:

- Complete CR250 and deliver as a fixed price requirement for the whole programme;
- Use a Project Request – but managed under Agile (or iterative) delivery (See below)

As the SMETS1 Programme is using an agile delivery process, and as BEIS had not given DCC approval to deliver the operational service for SMETS1, a Project Request was assessed as being the most appropriate contractual vehicle to deliver the scope.

### 7.1.4 Due diligence

In late July 2017, DCC submitted PR052 to DSP. DSP formally raised on 25 September 2017 the need to start development of the changes to the DSP that DCC required to support SMETS1. However, the formal statement of works was not received until the 27 October 2017. DCC then set the budget through a process of review and due diligence with DSP.



In this section we first describe the

- **Favourable variance** - how outturn costs were lower than the budget.
- **The breakdown of the variance** – and the rationale of why this happened.
- **The process of budget setting** – What assumptions and challenges went into making the budget (this was not a fixed price arrangement)

There were many exchanges with DSP as DCC examined and reviewed DSP's costs and scope following submission of its draft statement of works. These challenges, and the associated evidence, are set out in Table 5-4.

#### **Favourable variance**

##### **The breakdown of the favourable variance**

[REDACTED]

##### **The process of budget setting**

[REDACTED]

#### **7.1.5 SMETS1 Programme change process**

[REDACTED]