

268/07 ATTACHMENT A - SMART RISK EVALUATION

1. Introduction

- 1.1 The smart risk evaluation has been carried out with the support of the Issue 69 'Performance Assurance Framework (PAF) Review' workgroup. The issue group met twice, on 25 April and 24 May 2017 and developed an interim smart risk register.
- 1.2 We have developed the interim risk register independently of the current Risk Evaluation Register (RER) in order to focus attention on smart risks and to identify any mitigation for smart risks that need to be developed in the shorter term. The current RER will be reviewed as part of subsequent phases of the PAF Review and the interim smart risks will be incorporated into the overall, enduring RER.
- 1.3 The interim smart risk register also includes risks identified in response to the PAF Review Stakeholder Engagement Consultation in October 2016.
- 1.4 The risks have been grouped into ten 'risk areas' as shown in section 2 below and assigned a 'risk rating'. The method of assigning the risk rating is described in section 5 below. Please note that the methodology for assessing risk is within the scope of the Risk Evaluation Methodology (REM) work stream of the PAF Review. Once the smart risks have been incorporated into the enduring RER and the enduring risk assessment process defined, these risk assessments will need to be revised. In the interim, a 'gut feel' approach has been used by the workgroup to arrive at a high-level view of comparative risks for the purposes of identifying shorter-term smart risk mitigations.
- 1.5 The interim risk register itself is included in Section 6. The approach taken by the workgroup was to assess smart risks in general and then to assess whether these risks impacted Settlement. This helped to ensure that Settlement Risks were not overlooked. Not all risks identified in the interim smart risk register will be included in the enduring RER, as they may be deemed as not having an impact on Settlement.
- 1.6 Mandatory Half Hourly (HH) Settlement will be subject to a Significant Code Review by Ofgem and the industry changes needed to support it are largely undefined at this stage. As such it is out of scope of the risk register, except to the extent that delays to the smart roll-out could defer the benefits of HH Settlement. Risks associated with elective HH Settlement have been included.
- 1.7 A common theme in responses to the PAF Review Stakeholder Engagement Consultation was that there would be value in reviewing the lessons learned from advanced metering, 'Foundation' metering and the implementation of Modification P272 ['Mandatory Half Hourly Settlement for Profile Classes 5-8'](#). The Issue 69 workgroup carried out a review and the results are included in Section 7.

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2. Risk Area Summary

- 2.1 Risk areas 5 to 10, listed in the Issue 69 Interim Issue Report, relate to the end-to-end data retrieval process. This is illustrated in Sections 3 and 4 of this Attachment. The Impact and Risk Rating columns below relate to Settlement only. Wider impacts on consumers and industry parties are described in Section 6.

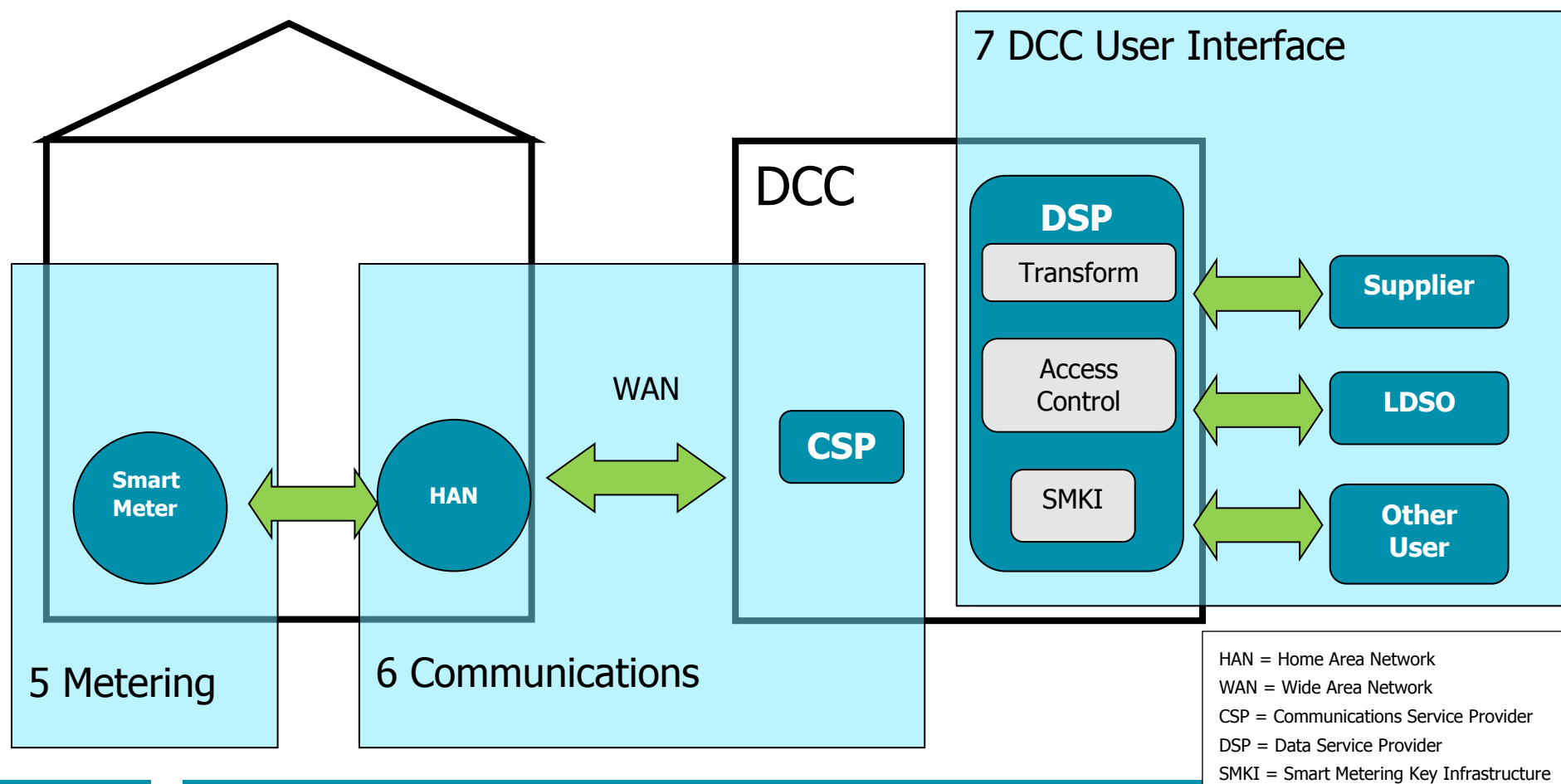
Ref.	Risk Area	Description	Likelihood	Settlement Impact	Settlement Risk Rating
1.	Readiness	The risk that the mass roll-out of smart meters is delayed due to lack of industry readiness.	Very High	Very Low	Low
2.	Installation	The risk that the installation process results in aborted visits and further delays to the completion of the mass roll-out.	High	Very Low	Low
		The risk that the errors in the installation process give rise to Settlement data quality issues.	Low	High	Medium
3.	Inter-operability	The risk that the gaining Supplier is unable to successfully process Metered Data following a Change of Supplier (CoS).	Medium	Medium	Medium
4.	Legacy	The short term risks are that the smart metering roll-out will identify historical error and will divert resources away from addressing legacy metering data quality and performance issues. The longer term risks associated with supporting an ever-diminishing pool of non-smart Meters.	Medium	Medium	Medium

