APPENDIX X

Registration Data Interface Specification

(REGIS)

Contents

DEFINITIONS

In this document, except where the context otherwise requires:

- expressions defined in section A of the Code (Definitions and Interpretation) have the same meaning as is set out in that section; and

- the expressions in the left hand column below shall have the meanings given to them in the right hand column below.

DCC Service Flag	means a flag used to indicate the status recorded by DCC of each MPAN or Supply Meter Point with respect to whether a Smart Metering System is Active, Non-Active or Installed but not Commissioned.

DCC Status File	means the file produced by DCC and transferred to each Network Party's Registration Data Provider detailing the DCC Service Flag of each MPAN or Supply Meter Point registered to that Network Party.

Electricity Registration Data Provider	means a Registration Data Provider appointed by an Electricity Network Party.

Energy Market Data Specification	means the Data Specification which forms part of the REC.

FTP	means file transfer protocol, a standard protocol for transmitting files between computers on a network.

FTPS	means FTP with Transport Layer Security.

Gas Registration Data Provider	means a Registration Data Provider appointed by a Gas Network Party.

Internet Protocol (or IP)	means the commonly used communications protocol enabling the delivery of data packets based on the IP addresses in the packet headers, used in establishing internet communications.

Issuer	has the meaning given to that term in the DCCKI Interface Design Specification.

Network Address Translation	means the standard methodology of remapping one IP address space into another by modifying network address information in Internet Protocol (IP) headers while they are in transit across a traffic routing device.

Policy Enforcement Point (or PEP)	a logical entity that enforces policies for admission control and policy decisions in response to a request for access. It is the logical boundary between the DCC Systems and connecting systems, namely User Systems and RDP Systems. The PEP ensures that: a. the policies in the applicable Code of Connection relevant to the applicable party are being enforced; b. there is appropriate separation of the DCC Systems from the connecting systems of the applicable party; and c. all the connections to the User Systems, RDP Systems, or DCC Systems are compliant with the same applicable Code of Connection .

Response File	means a file produced whilst processing a DCC Status File. For each record in the file being processed, the Response File contains either an acknowledgement that the record has been processed successfully or in the case of a failure in processing the record, the validation errors found.

Supported Version	means the latest version of the Energy Market Data Specification data flow that the DCC supports for use with the Registration Data Interface as listed and as updated from time to time on the Website.

Transport Layer Security (or TLS)	means a protocol that provides for the privacy and integrity of data transferred between communicating applications and their users.

1. INTRODUCTION

Document Purpose

1.1 Pursuant to Section E2 (Registration Data) of the Code, this document is the Registration Data Interface Specification.

2. REGISTRATION DATA INTERFACE

Establishment of the REGIS logical connection

2.1 The DCC shall make the Registration Data Interface available on an Internet Protocol version 4 (IPv4) address range.

2.2 Each Registration Data Provider shall use Network Address Translation to remap their internal Internet Protocol addresses to the DCC provided Internet Protocol addresses at the Registration Data Provider's firewall prior to accessing the Registration Data Interface.

2.3   Each Registration Data Provider shall use Network Address Translation to remap incoming DCC traffic Internet Protocol addresses from the published Internet Protocol addresses at the Registration Data Provider's firewall to the Internet Protocol addresses the Registration Data Provider has reserved within their subnet.

2.4   The DCC shall specify a range of ports and the DCC and each Registration Data Provider shall configure these ports to be open for the FTPS connection.

File Exchange Mechanism

2.5   The Registration Data Interface shall utilise FTPS following the list of recommended tasks for implementing an information exchange stated in NIST SP 800-47 revision 1 Section 3.2.2.

2.6   The DCC and each Registration Data Provider shall implement FTP, in a standard format conforming to the following internet standards as defined in the referenced Request for Comments (RFC) as published by the Internet Engineering Task Force (IETF) and the Internet Society:

(a)   RFC 959 - FTP; and

(b)   RFC 2228 – FTP security extensions.

