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**D-4.2.1 CSS User Requirements Specification**

**Design Workstream**

**Ofgem Switching Programme**

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**References**

This document is associated with the following other documents:

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| [1] | Switching Programme Defined Terms | Ofgem | n/a | n/a |
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| [3] | D-4.1.4 E2E Switching Arrangements NFRs | Ofgem | 30/11/2018 | V2.1 |
| [4] | D-4.1.10 E2E Security Requirements | Ofgem | tba | tba |
| [5] | D-4.2.2 CSS Detailed Non-Functional Requirements | DCC | 30/11/2018 | V2.2 |

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# Executive Summary

This User Requirements Specification (URS) document describes the requirements for the Central Switching Service (CSS) which underpins the reformed Switching Arrangements. The document presents contextual information and a comprehensive view of the functional requirements, which are also described in context of the end-to-end arrangements in the D-4.1.2 Detailed Design Model**[2]** held in the CASE tool ABACUS. An appendix to this document provides a complete list of functional requirements, stated formally (to an evaluative standard). Non-functional CSS requirements are described in D-4.2.2 CSS Detailed Non-Functional Requirements[5].

**CSS** has various components, each of which has a different purpose and set of functionalities:

* The **CSS Registration Service** - manages the gas and electricity registrations and addresses associated with them;
* The **Address Service** - manages a complete list of GB standardised addresses and performs address matching; and
* The **Switching Network** - connects the CSS Registration Service to the other Switching Arrangements participants.

This document provides the functional basis for the CSS procurement activity, with the CSS solution being procured from one or more service providers. Since the procurement structure is not yet known, the components have been expressed in this document in functional terms, according to the above list. ”CSS” in the remainder of this document means CSS Registration Service; if “overall CSS solution” is meant, then this is stated explicitly.

*This document provides illustrative information on how central systems will operate. These requirements may be updated as the design progresses from the logical to the physical level. In particular, updates may be required as a result of procurement of the CSS as well as development of the changes needed to other central data services, such as UK Link and MPAS, which are being progressed under the UNC and MRA.*

# Introduction

## Purpose and Scope

The Ofgem Switching Programme will deliver faster switching – including the capability for next-day switching and improved reliability of the switching process through better management and oversight of industry data. It will introduce a new, flexible overall CSS solution for gas and electricity switches.

This document describes the required functionality of the overall CSS solution and its interfaces to other parties in the new Switching Arrangements, including the supporting Switching Network. The document’s purpose is to describe this functionality at a logical level in such a way that the overall CSS solution can be procured, noting that it may be procured from one or more service providers. The document does not describe the changes that suppliers will need to make to re-design their customer-facing processes to deliver faster switching.

This document provides a high-level view of the overall CSS solution; for an understanding of the detailed functionality required, it should be read in conjunction with the end-to-end design as described in D-4.1.2 Detailed Design Model (ABACUS)**[2]**. In particular, a good understanding of the Decision Services and Business Rules contained in ABACUS is necessary to complement the information in this document. The body of this document describes the functional requirements in terms of the overall CSS solution. A full list of functional requirements is found in Appendix A, in the form of a spreadsheet. The spreadsheet also contains the relevant Decision Services and Business Rules (extracted from ABACUS and provided here for completeness, which CSS will need to implement).

This User Requirements Specification uses logical constructs to describe functionality, but these should not be interpreted literally in the system design. The system design needs to achieve the same result, for example, the idea of a logical scheduler is used, to describe that certain events, like securing of a switch, occur at pre-defined times. The design need not include a scheduler, as long as it has an appropriate method of ensuring that the events happen at the correct time.

This document describes only functional requirements; non-functional requirements are described for the end-to-end design in D-4.1.4 E2E Switching Arrangements NFRs**[3]** and will be described for CSS specifically in D-4.2.2 CSS Detailed Non-Functional Requirements[5].

## Document Contents

The document contains the following:

* An overview of the solution, together with assumptions and constraints;
* CSS Registration Service functions:
  + A description of the way in which CSS creates and maintains Registrations (covering the processing of Initial Registration Requests, Switch Requests, Annulment Requests, Objection Requests, Withdrawal Requests, Registration Event Requests and Deactivation Requests);
  + CSS facilities for managing addresses;
  + A description of the operations facilities needed to run CSS, including those for loading Switching Domain Data;
* Address Service functions:
  + A description of the Address Service facilities for address matching; and
  + The way in which CSS and the Address Service interact.
* Switching Network functions:
  + A description of the capabilities provided by the Switching Network.
* Interfaces
  + A description of the interfaces between CSS and other Central Data Services/Market Participants.
* Appendices containing a comprehensive list of functional requirements, an introduction to the data model (CSS-focused parts of the end-to-end D-4.1.2 Detailed Design Model (ABACUS)**[2]**) and a glossary.

# Overview

## End-to-End Switching Arrangements

The diagram below – Figure 1 - shows the systems that will participate in the end-to-end Switching Solution; each system is referenced in this document as a Data Service. With the exception of CSS, all the Data Services identified in the diagram exist currently. The Switching Domain Data Service, which exposes an interface to all Switching data services that may choose to act upon Switching Domain Data, and CSS in particular, is omitted from the diagram as it takes place only inside the realm of Switching governance. The Central Data Services are coloured blue and will undergo significant change as part of the Switching Programme. The flows shown are the major ones involved in switching.

Licenced Party Data Services (where each party is responsible for establishing and operating its own solution) are shown in yellow and will be subject to significant change. Supplier Agents’ Data Services (where each agent is responsible for establishing and operating its own solution) are shown in green and will be subject to limited change.

Those Data Services shown in white are indirectly linked to the Switching Programme and will not change, although Price Comparison Website (PCW) systems may change to use Retail Energy Location address if they so decide.

The Electricity Central Online Enquiry Service (ECOES) and gas Data Enquiry Service (DES) are shown individually, as they currently exist, although it is possible these will be merged into a single Market Intelligence Service (MIS).



Figure 1 - Switching Programme Constituent Data Services

CSS exchanges messages with other participants using the Switching Network (with the exception of CSS Smart Metering where communication is via the Smart Metering Gamma network, due to the stringent Smart Metering security requirements). CSS has a number of different logical interfaces over which it sends and receives messages of different types and formats. Registration data sent from CSS to Smart Metering, ECOES and DES is sent in real-time as individual messages.

ECOES (electricity) and DES (gas) are the central enquiry services which all participants in the industry access to retrieve non-commercially sensitive data about metering points. These services will need to reflect the changing state of a registration as switch requests are processed. Registration data sent to MPAS and UK Link will also be sent as individual messages, but may be accumulated by MPAS and UK Link and processed overnight[[1]](#footnote-2).

## CSS, Address Service and Switching Network

In order to facilitate procurement of the CSS solution from different service providers, this document distinguishes between requirements placed on:

* **The CSS Registration Service** - which manages the gas and electricity registrations and associated data (including addresses): this is referenced in the rest of this document as “CSS”. Where the overall CSS solution is meant, this is explicitly stated;
* **The Address Service** - which manages a complete list of GB standardised addresses and performs address matching; and
* **The Switching Network** - which connects CSS to the other Switching Arrangements parties.

Figure 2, below, illustrates at a high level the distinction between CSS and the Address Service functions. The Address Service includes a gazetteer service(s) which will act as the primary source of GB geographical data.



Figure 2 - Distinction between CSS and Address Service functions

Each Registrable Measurement Point (RMP) has two addresses: that of the Meter Point Location (MPL) and that of the Retail Energy Location (REL). These addresses are not necessarily the same as in some cases meter points are sited at a different location from the premises where energy is consumed. MPLs are created and maintained by network operators (GTs and DNOs). The REL may be derived from the MPL or may be subject to an override advised by a supplier (possibly based on energy consumer feedback). Energy consumers are expected to specify the REL when identifying the energy supply they wish to switch. The RELs for gas and electricity meter points supplying the same premises should be identical. Where there is an officially-recognised regional language (for example Welsh), CSS will obtain both English and Welsh versions of the address from the Address Service, although there will only ever be a single MPL address received from the network operator (which could be in either English or Welsh).

## CSS Registration Service

Management of registrations and switches, together with their associated data (including address) is the primary purpose of CSS. Initial registration of a new metering point and switch of a supplier are both considered as Registration functionality, since a switch is a change to the registration.

As illustrated below, CSS provides two key data objects:

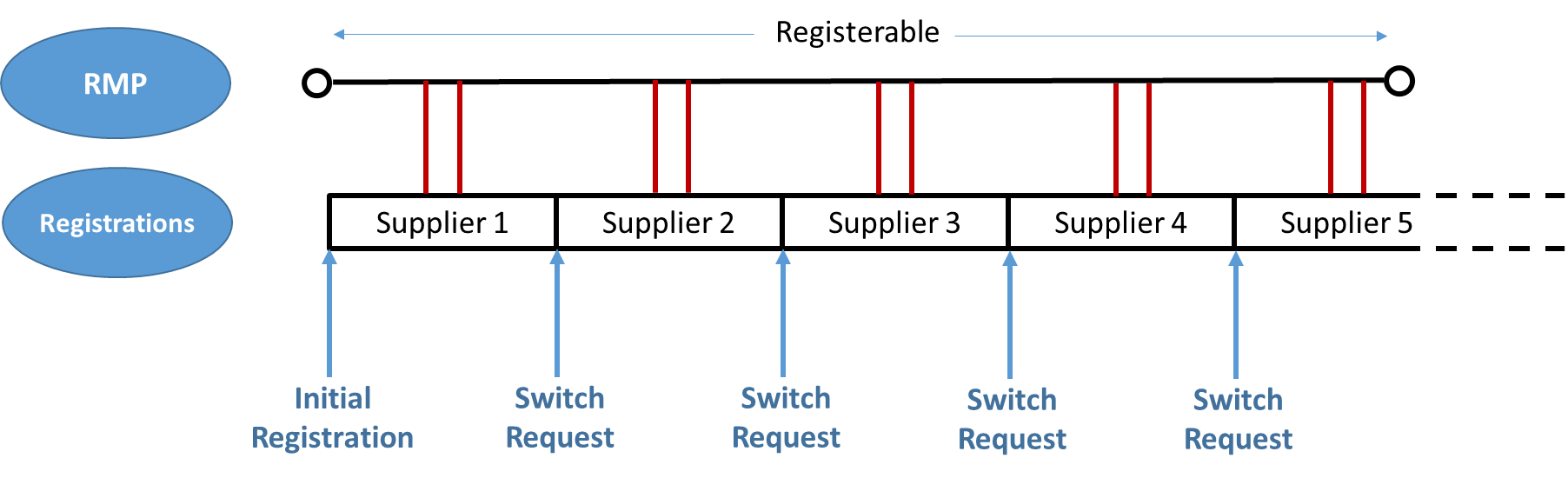
* + **Registration:** CSS masters and maintains the link between a Registrable Measurement Point (RMP) and the associated energy supplier, referenced by its Market Participant ID (MPID); this is the Registration, which shows the supplier with legal responsibility for that RMP. This link was previously mastered in MPAS and UK Link.
  + **REL Address:** CSS masters and maintains the Retail Energy Location (REL) Address. The REL address will stem from the Meter Point Location (MPL) address provided by the network operator or an address provided by the supplier. In either case the address supplied will be matched – by means of the Address Service - to a list of standardised GB addresses. This should maximise the probability of recording a legitimate REL address that the consumer will recognise. The REL address can be represented in English or an officially-recognised regional language.



**Figure 3 - Principal CSS Functionality**

Registration management provides the capability for energy suppliers to become the registered supplier for each RMP through a redesigned switching process. The process will be harmonised across gas and electricity, and changed to a supplier-led process for gas.