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Ref.	Risk Area	Description	Likelihood	Settlement Impact	Settlement Risk Rating
	Data Retrieval				
5.	Metering	The risk that Metered Data is inaccurate or cannot be retrieved due to systemic issues with a batch of Meters.	Very Low	Very High	Low
		The risk that Metered Data is inaccurate or cannot be retrieved due to issues/faults with individual Meters.	Very High	Very Low	Low
6.	Communications	The risk that readings cannot be retrieved remotely due to regional network failures.	Very Low	High	Low
		The risk that readings cannot be retrieved remotely due to communications issues at individual sites.	Very High	Very Low	Low
7.	DCC user interface	The risk that Metered Data is inaccurate or cannot be retrieved due to problems with DCC internal processes or the Supplier interface with the DCC.	Medium	Medium	Medium
8.	Supplier – agent interfaces	The risk that Metered Data is inaccurate or missing as a result of problems with the Supplier interface with its MOA and DC.	Medium	High	High
9.	Meter operations	The risk that Meter Technical Details are inaccurate or missing as a result of MOA processes.	Low	Medium	Medium
10.	Data processing	The risk that smart Meter readings are not successfully validated and/or processed by Data Collectors.	Low	Medium	Medium

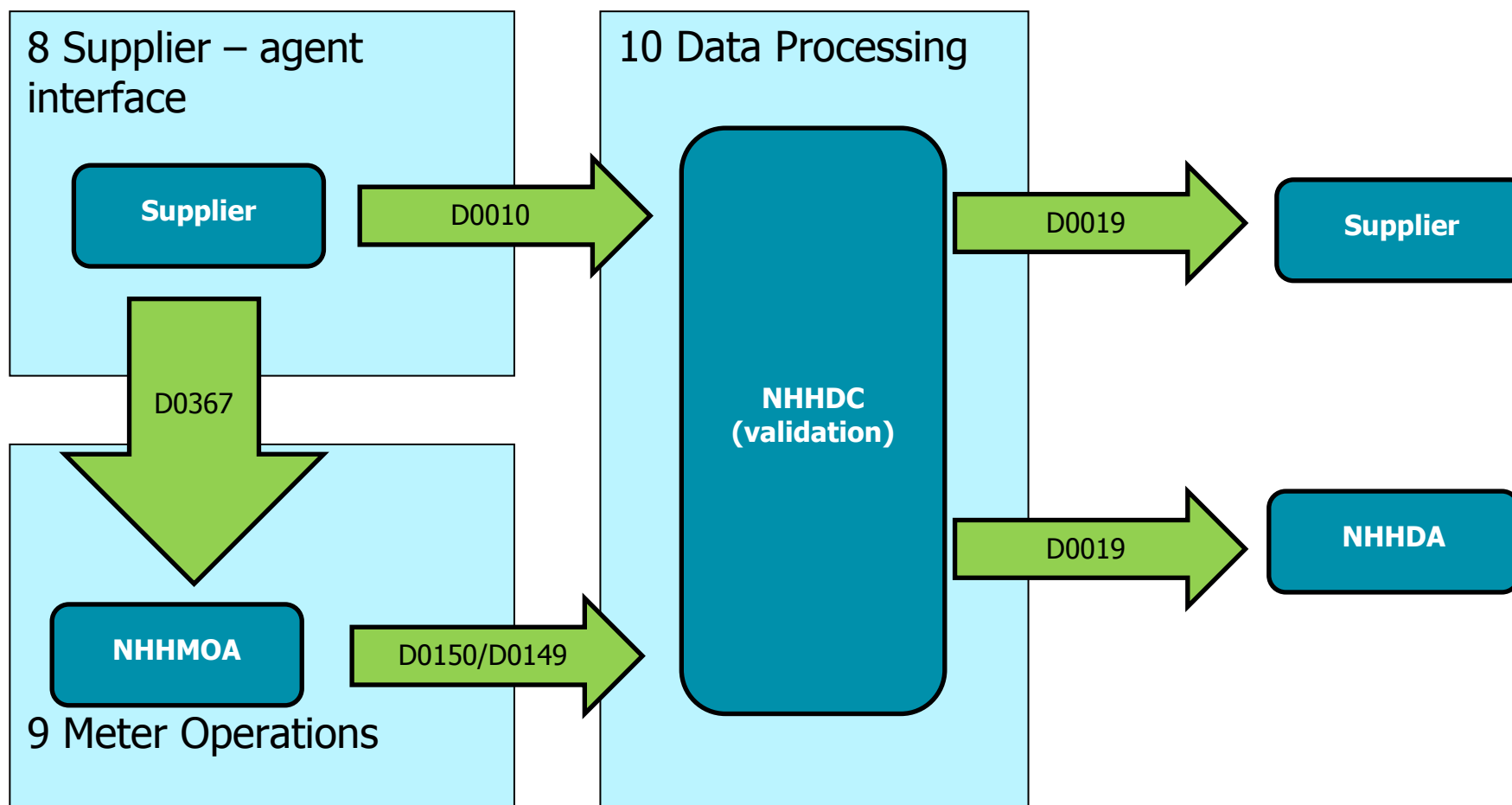
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3. End-to-end data retrieval process (Smart Energy Code processes)



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4. End-to-end data retrieval process (BSC processes)



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5. Risk Ratings

5.1 Four risk ratings have been applied.

Very High Risk	
High Risk	
Medium Risk	
Low Risk	

5.2 These are derived from 'Likelihood' and 'Settlement Impact' ratings, as follows:

			Settlement Impact				
			Very Low	Low	Medium	High	Very High
			1	2	3	4	5
Likelihood	Very High	5					
	High	4					
	Medium	3					
	Low	2					
	Very Low	1					

5.3 The 'Likelihood' and 'Settlement Impact' ratings have been allocated based on Issue 69 workgroup discussions. Each Risk Area has been assigned ratings relative to the other 'Risk Areas'.

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6. Interim Risk Register

Risk Area/description	1) Readiness	The risk that the mass roll-out of smart meters is delayed due to lack of industry readiness.			
Likelihood	Very High	Settlement Impact	Very Low	Settlement Risk Rating	Low
Risk Rating Commentary	Delays in the roll-out only impact Settlement in terms of deferred benefits.				
Risk Factors	<p>Risk factors leading to delays in the smart meter rollout include:</p> <ul style="list-style-type: none"> • Lack of availability of Smart Metering Equipment Technical Specifications version 2 (SMETS 2) Meters, communication hubs and other equipment (once the limitations on installing SMETS1 Meters take effect); • Logistics issues with delivering equipment to where it is needed, when it is needed; • Insufficient resources (with the right skills, in the right place, at the right time) to install metering equipment; • Insufficient Licensed Distribution System Operator (LDSO) resources to resolve connection issues; • Lack of resources to address exceptions resulting from final readings on the removed traditional Meter (see also Legacy); • Delays in implementing system changes by Suppliers, agents, LDSOs and the Data Communications Company (DCC); • Lack of industry knowledge/training in the new smart metering processes and lack of a common understanding across industry participants, for example Suppliers and Meter Operator Agents (MOAs), about their respective responsibilities; • Delays in putting in place appropriate contractual and commercial arrangements in support of the roll-out; • The need for return visits on installation (see also risk area 2 – Installation). <p>The BSC, Master Registration Agreement (MRA) and Distribution Connection Use of System Agreement (DCUSA) have already been updated to allow for smart metering, but further changes may be needed in the light of early roll-out experience, for example in relation to fault reporting processes. Whether the need for such changes is a further risk to industry readiness, is unknown at present.</p> <p>Mitigating smart roll-out risks through rigorous testing and audit (for example, the User Competent Independent Organisation (CIO) security assessments) may further delay the roll-out of DCC-serviced SMETS2 Meters, albeit for good reason.</p>				
Settlement Impact	Settlement benefits of access to more frequent, more accurate readings are delayed. Delays to the roll-out would also result in deferred benefits from dependent changes such as Half Hourly Settlement and reducing the Settlement reconciliation timescales.				