2.7   The DCC and each Registration Data Provider shall secure the FTP session using TLS, in a standard format conforming to the following internet standards as defined in the referenced RFC as published by the IETF and the Internet Society:

(a)   RFC 4217 - Securing FTP with TLS

2.8   In accordance with RFC 4217:

(a)   each Registration Data Provider shall populate the "USER command" (as defined in RFC 4217) with the RDP Signifier issued to it by the Panel, in lower case; and

(b)   the DCC shall populate the "USER command" with the Party Signifier issued to it by the Panel, in lower case.

2.9   The DCC and each Registration Data Provider shall ensure the session Transport Layer Security is achieved utilising:

(a)   the cipher suite TLS_RSA_WITH_AES_128_GCM_SHA256 as catalogued and further defined by the Internet Assigned Numbers Authority within the Cipher Suite Registry; and

(b)   DCCKI Certificates for mutual authentication.

2.10   The DCC and each Registration Data Provider shall ensure that the FTPS session is routed via the DCC's Policy Enforcement Point and the Policy Enforcement Point used by the Registration Data Provider.

2.11   When sending a DCC Status File, the DCC shall follow steps (a) to (d) below, and when receiving a DCC Status File each Registration Data Provider shall follow steps (e) to (K) below:

(a)   structure data files provided under Section E2.4 of the Code, in accordance with the structures defined in clause 3.9 of this document;

(b)   Digitally Sign the file in accordance with clause 2.12 of this document;

(c)   connect to the recipient's FTPS server in accordance with clauses 2.7 to 2.9 of this document using a DCC Gateway Connection;

(d)   initiate the transfer of the file to the relevant delivery directory on the recipient's FTPS server utilising FTP push mechanisms for all file exchanges;

(e) authenticate the source of the file through verifying that the file has been Digitally Signed in accordance with clause 2.12 of this document, and validate the file structure against the structure as defined in clause 3.9 of this document;

(f) raise an Incident in accordance with the Incident Management Policy, where the recipient is unable to authenticate the file pursuant to clause 2.16 of this document;

(g) in the case of Electricity Registration Data Providers only, raise an Incident in accordance with the Incident Management Policy, where the Electricity Registration Data Provider is unable to confirm that the file conforms with clause 3.9 of this document;

(h) in the case of Registration Data Providers only, generate a Response File as defined in clause 3.10(a) or 3.13(g) of this document, where the Registration Data Provider is unable to validate the file structure pursuant to clauses 3.11 or 3.14 of this document. The Registration Data Provider shall send the Response File to the DCC using the steps outlined in clauses 2.11(b) to (d) immediately above and on receipt of the Response File containing validation errors the DCC shall raise an Incident as defined in the Incident Management Policy;

(i) process each record within the file and perform record level validation, where the Registration Data Provider or DCC is able to successfully authenticate and validate the file pursuant to clause 2.11(e) of this document;

(j) in the case of Registration Data Providers only, generate a Response File as defined in clauses 3.10(a) and 3.13(g) of this document, where the Registration Data Provider is unable to successfully validate and process each record within the file pursuant to clause 2.11(i) of this document. The Registration Data Provider shall send the Response File to the DCC using the steps outlined in clauses 2.11(b) to (d) and on receipt of the Response File containing validation errors the DCC shall raise an Incident in accordance with the Incident Management Policy; and

(k) in the case of the DCC only, raise an Incident in accordance with the Incident Management Policy, where the DCC is unable to successfully validate and process each record within the file pursuant to clause 2.11(i) of this document.

Security Requirements

2.12 The DCC shall Digitally Sign each file sent via the Registration Data Interface with a Private Key.

2.13 The DCC shall ensure that the Digital Signature shall:

a) use, as the digital signature technique, Elliptic Curve Digital Signature Algorithm (ECDSA) (as specified in Federal Information Processing Standards Publications (FIPS PUB) 186-4) in combination with the curve P-256 (as specified in FIPS PUB 186-4 at Section D.1.2.3) and SHA-256 as the hash function;

b) be applied to the entirety of the file including header and trailer; and

c) be converted to Base64 and appended within the file itself to the trailer with a preceding "," separator.