As illustrated in the diagram below, once a new RMP is synchronised from UK Link or MPAS to CSS, an energy supplier may seek to register itself; an initial registration may be submitted followed by a series of switch requests. CSS will facilitate the submission process, including the management of a number of differing process variations and interventions, and thereby maintain a continuous record of Registrations for each RMP throughout the lifespan of the RMP. Only one of these Registrations is Active at any point in time.



**Figure 4 – Registrations and RMP**

When a Registrable Measurement Point (RMP) is created and initially registered, CSS and the Address Service interact to find an address in the GB standardised address list (using the associated network party address provided by MPAS/UK Link). If one is found, CSS stores this address against the RMP, where it becomes the authoritative address to be relied upon and referred to by consumers and all parties engaged in the retail energy market.

CSS maintains a further logical object which together with the Registration, holds the registration information:

* **Registration Request** – provides the means of managing new and changed Registrations (switches); an Initial Registration Request and a Switch Request is known to CSS generically as a Registration Request.

When a consumer switches supplier, the gaining supplier submits a Switch Request, which the CSS records as a Registration Request, and which passes through different states during the switch process, from Submitted to Completed. The state is also used to represent any intervention from a losing supplier, such as an Objection or an Annulment. Upon transition from one state to another, CSS carries out particular processing, mainly relating to notifications to other participants or the synchronisation of data to other central data services. To validate the Switch Requests CSS uses market participant switching domain data, which includes sanctions applied against suppliers. The data is supplied by an external governance organisation.

The CSS data model held in ABACUS contains a logical view of the data which is stored in, or passed to or from CSS. This model does not represent a physical database design, but provides the basis (together with non-functional requirements) from which a physical database can be designed. The principal model concepts are described in this document to aid understanding of the ABACUS model. Each entity in the logical model is described in an appendix.

Availability, capacity, audit, adaptability, scalability and reliability requirements for CSS are specified in D-4.1.4 E2E Switching Arrangements NFRs**[3]** to ensure a flexible platform which will support future market evolution.

# CSS Registration Service

## Introduction

Management of Registrations and associated data is the core purpose of CSS. CSS maintains two key logical objects:

* Registration Request (the generic term used for Initial Registration Requests and Switch Requests); and
* Registration.

RMPs are also held: an RMP is replicated in CSS as a result of a synchronisation from MPAS/UK Link. When an RMP has been created in MPAS/UK Link and synchronised to CSS, upon submission of an Initial Registration Request by a supplier, a Registration is created for that RMP. A Registration records the supplier associated with an RMP (and for gas, also a Registration Event to declare the shipper, which may possibly be updated within the duration of the Registration by the addition of further Registration Events to declare a changed shipper). Multiple Registrations may be held in CSS for a single RMP so that a continuous historical record is created, with each Registration effective from a stated date through to a later date (or until present). Only a single Registration is Active at any point in time.

Registration states are held to control the lifecycle of changes to each Registration, which must be compatible with RMP lifecycle states. Similarly, Registration Request states, held to control the process of submission of Registration Requests, must align with Registration States. Further details of valid states, are described in section 4.3 - Registration Lifecycle State and full details of this and the other lifecycles, see the D-4.1.2 Detailed Design Model (ABACUS)[2].

CSS uses market participant switching domain data, provided by an external governance organisation (who will collate, coordinate and assure any changes requested by industry), to validate the Initial Registration Requests and Switch Requests that it receives. This data includes, but is not limited to, the valid energy supplier identifiers (MPIDs), relationships between MPIDs owned by the same company or group and any sanctions applied and valid gas shipper-to-supplier relationships.

Some features of CSS are screen-based, requiring an action by a member of the team operating CSS. Where this is the case, the term “CSS operations user” has been employed; this could mean a Service Management agent or an operator or other staff member, since the organisation structure is not yet known.

## RMP Lifecycle State

Registrable Measurement Point (RMP) lifecycle state changes are controlled by UK Link and MPAS as part of the administration of RMPs. RMPs together with their lifecycle states are synchronised from UK Link or MPAS to CSS, where they are used by CSS to constrain changes to Registration states in accordance with business rules, described in the following section.

## Registration Lifecycle State

New Registrations are created within CSS in response to energy suppliers submitting valid Initial Registration Requests or Switch Requests. When they are created, the Effective From Date lies in the future and their state is set to Pending and when the Effective From Date is reached their state moves from Pending to Active. While at Pending status, it is possible for energy suppliers to submit a Withdrawal or Annulment of the Registration Request, which sets the Registration status to Cancelled.

Also under defined circumstances (generally when a meter point reaches end of life), the registered energy supplier may submit a Deactivation Request, which sets the Registration status to Inactive.

The valid state transitions of each Registration are represented in the D-4.1.2 Detailed Design Model (ABACUS)[2]. A tabular representation of valid combinations of states is given below.

|  |  |
| --- | --- |
| RMP State | Valid Registration states |
| Created | None valid |
| Operational | Pending  Active  Cancelled  Inactive |
| Dormant | Pending  Active  Cancelled  Inactive |
| Terminated | Active  Cancelled  Inactive |

Table 1 - Valid Registration states for each RMP state

A pictorial representation of the same information is given in the figures below.

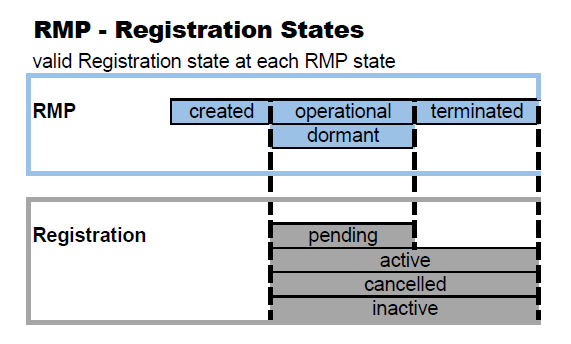


Figure 5 - Valid Registration states at each RMP state

## Registration Request State

New Registration Requests are created within CSS in response to energy suppliers submitting valid Initial Registration Requests or Switch Requests. These two types of request are referred to generically as Registration Requests.

Successful Registration Requests pass through the states of Submitted, Validated, Confirmed, Secured and Completed and the valid combinations of Registration and Registration Request states are set out below. Registration Requests which are invalid or whose progress is interrupted, may have the state of Rejected, Withdrawn or Annulled.

The valid state transitions of each Registration Request are represented in the D-4.1.2 Detailed Design Model (ABACUS)[2]. A tabular representation of valid combinations of states is given below: the first table shows the valid Registration states for each RMP state and the second shows valid Registration Request states for each Registration state. Registration Requests with a Rejected state contain a reason code to explain why the request was rejected (e.g. due to a validation failure or an objection by the losing supplier).

|  |  |
| --- | --- |
| Registration State | Valid Registration Request states |
| Pending | Validated  Confirmed  Secured |
| Active | Completed |
| Inactive | Completed |
| Cancelled | Annulled  Withdrawn  Rejected |

Table 2 -Valid Registration Request states for each Registration state

A pictorial representation of the same information is given in the figures below.

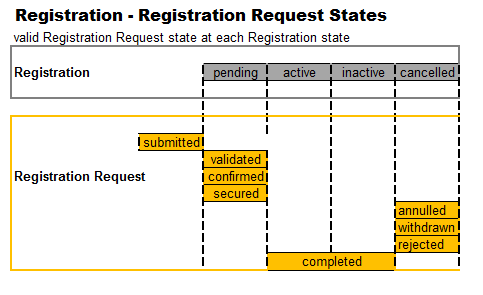


Figure 6 - Valid Registration Request states at each Registration state

## RMP Maintenance

### Introduction

In each function described below, a reference is made to the relevant business process in the D-4.1.2 Detailed Design Model (ABACUS)[2]. The reference is enclosed in square brackets in the function heading.

### RMP Creation and State Update [1.2, 2.14, 3.1]

Upon receipt of a synchronisation message from UK Link or MPAS containing information about a new RMP, CSS replicates this as an RMP together with its corresponding state of Created. When a message is received from UK Link or MPAS containing details of a change to the state (for example that it is now Operational or Terminated), CSS replicates the state accordingly. CSS then sends a synchronisation to Smart Metering to propagate the change.

Where the RMP state change is to Terminated and there is a Pending Registration, that Registration is Cancelled and the associated Registration Request is set to Rejected.

### RMP-Related Updates [1.2, 2.23]

Upon receipt of a synchronisation message from UK Link or MPAS containing information about RMP Associations (Related MPANs), Network Provision or RMP Events (Green Deal, Licence Exempt Network), CSS replicates the information. CSS then sends a synchronisation to Smart Metering to propagate the change where appropriate.

### Supplier Agent Update [2.11]

When a message is received from UK Link or MPAS containing details of a change to an agent (MEM - Metering Equipment Manager, or DC - Data Collector or DA -Data Aggregator), CSS replicates the agent held for the relevant RMP. CSS then sends a synchronisation to Smart Metering to propagate the change where appropriate.

### MAP Ownership Update [2.13]

When a message is received from UK Link or MPAS containing details of a change to the owning MAP, CSS replicates the information it holds for the relevant RMP.

### MPL Update [1.2, 2.15]

When the MPL for an RMP is first received from MPAS or UK Link, or when the MPL for an existing RMP is updated, CSS shall store this update and use it in the Address Management processes described in 4.7 - Address Management. CSS shall also send the MPL details to Smart Metering whenever it receives them.

## Registration Management

### Introduction

Registration maintenance covers both initial registration of an RMP and switching, since a switch is a change of registration, as well as deactivation.

This section describes initial registration first, followed by switching and deactivation.

The processing for an initial registration consists of:

* Receipt and validation of the Initial Registration Request and the initial processing;
* Securing the registration; and
* Completing the registration.

A request for initial registration may be withdrawn by the energy supplier that submitted the request, at any time between the Registration Request becoming Validated and becoming Secured.

Processing for a switch consists of:

* Receipt and validation of the Switch Request and the initial processing;
* Objection processing;
* Securing the switch; and
* Completing the switch.

A switch request may be withdrawn by the gaining supplier or annulled by the losing supplier at any time between becoming Validated and Secured.

A Registration may be de-activated by the energy supplier who holds the active registration, if the RMP is either Dormant or Terminated. Processing consists of:

* Receipt and validation of the Deactivation Request;
* Completing the deactivation.

Processing on receipt of an Initial Registration Request differs slightly from that for a Switch Request, so both are described below, as is processing for receipt of a Deactivation Request. Securing, completion and withdrawal are described only under the initial registration and are referenced from the switch, since these processes are common to both. Objection and annulment are described under switch.

The descriptions below include a logical concept of a Scheduler (of which there is an Objection Scheduler, a Securing Scheduler and a Completion Scheduler), which is used to represent events which are scheduled to happen at a pre-determined date and time.

In each case below, the changes in Registration Request state are described. The processing resulting from a state change may comprise:

* Synchronisations with other Central Data Services;
* Notifications to Market Participants;
* One-fail-all-fail (OFAF) testing and processing; and
* Related MPAN testing and processing.

### Initial Registration Request [1.4]

When an Initial Registration Request is received, it is stored by CSS as Registration Request with state Submitted. CSS validates it and if valid, changes the state to Confirmed, creates a Registration with state Pending and an entry in the Securing Scheduler derived from the effective date specified in the Request.

### Initial Registration Securing [1.6]

When the system time reaches the Securing Scheduler time for the Registration Request, CSS sets the Registration Request state to Secured, create an entry in the Completion Scheduler and send out notifications to Market Participants (see section 4.6.18 - Registration Request State Transitions) and synchronisations to the other Central Data Services.