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	Settlement performance should be no worse than the baseline, except to the extent that resources are diverted from legacy metering activities to smart roll-out preparation.
Market Impact	<p>Delays to the introduction of reforms which are partly or wholly dependent on smart metering, such as Half Hourly Settlement, faster and more reliable switching, innovative tariffs, demand side response and smart grids.</p> <p>Loss of consumer confidence in smart metering and reputational damage to the industry programme.</p> <p>There will be competition impacts if new entrants are unable to compete for metering and installer resources.</p>
Current Mitigations	<p>Suppliers must submit roll-out plans and report progress against the plans under:</p> <ul style="list-style-type: none"> Standard Licence Condition 43: 'Roll-out Reporting and Provision of Information to the Secretary of State'; Standard Licence Condition 44: 'Roll-out Reporting, Setting and Achieving Annual Milestones, and Provision of Information to the Authority'. <p>Additionally, Standard Licence Condition 48 'The Smart Energy Codes' sets out deadlines for becoming DCC Users.</p> <p>Ofgem has enforcement provisions in the event of breach of these conditions.</p> <p>There is a counter-risk, that pushing forward too quickly could expose customers, industry parties and Settlement to additional risk. However, Ofgem should strike a sensible balance between the pace of delivery and the risk to consumers.</p> <p>Suppliers should be factoring in contingency for aborted visits as part of their roll-out resource planning.</p>
Proposed Mitigations	<p>None.</p> <p>The Settlement Risk is low.</p> <p>The roll-out of smart metering is not being driven by a BSC mandate, so it would be inappropriate to monitor the progress of the roll-out as part of the PAF framework.</p> <p>Monitoring by both Ofgem and BSCCo would introduce the potential for inconsistencies, both in terms of the data and responses to delays.</p>

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Risk Area/description	2) Installation	The risk that the installation process gives rise to Settlement data quality issues.			
Likelihood of aborted visits and further delays to completion of the roll-out	High	Settlement Impact	Very Low	Settlement Risk Rating	Low
Likelihood of errors in the installation process giving rise to Settlement data quality issues	Low	Settlement Impact	High	Settlement Risk Rating	Medium
Risk Rating Commentary	<p>There is a high likelihood of aborted visits, which will further delay the roll-out, but only impact Settlement in terms of deferred benefits.</p> <p>Installation errors that could impact Settlement data quality include crossed meters, allocating an unsuitable Standard Settlement Configuration (SSC) in 'install and leave' situations or inappropriate configuration of Meters where the customer has a switched load. These are a high risk because Settlement data will be inaccurate, but the likelihood is limited by the sub-sets of metering arrangements that are at risk.</p>				
Risk Factors	<p>Problems arising on installation could result in site visits taking longer than planned, visits being aborted or 'install and leave' situations, where there are no working communications. This could prolong the overall roll-out schedules. Issues could include:</p> <ul style="list-style-type: none"> • Customer availability; • Refused entry due to consumer perception or lack of engagement; • Difficulty gaining access to long-term vacant premises or unmanned sites; • Problems arising from 'gas-first' installations; • Meter location issues; • Site safety issues, particularly for Small to Medium-sized Enterprises (SMEs); • LDSO support may be needed (for example in the case of shared cut-outs); • Lack of skilled installer availability could lead to sub-standard installation processes; • Issues relating to vulnerable customers; • DCC commissioning process failures. <p>For infrequently read or long-term vacant sites, final readings on the old meter may reveal data quality issues (see also risk area 4 - Legacy).</p> <p>Difficulties in matching meters to a customer's MPAN or address, may result in aborted</p>				

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	<p>visits, or in the worst case to “crossed Meters”. There is currently no communications solution for multiple occupancy sites.</p> <p>The change of responsibility for configuring Meters, from the MOA to the Supplier, creates a risk of configuration issues, including the remote configuration being inappropriate for the on-site situation e.g. electrical storage heating. This is particularly acute for non-standard set-ups such as Radio Tele-switch sites and twin-element/‘off peak’ arrangements. The pressure to install large numbers of Meters in short timescales could result in sub-standard commissioning and configuration processes.</p> <p>In the case of an ‘install and leave’ scenario, the Supplier will not have configured the time of use registers of the Meter, so will need to assign an SSC that is appropriate to the manufacturer’s default settings.</p>
Settlement Impact	<p>Settlement benefits of access to more frequent, more accurate readings will be further delayed as a result of aborted visits. Delays to the roll-out would also result in deferred benefits from dependent changes such as Half Hourly Settlement and reducing the Settlement reconciliation timescales.</p> <p>The allocation of energy volumes to Suppliers will be impacted by crossed Meters or register configuration issues (especially in the case of non-standard metering).</p>
Market Impact	<p>High numbers of aborted visits will cause further delays to the introduction of reforms which are partly or wholly dependent on smart metering, such as Half Hourly Settlement, faster and more reliable switching, innovative tariffs, demand side response and smart grids.</p> <p>Loss of consumer confidence in smart metering and reputational damage to the industry programme.</p> <p>Commissioning errors could affect customers with electrical storage heating and cause billing issues for customers with multi-rate tariffs.</p>
Current Mitigations	<p>For delays to the completion of the roll-out due to aborted visits, refer to risk area 1 – Readiness.</p> <p>Install and Commissioning tests are included in the Smart Energy Code (SEC) Common Test Scenarios Document (CTSD) as part of User Entry Process Testing (UEPT). However, they are not mandated, consist of format testing on a command-by-command basis, rather than end-to-end storyboard testing and are currently being carried out with Meter and user emulators. Choreography of the commissioning process is dependent on individual Meter types, so it is expected that Suppliers will carry out their own testing.</p> <p>Customer access to data through In Home Displays (IHDs) should reduce the risk of crossed meters. Under the Smart Meter Installation Code of Practice (SMICoP), Suppliers have an obligation to demonstrate the IHD to the customer, so a crossed Meter should be picked up and rectified on site during the installation.</p>

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	<p>Errors in commissioning smart Meters where the customer has a switched heating load may be immediately evident to the consumer or hidden (for example, if the consumer is still receiving 7 hours of storage load at a different time to that of the replaced legacy Meter). The greater risk to Settlement is where the Supplier doesn't align the register switch times with load switch times (Risk Area 7) or notifies an inconsistent SSC to the MOA (Risk Area 8).</p>
Proposed Mitigations	<p>ELEXON could use its database of Data Transfer Network (DTN) flows to report Metering Systems which are still allocated to a Radio Tele-switch (RTS) SSC after a smart Meter has been installed. These would indicate potential risk to the extent that the SMETS2 register configuration may not match the RTS SSC switch times. Any such Metering Systems would need to be migrated to new SSCs before the RTS service is discontinued, along with any legacy Metering Systems still assigned to RTS SCCs. This may not be viable until the later stages of the smart roll-out when Auxiliary Load Control Switches are available, tested and in use. The risk will be limited to circa 1.5 million Metering Systems.</p> <p>No additional mitigations have been identified for this risk area.</p>