2.14 Prior to Digitally Signing each file, the DCC shall append to the trailer of the file the Issuer, which shall be URL encoded (as specified in the IETF RFC 2253), and serial number of the SMKI Organisation Certificate with preceding "," separators.

2.15 Each Registration Data Provider may use the organisation identifier in the header of the file and the Issuer and serial number in the trailer of the file to retrieve the appropriate public key.

2.16 Each Registration Data Provider shall Check Cryptographic Protection on a file using ECDSA (as specified in FIPS PUB 186-4) in combination with the curve P-256 (as specified in FIPS PUB 186-4 at Section D.1.2.3) and SHA-256 as the hash function, and Confirm Validity of the Certificate used to Check Cryptographic Protection.

2.17 Each Registration Data Provider shall ensure that the Digital Signature calculation shall:

  (a) be performed on the entire file including header and trailer except the Digital Signature and preceding field separator appended to the trailer;

  (b) ensure that all line termination characters read from the file, except any termination characters in the trailer, shall be normalised to 0x0A; and

  (c) exclude any line termination characters in the trailer.

2.18 Prior to verifying the Digital Signature, each Registration Data Provider shall ensure that all line termination characters in the file, except the line termination characters in the trailer, shall be normalised to 0x0A.

Interface Error Handling

Data files not being received when expected

2.19 Identification of an Anomalous Event:

  (a) in the event of the DCC or a Registration Data Provider identifying an exception to the agreed schedules, either organisation may raise an Incident in accordance with the Incident Management Policy.

2.20 Connection & Transfer Failures:

  (a) in the event of connection failures or file transfer failures from the DCC to a Registration Data Provider, the DCC shall attempt to reconnect and/or resend the file on 3 further occasions at 5 minute intervals; and

  (b) if the DCC cannot establish a connection with the Registration Data Provider after such number of retries, the DCC shall raise an Incident in accordance with the Incident Management Policy.

2.21 Authentication Failure:

  (a) In the event of a transport authentication failure where the DCC is trying to send a DCC Status File to a Registration Data Provider, a transport authentication failure will result in no connection or transmission of Registration Data. In such circumstances, the DCC shall raise an Incident in accordance with the Incident Management Policy.

Data files not conforming to the Registration Interface Specification

2.22 Identification of an Anomalous Event:

  (a) The Registration Data Provider shall perform a check of the conformity of files against the agreed standards set out in clause 3 of this Registration Data Interface Specification; or

  (b) In the event of either the DCC or a Registration Data Provider being in receipt of a non-conforming file it shall raise an Incident in accordance with the Incident Management Policy.

2.23 Validation Failure:

  (a) where a validation failure is identified as a result of a DCC file that has been sent to the Registration Data Provider, the Registration Data Provider shall raise an Incident in accordance with the Incident Management Policy.

2.24 Other Circumstances:

  (a) in the event of an Incident arising that is not covered by clauses 2.19 to 2.23 above, a Registration Data Provider shall review its business processes; and

(b)   following compliance with clause 2.23(a) above, and in the event a Registration Data Provider has reasonable grounds to expect the issue to reside within the DCC, the Registration Data Provider shall raise an Incident in accordance with the Incident Management Policy.

Notification of Delays

2.25   In the event that the DCC has a planned or unplanned delay to a DCC Status File transfer, the DCC shall raise an Incident in accordance with the Incident Management Policy.

3.   INTERFACE FILES

General Obligations

3.1   The DCC shall maintain a separate unique reference number for each Network Party that it shall apply to all files corresponding to that Network Party that it sends through the Registration Data Interface to that Network Party's Registration Data Provider.

3.2   In the event that a file is suspected of being lost, each Registration Data Provider may raise an Incident in accordance with the Incident Management Policy.

3.3   Each Electricity Registration Data Provider shall, pursuant to clause 2.11(j), reject a record with a DCC Service Flag 'effective from date' for a Smart Metering System that is earlier than the DCC Service Flag 'effective from date' previously provided by the DCC for that Smart Metering System.