### Initial Registration Completion [1.7]

When the system time reaches the Completion Scheduler time for the Registration Request, CSS sets the Registration Request state to Completed and the Registration state to Active (NOTE that when the same process is carried out for a switch, the state of the previous Registration is additionally set to Inactive).

### Initial Registration Withdrawal [2.7]

When a Withdrawal is received, CSS validates it and if valid, sets the Registration Request state to Withdrawn and the Registration state to Cancelled.

### Registration Deactivation [3.3]

When a Deactivation Request is received, CSS validates it and if valid sets the Registration state to Inactive.

There are provisions for the incumbent supplier to override a future dated Registration Deactivation request. In such cases, the submitter shall submit a request that contains an ‘active’ registration lifecycle status indicator along with an effective from date which is identical to that of the existing future dated request.

CSS shall update records in the order of the source capture time. When CSS completes processing an override, it shall send out the relevant synchronisations and notifications as per the standard process.

### Switch Request [2.3]

When a Switch Request is received, CSS validates it and if valid, records it as a Registration Request with state Validated, creates a Registration with state Pending and an entry in the Objection Scheduler and sends out an Invitation to Intervene message to the losing supplier.

CSS may be configured not to carry out objection testing, or to only carry it out under certain circumstances. For a switch where objection testing is not being carried out, the Invitation to Intervene is sent to the losing supplier, but without a date and time for the objection response. The Registration Request state immediately changes from Validated to Confirmed and no entry is made in the Objection Scheduler but an entry is made in the Securing Scheduler. The processing described in section 4.6.8 - Switch Objection [2.3] does not take place.

### Switch Objection [2.3]

There are provisions for the currently registered supplier – the losing supplier - to object to a switch requested by a gaining supplier. The circumstances under which objections may be raised are tightly prescribed and differ between domestic and non-domestic consumers. The Invitation to Intervene message provides the trigger for the losing supplier to decide whether the objections criteria apply and whether to object. The losing supplier has a set window of time during which either an objection can be raised or a ‘no objection’ submitted. If no response is received by the time the window closes, it is assumed that the losing supplier does not wish to object.

When a valid Intervention Response is received: if “no objection”, CSS sets the state of the Registration Request to Confirmed, removes the relevant entry from the Objection Scheduler and creates an entry in the Securing Scheduler; if “objection raised”, CSS sets the state of the Registration Request to Rejected, the Registration to Cancelled and removes the relevant entry in the Objection Scheduler.

When the system time reaches that of an entry in the Objection Scheduler without an objection having been raised, CSS sets the Registration Request to Confirmed, removes the relevant entry from the Objection Scheduler and creates an entry in the Securing Scheduler.

### Determining Objection Window [2.3.9]

CSS uses Registration Request data and switching process parameters (part of the Switching Domain Data) to determine the length of the objection window. The Registration Request data used is the Domestic Premises Indicator and the Change of Occupancy Indicator (CoO Indicator). The switching process parameters used are:

* Switching objection parameter, for which there are separate instances for domestic and non-domestic and which determines whether or not a switch is subject to objections processing. Its values are All, None or Only if CoO Indicator is not set;
* Objection window length parameter, for which there are separate instances for domestic and non-domestic and which determines the length of the objection window either in days, hours, minutes or milliseconds;
* System-wide calendar/working day parameter, which determines whether the calculation is done in calendar days or working days; and
* Time of registration securing parameter, which defines the time at which the objection window ends, since this is the same time as securing.

For further detail on these parameters, see section 4.9.3 - Switching Domain Data Update.

### Switch Securing [2.5]

The processing is the same as for an Initial Registration - see section 4.6.3 - Initial Registration Securing [1.6].

### Switch Completion [2.6]

The processing is the same as for an Initial Registration - see section 4.6.4 - Initial Registration Completion [1.7].

### Switch Annulment [2.8]

The losing supplier may be notified by the consumer that a switch has been initiated which the consumer did not authorise. The Annulment feature allows the losing supplier to stop a switch where, otherwise, it would result in an Erroneous Switch.

When an Annulment Request is received, if valid, CSS sets the Registration Request to Annulled and remove any relevant entries from the Schedulers.

CSS may be configured not to allow annulment. In this case, when an Annulment Request is received, CSS responds with a rejection together with the reason.

### Switch Withdrawal [2.7]

The processing is the same as for an Initial Registration - see section 4.6.5 - Initial Registration Withdrawal [2.7].

### Registration Notifications [1.4, 1.6, 2.3, 2.5]

When a Registration Request changes state, a notification may be sent out to one or more parties. For details of the notification(s) sent at each state transition, see section 4.6.18 - Registration Request State Transitions.

A market participant is given the opportunity to opt out of notifications.

### Registration Synchronisations [1.4,1.6, 2.3, 2.5]

When a Registration Request changes state, a synchronisation message may be sent out to one or more parties. For details of the synchronisation(s) sent at each state transition, see section 4.6.18 - Registration Request State Transitions.

Synchronisations to all parties are message-based: each synchronisation is sent over the relevant interface individually, when it occurs. However, not all are actioned immediately by the receiving Data Service. See section 7 - Interfaces for further details.

### OFAF Processing [2.3]

The gaining supplier may group Switch Requests to achieve One-Fail-All-Fail (OFAF), where if any one Request fails (as a result of validation failure, objection, annulment, withdrawal or RMP termination), then CSS rejects all the others in that group with a reason of “OFAF”.

For OFAF Switch Requests, CSS does not undertake further processing until all individual constituent Switch Requests in the OFAF group have been successfully validated. OFAF Switch Requests are subject to the following additional checks:

* All individual Switch Requests in the OFAF group originate from same Retail Energy Company but not necessarily the same MPID;
* All individual Switch Requests in the OFAF group have the same switch effective date;
* All individual Switch Requests in the OFAF group are marked with the OFAF Group indicator;
* All individual Switch Requests in the OFAF group match to a common supplier generated RequestID;
* All individual Switch Requests in the OFAF group include a Group count (i.e. message 1 of 123) for reconciliation purposes – which are included by the Retail Energy Company.

CSS determines the Retail Energy Company[[2]](#footnote-3) by look-up of the Market Participant used to submit the Switch Request in the switching domain data.

### Related MPAN Processing [2.3]

In prescribed circumstances, MPANs may be linked together such that if one is switched, all the Related MPANs are also switched. In most of these cases there are pairs of Related MPANs but in a few there may be up to four. The relationships between MPANs are maintained by MPAS (they only exist in electricity) and one MPAN will be designated as the “parent” with the other(s) designated as the “child”/ “children”.

Following successful validation of a Registration Request (the Registration request will be rejected if it contains a ‘child’ MPAN), CSS checks whether the MPAN is a “parent” of related “child” MPANs and if so, generates a related Registration Request for each one. If the Registration Request for a “parent” Related MPAN is objected to, withdrawn or annulled, CSS rejects, withdraws or annuls the related “child” MPANs.

Note: MPAN is synomymous with RMP in CSS.

### Registration Request State Transitions

The following table shows the processing resulting from a Registration Request state transition. A Submitting supplier can either be an Enforcing Energy Supplier or a Gaining Supplier, depending on the scenario. Note that while this table pertains to Registration Requests (Initial Registration, Switch), there are no losing parties in an Initial Registration Request scenario.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| State from | State to | Registration Request status notifications (via RegMgmtRequestNotification) | Registration status notifications (via RegMgmtRequest Notification) | Enquiries (applies to Switch Requests only) | Synchronisation | OFAF (applies to Switch Requests only) | Related MPAN |
| - | Submitted | n/a | n/a | n/a | n/a | n/a | n/a |
| Submitted | Validated | * Losing Shipper * Submitting Supplier * Gaining Shipper | * Losing Shipper * Gaining Supplier * Gaining Shipper | * InvitationTo Intervene to Losing Supplier | * GasRegistration to DES * ElectricityRegistration to ECOES * RMPRegApptSync to Smart Metering * RegistrationSync to UK Link * RegistrationSync to MPAS | Check whether this Registration Request should be Rejected for OFAF:  If the Registration Request has an OFAF group identifier, CSS checks the status of all other existing Registration Requests from that group to determine if any of them has been Annulled, Withdrawn or Rejected. If so, then CSS sets the Registration Request to Rejected with a reason of OFAF. | Validate Related MPANs and create Registration Requests for them, so that the change applies to all at the same time:  If the Registration Request is for an MPAN “parent” with related “children”, then:   * If any of the children will no longer be linked to the parent on the Effective Date of the Registration Request, then it cannot go ahead and the Registration Request is Rejected; * Otherwise, a Validated Registration Request and a Pending Registration are created for each child |
| Validated | Confirmed | * Losing Supplier * Losing Shipper * Submitting Supplier * Gaining Shipper * Losing MEM * Losing DC/DA | * Losing Supplier * Losing Shipper * Gaining Supplier * Gaining Shipper * Losing MEM * Losing DC/DA | n/a | * GasRegistration to DES * ElectricityRegistration to ECOES * RMPRegApptSync to Smart Metering * RegistrationSync to UK Link * RegistrationSync to MPAS | n/a | Update Related MPANs in line with change to parent:  If the Registration Request is for an MPAN “parent” with related “children”, then:   * Apply the same updates to the children as just carried out for the parent. |
| Confirmed | Secured | * Losing Supplier * Losing Shipper * Submitting Supplier * Gaining Shipper * Losing MEM * Losing DA/DC * MAP | * Losing Supplier * Losing Shipper * Gaining Supplier * Gaining Shipper * Losing MEM * Losing DA/DC * MAP | n/a | * GasRegistration to DES * ElectricityRegistration to ECOES * RMPRegApptSync to Smart Metering * RegistrationSync to UK Link * RegistrationSync to MPAS | n/a | As for Validated to Confirmed. |
| Secured | Completed | n/a | n/a | n/a | n/a | n/a | As for Validated to Confirmed. |