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Risk Area/description	3) Inter-operability	The risk that the gaining Supplier is unable to successfully process Metered Data following a Change of Supplier (CoS)			
Likelihood	Medium	Settlement Impact	Medium	Settlement Risk Rating	Medium
Risk Rating Commentary	The centralised DCC service and Smart Metering Equipment Technical Specifications (SMETS) should mean that the Meters are interoperable. However, multiple new DCC and Supplier processes inevitably carry risk.				
Risk Factors	<p>SMETS 2 Meters operated using the DCC should be more inter-operable than SMETS 1 Meters operated by SMSOs (Smart Meter System Operators) due to the reduced need to transfer communications and security details between different service providers.</p> <p>However, inter-operability issues associated with SMETS 1 Meters, across multiple head end systems and with different Meter types, will endure until these Meters can be enrolled and adopted by the DCC.</p> <p>There may still be SMETS 2 inter-operability issues due to:</p> <ul style="list-style-type: none"> • Different interpretations of the requirements in the SMETS and GB Companion Specifications (GBCS); • Different interpretations of Zigbee and DLMS COSEM¹ protocols; • Operating smart and non-smart processes concurrently; • Not all Suppliers being ready to operate the DCC processes at the same time; • Errors in configuring variant metering (e.g. switched load, off-peak) at the same time as a CoS, including failures to identify the Meter type and capability or switched load ahead of the CoS. <p>There are also risks associated with the 'bedding in' of new processes, including:</p> <ul style="list-style-type: none"> • The implementation of Modification P302 'Improve the Change of Supplier Meter read and Settlement process for smart Meters'; • The potential increase in the use of Time of Use tariffs and the complexities of register mapping that this could bring; • The new Change of Measurement Class (CoMC) process for elective Half Hourly, especially where concurrent with a CoS; • Switching prepayment to credit on a CoS. <p>Under the transitional CoS security arrangements (TCOS), the DCC will act as a broker to ensure that the gaining Supplier can access the Meter. Under the enduring arrangements (ECOS), to be implemented (provisionally) at the same time as Ofgem's Faster and More Reliable Switching changes, the gaining Supplier will be</p>				

¹ Device Language Message specification (DLMS): Companion Specification for Energy Metering (COSEM)

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	reliant on the losing Supplier to gain security access, creating a new risk.
Settlement Impact	<p>The allocation of energy volumes to Suppliers will be affected by issues in processing and agreeing CoS reads.</p> <p>The reading performance of the gaining Supplier may be adversely affected by inter-operability issues.</p> <p>HAN operability issues should not impact the CoS process.</p>
Market Impact	<p>Delays or inaccuracies in customer billing.</p> <p>Loss of consumer confidence in smart metering and reputational damage to the industry programme.</p> <p>Inaccuracies in Transmission Use of System (TNUoS) and Distribution Use of System (DUoS) charging.</p>
Current Mitigations	<p>Technical interoperability should be ensured by compliance with the SMETS, the GBCS, Zigbee and DLMS COSEM protocols and the DCC User Gateway Interface Specification (DUGIS).</p> <p>Smart Meter Device Assurance (SMDA) was initiated by Energy UK, the British Electrotechnical and Allied Manufacturers Association (BEAMA), the Energy and Utilities Alliance (EUA) and the Community of Meter Asset Providers (CMAP). It provides a way of providing energy suppliers with a means of testing compliance with their GBCS and DCC interoperability obligations. Gemserv is the Scheme Operator and the use of the service is optional for Suppliers.</p> <p>A governance framework has been established to resolve GBCS interpretational differences arising from testing.</p> <p>A central firmware library, which would improve interoperability, has been proposed as a SEC modification.</p> <p>Failures to retrieve readings as a result of interoperability issues will be manifested in Serial SP08a 'Energy on Annual Advances at each Volume Allocation Run' (and associated PAF techniques, routine monitoring against Settlement Risk (SR0074²), Error and Failure Resolution (EFR) and Peer Comparison). Customer own reads are an additional mitigation, as are pedestrian reads, subject to the availability of field staff.</p>
Proposed Mitigations	Although Modification P302 was implemented in June 2016, the revised processes have not been used because of delays to the smart roll-out. The Issue 69 workgroup suggested that ELEXON could hold a process walkthrough and educational session

² SR0074 - The risk that NHHDCs do not collect and / or enter valid Meter readings resulting in old/default data entering Settlement.

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	<p>on P302.</p> <p>No additional mitigations are proposed in relation to technical interoperability. The definition of technical interoperability requirements is under the SEC rather than the BSC.</p>
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Risk Area/description	4) Legacy	The short term risks that the smart metering roll-out will identify historical error and will divert resources away from addressing legacy metering data quality and performance issues. The longer term risks associated with supporting an ever-diminishing pool of non-smart Meters.			
Likelihood	Medium	Settlement Impact	Medium	Settlement Risk Rating	Medium
Risk Rating Commentary	There is a higher likelihood of issues arising during the later stages of the smart roll-out. Data quality issues identified on removing infrequently read legacy Meters will be limited to a small sub-set of Metering Systems.				
Risk Factors	<p>For infrequently read or long-term vacant sites, the final readings on the old meter may reveal historical data quality issues. There is a risk that these issues could delay the processing of subsequent smart Meter readings.</p> <p>The prioritisation of the smart roll-out over legacy metering could result in data quality and performance issues for legacy metering being neglected.</p> <p>There may also be issues in segmenting systems for traditional and smart Meters.</p> <p>In the longer term, servicing the residual pool of non-smart Meters could be subject to a number of risks;</p> <ul style="list-style-type: none"> • A reduced stock of non-smart Meters; • Increased costs arising from the loss of ongoing support from manufacturers for traditional Meters and higher rental charges from Meter Asset Providers (MAPs); • A shrinking market for traditional MOAs (who could potentially go out of business), as well as the loss of skills, could result in difficulties in maintaining the residual non-smart Meters; • The reduction in Non Half Hourly Data Collector (NHHDC) field staff and the loss of density, will make traditional Meters harder to read; • The diminished NHHDC role, due to loss of the retrieval function, diminished validation requirements and any take up (whether elective or mandatory) of Half Hourly Settlement could shrink the competitive marketplace for NHHDCs. However, this may be offset to some extent by the need to address data quality issues. 				
Settlement Impact	<p>Higher levels of historical data error may be uncovered:</p> <ul style="list-style-type: none"> • at the time of the roll-out due to the high numbers of premises being visited that may not have been visited for a long time; and • after the roll-out, because regular remote readings show that historical readings were inaccurate. <p>Arguably this is as much a data cleansing opportunity as it is a risk. Depending on how Suppliers choose to resolve errors, there may be increased use of Gross Volume Correction (GVC) and impacts on GSP Group Correction Factors.</p>				

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	<p>The diversion of resolving legacy data quality issues and the longer term risks associated with supporting an ever-diminishing pool of non-smart Meters will both impact Settlement reading performance (and hence accuracy). However, the balance between improved performance for a growing pool of smart Meters and reduced performance for a shrinking pool of traditional Meters should result in a net opportunity rather than a net risk.</p>
Market Impact	<p>Delays or inaccuracies in customer billing.</p> <p>Loss of consumer confidence in smart metering and reputational damage to the industry programme.</p> <p>Volatility in TNUoS, DUoS and (potentially) Balancing Services Use of System (BSUoS) charging.</p>
Current Mitigations	<p>Reductions in legacy performance will be evident through Serial SP08a and the current PAF mitigations will apply – routine monitoring against SR0074, EFR and Peer Comparison.</p> <p>Suppliers should be making allowances for the resources needed to resolve legacy issues as part of their roll-out plans.</p>
Proposed Mitigations	<p>The Issue 69 workgroup considered whether smart and legacy metering should be subject to separate monitoring.</p> <p>This would require a Modification, particularly if delivered through the use of new Measurement Classes and Consumption Component Classes, which would entail costly changes to the NHH Data Aggregator (NHHDA) and Supplier Volume Allocation Agent (SVAA) systems. These changes would be rendered redundant if and when Half Hourly Settlement is mandated.</p> <p>The balance of risk between legacy and smart will be continually changing over the course of the roll-out, presenting a challenge in terms of applying appropriate weightings to the respective performance measures.</p> <p>Ultimately, both legacy and smart issues will manifest themselves in increased volumes of Estimated Annual Consumption (EAC) values, which are less accurate than Annualised Advances (AAs). As an EAC for a smart Meter at Final Reconciliation is likely to be no better or worse than an EAC for a traditional, non-smart Meter, there appears to be limited benefit in differentiating performance.</p> <p>Once the roll-out is sufficiently advanced, ELEXON will be able to use 'Metering System EAC/AA Data' (D0019) and 'Non Half-hourly Meter Technical Details' (D0150) flows from its DTN flow database, to review the relative movements in actual energy performance for legacy, smart and NHH advanced metering. This would be based on annualised volumes, but these are a reasonable proxy for the profiled volumes used by SP08a. Alternatively, ELEXON could apply period profile coefficients to replicate the SP08a calculations. Incorrect Meter Types, 'Install and Leave' instances and the DTN flow database not encompassing all data flow submissions would mean that</p>

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such analysis would not provide a suitable basis for peer comparison or EFR. However, it would help support any further decisions on differentiated performance monitoring.