3.4   Each Gas Registration Data Provider shall detect duplicate files and where detected shall not process duplicate files.

3.5   Each Gas Registration Data Provider shall process files in the order they are received.

3.6   Each Registration Data Provider and the DCC shall not use file compression on files transferred through the Registration Data Interface.

3.7   The DCC shall provide any DCC Status Files utilising the FTPS connection or via an alternative means as agreed between the DCC and the Gas Registration Data Provider or Electricity Registration Data Provider to whom the file is being sent, (provided that any such alternative means must incorporate the use of security controls that are at least as robust as those that apply to the FTPS connection).

Electricity Registration Data File Structure and Data Formats

3.8   The DCC shall use variable length delimited file format for sending files, which meet the following requirements:

(a)   fields shall be separated with "|" (ASCII 124) characters

(b)   only use ASCII characters;

(c)   not exceed the field lengths shown in the flow definitions referenced in clause 3.9 of this document;

(d)   values shall not be padded (with leading zeroes or trailing spaces) where less than the maximum field length;

(e)   fields shall not be enclosed in double quotes;

(f)   no characters shall be entered into fields that are intended to be blank; and

(g)   records shall be terminated with a line feed (ASCII 10) character.

3.9   The DCC shall ensure that all files contain header and trailer records that conform to the formats as specified below:

(a)   File Header

Data Item	Format	Optionality	Comment
Group Header	CHAR(3)	Mandatory	'ZHV'
File Identifier	CHAR(10)	Mandatory	File identifier - unique within market participant
Data flow and Version Number	CHAR(8)	Mandatory	Dxxxxnnn Consists of 5 char data flow reference followed by 3 char flow version number - where 'n' has a range of 0-9 e.g. 001, 105....
From Market Participant Role Code	CHAR(1)	Mandatory	e.g. Registration systems have value P
From Market Participant Id	CHAR(4)	Mandatory	e.g. DCC has value DCCO
To Market Participant Role Code	CHAR(1)	Mandatory	e.g. DCC has value Z
To Market Participant Id	CHAR(4)	Mandatory	e.g. DCC has value DCCO
File creation timestamp	CHAR(14)	Mandatory	DATETIME (GMT) DCC is using UTC Formatted: YYYYMMDDHHMMSS
Sending Application Id	CHAR(5)	Optional	Application identifier. For possible future use
Receiving Application Id	CHAR(5)	Optional	Application identifier. For possible future use
Broadcast	CHAR(1)	Optional	For possible future use.
Test data flag	CHAR(4)	Optional	Indicates whether or not this file contains test data. All operational (non-test) files shall contain the value OPER

(b)   File Trailer

Data Item	Format	Optionality	Comment
Group Name	CHAR(3)	Mandatory	'ZPT'

File identifier	CHAR(10)	Mandatory	File identifier - unique within market participant
Total Group Count	INT (10)	Mandatory	Total number of groups in file excluding header/trailer
Checksum	INT (10)	Optional	Checksum
Flow count	INT (8)	Mandatory	Number of flow instances excluding file header/trailer
File completion timestamp	CHAR(14)	Optional	DATETIME (GMT) DCC is using UTC Formatted: YYYYMMDDHHMMSS

3.10 Each Electricity Registration Data Provider shall provide the following files, which shall conform to the latest Supported Version of the specified data flow structures as defined in the Energy Market Data Specification:

(a) Response File - DCC Service Flag update rejections

To notify the DCC of any data records rejected during processing of a DCC Status File due to validation errors, each Electricity Registration Data Provider shall send a Response File as specified in the Energy Market Data Specification D0351 data flow; and

(b) Response File - DCC Service Flag update acknowledgement

To notify the DCC of successful processing of the DCC Status File, each Electricity Registration Data Provider shall send a Response File as specified in the Energy Market Data Specification D0172 data flow.