Table 3 –Registration Request state transitions

The following table shows the processing resulting from a Registration Request state transition to a Withdrawn/Rejected/Annulled state. A Submitting supplier can either be an Enforcing Energy Supplier or a Gaining Supplier, depending on the scenario. Note that while this table pertains to Registration Requests (Initial Registration, Switch), there are no losing parties in an Initial Registration Request scenario.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| State from | State to | Registration Request status notifications (via RegMgmtRequestNotification) | Registration status notifications (via RegMgmtRequest Notification) | Enquiries (applies to Switch Requests only) | Synchronisation | OFAF (applies to Switch Requests only) | Related MPAN |
| Submitted | Rejected | n/a | n/a | n/a | n/a | Check whether OTHER Registration Requests should be rejected for OFAF:  If the Registration Request has an OFAF group identifier, CSS locates other Registration Requests from that group and sets them all to Rejected with a reason of OFAF. | Update Related MPANs in line with change to parent:  If the Registration Request is for an MPAN “parent” with related “children”, then:   * Apply the same updates to the children as just carried out for the parent. |
| Validated | Rejected | * Losing Supplier * Losing Shipper * Submitting Supplier * Gaining Shipper | * Losing Supplier * Losing Shipper * Gaining Supplier * Gaining Shipper | n/a | * GasRegistration to DES * ElectricityRegistration to ECOES * MeteringPointSync to MPAS * SupplyMeterPointSync to UK Link * RMPRegApptSync to Smart Metering | As for Submitted to Rejected. | As for Submitted to Rejected. |
| Validated | Withdrawn | * Losing Supplier * Losing Shipper * Submitting Supplier * Gaining Shipper | * Losing Supplier * Losing Shipper * Gaining Supplier * Gaining Shipper | n/a | * GasRegistration to DES * ElectricityRegistration to ECOES * MeteringPointSync to MPAS * SupplyMeterPointSync to UK Link * RMPRegApptSync to Smart Metering | As for Submitted to Rejected, except set to Withdrawn. | As for Submitted to Rejected. |
| Validated | Annulled | * Losing Supplier * Losing Shipper * Submitting Supplier * Gaining Shipper | * Losing Supplier * Losing Shipper * Gaining Supplier * Gaining Shipper | n/a | * GasRegistration to DES * ElectricityRegistration to ECOES * MeteringPointSync to MPAS * SupplyMeterPointSync to UK Link * RMPRegApptSync to Smart Metering | As for Submitted to Rejected, except set to Annulled. | As for Submitted to Rejected. |
| Confirmed | Rejected | * Losing Supplier * Losing Shipper * Submitting Supplier * Gaining Shipper * Losing MEM * Losing DC/DA | * Losing Supplier * Losing Shipper * Gaining Supplier * Gaining Shipper * Losing MEM * Losing DC/DA | n/a | * GasRegistration to DES * ElectricityRegistration to ECOES * MeteringPointSync to MPAS * SupplyMeterPointSync to UK Link * RMPRegApptSync to Smart Metering | As for Submitted to Rejected. | As for Submitted to Rejected. |
| Confirmed | Withdrawn | * Losing Supplier * Losing Shipper * Submitting Supplier * Gaining Shipper * Losing MEM * Losing DC/DA | * Losing Supplier * Losing Shipper * Gaining Supplier * Gaining Shipper * Losing MEM * Losing DC/DA | n/a | * GasRegistration to DES * ElectricityRegistration to ECOES * MeteringPointSync to MPAS * SupplyMeterPointSync to UK Link * RMPRegApptSync to Smart Metering | As for Submitted to Rejected, except set to Withdrawn. | As for Submitted to Rejected. |
| Confirmed | Annulled | * Losing Supplier * Losing Shipper * Submitting Supplier * Gaining Shipper * Losing MEM * Losing DC/DA | * Losing Supplier * Losing Shipper * Gaining Supplier * Gaining Shipper * Losing MEM * Losing DC/DA | n/a | * GasRegistration to DES * ElectricityRegistration to ECOES * MeteringPointSync to MPAS * SupplyMeterPointSync to UK Link * RMPRegApptSync to Smart Metering | As for Submitted to Rejected, except set to Annulled. | As for Submitted to Rejected. |

Table 4 –Registration Request failure state transitions

### Registration Event Update [2.20]

When a Registration Event is received from a supplier containing details of a change to data that CSS holds which is related to the Registration (that the consumer has changed from domestic to non-domestic or for gas, a change to the shipper), if valid, CSS updates the data it holds accordingly. If relevant, CSS synchronises the information to Smart Metering and/or to ECOES/DES.

There may be cases where a future dated Registration Event needs to be overridden. In such cases, the submitter shall submit a request that contains updated Registration Event information (such as Shipper identifier or domestic/non-domestic indicator) along with an effective from date which matches the effective from date and time of the existing future dated request.

CSS shall update records in the order of the source capture time. When CSS completes processing an override, it shall send out the relevant synchronisations and notifications as per the standard process.

### Forced Registrations

In the exceptional circumstance that a Supplier has failed to complete a required Registration, there are provisions that allow an Enforcing Supplier to submit one on their behalf. An Initial Registration Request will be submitted by the Enforcing Supplier to CSS over the RegMgmtRequestSubmission interface.CSS will recognise that this is a Forced Registration as it will be a request submitted by an Enforcing Supplier who is assigned a corresponding Market Participant role-code. Subsequent interactions to complete the registration will follow business-as-usual processes. The remainder of this document refers to Enforcing Supplier or Submitting Supplier where applicable.

## Address Management

### Introduction

Another core feature of CSS is its use of an address related to an RMP which has, as far as is possible, been matched by the Address Service to a set of “standardised” Great Britain addresses. This single address (REL Address) is used for both the electricity and gas RMPs at a given premises and is the authoritative address to be relied upon and referred to by consumers and all parties engaged in the retail energy market.

CSS’s principal purposes with regard to addresses are to:

* Create, store and maintain an address for each RMP; and
* Manage the quality of the addresses held.

CSS holds up to three addresses for each RMP:

* **Meter Point Location (MPL) Address** - the address that a Network Operator holds for a given RMP. This is created and maintained in UK Link/MPAS and synchronised to CSS at the point of initial registration and which CSS does not amend. Following initial registration, this address will always be present for a given RMP. This may be in English or an officially-recognised regional language.
* **Retail Energy Location (REL) Address** – is an address created and maintained by CSS and synchronised to ECOES and DES. It is the principal address that consumers are expected to provide (e.g. to a supplier or a Price Comparison Website) when identifying the energy supply they wish to switch. The RELs for gas and electricity meter points supplying the same premises should be identical. Following initial registration, this address will always be present for a given RMP. This may be in English, in an officially-recognised regional language, or both.
* **Manually-Entered (ME) Address** – is also created and maintained by CSS and is used internally within CSS and not disseminated externally. It is likely to be present for very few RMPs, because it is only needed in the unusual cases where the MPL Address and REL Address need to be differentiated. This may be in English or an officially-recognised regional language.

The MPL Address represents the Network Operator’s view of the address associated with the energy supply point address (the physical off-take from the network). CSS uses this to determine the REL Address when an Initial Registration is submitted (it is done at registration and not when the RMP is first notified to CSS because the registration is the first time when the address is used in CSS and is more likely to be a good quality address). The REL Address is that which the consumer considers to be his address.

In some cases, however, the MPL Address is different from the one that the consumer considers to be “his” address and cannot therefore be used to determine the REL Address. This may happen for example where the MPL Address differs from the main entrance/postal address. In this case, CSS allows the operator to record an ME Address, which is used instead of the MPL Address to determine the REL Address. The ME Address is optional and is not present for the majority of RMPs.

CSS will enable users operating the CSS Service to actively manage the quality indicator of its REL Addresses. As custodians of the address data the role these users perform is an important one in ensuring that its quality continuously improves. Since the organisational structure of this service is not yet known, the term “CSS operations user” has been adopted for these service users, in the same way as in the preceding sections.

### Determine REL Address on Initial Registration [2.22]

When CSS receives an Initial Registration request from a supplier, CSS determines the REL Address and records it. For the case of a newly created RMP, CSS requests a match from the Address Service, as described in section 5.2 - Match to GB Standardised Address List (Single Response) [2.22], using the MPL Address. CSS passes to the Address Service the MPL Address when it requests a match.

If the Address Service returns a “no match”, then CSS uses the MPL Address to create the REL Address, sets an appropriate language indicator to indicate that the language is unknown, and sets an appropriate quality indicator.

If the Address Service returns “match”, CSS shall:

* use the GB-Matched Address returned to create the REL Address. This consists of:
  + an English language representation (this is present for all GB-Matched Addresses by default) along with a relevant language indicator; and
  + an officially-recognised regional language representation, if one is available, along with a relevant language indicator;
* record REL Address derivation as “MPL”;
* record the unique GB address identifier returned; and
* record the address quality indicator returned.

If there is already a REL address for a RMP, there is no request for an address match from the Address Service.

### Update MPL Address [2.15]

When CSS receives an update to an MPL Address from MPAS or UK Link, CSS applies the update to the relevant MPL Address, retaining a record of the previous MPL Address for audit purposes.

If the REL Address derivation is “MPL”, CSS initiates a Match to GB Standardised Address List (Single Response) [2.22] (see section 5.2), using the updated MPL Address. The processing of the result is the same as that for Determine REL Address on Initial Registration [2.22] (see section 4.7.2). In addition, a record of the previous REL Address is retained for audit purposes.

If the REL Address derivation is “ME”, CSS does not attempt a match and leaves the REL Address unchanged. CSS queues this Address Issue for manual intervention because it may be that the MPL Address now provided is better quality and will produce a match against the GB Standardised Address List and the ME Address is no longer needed.

### Manually Maintain ME Address [2.18]

This facility is used where a Service Management incident has been raised (as a result of information provided by the supplier, which may originally have come from the consumer). CSS provides an operations facility allowing a CSS operations user to enquire on MPL Address, REL Address and ME Address using an identifier for the RMP. CSS allows the CSS operations user to enter a new ME Address or update or delete the existing ME Address.

If the ME Address is created or updated, CSS then initiates a Match to GB Standardised Address List (Single Response) [2.22] (see section 5.2). Processing of the result is as for Determine REL Address on Initial Registration [2.22] (see section 4.7.2), except that the derivation of address is “ME” instead of “MPL”.

If the ME Address is deleted, then CSS initiates a Match to GB Standardised Address List (Single Response) [2.22] (see section 5.2) using MPL Address. Processing of the result is as for Determine REL Address on Initial Registration [2.22] (see section 4.7.2).

In all cases, a record of the previous ME Address is retained for audit purposes.

### Re-Match Request for Single Input Address

CSS provides a user interface facility for a CSS operations user to initiate a Match to GB Standardised Address List (see section 5.2), using either the MPL Address or the ME Address, depending on which was used to derive the REL Address. The processing of the result is the same as that for Determine REL Address on Initial Registration [2.22] (see section 4.7.2), except that the derivation is “ME” if ME Address has been used.

### Re-Match Request for Multiple Input Addresses

In order to support continuous quality improvement for addresses which have been highlighted as being poor quality, CSS provides a user interface operations facility to start a process to re-send to the Address Service certain addresses for another matching attempt. The CSS operations user identifies REL Addresses corresponding to certain criteria including quality indicator and postcode. For each REL Address, the ME Address or the MPL Address (depending on the derivation of the REL Address) is used to initiate a Match to GB Standardised Address List (see section 5.2). The processing of the result is the same as that for Determine REL Address on Initial Registration [2.22] (see section 4.7.2), except that the derivation is “ME” if ME Address has been used.

This process is scheduled to run at a time specified by the CSS operations user.

### All Possible Match Details for Single Input Address

In order to investigate possible matches for a poor-quality address, CSS has a user interface facility which allows a CSS operations user to enter an address (or a partial address) or a unique address identifier and make a request to the Address Service to return all possible matches it identifies for that address. The user can enter an address (or a partial address).

The CSS operations user enters the address and CSS requests matches from the Address Service, as described in section 5.3 - Match to GB Standardised Address List (Multiple Responses). When the Address Service returns one or many possible matches, CSS displays them and their associated data on the screen.

### Synchronise REL Address to ECOES, DES, MPAS, and UK Link [1.4.8, 2.24]

When the REL Address is updated, the update, which includes the officially-recognised regional language equivalent (if relevant), is synchronised to ECOES, DES, MPAS, and UK Link over the RetailEnergyLocation interface.

### Smart Metering CommsHubDataLink Data [2.17]

Information is received from Smart Metering each time a communications hub (comms hub) has a meter joined to it, when there is already at least one meter joined to it. The information contains the MPxNs of all the meter points associated with that comms hub.

When a message is received from Smart Metering over the CommsHubDataLink interface, CSS updates the information it holds about the RMPs as follows:

* If the unique GB address identifier held in CSS of both/all RMPs related to a single comms hub is the same, then CSS takes no action; or
* If the unique GB address identifier of both/all RMPs related to a single comms hub is not the same, then CSS queues this Address Issue for manual intervention.

### Resolve Address Issues by Manual Intervention [2.18]

CSS allows a CSS operations user to display the list of Address Issues queued for manual intervention. These Issues arise from mismatches of address for RMPs attached to a single comms hub or by receiving an update to an MPL Address, where the RMP’s REL Address is derived from the ME Address. The CSS operations user may select an entry and resolve the issue by either:

* Updating/creating an ME Address in Manually Maintain ME Address [2.18] (see section 4.7.4) as appropriate; or
* Indicating that no action is needed.