ELEXON will provide guidance on addressing data quality exceptions on legacy Meters that are identified as a result of installing smart Meters.

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Risk Area/description	5) Metering	The risk that Metered Data is inaccurate or cannot be retrieved due to metering issues.			
Likelihood of systemic issues with a batch of Meters	Very Low	Settlement Impact	Very High	Settlement Risk Rating	Low
Likelihood of issues with individual Meters	Very High	Settlement Impact	Very Low	Settlement Risk Rating	Low
Risk Rating Commentary	The likelihood and impact of metering faults will vary depending on the scale of the fault.				
Risk Factors	<p>There is a risk that Meters do not operate correctly or in accordance with the multiple technical specifications. Faults could be systemic and may not be identified until large numbers of Meters are already installed.</p> <p>The replacement of faulty Meters could be hampered by non-availability of functioning Meters.</p> <p>Firmware upgrades, whether to resolve faults or add functionality, will present challenges in terms of site information (e.g. good quality information on the Meter Type, SMETS version, firmware version at each site), co-ordination across Suppliers, scheduling and comms availability.</p> <p>Whilst not specifically a Settlement Risk, the inter-changeability of devices connected to the communications hub could add complexity.</p> <p>Lack of understanding and management of Meter alerts and faults could result in data quality issues, as could lack of co-ordination between separate gas and electricity Suppliers at a premises.</p>				
Settlement Impact	<p>Potential data quality issues.</p> <p>Reduced Settlement reading performance (and hence accuracy).</p>				
Market Impact	<p>Delays or inaccuracies in customer billing.</p> <p>Loss of consumer confidence in smart metering and reputational damage to the industry programme.</p> <p>Inaccuracies in TNUoS, DUoS and (potentially) BSUoS charging.</p>				
Current Mitigations	In 2015 the Department of Energy and Climate Change (DECC), now the Department for Business, Energy and Industrial Strategy (BEIS), developed a Device Assurance Framework (DAF) for smart devices. This includes device functionality and device interoperability.				

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	<p>Device functionality testing covers the ability of smart metering equipment to complete the actions defined in the SMETS and GBCS. Only a subset of this functionality (obtaining readings and configuring time of use registers) is needed for Settlement purposes.</p> <p>Suppliers will test that devices are in line with the SMETS and existing metering obligations to obtain European Conformity (CE) and Measuring Instruments Directive (MID) marking. Suppliers are required to retain evidence of testing.</p> <p>Device manufacturers and test houses are carrying out additional functionality testing.</p> <p>The 'Code of Practice for the Calibration, Testing and Commissioning Requirements of Metering Equipment for Settlement Purposes' (CoP 4) will still apply.</p> <p>In many cases it should be possible to resolve functionality issues using firmware upgrades (subject, of course, to there being no issues applying the upgrades).</p> <p>Customer access to data through IHDs may help identify metering issues.</p>
Proposed Mitigations	<p>None proposed.</p> <p>SMETS compliance falls outside the BSC scope, the risk is deemed to be low and the DAF provides a higher level of metering assurance than is currently the case for NHH metering under the BSC.</p>

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Risk Area/description	6) Communications	The risk that readings cannot be retrieved remotely due to communications issues.			
Likelihood of regional network failures	Very Low	Settlement Impact	High	Settlement Risk Rating	Low
Likelihood of comms. issues at individual sites	Very High	Settlement Impact	Very Low	Settlement Risk Rating	Low
Risk Rating Commentary	<p>The likelihood and impact of communications faults will vary depending on the scale of the fault.</p> <p>The wider the scale of the failure, the higher the likelihood of the DCC resolving it more quickly. Even though a regional network failure would have a high short-term impact, it is extremely unlikely that it would impact Settlement accuracy at Final Reconciliation.</p>				
Risk Factors	<p>The centralised provision of communications (or at least regional) could result in failures of an entire regional network. Risks include lack of robustness of the Wide Area Network (WAN) and inability to manage heavy network traffic, multiple user connections and high volume transactions, such as tariff rate changes and firmware upgrades. There are also security risks and the potential for hacking.</p> <p>Non-industry changes to common protocols e.g. Zigbee could impact DCC communications.</p> <p>At a more local level, risks include:</p> <ul style="list-style-type: none"> • Signal black spots in remote areas and difficult Meter positions; • Interference with the Meter by other devices on the Home Area Network (HAN) or from other home networks; • Incorrectly installed or commissioned Communication Hubs or equipment damage. <p>Where communications issues arise, resolution may be challenged or delayed by:</p> <ul style="list-style-type: none"> • Difficulties in isolating causes to the HAN or WAN; • Unclear user responsibilities or processes for fault resolution; • The potential need for firmware upgrades to communication hubs and the difficulties in co-ordinating and scheduling these. <p>Whilst one alternative to remote readings in the event of comms failures is to take 'eye-ball' or 'pedestrian' readings, this will be less effective as the roll-out progresses, field staff numbers decline and the efficiencies from the density of premises reduce.</p> <p>Whilst WAN issues will impact the retrieval of data for Settlement purposes, some</p>				

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	HAN issues will only impact the consumer.
Settlement Impact	Reduced Settlement reading performance (and hence accuracy). The impact will clearly depend on the duration of any comms failures. Only those communication failures that extend beyond the Final Reconciliation window will have a lasting impact on Settlement performance.
Market Impact	<p>Delays in customer billing (depending on the duration of the comms. failure).</p> <p>Customer inconvenience if comms hubs need to be replaced.</p> <p>Loss of consumer confidence in smart metering and reputational damage to the industry programme.</p>
Current Mitigations	<p>Supply Licence Condition 49 requires Suppliers to take all reasonable steps to ensure that a connection is established that enables the exchange of information between the Smart Metering System and the DCC.</p> <p>Device interoperability testing under the DAF is designed to assure the ability of smart metering equipment to communicate effectively and work together with other parts of the smart metering system.</p> <p>Assurance includes:</p> <ul style="list-style-type: none"> • Testing that devices meet GBCS requirements, including the SMDA and GBCS Interface Test (GFI); • Zigbee certification; • DLMS COSEM certification; • Commercial Product Assurance (CPA) certification (including security); <p>The SEC Panel maintains a Certified Products List (CPL) with details of Zigbee, DLMA COSEM and CPA certification.</p> <p>The DCC is responsible for the certification of communications hubs against the Communication Hub Technical Specification (CHTS). The DCC also provide Communications Services Provider (CSP) test lab services to allow users to test communication with their own Meters.</p> <p>The DCC is also subject to an Operational Performance Regime (OPR), which includes service levels for:</p> <ul style="list-style-type: none"> • WAN coverage and reliability; • Response times for core service requests; • Communications Hub delivery and quality; • Service and system availability; • Resolution of incidents by the Service Desk.

