Department
of Energy &
Climate Change

TBDG Design Note

Document Title:	Change of Supplier

	FOR INFORMATION	FOR COMMENT	FOR DECISION
Purpose of Paper*	Whilst the content of design notes were subject to peer review and considered to be accurate at the time of their publication, changes may have since taken place that mean this is no longer the case. In any event, design notes should be considered to contain non-binding clarifications on the topic identified. In the event of any conflict or inconsistency between any design note and any relevant licence conditions, the SEC or any other relevant regulation, the relevant licence conditions, SEC and/or other relevant regulation shall take precedence over the design note.		
Summary of Document Purpose	To provide clarification on the design of the smart metering solution in relation to Change of Supplier (CoS). This Design Note excludes coverage of issues relating to CoS of prepayment customers which are addressed in a separate Design Note.		
Submitted By	Colin Sawyer, DECC	**Meeting Date**	DD/MM/YYYY
Document Status*	FIRST DRAFT	FOR INTERNAL REVIEW	TBDG DRAFT	FINAL

*Delete as appropriate

Approval				
Version	**Purpose**	**Name**	**Position**	**Date**
0.1	First draft	Colin Sawyer	DECC	4/2/14
0.2	Revision based on PM/MB comments	Colin Sawyer	DECC	10/2/14
0.3	Revised based on internal review and Elexon comments	Colin Sawyer	DECC	12/2/14
0.4	Updated for discussion at TBDG workshop	Colin Sawyer	DECC	25/3/14
0.5	Updated following TBDG workshop	Colin Sawyer	DECC	9/4/14
1.0	Approved by TBDG for publication	Colin Sawyer	DECC	7/5/14
1.1	Updated to include revised introductory text	Adam Dudzinski	BEIS	19/4/17

1. Introduction

1.1   Summary of action required from TBDG

1. TBDG is invited to note this draft Design Note and that no changes are required to existing baseline documents (SMETS, CHTS, DCC User Gateway Catalogue) or the drafting of SEC.

2. TBDG is invited to note that ELEXON is taking forward work to determine whether any changes are required to the Balancing and Settlement Code in relation to CoS procedures where smart meters are installed (Issue 53).

3. TBDG is invited to note that SPAA / UNC have set up a parallel initiative to the ELEXON work to consider the implications for gas change of shipper (supplier).

4. TBDG is invited to note that Ofgem is planning to review whether the Effective Switching obligations established for Advanced and Foundation meters should apply to SMETS2 meters operated by DCC Users.

1.2   Identification of the issue

5. This Design Note covers features of the smart metering solution design pertaining to CoS. The topics addressed are:

    - Actions by gaining suppliers in advance of CoS
    - Configuration of the meter by the gaining supplier
    - Action required by the losing supplier
    - Data requirements of the settlements processes
    - Implications of 'meter CoS' and SSD not being aligned
    - Combined CoT/CoS

6. Issues relating to prepayment functions and how prepayment customers may be impacted by CoS are excluded from the scope of this paper and are covered by a separate Design Note. Issues related to CoS at opt-out / opt-in of non-domestic customers are also outwith the scope of this Design Note.

2. Background and Context

7. Processes covering the switching of customers between energy suppliers are set out for electricity in the Master Registration Agreement (MRA) and for gas in the Supply Point Administration Agreement (SPAA) and relevant Uniform Network Code. The act of switching a customer between suppliers also has implications for the retail market settlement functions as defined by the Balancing and Settlement Code (BSC) and Uniform Network Code (UNC). The introduction of smart metering has triggered the need for changes to the CoS regulations and these have been progressed under the SMIP's Consequential Issues Group and by stakeholders acting as Parties to the Codes / Agreements.

8. In terms of smart metering, the security and privacy controls dictate that the registered supplier for a metering point is the only party capable of configuring parameters on the meter (e.g. tariff)

which impact energy supply or financial calculations[1]. These controls are implemented through the use of security credentials which are held on the meter. Only the supplier whose credentials are held on the meter is permitted to perform these 'critical' commands and only one supplier's credentials may be present at any one time.

9. DNO / GTs are not expected to be impacted by the transfer of smart meters between suppliers at CoS. There is no requirement for the network operator's security credentials to be updated or for their configuration data items to be changed at CoS. Calculation of use of system charges will continue to be determined by reference to legacy registration and/or settlement systems.