In both cases, the entry is removed from the queue.

If the CSS operations user takes no action, then the entry is left on the queue.

### Update REL Addresses based on GB Standardised Address List Updates [1.1]

When CSS receives over the PremisesAddress interface from the Address Service a list of GB Standardised Address updates that it has processed, CSS uses the unique GB address identifier and language indicator for each entry in the list to search for a REL Address. If a match is found, the REL Address is updated and a record of the previous REL Address is retained for audit purposes. If none is found, then CSS takes no action with respect to this entry.

### Report on Address Quality

CSS provides a reporting facility which allows a CSS operations user to produce user-defined reports to support the active management of address quality, as described in section 4.8 - Reporting.

## Reporting

### Introduction

CSS allows authorised CSS operations users to develop, save and submit ad hoc reports and to browse or print report output. Predefined reports are also provided. Reports are presented and formatted suitably for human usage. Reports are also output in an Open Standard format that allows the recipient to transform the report layout, using a wide variety of reporting tools, to meet their own needs. Their needs may range from meticulous corporate-style printing specifications to simple data interchange formats that allow import into common office software. The standard used will support a range of reporting features in the style of Report Definition Language (RDL), an XML schema for representing reports, or similar.

Report output is made available at a secure location that allows for secure collection by operator-configurable report recipients.

Only the data shown in the Detailed Data Model in the D-4.1.2 Detailed Design Model (ABACUS)[2] is employed in the creation of reports. Access is suitably constrained for privacy purposes and to avoid any contention with system resources reserved for operational purposes. A separate dedicated reporting database, data warehouse or data mining facility is not included in the solution.

### Address Quality

The following table outlines a non-exhaustive list of pre-defined address quality reports that CSS is capable of producing:

|  |  |
| --- | --- |
| Report | Comments |
| Unmatched RMPs | RMPs unmatched to GB Standardised Addresses listed together with their meter point location address |
| Unchanged Plot Addresses | Addresses that have not changed from a plot address (no post code assigned) for a predetermined length of time. Corresponding historical values/trends. |
| Address Quality Analysis | Quantitative analysis of address quality, including numbers of RMPs matched and unmatched, summaries of their quality indicator values and corresponding historical values/trends.  The number of addresses with a quality indicator of less than *x* in each post code district and area (district being the letters of the first part of the post code and area being the numbers of the same district; using SE1 as an example, SE would be the district and 1 would be the area). |
| Updated ME Addresses | Addresses whose derivation is “ME” and for which the MPL has been updated. This is used to indicate those ME derived addresses that may need to be deleted and the MPL Address used instead to derive the REL Address, since the MPL Address has been updated to a better quality. |
| Updated Addresses | A report of addresses that have been created or changed since the previous report, for possible use by external parties who are interested in the use of REL Address. Each MPxN is listed together with its current REL Address, if:   * REL Address has been established (as a result of an initial registration); or * REL Address has changed for any reason (because of the introduction or removal of an ME Address, update of MPL Address or updated address passed to CSS by the Address Service. |
| Updated REL Addresses | A report of addresses, filtered by an Energy Supplier’s portfolio, that have been created or changed since the previous report. Each MPxN is listed together with its current REL Address, if:   * REL Address has been established (as a result of an initial registration); or * REL Address has changed for any reason (because of the introduction or removal of an ME Address, update of MPL Address or updated address passed to CSS by the Address Service). |

Table 5 - Address management reports

### Market Intelligence

CSS provides a suite of predefined market intelligence reports for the use of Ofgem on a periodic basis, as listed immediately below. The reports contain summary information only. The reports are:

* Performance assurance;
* Market monitoring;
* Aggregate data – aggregate number of:
  + Accurately completed switch requests on a monthly, quarterly and annual basis;
  + Rejected switch requests on a monthly, quarterly and annual basis and by the rejection reason;
  + Switch request objections on a monthly, quarterly and annual basis;
  + Switch request annulments on a monthly, quarterly and annual basis and by the number of days prior to Securing that the annulment occurred;
  + Switch request withdrawals on a monthly, quarterly and annual basis;
  + Resolved erroneous switches on a monthly quarterly and annual basis and by the number of days after the switch by which the resolution was complete;
  + Switches analysed between domestic and non-domestic;
  + Domestic switches from large to large, large to small and small to large suppliers;
  + Domestic switches where the COO indicator was set – split between objected and not objected; and
  + Initial registrations and deactivations on a monthly, quarterly and annual basis.
* Supplier Portfolio Information – as for Aggregate data at the individual supplier level (corporate group) and at a Market Participant Role level.

### Update Statistics

CSS provides a suite of predefined update statistics reports for the use of Service Management and operations on a periodic basis. The reports contain summary information only.

### Audit

CSS is capable of providing ad-hoc audit reports for the use of Service Management and operations. Detailed audit data may be selected and reported corresponding to specific data objects such as a specified RMP. The audit reporting capability supports low volumes of output information only. Further details on audit requirements are found in the D-4.1.4 E2E Switching Arrangements NFRs[3]

### Billing

CSS provides a suite of pre-defined reports for the use of the Billing Service (to be administered by RECCo). The reports include data showing for a given period:

* For each gaining supplier:
  + Number of Registration Requests submitted;
  + Number of successful Registration Requests reaching Completed;
  + Number of Registration Requests which were Withdrawn;
  + Number of Registration Requests which were Annulled;
  + Number of Registration Requests which were objected;
  + Number of Registration Requests which failed validation;
  + Number of other updates submitted; and
  + Number of chargeable reports obtained
  + Number of RMPs registered at the end of the period.
* For each losing supplier:
  + Number of Registration Requests which were Annulled; and
  + Number of Registration Requests which were objected.

The solution to transfer the data will be achieved through the projected DCC Enterprise Data Hub implementation in which files will be staged on a data hub platform for subsequent transmission and/or processing. The fall-back option will be to transfer data by secure FTP if the Enterprise Data Hub implementation cannot meet the switching programme requirement or timescales.

## Operations

### Introduction

Operator access to CSS is necessary to perform the functions described in section 4.7 - Address Management.

### CSS Operations User Access

CSS provides an authentication method for CSS operations user sign-on in accordance with the D-4.1.10 E2E Security Requirements[4], in order to access screen-based CSS functions. Role-Based Access Control to the functions is provided, with the roles being assigned to CSS operations users by the system administrator role.

### Switching Domain Data Update

There are several types of switching domain data which CSS stores and are provided to CSS by the Switching Domain Data Service:

* Authorised Market Participant Roles along with their details and their associated Retail Energy Companies and Groups;
* Suspensions (including sanctions) of participants;
* Supplier / Shipper alliances; and
* Switching process parameters.

Switching Domain Data is authored by a designated governance body, which receives requests from industry and follows the applicable governance processes before finalising data values. Instructions for data updates may be passed to the governance body using manual forms, which may be emailed or sent by other general administrative means. The governance body is responsible for the capture and maintenance of the Switching Domain Data and for disseminating it as appropriate to those participants in the Switching Arrangements that require it, including CSS.

The Switching Domain Data is received from the Switching Domain Data Service as an incremental update over the SwitchingDomainData interface. Both confidential and non-confidential sets of information are received by from the same SwitchingDomainData interface.

Confidential switching domain data (including possibly Supplier / Shipper Alliances) is issued to CSS by the Switching Data Service separately from non-confidential information and it is handled by CSS with security controls that are applicable to the information classification.

Note that when a revocation occurs to an organisation’s licence to operate or the roles in which it is authorised to operate, CSS leaves in place any Registration Requests for which the effective date is on or after the date of change to the licence/roles. The same is true for the application of sanctions.

Switching Domain Data contains the parameters which apply to the switching and registration process, including:

* Switches for which objection testing will be conducted:
  + Domestic switches (domestic switch objection parameter): value is one of: All, None, Only if Change of Occupancy Indicator is not set; and
  + Non-domestic switches (non-domestic switch objection parameter): value is one of: All, None, Only if Change of Occupancy Indicator is not set.
* Indicator showing whether or not Annulment is allowed;
* Objection window length for the following:
  + Domestic switches; and
  + Non-domestic switches.

Each value may be expressed in:

* + Days (either calendar days or working days, depending on the system-wide calendar day/working day parameter); or
  + Hours; or
  + Minutes; or
  + Milliseconds.
* Time of Registration Securing – currently planned to be 17:00 on the calendar day prior to SSD;
* Length of Standstill Period, held separately for DCC-enrolled and traditional meters. Length may be expressed in:
  + Days (values from 0 upwards and the days may be calendar days or working days depending on the system-wide calendar day/working day parameter); or
  + Seconds.
* Length of maximum switch period, expressed in:
  + Days in advance of date of submission (values from 1 calendar day upwards, currently planned to be 28 calendar days); or
  + Seconds.
* System-wide calendar day/working day parameter: governing those parameters which may operate in either calendar days or working days
* Character-set supported by CSS, including characters in an officially-recognised regional language.

CSS accepts this data in standard CSS interface format and applies it immediately. It should be noted however, that each switching domain data entry has an associated Effective Date/Time and may therefore not be effective immediately.

CSS loads the Switching Domain Data at any time during the day, including when registrations and switches are entering CSS and being processed.

### Trade Sale

A trade sale comprises the movement of a Market Participant’s entire portfolio to another Market Participant. CSS allows the selling Market Participant to be substituted with the buying Market Participant to effect the transfer within the Switching Domain Data (that is received from the Switching Domain Data Service). This approach avoids the need to generate a large number of individual switches and is mirrored in Smart Metering by a similar process.

# Address Service

## Introduction

The following diagram illustrates at a high level the distinction between CSS and the Address Service functions. The Address Service includes a gazetteer service(s) which will act as the primary source of GB geographical data.



Figure 7 - Distinction between CSS and Address Service functions

Each RMP has two addresses: the MPL Address and the REL Address. These addresses are not necessarily the same, as in some cases meter points are sited at a different location from the premises where energy is consumed. MPL Addresses are created and maintained by network operators (GTs and DNOs). The REL Address may be derived from the MPL or may be subject to an override advised by a supplier (possibly based on consumer feedback). Consumers are expected to specify the REL Address when identifying the RMP they wish to switch. The REL Addresses for gas and electricity meter points supplying the same premises should be identical.

The Address Service consists of:

* **GB Standardised Address List** – a complete set of all domestic and commercial GB addresses, plus as many other locations to which energy is supplied as is practicable, held in a widely-recognised standardised form, most likely to be compliant with BS7666, in all official GB languages (which would be most likely be a list from a subset of ISO 639-2:1998); and
* **Address-matching software** – a set of algorithms, configuration settings and related software which, given an input address, searches the GB Standardised Address List and produce a match, together with a reference number that uniquely identifies the matched address (for example, the UPRN) and an indicator of the quality (degree of certainty) of the match.

The principal purpose of the Address Service is to:

* Store and maintain an up-to-date list of GB standardised addresses; and
* Find the standard GB address that most closely matches an address passed to it by CSS (either in English, or an officially-recognised regional language).

CSS passes the MPL Address or the ME Address to the Address Service to find a GB-Matched Address in the list of GB standardised addresses. If a GB-Matched Address is found, then CSS records this as the REL address, together with the quality indicator of the REL address (and language indicator if appropriate). If no GB-Matched Address is found, then CSS records the MPL Address or ME Address as the REL address, with a corresponding quality indicator, and indicating that the language of the REL address is unknown.

The quality indicator returned by the Address Service is intended to be used by CSS to manage the quality of its addresses. It represents the level of certainty associated with a particular address match and is likely to be based on a number of different factors, such as whether the house number and postcode are identical (high quality indicator) or house number and street name but NOT postcode (lower quality indicator).