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	<p>Where there is an outage of more than 1 million supply points (Severity Level 1), the Service Level Agreement with CSP's is for them to fix within 4 hours. The lowest Severity Level (Level 5 for up to 30k supply points) is 10 days.</p> <p>The DCC publishes WAN coverage tables and details of allowable 'black spots'. Supplier volume forecasts and randomisation processes have been designed to mitigate the risks caused by network traffic bottlenecks.</p> <p>"Mesh" radio technology will be used as "in-fill", to supplement connectivity in hard to reach locations.</p> <p>Communications in multi-dwelling units are still under consideration.</p> <p>Failures to retrieve readings as a result of interoperability issues will be manifested in Serials SP08a (for NHH) and SP08c (for elective HH) and the current PAF mitigations will apply – i.e. routine monitoring against SR0074, EFR and Peer Comparison.</p>
Proposed Mitigations	<p>None proposed.</p> <p>The definition of communications requirements is under the SEC rather than the BSC. The risk is low and the PAF does not offer any obvious additional mitigations.</p>

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Risk Area/description	7) DCC User Interface	The risk that Metered Data is inaccurate or cannot be retrieved due to problems with DCC internal processes or the Supplier interface with the DCC.			
Likelihood	Medium	Settlement Impact	Medium	Settlement Risk Rating	Medium
Risk Rating Commentary	Impacts are variable depending on whether issues are with DCC or Supplier systems and the nature of the failure.				
Risk Factors	<p>The risk that the DCC processes do not work as intended, for example:</p> <ul style="list-style-type: none"> • Errors in translating data to and from the smart Meter; • Failures in performance and response times (against Service Level Agreements); • Problems with the security credential exchange process, impacting Supplier access to Meters; <p>The risk that Supplier processes do not work as intended, for example:</p> <ul style="list-style-type: none"> • Issues in command sequencing or interpreting responses; • Poor management of alerts; • Inadequate segmentation between SMETS 1 and SMETS 2 processes, Meters that are DCC-enrolled or not, and legacy metering processes; • Mapping issues between the Meter Serial Number (MSN) used in Data Transfer Catalogue (DTC) flows and the Globally Unique Identifier (GUID) used by the DCC. <p>The risk that issues in either or both DCC and Supplier processes are not identified because of insufficient numbers of different Meter Types in end-to-end testing or because of varying attitudes and approach to compliance from industry parties.</p>				
Settlement Impact	Reduced Settlement reading performance (and hence accuracy). Errors in translating data to and from the smart Meter could result in erroneous reads and therefore erroneous AAs entering Settlement. This in turn would lead to inaccurate imbalance charges.				
Market Impact	<p>Delays or inaccuracies in customer billing.</p> <p>Loss of consumer confidence in smart metering and reputational damage to the industry programme.</p> <p>Inaccuracies in TNUoS, DUoS and (potentially) BSUoS charging.</p>				
Current Mitigations	<p>The DCC functions are subject to System Integration Testing (SIT) between the DCC, Data Services Provider (DSP), CSPs, Registration Data Providers (RDPs) and Smart Meter Key Infrastructure (SMKI) Service Provider. Oversight is provided by an independent auditor and SEC Panel reporting.</p> <p>DCC Users will be subject to UEPT using the CTSD. These tests are designed to</p>				

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	<p>ensure that prospective DCC users can send and receive messages in accordance with the DUGIS, Message Mapping Catalogue (MMC) and the Self-Service Interface (SSI), for alerts and responses. DCC Users must retain test evidence.</p> <p>For new functionality (e.g. new service requests), the DCC will run an informal test process.</p> <p>The DCC's Parse and Correlate functionality will provide standard software for converting messages to and from the Meter into Extensible Markup Language (XML).</p> <p>Failures to retrieve readings as a result of interoperability issues will be manifested in Serials SP08a (for NHH) and SP08c (for elective HH) and the current PAF mitigations will apply – i.e. routine monitoring against SR0074, EFR and Peer Comparison.</p>
Proposed Mitigations	<p>None proposed.</p> <p>The DCC functions and interfaces fall under SEC governance and assurance. Whilst failures in these processes are a risk to Settlement, there are no real opportunities to mitigate these risks under the BSC PAF.</p>

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Risk Area/description	8) Supplier – agent interface	The risk that Metered Data is inaccurate or missing as a result of problems with the Supplier interface with its MOA and DC.			
Likelihood	Medium	Settlement Impact	High	Settlement Risk Rating	High
Risk Rating Commentary	Suppliers may be unprepared for their new, more active role or delegate responsibilities to service providers who fall outside the Performance Assurance Framework. There will be a steep learning curve for Suppliers, exacerbated by high numbers of Meter exchanges and, potentially, increases in the numbers of tariffs.				
Risk Factors	<p>MOAs will not configure DCC-serviced SMETS 2 Meters. Instead the Supplier will maintain the switching times of the Time of Use registers to support the tariffs offered to the customer. Suppliers will send the MOA a 'Smart Meter Configuration Details' (D0367) flow or use an alternative method of notification by agreement. This is a new role for Suppliers who will need to develop more technical expertise or sub-contract the translation of DCC User Interface responses into DTC flows. An increase in Time of Use tariffs will mean that Suppliers have to reconfigure Meters at a greater frequency than NHHMOAs have previously had to reconfigure traditional Meters.</p> <p>Suppliers, rather than NHHDCs will retrieve routine readings, and Supplier will need to pass these to their NHHDC on a 'Meter Readings' D0010 flow. Although Suppliers already send customer own readings to their NHHDCs, they will be sending readings at high volumes.</p> <p>There are risks that:</p> <ul style="list-style-type: none"> Suppliers, in taking over the responsibility for configuring Meters from the NHHMOA, map registers to an incorrect SSC or a configuration that is not supported by a valid SSC in Market Domain Data (MDD), or formulate the D0367 (or equivalent) incorrectly. There is a potential lack of expertise within supply companies (or their service providers) in mapping SSCs to switching times; Suppliers may fail to send a D0367 on configuration of a smart Meter or final/initial readings on reconfiguration or meter replacement; Suppliers may send inaccurate reading data as a result of translation errors (for example, if customer reads are provided to fewer significant digits than readings retrieved remotely) or fail to send readings in a timely manner; Suppliers may send readings to the NHHDC in respect of Meter Register Ids that are inconsistent with those provided to the NHHDC by the MOA; Suppliers will be configuring Meters and taking final and initial readings in the context of new and largely untried processes, including P302, concurrent CoS and CoMC for elective Half Hourly; Suppliers may have implemented contradictory processes in terms of their expected interfaces with agents; Suppliers are unprepared for new responsibilities such as scheduling 				