3.11 The DCC shall provide the following files to each Electricity Registration Data Provider conforming to the data flow structures as defined in the Energy Market Data Specification:

(a) DCC Status File

To notify Electricity Network Parties of DCC Service Flag updates and the identity of the person that the DCC believes to be registered in relation to an MPAN as set out in Section E2.4 of the Code, the DCC shall send a DCC Status File as specified in the Energy Market Data Specification D0350 data flow.

3.12 Clause 3.11 constitutes the data that is to be provided by the DCC to Registration Data Providers under Section E2.4 (a) of the Code.

Gas Registration Data File Structure and Data Formats

3.13 The DCC shall use comma separated file format for sending files to Registration Data Providers of Gas Transporters, and each shall ensure that all of the files that it sends meet the following requirements:

(a) fields shall be comma-separated;

(b) only use ASCII characters;

(c) do not exceed the field lengths shown below at clause 3.28 of this document and exclude any opening and closing double quotation marks or comma separators;

(d) values shall not be padded where less than the maximum field length;

(e) text fields shall be enclosed with opening and closing double quotation marks, but no quotation marks shall be used in date and numeric fields; and

(f)   blank fields shall not contain characters other than opening and closing double quotation marks for text fields.

3.14   Each Gas Registration Data Provider shall employ the file naming convention described below, ensuring that each file sent through the DCC Gateway Connection has a unique name. Within the names shown in clauses (a) and (b) below: 'PN' indicates that the files are production (will be 'TN' for test); nnnnnn is the sequence number of the file in question; and xxx is the file type (ERR, FRJ or DXR) as detailed in clause 3.16:

(a)   Daily DCC Status Files:
DCC01.PNnnnnnn.DXI

(b)   Response Files from Daily DCC Status File processing will be:
XOS01.PNnnnnnn.xxx

(c)   Response File - DCC Service Flag update responses

Following the processing of the DCC Status File (file format described in clause 3.29(a) of this document) each Gas Registration Data Provider shall provide a Response File indicating whether each of the DCC Service Flag update records (record reference 'E45') was accepted or rejected. For each E45 record in the incoming "DXI" DCC Status File there will be a corresponding E46 record (as described immediately below) in the "DXR" Response File. If the E45 record is processed successfully, the outcome code in the E46 record will be "AC" and if unsuccessful the outcome code is "RJ".

Where the outcome is "RJ" the rejection reason will be notified to the DCC through an S72 record or records directly following the E46.

(i)   The format of an E46 record is as follows:

Field Name	Optionality	Type	Length	Description
Transaction Type	Mandatory	Text	3	Value: E46
Outcome Code	Mandatory	Text	2	Details whether the request has been accepted or rejected. AC – Accepted RJ – Rejected.
Meter Point Reference	Mandatory	Number	10	
DCC Service Flag	Mandatory	Text	1	Service flag provided by the DCC. The allowable values are: • A – Active • N – Non-Active • I – InstalledNotCommissioned
DCC Service Effective From Date	Mandatory	Date	8	The date the DCC Service Flag (provided above) is effective from. Format : YYYYMMDD

Service Flag	Description
Active	DCC Service Flag 'A' requires at least one of the associated Smart Meters at an SMS to have the 'Commissioned' Device status in the SMI.

Non-Active	DCC Service Flag 'N' indicates that an SMS is not associated with a Device with an 'InstalledNotCommissioned' or 'Commissioned' Device status, but has been previously.
InstalledNotCommissioned	DCC Service Flag 'I' requires all the associated Smart Meters at an SMS to have the 'InstalledNotCommissioned' Device status in the SMI.