The Address Service is responsible for maintenance of its GB Standardised Address List, which is kept up-to-date by the provision of updates from an external service, such as a gazetteer service. The Address Service also informs CSS of those addresses updated so that CSS can amend the REL to match the new address (e.g. following a re-allocation of post codes).

Addresses matched to the list of GB standardised addresses and returned to CSS will form the REL Address mastered by CSS. REL Addresses will be synchronised to ECOES and DES so that all industry parties (including Price Comparison Websites) can raise enquiries against them.

## Match to GB Standardised Address List (Single Response) [2.22]

CSS passes to the Address Service a request to match a specific address, which contains:

* Address for Matching.

The Address Service uses the Address for Matching to match against its GB Standardised Address List. The matching functions include the ability to take as the Address for Matching an out-of-date address and find a match which returns the most recent version of that address. For example, if CSS passes a “plot” address, the Address Service is capable of returning the full postal address relating to that plot, once it is known. The result of matching is:

* No GB-Matched Address found; or
* One or more GB-Matched Address found.

“No match found” will be returned if either no match can be identified or if the best match identified is of insufficient quality. If no match is found, a response indicating “no match” is sent to CSS.

If one or more matches are found, a response indicating “match” is sent to CSS, containing the highest quality GB-Matched Address, the unique GB address identifier and a quality indicator. The GB Standardised Address returned to CSS is always in English; however, CSS is also sent an address, where available, in an officially-recognised language representation of the same address along with a corresponding language indicator.

## Match to GB Standardised Address List (Multiple Responses)

CSS passes to the Address Service a request to match a specific address, which contains:

* Address for Matching, which may be a partial address or a unique address identifier.

The Address Service uses the Address for Matching in the same way as section 5.2 - Match to GB Standardised Address List (Single Response) [2.22], but instead of returning a single match, it returns as many possible matches as it finds, together with the associated data, including the quality indicator, for each one.

## Maintain GB Standardised Address List

The Address Service maintains its GB Standardised Address List from the relevant published input data received from the Gazetteer. This list comprises a complete record of all GB addresses; where all entries contain an address in English, and where appropriate, the same address expressed in an officially-recognised regional language.

When an update has taken place, the Address Service sends to CSS a list of all updates made, comprising for each:

* unique GB address identifier;
* updated GB Standardised Address List entry; and
* language identifier.

## Maintain Matching Configuration

The Address Service has facilities to enable the matching logic to be continuously optimised.

## Regional Language Character Set

The Address Service supports the character sets associated with English and any officially-recognised regional language. To support the maintenance of this, the Address Service has facilities for the language character-set to be reconfigured.

# Switching Network

## Introduction

Data in motion between the CSS and other Data Services with which it has interfaces are communicated via a secure, high-speed network known as the Switching Network. This logical Switching Network function may be provided by more than one physical network. The intention is that existing network providers Information Exchange (iX) and the Data Transfer Network (DTN) will provide Switching Network access for participants and that a participant may choose which of these two networks it wishes to use.

Interfaces between the CSS and Smart Metering are an exception and must not be carried by the Switching Network but instead must be carried by the DCC Data Network to comply with their high security rating. Also the network carrying the PremisesAddress interface will be determined by IT service procurement and is not encompassed within the Switching Network.

The Switching Network connects the CSS to other Data Services that participate in the switching arrangements. It provides no connectivity in between each of the Data Services that are connected to the CSS.

The Switching Network comprises the following elements:

* Appropriately secured point-to-point connectivity to support physical interfaces between CSS and other Data Services within the switching arrangements
* Physical and logical mechanisms to meet the security and non-functional requirements
* An operational service management capability, to enable users to log issues and for these to be managed and resolved by the Switching Network provider.



**Figure 8 – CSS and Switching Network**

## Availability, Capacity, Adaptability, Scalability and Reliability

Availability, capacity, adaptability, scalability and reliability requirements for the Switching Network are specified in D-4.1.4 E2E Switching Arrangements NFRs**[3]** to ensure a flexible platform which will support future market evolution.

## Security Requirements

Non-repudiation and other security-related requirements for the Switching Network are specified in D-4.1.10 E2E Security Requirements[4]. The D-4.1.10 E2E Security Requirements also contains a Security Rating for each interface (reproduced here in Table 10 – Interface Specifications), which corresponds to a set of information security requirements and controls that apply to that interface.

## Types of Interface Supported

The Switching Network supports the Interaction Patterns which are described in more detail in section 7.2 - Interaction Patterns and are:

* Notification;
* Enquiry;
* Synchronisation; and
* Update.

## Switching Network Access Control

All interfaces operating across the Switching Network are subject to access control.

The Switching Network access control function only accepts and delivers communications from Market Participant Roles that are contained in the SwitchingDomainData Interface.

It is possible that the Switching Network access control may permit multiple Market Participant Roles to accept and deliver communications from/to a single node if each Market Participant Role is owned by the same Retail Energy Company. If suppliers use a network access control that supports this requirement, Switch Requests belonging to a one-fail-all-fail (OFAF) group may be submitted by more than one Market Participant Role.

The access control function will be integrated into the Switching Network (most likely by the provision of an integration layer on top of the network itself), harmonising and extending the industry business interoperability interfaces currently provided by the DTN and iX.

## Validation

Validation by the Switching Network includes the following:

* Checksum validation following decryption for encrypted messages – incoming messages only.

# Interfaces

## Introduction

CSS provides application interfaces to the following Market Roles (any participant performing a role in a business process) and corresponding Data Services, which participate in the new Switching Arrangements:

* Suppliers;
* UK Link;
* DES;
* Shippers;
* MPAS;
* ECOES;
* Smart Metering;
* Data Collectors;
* Data Aggregators;
* MAPs;
* MEMs;
* Switching Domain Data Service; and
* Address Service.

This section is relevant to all of the above and also contains information relating to CSS, the Address Service and the Switching Network.

## Interaction Patterns

CSS supports inbound and outbound interfaces over the Switching Network, which operates using one of the following defined interaction patterns:

**Notifications** – an outbound message Notification from CSS which informs the recipient of an event and provides some related information in a structured form. CSS issues a range of Notifications; which Recipients have no requirement to act on and may (or may not) choose to receive.

**Enquiry** – a message between two Data Services that informs the recipient of an event and provides the recipient with an opportunity to respond in a structured form (within a fixed timescale). The response may or may not be mandatory, but confirmation of receipt is required and Enquiries are outbound.

**Synchronisation** – a formal mechanism designed to keep information shadowed in one Data Service in line with that mastered in other Data Services. Synchronisation can be an inbound or outbound interface with CSS.

**Update** - A mechanism to issue CSS proposed changes to data that it masters. Acknowledgment of receipt is mandatory, and a formal response message may be required following processing, but is optional. CSS maintains a record of all Updates received and applied.

Table 6 – CSS Interaction Patterns summarises the characteristics of the four interaction patterns:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Interaction Pattern | Notification (N) | Enquiry (E) | Synchronisation (S) | Update (U) |
| Purpose | Information only – no action required | Where a business process forks and a decision is required | To align replicated data with current Master data | Notify updates to Master data |
| Inbound / Outbound | Outbound only from CSS | Outbound from CSS only | Inbound or outbound, between Central Data Services only | Inbound. |
| Acknowledgement of receipt | Not required | Mandatory | Mandatory | Mandatory |
| Confirmation of structural validation | Not required | Mandatory | Mandatory | Mandatory |
| Confirmation of processing | Not required | Optional | Mandatory | Mandatory |
| Response | Not required | Mandatory if processed | Not required | Not required |
| Is It Timebound? | No | Response window is timebound | Yes – acknowledgement, structural validation  No – processing confirmation | No |

**Table 6 – CSS Interaction Patterns**

Note that the Address Service interface will be largely dependent on the solution chosen.

The interaction patterns and their application within the Switching Arrangements are shown in Table 7 - Interaction Pattern Use.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Interaction Pattern | Central Data Services | Suppliers | Shippers | Agents |
| Notification | No | Yes | Yes | Yes |
| Enquiry | No | Yes | No | No |
| Synchronisation | Yes | No | No | No |
| Update | Yes\*\* | Yes | No | No |

Table 7 - Interaction Pattern Use

\*\* The only Central Data Service with an Update pattern is Smart Metering (for the CommHubDataLink).

Table 8 - Inbound Interfaces to CSS and Figure 9 – CSS Inbound Interfaces summarise the inbound and outbound interfaces with CSS:

|  |  |  |  |
| --- | --- | --- | --- |
| Interface Name | Purpose | Interface User | Pattern |
| CommsHubDataLink | Information that relates the electricity and gas meters connected to the same communications hub | Smart Metering Data Service | U |
| DADCAppointment | Synchronisation of Data Aggregator and Data Collector Appointments between the mastering and secondary (referencing) data services | MPAS | S |
| MEMAppointment | Synchronisation of Supplier Arranged Appointments between the mastering and secondary (referencing) data services | MPAS  Gas Central Data Service | S |
| MeteringPointSync | Synchronisation of electricity Meter points between the mastering and secondary (referencing) data services | MPAS | S |
| PremisesAddress | Update of REL Address based on a match with an address in the GB standardised address list | Address Data Service | U |
| RegMgmtRequestSubmission | Registration Requests submitted by a gaining supplier or an enforcing energy supplier, along with Withdrawals, Registration events and deactivation requests | Supplier  Enforcing Energy Supplier | U |
| SwitchIntervention | Objection or Annulment lodged by a losing supplier | Supplier | U |
| SwitchingDomainData | Information published by industry governance concerning the parameters and settings applicable across all participants in switching processes. | Switching Domain Data Service | n/a |
| SupplyMeterPointSync | Synchronisation of gas Supply Meter Points between the mastering and secondary (referencing) data services | UK Link | S |

**Table 8 - Inbound Interfaces to CSS**



**Figure 9 – CSS Inbound Interfaces**

Table 9 – Outbound Interfaces from CSS and Figure 10 – CSS Outbound Interfaces summarise the inbound and outbound interfaces with CSS. Note – there are multiple types of Notification, please refer to D-4.1.2 Detailed Design Model**[2]**for full details.

|  |  |  |  |
| --- | --- | --- | --- |
| Interface Name | Purpose | Interface User | Pattern |
| ElectricityRegistration | Synchronisation of electricity RMPs between the mastering and secondary (referencing) data services | ECOES | S |
| GasRegistration | Synchronisation of gas RMPs between the mastering and secondary (referencing) data services | DES | S |
| InvitationToIntervene | Registration details delivered to the losing supplier to provide an opportunity to object or annul within the timing constraints of the Switching windows. | Losing supplier | E |
| PremisesAddress | Request for matching by passing MPL or ME Address | Address Service | E |
| RegistrationSync | Synchronisation of Registrations between the mastering and secondary (referencing) data services | MPAS  UK Link | S |
| RegMgmtRequestNotification | Registration Request and Registration details passed to interested parties at each Registration Request change of state, as described in section 4.6.18 - Registration Request State Transitions. | Submitting supplier (Enforcing energy supplier or Gaining supplier)  Gaining shipper  Losing supplier  Losing shipper  Losing DC / DA  MAP  Losing MEM | N |
| RetailEnergyLocation | Details of Retail Energy Locations passed from the mastering data service to the enquiry data services | ECOES  DES  MPAS  UK Link | S |
| RMPRegApptSync | Synchronisation of RMPs, Registration and Appointment details | Smart Metering | S |

**Table 9 – Outbound Interfaces from CSS**



**Figure 10 – CSS Outbound Interfaces**

## Processing Priorities

CSS processes messages received on any interface in the order in which they are received on that interface. CSS cannot guarantee the application of updates in sequence of receipt on a system-wide basis.