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	readings and carrying out preliminary validation checks.
Settlement Impact	<p>Configuration errors (or incorrectly representing the configuration on a D0367 flow or equivalent) could create data quality issues, including allocating consumption to the wrong Settlement Periods.</p> <p>Reduced Settlement reading performance (and hence accuracy).</p>
Market Impact	Delays or inaccuracies in customer billing, if the Supplier elects to bill on NHHDC-validated readings.
Current Mitigations	<p>Failures to process readings as a result of missing readings or missing meter configuration details will be manifested in Serials SP08a (for NHH) and SP08c (for elective HH) and the current PAF mitigations will apply – i.e. routine monitoring against SR0074, EFR and Peer Comparison.</p> <p>PARMS Serial NM11 'Timely Sending of NHH MTDs to NHHDCs' (on change of MTD) and PARMS Serial NM12 'Missing NHH MTDs' (on change of agent) will identify late and missing MTD flows. However, the extent to which NHHMOA performance is attributable to Suppliers not sending D0367 flows cannot be readily measured. A significant increase against a Supplier (in relation to more than one NHHMOA) could be an indicator of D0367 issues.</p> <p>The XML messages will report readings in Wh. Failure to convert into kWh should be trapped by ELEXON's Erroneously Large EAC/AA monitoring.</p>
Proposed Mitigations	<p>ELEXON will assess the feasibility of monitoring the sending of D0367 flows. Options include extending ELEXON's database of DTN flows to include the D0367 and monitoring delayed or missing flows. As Suppliers can use alternative methods of notifying configuration details to their NHHMOA, ELEXON will first check the likely coverage of the D0367. Alternative options would be to use the BSC Audit or Technical Assurance of Performance Assurance Parties (TAPAP) checks.</p> <p>Peer Comparison against NM11 can be applied to both Suppliers and NHHMOAs. The limitation would be that the Serial doesn't differentiate between Supplier performance in sending D0367 flows and NHHMOA performance in sending D0150 flows. Supplier performance could be inferred to some extent, but only where evident in respect of more than one NHHMOA.</p> <p>Monitoring of the D0367 flow will mitigate the risk of Suppliers not sending configuration details, but not the risk that the configuration details do not represent how the Meter is actually configured.</p> <p>ELEXON will also assess the feasibility of assuring the correct translation of DCC commands messages from XML into D0367 and D0010 data flows. This will include exploring the potential for sample-based desk top audits (e.g. as part of a TAPAP check) or a more automated approach in order to allow wider scale monitoring</p>

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Although BSCP504 4.16 requires NHHDCs to retain the sources of readings for audit purposes, there is no current requirement for Suppliers to retain XML messages from the DCC. Depending on the eventual approach adopted, a Change Proposal may be needed in this area.

See also risk area 4 (Legacy) for the Issue 69 group's consideration of separating smart and legacy performance measures.

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Risk Area/description	9) Meter operations	The risk that Meter Technical Details are inaccurate or missing as a result of MOA processes.			
Likelihood	Low	Settlement Impact	Medium	Settlement Risk Rating	Medium
Risk Rating Commentary	The NHHDC will be unable to validate smart Meter readings without the Meter Technical Details (MTD) from the MOA.				
Risk Factors	<p>The MOA should receive a 'Smart Meter Configuration Details' (D0367) flow from the Supplier or alternative method of notification by agreement. The MOA will then use these details to complete the 'Non Half-hourly Meter Technical Details' (D0150) and 'Notification of Mapping Details' (D0149).</p> <p>There are risks that:</p> <ul style="list-style-type: none"> • NHHMOAs do not receive configuration details from Suppliers in time to send the Meter Technical Details to the NHHDC; • NHHMOAs create translation errors between the D0367 (or equivalent) and the D0150/D0149; • NHHMOAs have inadequate exception processes for addressing missing or incorrect D0367 flows; • Suppliers and NHHMOAs are unclear about their respective responsibilities for fault resolution. <p>The NHHMOA role will diminish as responsibilities for configuration are passed to Suppliers. This could make the role less attractive, both to the incumbents and potential new entrants, reducing competition. In the longer term, this could result in a scarcity of NHHMOA services, impacting legacy as well as smart meters.</p>				
Settlement Impact	Reduced Settlement reading performance (and hence accuracy) as the NHHDC will not have the MTD to validate smart readings. There is also a small risk that translation errors could result in readings being processed incorrectly by the NHHDC and erroneous AAs entering Settlement.				
Market Impact	<p>Delays or inaccuracies in customer billing, if the Supplier elects to bill on NHHDC-validated readings.</p> <p>Adverse impacts on agent competition if MOAs are marginalised by their reduced role.</p>				
Current Mitigations	<p>PARMS Serial NM11 'Timely Sending of NHH MTDs to NHHDCs' (on change of MTD) and PARMS Serial NM12 'Missing NHH MTDs' (on change of agent) will identify late and missing MTD flows.</p> <p>The Serials will not differentiate between failures or delays by the NHHMOA in sending MTD and failures or delays by the Supplier in sending the configuration details.</p> <p>Failures to process readings as a result of missing MTD will be manifested in Serials SP08a (for NHH) and SP08c (for elective HH) and the current PAF mitigations will apply – i.e. routine monitoring against SR0074, EFR and Peer Comparison.</p>				
Proposed	If D0367 monitoring proves to be feasible, this could be used to provide supporting				

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Mitigations	<p>information in cases where NHHMOAs are underperforming against Serial NM11.</p> <p>Peer Comparison against NM11 can be applied to both Suppliers and NHHMOAs. The limitation would be that the Serial doesn't differentiate between Supplier performance in sending D0367 flows and NHHMOA performance in sending D0150 flows. Supplier performance could be inferred to some extent, but only where evident in respect of more than one NHHMOA.</p> <p>See risk area 4 (Legacy) for the Issue 69 group's consideration of separating smart and legacy performance measures.</p>
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Risk Area/description	10) Data Processing	The risk that smart Meter readings are not successfully validated and/or processed by Data Collectors.			
Likelihood	Low	Settlement Impact	Medium	Settlement Risk Rating	Medium
Risk Rating Commentary	Although NHHDCs will have a reduced role in terms of data retrieval, fault resolution and some validation checks, they are still on the critical path for ensuring that readings from smart Meters are included in the Settlement calculations.				
Risk Factors	<p>Data Collectors are unable to process smart Meter readings because:</p> <ul style="list-style-type: none"> • Meter Technical Details are not received on time, or at all; • DC systems and operational process are not capable of supporting the increased volume of readings; • Supplier reading schedules are not optimised in relation to DC processing schedules; • The readings do not align with the Meter Register Ids provided by the Supplier via the MOA. <p>The responsibility for the quality of reading data will be split between the Supplier and the NHHDC. The register mappings that the NHHDC will hold for the purposes of validating readings from the Supplier will have been provided by the Supplier (via the MOA) so the readings and MTD should be consistent. Unless there has been a long period of comms unavailability, readings should be consistent with previous readings from the same smart Meter. So while the Supplier, MOA and NHHDC can cause valid readings to be incorrectly rejected, it will be unlikely that the NHHDC will trap invalid readings based on independent information. The independent role of the NHHDC will be diminished.</p> <p>There is a risk that the NHHDC role is marginalised as responsibilities for data retrieval and some validation checks are passed to Suppliers, leaving EAC/AA calculation and the interface with the NHHDA (both of which are standardised) and the maintenance and transfer of the Meter Read history (the latter only required on change of NHHDC, as not needed in the smart CoS process). This could make the role less attractive, both to the incumbents and potential new entrants, reducing competition. In the longer term, this could result in a scarcity of NHHDC services, impacting legacy as well as smart meters.</p>				
Settlement Impact	Reduced Settlement reading performance (and hence accuracy) if the NHHDC is unable to validate smart readings.				
Market Impact	<p>Delays or inaccuracies in customer billing, if the Supplier elects to bill on NHHDC-validated readings.</p> <p>Adverse impacts on agent competition if NHHDCs are marginalised by their reduced role.</p>				
Current Mitigations	Failures by the NHHDC to process readings will be manifested in Serials SP08a (for NHH) and SP08c (for elective HH) and the current PAF mitigations will apply – i.e. routine monitoring against SR0074, EFR and Peer Comparison.				