10. At Initial Live Operations (ILO) the exchange of supplier security credentials will be performed using the Transitional CoS method. Under this method the gaining supplier will submit a SR6.23 CoS Update Security Credentials (see SEC H4.18). The DCC will validate that the gaining supplier is the registered supplier, or has a registration pending, and at the specified date/time the CoS Party[2] will initiate the command to replace the security credentials on the meter with those of the gaining supplier[3].

11. The solution design assumes that suppliers specify that the SR6.23 CoS Update Security Credentials is executed at a date/time which is equal to (or as close as possible to) the Supply Start Date (SSD) shown in the registration system[4].

12. In future, the Transitional CoS Method will be replaced by an Enduring CoS Method in which the losing supplier will take over the CoS Party's responsibilities for updating the security credentials. The timing for switching from the Transitional to the Enduring CoS Method has yet to be agreed.

13. Whenever the CoS Update Security Credentials command is executed the meter will send a response to the losing supplier (see UGIS SR6.23 and GBCS Section 13). If the meter is holding any future dated commands at the time security credentials are updated, these commands will become invalid[5].

14. During the period following ILO it is possible that some suppliers may be DCC Users while others have yet to complete User Entry Process Testing. The arrangements for switching a customer between a DCC User and a 'non User' are outwith the scope of this Design Note and will be covered under the Foundation Steering Group.

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[1] The registered network operator is also permitted to update a very limited set of network-related data items.
[2] The CoS Party is a discrete operational unit within DCC authorised to update security credentials on meters.
[3] Prior to sending the Update Security Credentials command to the meter the CoS Party will undertake a separate validation against the registration data. This eliminates the possibility that the pending supplier has been changed in the interim and mitigates the risk of rogue transactions being generated within DCC.
[4] It is recognised that for gas the settlement day begins at 06:00 not 00:00. The snapshot of the daily read log for a SMETS2 gas meter is specified to occur at midnight and the CoS read may be taken from this. Gas settlement rules allow the opening read to be taken at CoS plus or minus 5 days. Electricity settlement uses local time so there will be a 1 hour difference between meter and local time during BST.
[5] Commands executed by the meter must match the supplier credentials held by the meter at the time of execution. It follows that future dated commands issued by the losing supplier will not match the credentials of the gaining supplier so – following CoS – these transactions will not be valid.

3. Smart Metering Design Approach

3.1 Actions by gaining suppliers in advance of CoS

15. The first question that a gaining supplier may raise is whether a prospective customer has a smart meter. This can be resolved by reference to the relevant legacy registration systems which are updated with an indicator of whether a smart meter has been installed at the relevant MPxN.

16. During the process of signing up a new customer the gaining supplier will not be able to access data from the customer's meter using its supplier organisation code as only the registered supplier[7] is permitted such access. Gaining suppliers will however be able to access information using their Other User role code[8]. They may also wish to access data from the DCC's inventory database.

17. For a given MPxN or address / UPRN, gaining suppliers will be able to access data through the DCC's Self Service Interface (SSI) to show all devices (device ID and device type) that are installed. For each device the supplier will then be able to 'drill down' to see the manufacturer, model number, device status and firmware version. From the manufacturer / model number the supplier can determine whether a meter is SMETS 1 or 2[9] and whether it is a 'variant' electricity meter (i.e. polyphase, twin element, or meter with ALCS and/or boost button).

18. Using its Other User role code the gaining supplier may also wish to retrieve data from the meter to support sales activities or to prepare for CoS (again, retrieval is subject to customer consent). Data that suppliers may wish to retrieve includes:

   - Payment mode – credit or prepayment
   - ALCS settings – including randomisation offset (electricity only)
   - Profile data, daily consumption log and tariff – may be used to prepare a quotation / price comparison

19. If the metering point has no WAN connection the data listed above will not be accessible remotely. Suppliers can use the WAN coverage matrix to determine whether the lack of WAN connection is temporary or permanent[10].