CSS processes changes to Switching Domain Data and Sanctions at a higher priority than changes to Registration Data (i.e. setting a Registration Request to secured), recognising that a Switching Domain Data change may result in a registration change having a different outcome. For example, a Switch Request may be rejected if a change to shipper-supplier alliance has been applied that invalidates the switch.

## Validation

Validation carried out by CSS for interfaces includes the following activities:

* Structural (schema) validation: this process protects against malicious or malformed messages by comparing of the message against a pre-defined template. Structural validation confirms if the message contains the required data elements in the correct order, and that the format, range, type and length of each data element is valid; and
* Content validation: while structural validation confirms if a message and its content is correctly formed, the (business) validity of the message content is established during processing by the target Data Service.

CSS logs the outcome of all message validations in order to meet operational reporting requirements.

## Validation Failure

Failure codes are returned in response to invalid incoming messages. All failure codes are returned (as opposed to just the first error detected).

## Error Handling on Interfaces

This section relates to failures in the process of exchanging data through CSS interfaces. Errors are sent back on the same interface used for the original message.

Failure codes are defined for each failure scenario identified during the development of the CSS solution. It is not possible to list all failure codes at this stage, but as a minimum requirement, they must account for faults in these areas:

* Message transmission;
* Content validation;
* Message processing.

Definition of failure codes also includes a plain English description to aid diagnosis and resolution, and includes the following details as a minimum:

* Time at which the fault occurred;
* System identifier – identifying the specific IT System component in which the fault occurred;
* Operation or process ID in which the fault was encountered;
* Nature of fault.

Certain errors are sufficiently severe (for example inbound synchronisation errors) that the interface is stopped until restored by manual intervention on the part of a CSS operations user.

When CSS itself encounters a failure while processing a message, a ticket is raised within the Service Management system and assigned to the appropriate Operational Support organisation.

The solution allows for automated resolution of commonly occurring incidents.

Where manual intervention is required, the CSS Service Operator invokes their Incident Management processes as required to resolve the fault.

## Interface Mechanisms & Operation

CSS supports Messaging interfaces for both inbound and outbound data:

* **Messaging** –interface operation features mechanisms to enable the source Data Service to transmit individual (complete) data items/messages/transactions[[3]](#footnote-4) to the target Data Service as soon as they are generated. The target Data Service may choose to process the incoming messages as soon as possible, or employ a holding mechanism (buffered) to hold them for later processing.

This approach has been adopted in order to future-proof the design. Batch interfaces (for example file-based transmission containing multiple records and processed on a schedule) will not be provided because of the constraints these would impose on the CSS and the Switching Arrangements as a whole.

All outbound interfaces from CSS operate as Messaging, but note that MPAS and UK Link may buffer messages (at their destination).

For inbound interfaces to CSS, parties have the option of buffering messages (at their source) as appropriate. Parties should give consideration to the constraints of the parent business processes which that interface supports.

All messages sent or received by CSS include a relevant timestamp (stated in UTC). Message receipt timestamps act as an audit trail for individual messages.

It is possible to continue to receive incoming requests/messages even if CSS is not capable of processing them fully at that point in time. Situations where this may be applicable include:

* When the system is undergoing planned maintenance;
* If the system is experiencing unplanned outages (assuming that the ability to receive messages is unaffected);
* If system demand is exceeding available capacity and no resources are available to service the processing of incoming requests.

CSS controls ensure that all incoming messages are processed and applicable responses are made.

## Data Structure & Format

Following completion of CSS procurement, the Service Provider will define the final technical specification and structure of all messages, including:

* Published message schemas for each interface
* Physical data structure and content
* Data format for message bodies – for example JSON, XML, CSV

The data elements required to be exchanged through each interface are defined logically in D-4.1.2 Detailed Design Model (ABACUS)**[2]**and are listed for each interface.

Note that the logical interface model does not show gas and electricity variants of messages. This should be included in the physical model, with attributes for fuel type to be implemented in the physical message model accordingly.

## Interface Specifications

Table 10 – Interface Specifications below details all of the CSS interfaces that operate over the Switching Network.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Interface Name | Purpose | Interface User(s) | I/O | Pattern | Mechanism |
| CommsHubDataLink | Information that relates the electricity and gas meters connected to the same communications hub | Smart Metering | I | U | Messaging (buffered at source) |
| DADCAppointment | Synchronisation of Data Aggregator and Data Collector Agents Appointed between the mastering and secondary (referencing) data services | MPAS | I | S | Messaging (buffered at source) |
| ElectricityRegistration | Synchronisation of electricity RMPs between the mastering and secondary (referencing) data services | ECOES | O | S | Messaging |
| GasRegistration | Synchronisation of gas RMPs between the mastering and secondary (referencing) data services | DES | O | S | Messaging |
| InvitationToIntervene | Registration details delivered to the losing supplier to provide an opportunity to object or annul within the timing constraints of the Switching windows. | Losing Supplier | O | E | Messaging |
| MEMAppointment | Synchronisation of supplier Arranged Appointments between the mastering and secondary (referencing) data services | MPAS  UK Link | I | S | Messaging (buffered at source) |
| MeteringPointSync | Synchronisation of electricity Meter points between the mastering and secondary (referencing) data services | MPAS | I | S | Messaging (buffered at source) |
| PremisesAddress | Update of REL Address based on match with GB standardised address list | Address Service | I/O | U/E | Messaging |
| RegistrationSync | Synchronisation of Registrations between the mastering and secondary (referencing) data services | MPAS  UK Link | O | S | Messaging (buffered at destination) |
| RegMgmtRequestNotification | Registration Request and Registration details passed to interested parties subsequent relating to receipt of a valid registration request, withdrawals, within-switch events and deactivations. | Submitting supplier (Enforcing Energy supplier or Gaining supplier)  Gaining shipper  Losing supplier  Losing shipper  Losing DC / DA  MAP  Losing MEM | O | N | Messaging |
| RegMgmtRequestSubmission | Application for a Registration made by a submitting supplier or an enforcing supplier, along with Withdrawals, within-switch events and deactivations | Supplier (Enforcing Energy supplier or Gaining supplier) | I | U | Messaging |
| RetailEnergyLocation | Details of Retail Energy Locations passed from the mastering data service to the enquiry data services | ECOES  DES  MPAS  UK Link | O | S | Messaging |
| RMPRegApptSync | Synchronisation of RMPs, Registration and Appointment details | Smart Metering | O | S | Messaging |
| SupplyMeterPointSync | Synchronisation of gas Supplier Meter Points between the mastering and secondary (referencing) data services | UK Link | I | S | Messaging (buffered at source) |
| SwitchingDomainData | Information published by industry governance concerning the parameters and settings applicable across all participants in switching processes. | Switching Domain Data Service | I | n/a | n/a |
| SwitchIntervention | Objection or Annulment lodged by a losing supplier | Supplier | I | U | Messaging |

Table 10 – Interface Specifications

1. Functional Requirements

The CSS Functional Requirements describe the expected characteristics of CSS, the Address Service and the Switching Network. They are contained in the embedded spreadsheet below.

The spreadsheet consists of a number of tabs, which should be used in conjunction:

* *Requirements* – contains the full list of functional requirements; a requirement may refer to a Decision Service;
* *Decision Services Diagrams* – contains the Decision Services diagrams, extracted from the D-4.1.2 Detailed Design Model (ABACUS)[2],, from which the relevant Business Rules can be found;
* *Business Rules* – contains the Intent of each Business Rule, extracted from the D-4.1.2 Detailed Design Model (ABACUS)[2], and
* *Decision Services List* – contains a list of the Decision Services (extracted from the D-4.1.2 Detailed Design Model (ABACUS)[2]).

Use of a *Requirement* to refer to a *Decision Service*, which in turn refers to a number of *Business Rules* gives a complete picture of the requirement.



Table 11 - Detailed Functional Requirements

**NOTE**:

RMP, Registration, Registration Request and the other data entities and attributes are references to the LOGICAL data constructs. They are used to define the data and its processing in a consistent manner, including maintaining consistency with the logical data model. The system design, when carried out in the DBT Phase, may use different terminology, objects and processing, but must ensure that the results are equivalent to the requirements expressed in this model.

1. Detailed Data Model
2. Introduction

The Detailed Data Model consists of a number of classified structures inside the published Abacus Data Model. This Appendix gives descriptions of the Object Classes, Data Elements, and Message Structures which are in scope of the CSS persistent store and interface design, from a *logical* viewpoint. The Logical Data model gives a technology agnostic definition of the data included in CSS. In addition, it is used to:

* Ensure data used by business processes is included;
* Validate business rules and logic;
* Identify and understand entities, their attributes and relationships;
* Input into impact analysis;
* Ensure procurement due diligence;
* As the basis to develop a physical data model which could identify and rectify potentially costly mistakes before implementation.

1. References

This URS document references the following artefacts which are present in the architecture development tool ABACUS and intended to be kept up-to-date with any changes as the design evolves.

Latest version of the artefacts may be viewed via published links to ABACUS.

The following artefacts were originally defined in the DLS phase, but have been updated to reflect changes based on:

* Pending changes not incorporated in the baseline
* Analysis of the “as-is” data architecture including data formats, interfaces, impacts
* Feedback from industry/ forum reviews, the Design Proving Programme (DPP), and other input.

|  |  |  |
| --- | --- | --- |
| Deliverable | Description | Artefact (link) name in ABACUS |
| Data Catalogue | A tabular view of Object Classes (entities) with descriptions for each | Object Classes Catalogue |
| Data Catalogue (contd) | A tabular view of Data Element Concepts (attributes) with descriptions for each | Data Elements Catalogue |
| Logical Data Model | A view of the object classes and data elements from the **CSS** logical data model i.e entities, attributes and entity associations –as a ‘diagram’ | CSS Logical Data Model |
| Data Mastership | A view showing the “Mastership” role played by a Data service (system), for a particular data item. This is used to understand data ownership, dissemination and identify avenues for system rationalisation. In addition, it helps present the data flow and interface requirements, and is used as input into Data Governance. | Data Mastership Catalogue |
| Interface (Data) Specification | Lists the (logical) data elements contained in each interface specification of the service interfaces defined between the various data services. | Interface Specifications Contents |
| Messages | These consist of the unique Message names and descriptions that make up the interfaces between CSS and industry participants.  Each message has a defined Message Route, which are defined as the paths between the market roles that the message starts from and ends at.  Each message also has Message Data Content, which is a list of the individual data elements that make up the body of the message. | Messages/Message Routes/Message Data Content |

1. Data Management and Governance Framework

The data model description refers to certain terminology for classifying data and the systems which hold it.

* 1. Data/System Mastership framework

A “Mastership” framework provides a way to classify systems according to the role they play in the lifecycle of a data item in terms of generation and consumption. It presents an overview to derive, or review the flow of data between systems and use this information for purposes of:

* verifying existence/ requirement of interfaces between systems
* data governance (identify system of data creation, dissemination and usage)
* rationalising the landscape
* data impact analysis (e.g.: during replacement/ change management of systems).