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Proposed Mitigations	<p>A potential review of NHHDC and Supplier validation requirements (and the auditing of those requirements) in the light of experience, once the roll-out has gained momentum.</p> <p>See risk area 4 (Legacy) for the Issue 69 group's consideration of separating smart and legacy performance measures.</p>
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7. Lessons from roll-out of Advanced Meters, P272 and 'Foundation metering'

Ref.	Problem / Solution	Lesson for smart roll-out
Advanced Meters		
1	<p>Although installation targets have not yet been met, there are high numbers of installed Meters. Advanced Meters have delivered:</p> <ul style="list-style-type: none">• Improved access to unmanned sites (e.g. mobile phone masts);• Improvements in Settlement read performance;• Improvements to customer billing;• Improved energy management;• Reductions in Supplier costs;• Leveraging of elective HH Settlement.	<p>It is important to remember that the smart metering roll-out carries the short-term risks commensurate with an undertaking of its size and complexity, but represents a longer-term opportunity rather than a threat.</p>
2	<p>Inter-operability (and other) issues during the Advanced Meter rollout included:</p> <ul style="list-style-type: none">• Swapping out Meters on change of MOA or defaulting to 'dumb' mode on CoS;• Novating SIM cards;	<p>These issues will not apply to DCC-serviced SMETS Meters:</p> <ul style="list-style-type: none">• the detailed SMETS and GBCS should ensure consistent metering;• the standard user interface with the DCC will allow a consistent view of how Meters are configured;• central communications and security negates the need for transfer of MTD

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Ref.	Problem / Solution	Lesson for smart roll-out
	<ul style="list-style-type: none"> • Inconsistencies in the definition of an Advanced Meter; • Failing to understand the configuration on change of agent; • Failures in the exchange of Auxiliary MTDs on change of agent; • Issues arising from customer-contracted agents. 	<ul style="list-style-type: none"> • and SIM card contracts between industry parties; • customer-contracted agents will be low in numbers in the domestic and small non-domestic sector.
3	<p>Advanced Metering issues that are also likely to be risks for the smart Metering roll-out include:</p> <ul style="list-style-type: none"> • challenging regulatory targets; • regulatory uncertainty (for example, about whether there will be a current transformer solution for the DCC); • the need for alternative comms solutions for low-signal areas (the cost of alternative solutions means they are not as viable in the domestic and small non-domestic sector); • forecasting stock requirements; • difficulties in replacing Radio Tele-switches; • the need for LDSO support to resolve connection issues; • making and keeping appointments with customers and the need for out-of-hours installations to meet customer needs; • lack of ongoing reviews of processes designed before the roll-out began; 	<p>Advanced Meter issues that are also likely to be smart roll-out risks have been included in the risk register in Section 6.</p> <p>The smart roll-out risks will clearly be bigger due to the scale of the roll-out. A smaller selection of SMETS 2 Meters will mean that Suppliers have less scope to vary the supply chain in order to ensure that they have sufficient Meters. Suppliers will perform a more significant role, due to their increased responsibilities and the smart CoS, elective HH CoMC and fault resolution processes will be less well established.</p> <p>On the other hand, the DCC should provide better information about communications coverage ahead of site visits, than was the case with the Advanced Meter roll-out.</p>

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Ref.	Problem / Solution	Lesson for smart roll-out
	<ul style="list-style-type: none"> delays in obtaining final readings from replaced Meters due to legacy issues. 	
P272		
1	<p>A high percentage of Metering Systems were migrated by the 1 April 2017 deadline after a slow start. The Issue 69 workgroup considered that P272 had been helped by:</p> <ul style="list-style-type: none"> close management and control from ELEXON through the use of Supplier Management Plans (SMPs), although the Supplier Monthly Updates (SMUs) were challenging because of “churn” and changing reporting requirements; good Supplier and agent co-ordination eventually, although this was lacking early on; Ofgem focus and well-publicised enforcement options. 	<p>The smart Metering roll-out is not mandated by the BSC, unlike P272, so it is not incumbent on ELEXON to monitor Supplier progress. Instead this will be carried out by Ofgem.</p> <p>Whilst MOAs will have a key role as Meter installers, the smart roll-out will be more Supplier-focussed and Supplier-led. There will not be the same need to draw up new agent contracts.</p>
2	<p>Issues with P272 that are unlikely to occur (or will be significantly reduced) during the smart roll-out include:</p> <ul style="list-style-type: none"> Failures in the exchange of Auxiliary MTDs (particularly Level 3 passwords); Historical mismanagement of Profile Class allocation led to customers who should not have been in Profile Classes 5 to 8 	<p>Where issues do not translate to smart roll-out risks they have not been included in the risk register in Section 6.</p>

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Ref.	Problem / Solution	Lesson for smart roll-out
	<p>having to move to HH Settlement and caused customer resistance;</p> <ul style="list-style-type: none"> • Lack of visibility of Profile Class 5-8 Metering Systems with Advanced Meters but no working communications caused scope and planning problems; • Multiple Supplier-agent CoMC processes; • CoMC processes that were originally designed in relation to physical Meter exchanges needed additional Change Proposals; • Confusion about the date used for the final NHH reading; • Communications issues on Change of Supplier following P272; • DUoS charging was not reflective of Profile Class 5 to 8 consumption; • On-going issues in converting 'Auxiliary Meter Technical Details' (D0313) flows into 'Half Hourly Meter Technical Details' (D0268) flows; • Initial lack of clarity (resolved by Change Proposals) about requirements for commissioning and proving tests. 	
3	P272 issues that are also likely to be risks for the smart Metering roll-out include:	P272 issues that are also likely to be smart roll-out risks have been included in the risk register in Section 6. It is notable that, although P272 was subject to multiple issues,

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Ref.	Problem / Solution	Lesson for smart roll-out
	<ul style="list-style-type: none"> • Lack of participant readiness at the start of the migration; • Difficulties in addressing any residual "problem sites". 	few are also applicable to the smart roll-out.
Foundation metering		
1	<p>Smart Meters (including SMETS1 Meters) have been installed in high numbers (circa 5 million). They have:</p> <ul style="list-style-type: none"> • provided an initial boost to Settlement performance, albeit constrained by subsequent inter-operability issues on CoS; • provided lessons learnt in terms of the installation process, communication issues and Home Area Networks; • allowed for trials of Time of Use tariffs; • provided customer education on smart Meters; • identified legacy issues, resulting in aborted installs. 	Suppliers will have learnt lessons from Foundation metering to varying degrees. Many Suppliers will not have installed any smart Meters to date.
2	<p>Issues with Foundation metering that are unlikely to occur (or will be significantly reduced) during the smart roll-out include:</p> <ul style="list-style-type: none"> • installing Meters before clear rules and metering and communications standards had been introduced; • installing Meters against a background of evolving licence obligations (although there is still some uncertainty about how 	Where issues do not translate to smart roll-out risks they have not been included in the risk register in Section 6.

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Ref.	Problem / Solution	Lesson for smart roll-out
	<p>long SMETS 1 Meters can be installed);</p> <ul style="list-style-type: none"> • register labelling issues (as standards have been introduced for SMETS 2 Meters); • lack of clarity about the Meter Type inherited by a Supplier or agent (richer Meter Type data is defined in the DTC for SMETS 2 Meters). • Inter-operability issues (because of central communications and standard protocols and user interface). 	
3	<p>Foundation metering issues that are also likely to be risks for the smart Metering roll-out include:</p> <ul style="list-style-type: none"> • innovative use of tariffs in billing not reflected in Settlement; • challenges arising where customer has separate gas and electricity Suppliers; • managing “install and leave” sites (i.e. where the smart Meter has been installed, but functioning communications are not in place or Meter has not been commissioned); • difficulties in identifying pre-payment types; • recording and providing firmware versions (should be less of a risk due the DCC inventory); • the need for customer education on smart Meters. 	<p>Foundation metering issues that are also likely to be smart roll-out risks have been included in the risk register in Section 6.</p>