3.2 How should the gaining supplier configure the meter at CoS?

20. The operational licence condition (see condition 49.4 for electricity and 43.4 for gas) requires suppliers to provide access to Customer Information via the HAN, including the cost of energy consumed. This implies that the supplier must – subject to all reasonable steps – download the effective tariff to the meter from the time they become the registered supplier (i.e. from SSD). In order to satisfy this obligation, the gaining supplier will need to arrange for the CoS Update

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[7] Or previous suppliers in relation to the period when they were the registered supplier

[8] When using the Other User role code suppliers will be subject to SEC requirements to secure the customer's permission prior to accessing consumption data.

[9] The general principle is that, when issuing service requests, suppliers should not need to be aware whether a meter is SMETS 1 or 2 as DCC will handle all transformations. Suppliers may need to be aware that SLAs for SMETS 1 adopted comms contracts may be different from those operated by the CSP.

[10] There is a limited discussion of no-WAN options at paragraph 41 and a separate Design Note will be prepared to address no-WAN scenarios, including CoS with no-WAN.

Security Credentials command, followed by other configuration commands discussed below, to be issued in advance of or at SSD.

21. It will be for gaining suppliers to decide how to configure meters inherited at CoS. This paper identifies issues that suppliers may take into account when designing their business processes and systems.

22. A key principle is that the command to update security credentials will not modify any other data stored by the meter[11]. This means that data such as tariff details, prepayment parameters, time of use register values and ALCS settings will be in the state they were left by the losing supplier, until such time that they are updated by the gaining supplier.

23. The fact that data items on the meter are carried over at CoS presents the possibility that the gaining supplier could access personal data (e.g. Time and Payment Debt Registers) that do not pertain to them. To prevent their staff inadvertently accessing such personal data, it is assumed that gaining suppliers will reset such data items immediately following CoS.

24. A full list of configuration and operational data items is included in SMETS / GBCS. Key data items that gaining suppliers may wish to consider updating or resetting are as follows:

- Prepayment configuration parameters (e.g. emergency credit threshold / limit, disablement threshold, disablement calendar, low credit threshold and debt recovery): (see UGIS / GBCS references: SR1.6 / ECS02 & ECS03, GCS02 & GCS03; SR2.3 / ECS07, GCS04; SR2.1 / ECS08, GCS05) suppliers should set these parameters to align them with the gaining supplier's terms, as set out in the contract with the customer. If the gaining supplier intends to operate the meter in credit mode these fields could be left unchanged: however if suppliers adopt this approach they will need to ensure the parameters are reset when/if the payment mode is subsequently changed to prepayment[12]
- Balances:
  - Meter to be operated in prepayment mode: treatment of the Meter Balance is discussed in a separate Design Note. It is assumed that the Debt Registers and the Emergency Credit Balance will be reset to zero (this will cause the Debt to Clear Balance to be reset to zero)
  - Meter to be operated in credit mode: the Meter Balance (see UGIS / GBCS references: SR1.2 / ECS04, GCS40) can be set to reflect the opening balance of the customer's account with the gaining supplier (i.e. generally zero). The display of meter balance for credit customers is not mandatory.
- Auxiliary load control parameters (see UGIS / GBCS references: SR7.12 / ECS38; SR6.14 / ECS46a&b; SR7.5, 7.6, 7.7&7.8 / ECS47a,b,c&d): the treatment of these data items is addressed in a separate Design Note on ALCS. Suppliers' attention is drawn to BSC obligations regarding the alignment of switching times with Standard Settlement Configurations (SSCs)
- Gas specific parameters (see UGIS / GBCS references: SR6.6 / GCS23; SR6.7 / GCS24): suppliers are responsible for configuring the calorific value and conversion factor and for setting the uncontrolled gas flow rate and valve behaviour

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[11] Other than future-dated commands which are invalidated – see paragraph 13
[12] The treatment of prepayment customers at CoS is the subject of a separate Design Note.