(ii)   The format of an S72 record is as follows:

Field Name	Optionality	Type	Length	Description
Transaction Type	Mandatory	Text	3	Value: S72
Rejection Code	Mandatory	Text	8	The unique reference number identifying the reason for the validation failure. One of the following two values: 'MPO00001' Supply Meter Point does not exist 'DCC00001' DCC Service Flag value is not recognised

3.15   The DCC shall provide files to each Gas Registration Data Provider conforming to the following data flow structure:

(a)   DCC Status File

To notify each Gas Registration Data Provider of DCC Service Flag updates the DCC shall send a single DCC Status File (Ref DXI) that shall consist of a single data record per update (Ref. E45). The format of an E45 record is as follows:

Field Name	Optionality	Type	Length	Description	SEC reference
Transaction Type	Mandatory	Text	3	Value: E45	Not applicable
Meter Point Reference	Mandatory	Number	10		Section E2.4 (b)
DCC Service Flag	Mandatory	Text	1	Service flag provided by the DCC. The allowable flags are: • A – Active • N – Non-Active • I – InstalledNotCommissioned	Section E2.4(b)
DCC Service Effective From Date	Mandatory	Date	8	The date the DCC Service Flag (provided above) is effective from. Format : YYYYMMDD	Section E2.4 (b)

3.16 Each Gas Registration Data Provider shall create and send the Response Files as defined in clause 3.16 (a) and (b) below, in response to failures in validation of the DCC Status File. On receipt of the Response File DCC shall raise an Incident as defined in the Data Incident Management Policy.

(a) Record level format failure Response File

To record any record level format validation errors found in processing the DCC Status File, the Gas Registration Data Provider shall create a Response File with header and trailer as defined in clause 3.14 of this document and one or more record level error records as detailed below. The file name will be as defined in clause 3.14(b) of this document with suffix 'ERR'.

Field Name	Optionality	Type	Length	Description
Transaction Type	Mandatory	Text	3	Value: E01
Rejection Code	Mandatory	Text	8	The unique reference number identifying the reason for the validation failure as defined in the Error Code under clause 3.30(c)
File Reference	Mandatory	Number	10	The unique reference number of the file that was received and processed.
Rejection Description	Mandatory	Text	250	Description of the error found and which record/field it occurred as defined in the Rejection Reason under clause 3.30(c).

(b) Response File - File level rejection

To record any file level format validation errors found in processing the DCC Status File, the Registration Data Provider shall create a Response File with header and trailer as defined in clause 3.26 of this document and the file name will be as defined in clause 3.24(d) of this document with suffix 'FRJ'. File level validation failures will be contained within a single file and will consist of 2 different types of data record per file – Rejected File (record reference S71) and Rejection Details (record reference S72). There will be one S71 record followed by one or more S72 records.

(i) The format of an S71 record is as follows:

Field Name	Optionality	Type	Length	Description
Transaction Type	Mandatory	Text	3	Value: S71
File Reference	Mandatory	Text	30	The unique reference number of the file that was received and processed.

(ii) The format of an S72 record is as follows:

Field Name	Optionality	Type	Length	Description
Transaction Type	Mandatory	Text	3	Value: S72

Rejection Code	Mandatory	Text	8	The unique reference number identifying the reason for the validation failure as defined in the Error Code under clause 3.30(d)

(c)   Record level - Error codes

Error Code	
CSV00010	Transaction type not recognized - *<Record identifier>*
CSV00011	Invalid character - *<Record identifier>*, *<Field number>*
CSV00012	Invalid numeric field , *<Record identifier>*, *<Field number>*
CSV00013	Premature end of record - *<Record identifier>*
CSV00014	Invalid record termination - *<Record identifier>*
CSV00015	Invalid text field - *<Record identifier>*, *<Field number>*
CSV00019	Record too short - *<Record identifier>*
CSV00020	Mandatory field expected - *<Record identifier>*, *<Field number>*
CSV00021	Invalid Date/Time field - *<Record identifier>*, *<Field number>*
CHK00036	Mandatory record not supplied - *<Record identifier>*

(d)   File level - Error codes

FIL00013	Organisation ID on header cannot be found
FIL00014	Organisation ID on the header does not match the sender's ID
FIL00015	File type on the header is not the same as that in file name
FIL00016	Generation number on the header is not the same as that in file name
FIL00017	A file has previously been received & processed with this generation number
FIL00018	A count of detail records in the file does not match that held on the trailer
FIL00019	Invalid record type found