The following classification has been used to categorise the systems in the landscape.

|  |  |  |
| --- | --- | --- |
| Code | Name | Description |
| M | Master | A system (e.g.: Deployed IT Application/ Data Service/ information store) which holds the authoritative definitions and values of relevant data elements. This is the system in which data values should be maintained and from which data values should always be distributed as the primary source. Typically, there should be only one Master for a data element in the end to end landscape. |
| S | Secondary | A system (e.g.: Deployed IT Appplication/ Data Service/ information store) which references or reads the data, but does not maintain or master it. The Secondary typically needs to have a means to synchronise data with the Master (or Authorised Provider) that satisfies its service requirements. |
| A | Authorised provider | This is a form of Secondary. However, it is an architecturally approved source for distributing the data set, in addition or as an alternate, to the Master. Typically, these systems would be used to collate various populations of conceptually similar data objects that may have multiple masters to enable the overall architecture to better meet its design objectives. Having an architecturally approved Authorised provider, which provides data elements synchronised with the relevant Master(s), enables more efficient distribution of collated data sets which can be used by referencing systems in the landscape. |

***Note****: The classification is applicable to a* ***combination*** *of a data item and a system, hence also referred to as “Mastership Matrix”. A system could play various Mastership roles across different data items (and vice-versa).*

* 1. Data Type domain framework

The following list of (non-primitive) data types have being used to classify the logical data elements:

|  |  |
| --- | --- |
| Element | Description |
| Date Time | A date time identifies a date and time of day to various common resolutions: year, month, week, day, hour, minute, second, and fraction(s) of second. |
| Duration | A duration is the specification of a length of time without a fixed start or end time, expressed in Gregorian calendar time units (Year, Month,  Week, Day) and Hours, Minutes or Seconds or fractions thereof. |
| Identifier | An identifier is a numeric value used to uniquely identify one instance of an object within an identification scheme. |
| Indicator | An indicator is a list of two mutually exclusive Boolean values that express the only possible states of a property (e.g. TRUE/FALSE). |
| Name | A name is a word or phrase that constitutes the distinctive designation of a person, place, thing or concept. A name is intended to be meaningful for human readers rather than for machines and applications. |
| Number | A mathematical number that is assigned or is determined by calculation. |
| Code | A code is a character string of letters, numbers, special characters (except escape sequences), and symbols. It represents a definitive value, a method, or a property description in an abbreviated or language-independent form that is part of a finite list of allowed values. |
| Text | Text is a character string such as a finite set of characters generally in the form of words of a language. |
| Quantity | A quantity is a counted number of non-monetary units, possibly including fractions. |
| Amount | An amount is a number of monetary units specified in a currency. |

***Note****: As part of logical design the data types have been intentionally presented without any physical specifications, for e.g.: stating the data type as “NAME” rather than “CHAR(35)”. This is done so as to keep the structure solution agnostic.*

1. Logical Data Model Description

A few points to note while using the ABACUS Logical Data Model:

* For definitions of object classes and data elements please refer to the data catalogue in ABACUS (link in References section).
* For a diagram view of the model being described please refer to the Logical Data Model in ABACUS (link in References section). It is recommended that the diagram view be at hand for reference while reading this document.
* The below diagram describes the symbols used in ABACUS and what they represent.

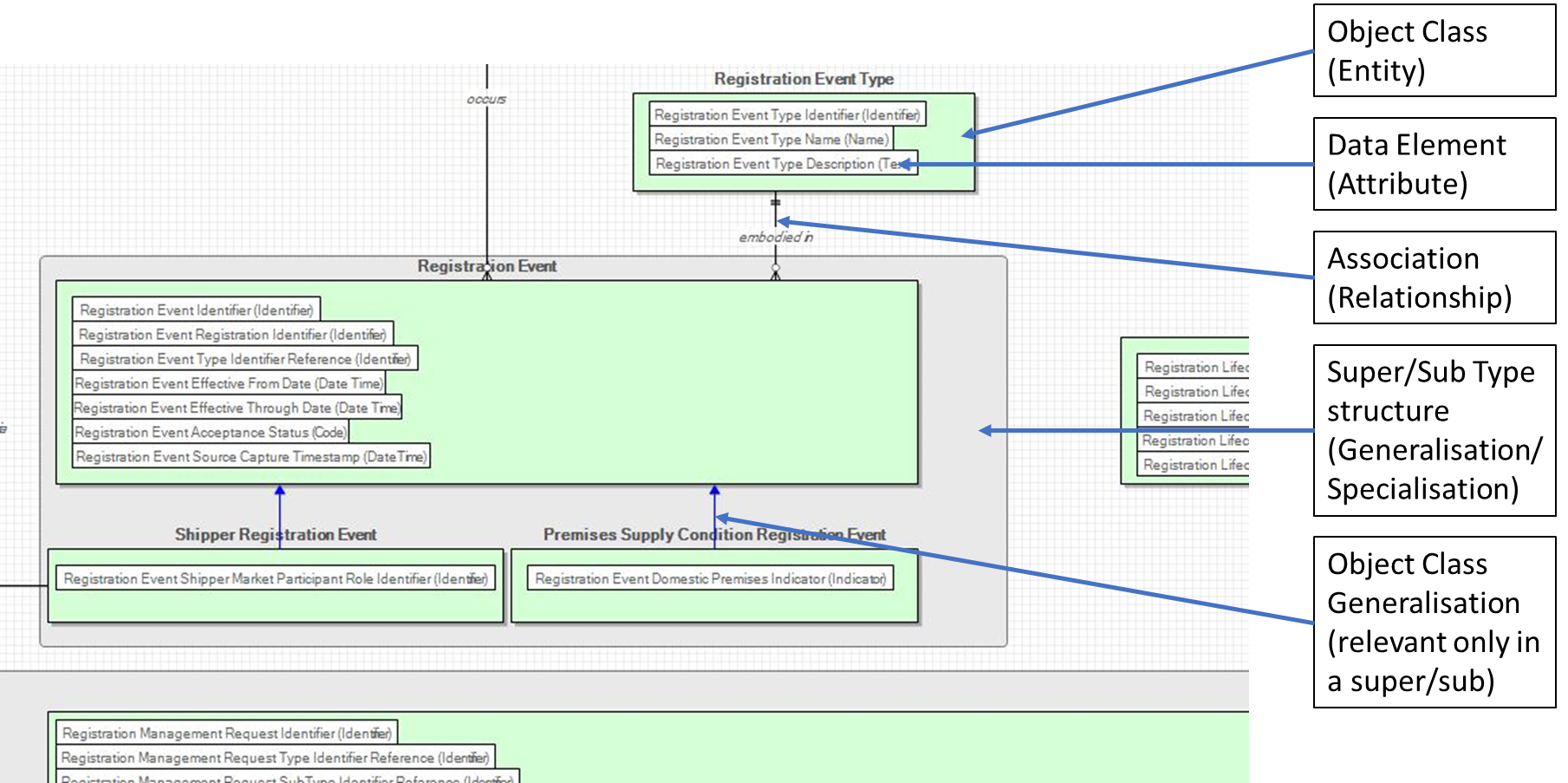


Figure 11 - ABACUS legend

The diagram below shows the diagramming convention used for depicting ‘generalised/ specialised’ object classes and data elements.

In the following example, we have:

|  |  |
| --- | --- |
| **Generalised object class** | **Specialised object class** |
| Registration Management Request | Registration Request |
|  | Registration Request Action |

|  |  |
| --- | --- |
| **Generalised data element** | **Specialised data element** |
| Registration Management Request Identifier | Registration Request Identifier |
|  | Registration Request Action Identifier |

It’s important to understand that the specialised object classes and data elements are **not** *additional* ones. They are just logical placeholders which are explicitly called out for reference in any business processes which may need to deal only with the specialised object classes and data elements.

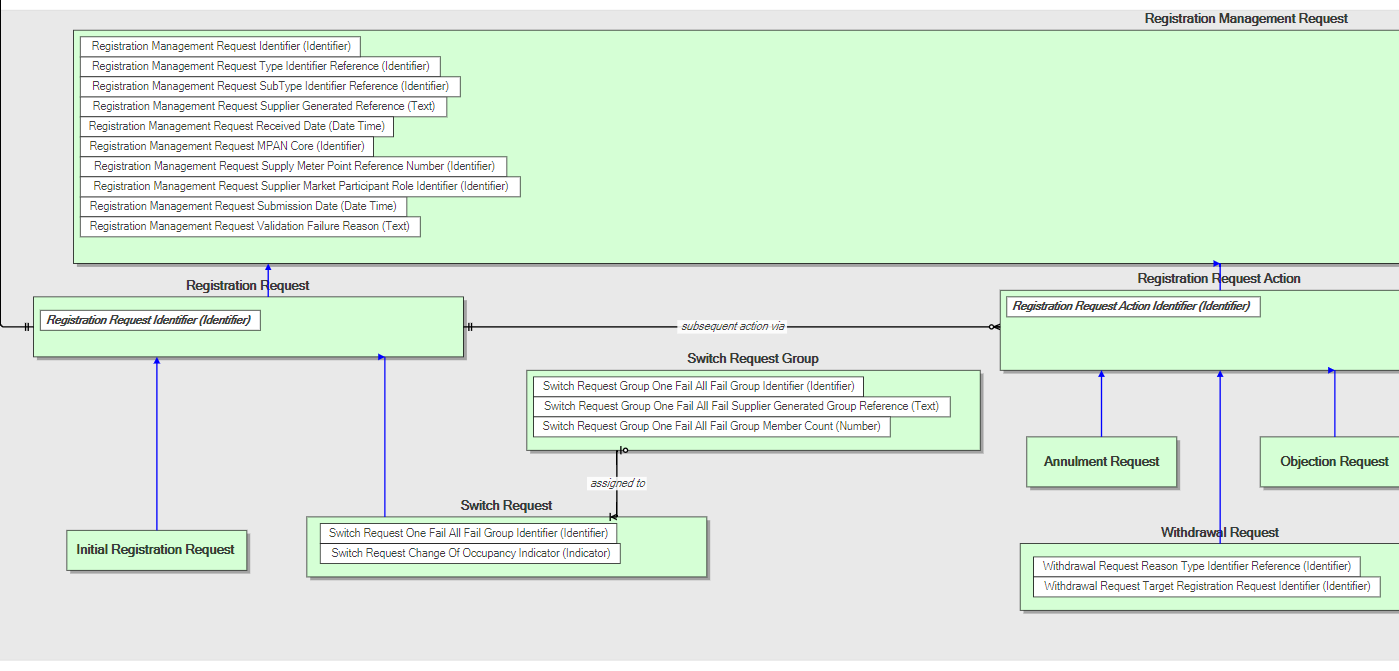


Figure 12 - ABACUS specialisations

1. Data Landscape

A diagram of the full CSS logical data model is found in the embedded file in Table 12 - Data Landscape, below.



Table 12 - Data Landscape

1. Glossary

A glossary of terms used in the Switching Programme can be found in the list of Defined Terms. Numerous additional terms have also been taken from the D-4.1.2 Detailed Design Model (ABACUS), which contains corresponding definitions. Those terms used in this document which are not part of these sources are listed below.

|  |  |
| --- | --- |
| Term | Definition |
| Data Element | The most granular level of data within the solution, defining a specific attribute or property, e.g. MPAN ID, MPID |
| Data Object | A grouping of data elements into a data structure which logically represents a switching concept – for example, an individual Switch Request. |
| Interface | A boundary across which two independent entities meet and interact or communicate with each other. In the context of the Switching Arrangements this will involve the transfer of a specific message between two Actors in a business process. |
| Interface User | An IT system which has a requirement to send or receive data through an interface with CSS. |
| Message | A formal data structure used to exchange business information between data services. |
| Officially-recognised regional language | Any officially-recognised GB language other than English. |
| Service | The overall capability delivered by the interface components of the solution. |

**Table 13 – Glossary**

1. It has been suggested that UK Link and MPAS may continue to process each day’s changes in an overnight process as at present. Details of this remain to be confirmed. [↑](#footnote-ref-2)
2. The Retail Energy Company in this case relates to a supplier. The Retail Energy Company will not be described as the REC, because this acronym is reserved for the Retail Energy Code. [↑](#footnote-ref-3)
3. Note that a message may contain data relating to more than one transaction, for example two switch requests for a dual-fuel OFAF switch in a single message. [↑](#footnote-ref-4)