- Tariffs: this topic is discussed below
- Billing calendar (see UGIS / GBCS references: SR6.8 / ECS30, GCS25): this calendar triggers the meter to take snapshots of billing data at predefined dates/times. At the specified dates/times the meter will send an alert containing the snapshot of billing data to the comms hub, for onward transmission to DCC and the supplier
- Contact details (see UGIS / GBCS references: SR3.4 / ECS16, GCS44): suppliers are expected to provide a contact telephone number for the supplier's contact centre. Having up to date contact details is particularly important for prepayment customers who may need to make special arrangements (e.g. to issue a manual UTRN) in the event that a remote top-up cannot be performed. Suppliers may also choose to send a supplier message (e.g. "welcome to your new supplier") or a blank message to overwrite any message left by the losing supplier (see UGIS / GBCS references: SR3.1 / ECS10, GCS07)
- Device logs (see UGIS / GBCS references: SR8.6 / CS01; SR8.7 / CS02; SR8.11 / ECS76; SR8.12 / ECS78):   device logs on comms hubs and meters contain the security information which join devices to the HAN and link Type 1 & 2 devices with meters (e.g. to designate the IHD a meter will provide data for). If the gaining supplier modifies a device log the consumer may be prevented from continuing to use a PPMID, IHD or CAD which had been installed.
- Supply status and load limiting (see UGIS / GBCS references: SR4.15 / ECS27; SR6.4 / ECS28a&b; SR7.4 / ECS45, GCS33):   suppliers will need to decide whether to routinely check that supply is enabled and/or armed and whether any load limiting is in operation
- Time (see UGIS / GBCS references: SR6.19 / ECS60, GCS50; SR6.11 / ECS70, GCS28): suppliers are responsible for setting the time on the meter (i.e. synchronising the meter clock with the comms hub) and may choose to issue a Synchronise Clock service request at CoS. They may also consider checking / updating the local time change rules
- Instantaneous power thresholds (see UGIS / GBCS references: SR6.12 / ECS34): these values affect the low/med/high usage indicator displayed on an IHD. Suppliers may wish to review with the customer whether the previous values were appropriate or whether they should be adjusted
- MPAN/MPRN (see UGIS / GBCS references: SR6.20 / ECS39a&b, GCS41): suppliers are responsible for ensuring that the correct MPxN is held on the meter so, following CoS, they may wish to check the MPxN is correct
- Supply tamper state (see UGIS / GBCS references: SR6.25 / ECS81): suppliers can configure the meter such that if a Tamper Event is detected the meter can disable supply or leave supply state unchanged.

25. In addition to the above, suppliers may also wish to determine which firmware version is currently in operation (see UGIS / GBCS references: SR11.2 / ECS52, GCS38). This can be compared against the latest firmware version available for that product (which the supplier can access from the Certified Products List) to determine whether a firmware update is required.

Setting tariffs

26. Suppliers are required by the Operational Licence Conditions to set tariff and pricing parameters on the meter to align it with the terms agreed with the customer.   The tariff and pricing

parameters are used to calculate monetary consumption values (e.g. Instantaneous Active Power Import value) and the Meter Balance displayed on the IHD[13].

27. A key feature of SMETS is that meters have multiple registers which are used to record consumption by time of use period and consumption blocks (i.e. first n units in a period billed at one price, next n units billed at another price, etc.). The registers can be used by suppliers in whatever manner suits their tariff structure and there are no obligations to use the registers in an industry-standard manner (e.g. no requirement to use particular registers for day and night consumption). Accordingly there is risk if losing and gaining suppliers use different registers the customer cannot easily discern the relationship between closing and opening reads. Steps to mitigate this risk include:

- Customer education: during the sales process prospective suppliers can explain how the registers are used under the proposed tariff and how the customer can reconcile the closing and opening reads
- Standardisation: it is noted that EUK is considering the merits of defining a portfolio of standard register-use regimes which suppliers could adopt for commonly-used tariffs

28. The consumption recorded on the tariff registers cannot be reset by suppliers (i.e. this ensures that the aggregated consumption across all registers will always be equal to the value in the Active Import / Consumption Register – the MID register). It is assumed that Suppliers will retrieve and store the register values at CoS and use them as the base against which advances since CoS are measured. A standard set of descriptors for the registers is specified in DUGIS.

29. The gaining supplier should set whichever of the following are relevant to the terms agreed with the customer (see UGIS / GBCS references: SR1.1&1.2 / ECS01, GCS01; SR1.7 / ECS05):

- The Tariff Type – Time of Use or Time of Use with Block
- The Tariff Switching Table – to set the rules defining which registers are to be used for recording consumption in every time period
- The Time of Use price matrix – prices for time of use pricing
- The Tariff Threshold Matrix – the thresholds for controlling block tariffs
- The Tariff Block Price Matrix – prices for block pricing

30. At minimum (i.e. for a single rate tariff) the solution design assumes that the supplier will: set the tariff type (to time of use); set a single switching rule (to assign all consumption to a single TOU register); and set a single price to be applied to that register. This will have the effect of showing a constant price per kWh on the IHD and calculating the Instantaneous Active Power Import and Meter Balance based on this constant price.

3.3   Action required by the losing supplier

31. Ofgem's 'Effective Switching' obligations require losing suppliers to clear down tariff and other data which could result in misleading information being presented to customers following CoS. These obligations were developed to address situations where Foundation meters are subject to CoS and the gaining supplier is unable to operate them as 'smart' (and therefore to download a new tariff to the meter). Ofgem is planning to review whether these obligations should apply to

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[13] It is not mandatory to display the Meter Balance where the meter is in credit mode.

meters operated by DCC Users, where the gaining supplier is under Operational Licence Condition obligations to ensure that the current tariff is used to calculate the value of energy consumed.

32. If DCC-operated meters are not subject to the Effective Switching rule, losing suppliers will not need to undertake any configuration of meters prior to or at CoS. Under the Transitional CoS Method the timing of the Update Security Credentials service request is determined by the gaining supplier and for this reason it will not be possible to guarantee that the losing supplier can synchronise their actions with those of the gaining supplier.

33. In future this position will change as the Enduring CoS Method will require gaining suppliers to instruct the losing supplier to perform the update to security credentials. At the point of switching to the Enduring CoS Model the SEC Panel may wish to consider whether it would be appropriate to require the losing supplier to take action – for example to reset any sensitive data fields (e.g. debt registers).

34. It is assumed that losing suppliers will close the customer's account based on a closing read taken at Supply Start Date (SSD). The closing read can be taken from the Daily Read Log (see UGIS / GBCS references: SR4.6.1 / ECS21a, GCS16a) which contains daily 'snapshots' of specified operational data items taken at midnight. 31 entries are stored in the Daily Read Log with the oldest entry over-written each day. The losing supplier can access the Daily Read Log for the period while they were the registered supplier (including the read at midnight on SSD – i.e. both gaining and losing supplier can access this entry).[14]

3.4   Data requirements of the settlements processes

35. The current settlements processes for gas and electricity require gaining suppliers to submit opening reads. In addition, for electricity the losing supplier is required to submit a closing read and for gas the losing shipper (supplier) can submit a closing read if they disagree with the gaining supplier's read. Existing arrangement include procedures for resolving disputes, following which a CoS reading is agreed. This is used to set the point at which responsibility for wholesale energy is transferred from the losing to the gaining supplier. It is expected that the volume of disputes should fall significantly when both suppliers are able to rely on data retrieved from the Daily Read Logs of smart meters.

36. Work is currently being undertaken in the Issue 53 workgroup to define a modification to the BSC to require the losing supplier to submit a closing read for electricity settlement. This will require the losing supplier to submit advances for those registers which relate to the SSC. This avoids the need for the gaining supplier or ELEXON to understand the mapping of registers to the SSC elements. A similar modification is at the early stages of consideration by SPAA for gas settlement. These obligations will only apply to SMETS meters.

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[14] In the TBDG workshop there was discussion as to whether the Billing Data Log might be used in preference to the Daily Read Log, especially for gas meters where SSD occurs at 06:00 rather than midnight. Billing Data Log snapshots are triggered by changes to the tariff (and by the Billing Calendar). A Billing Data Log entry should therefore be generated by the tariff update at CoS but if the losing supplier uses this source they will in effect be reliant on the gaining supplier executing the CoS and tariff update in a timely fashion. Adopting this approach would also require a change to DCC's access control rules to allow the losing supplier to access a Billing Data Log entry after CoS.

3.5   Implications of 'meter CoS' and SSD not being aligned

37. In exceptional cases the CoS Update Security Credentials command will not be processed on SSD. This could arise due to:

- Gaining supplier failing to submit a CoS service request in time
- Registration data not being updated in DCC in time
- WAN being unavailable to transport the Update Security Credentials command to the meter at the scheduled time

38. The following paragraphs discuss implications arising from these three scenarios.

39. If the gaining supplier fails to submit the Update Security Credentials service request ahead of or at SSD they will have failed to satisfy their Operational Licence Conditions:

- The gaining supplier will only be able to configure / reset the meter once the security credentials have been updated. A new tariff – using a new set of TOU or block rate registers – will only take effect on the meter from this time (i.e. after SSD)
- The gaining supplier can take the CoS reading corresponding to SSD from the Daily Read Log. This can be used as the opening read for the gaining supplier's account and submitted to settlements as required
- If the gaining supplier is using a single rate tariff, the account balance (if displayed) for the 'missing' period between SSD and the security credentials being updated can be calculated offline and the Meter Balance set to this value
- If a complex (i.e. TOU or block rate) tariff is to be used the gaining supplier will need to estimate the starting Meter Balance (using the Daily Profile Log to estimate the 'missing' days with an explanation to the customer as to why an estimate was needed)
- If prepayment mode applies (either for gaining or losing supplier), the arrangements described in the Prepayment CoS Design Note will need to be considered

40. The treatment of exceptions when the registration data is not updated in DCC in time for CoS needs to be considered in the context of why the registration is 'late':

- DCC incident: if the DCC's version of registration data becomes corrupted and needs to be recreated from RDPs then service requests to Update Security Credentials may be rejected. DCC's BCDR arrangements should mitigate this risk and, at worst, RDPs are required by SEC to provide a refresh of the registration data. In such an exceptional event DCC's incident management procedures would need to include sending an advice to suppliers that CoS requests (and all other requests subject to access control) could be rejected until the registration data is refreshed
- Gas: CoS transactions become 'firm' in xoserve's registration system 7 days prior to SSD[15]. Once the new registration is firm it cannot be backed out. In the case of an erroneous registration the original CoS will proceed and a second CoS will be required to revert the MPRN to the previous supplier
- Electricity: there is no 'firm' CoS date as there is for gas. The gaining supplier is responsible for setting the SSD on the MPAS system but there is a 10 day 'objections

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[15] UNC Mod 477 will reduce the window from 7 days to 2 days. This is scheduled for implementation by end-2014.

window' during which the losing supplier may block the switch. As a result the SSD may need to be changed or withdrawn and – if an objection is subsequently removed – it is possible for SSD to be set retrospectively[16]. As for gas, erroneous transfers are corrected by processing a second CoS to reinstate the previous supplier. These arrangements give rise to the possibility that DCC's registration data will only show a CoS after SSD which, in turn, means that DCC and/or the CoS Party will not be able to process the change of security credentials at SSD

- Resolving registration errors: any errors that occur in registration data must be resolved in the master dataset (i.e. the RDP's database). DCC will not process modifications to registration data held in the copy it retains for validation purposes.

41. If the WAN is unavailable to transport commands to the meter at CoS:

- If the WAN unavailability is other than a short-term outage, the gaining supplier will need to consider whether to make a site visit to Update Security Credentials, capture the CoS read and configure the meter using a handheld terminal (this issue will be covered by a separate 'no WAN' Design Note)[17]
- In situations where the interruption to WAN service is only temporary the actions required will be similar to those where the gaining supplier fails to submit the Update Security Credentials request at SSD. This approach will work for up to 31 days (when the Daily Read Log starts to be over-written). After this date it will not be possible to retrieve opening / closing reads as at SSD.

3.6 Combined CoT/CoS

42. If there is a combined CoT/CoS and the incoming tenant fails to notify the supplier at the time they move in:

- It is assumed that existing arrangements will continue to be applied to cover the period between the date of CoT and the date when the incoming tenant notifies the gaining supplier and agrees a Supply Start Date. These arrangements involve the creation of a 'deemed contract' between the incoming tenant and the losing supplier for the CoT to SSD period with the new contract between the incoming tenant and the gaining supplier taking effect from SSD
- The losing supplier will need to close the outgoing tenant's account as at CoT and then invoice the incoming tenant for the CoT to SSD period.

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[16] Parties to the MRA are considering CP209 which proposes to reduce the objections window to 6 days (5 days to raise an objection and 1 to resolve objections) although this change request has not yet been authorised.

[17] The Issue 53 group will need to consider the implications of this: it is assumed that the gaining supplier will be the party to undertake a site visit but Issue 53 may place obligations on losing suppliers to retrieve reads for settlement. It would be highly inefficient to require both suppliers to undertake a site visit