

Balancing and Settlement Code

BSC PROCEDURE

BSCP533 – Appendix A: PARMS Data Provider File Formats

Version 18.0

Date: 1 September 2021

BSCP533 Appendix A
Relating to
PARMS Data Provider File Formats

1. Reference is made to the Balancing and Settlement Code and in particular, to the definition of “BSC Procedure” In Section X, Annex X-1 thereof.
2. This is BSC Procedure 533 Appendix A Version 18.0 relating to PARMS Data Provider File Formats.
3. This BSC Procedure is effective from 1 September 2021.
4. This BSC Procedure has been approved by the Panel.

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AMENDMENT RECORD

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3.0	01 November	Changes for Modification P68	P68	NPAB19/210
4.0	01/03/03	Updated to reflect the terminology used in the BSC	CP852	NPAB22/244
5.0	01/08/03	Updated for Modification P62	P62	
6.0	06/01/04	Updated for Modification P99	P99	
6.1	13/01/04	Updated with SVG and P99 workshop comments	P99	
7.0	01/05/04	Approved by SVG	P99	
8.0	01/07/04	Consistency Amendments and Working Day timings updates	P99	SVG41/002
9.0	04/11/04	Incremented to align with document suite amended for the SVA November 2004 Release		
10.0	23/02/05	SVA February 05 Release and BETTA 6.3	BETTA 6.3, CP1090, CP1091	SVG47/004
11.0	30/06/05	SVA June 05 Release	CP1103	SVG52/005
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14.0	05/11/09	November 09 Release	CP1248 v2.0	SVG97/01
15.0	01/11/10	November 10 Release	CP1325	SVG111/01
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18.0	01/09/21	1 September 2021 Non-Standard Release	P420	P316/05

¹ Please note: CP1334, CP1344 and CP1348 were implemented as part of the June 2011 Release, effective from 01 July 2011

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Related Documents

Reference 1	PARMS User Requirements Specification
Reference 2	BSC Procedure: PARMS Data Provision, Reporting and Publication of Peer Comparison Data (BSCP533)
Reference 3	BSC Procedure: PARMS Data Provision (BSCP533 – Appendix B: PARMS Calculation Guidelines)

1. INTRODUCTION

1.1 Purpose

The purpose of this document is to specify the file format specification associated with the information to be submitted to the Performance Assurance Reporting and Monitoring System (PARMS) which monitors Market Participants' performance. This is intended to provide guidance for Data Providers to assist them in the development of their systems.

1.2 PARMS Data

1.2.1 PARMS Data: General Description

PARMS Data consists of data pertaining to the performance of specified market Participants and is provided via a pre-determined series of files by agreed Data Providers (SMRAs, the SVAA, the CDCA, Suppliers or Supplier Agents). This data is specified in BSCP533 PARMS Data Provision, Reporting and Publication of Peer Comparison Data. The data will be loaded automatically into the PARMS database using the corresponding PARMS validation process.

The data descriptions defined in the relevant Data sections of BSCP533 have been summarised in this paper into usable data identifiers.

The appropriate files are summarised below:

Output Data		
Serial	Titled	FILETYPE
TA01	GSP Group Correction Factor	P0137001
TA02	Annual Demand Ratio	P0138001
CM01	CVA MOA Proving Tests	P0133001
CM02	CVA MOA Fault Resolution	P0134001
SP01	Delivery of Routine Performance Reports	P0139001
SP02	Delivery of Routine Performance Logs	P0140001
SP04	Installation of HH Metering	P0142001
SP07	SMRA & SVAA MSID Count – SMRA File	P0045002 (SMRA)
SP07	SMRA & SVAA MSID Count – SVAA File	P0164001 (SVAA)
SP08	Energy and MSIDs on Actuals	P0145002
SP09	NHH Defaults	P0146001
SP11	Timely Appointment of Agents	P0224001
SP12	Timely Notification of Changes of the Data Aggregator via D0148	P0225001
SP13	Timely Notification of Changes of the SVA Meter Operator Agent via D0148	P0226001
SP14	Timely Notification of Changes of the Data Collector via D0148	P0227001
SP15	Missing Appointments of Agents	P0228001
HM11	Timely Sending of HH MTDs to HHDCs	P0229001
HM12	Missing HH MTDs	P0230001
HM13	Quality of HH MTDs	P0231001
HM14	Timely HH Meter Investigation Requests	P0232001
NM11	Timely Sending of NHH MTDs to NHHDCs	P0233001

Output Data		
Serial	Titled	FILETYPE
NM12	Missing NHH MTDs	P0234001
NC11	Missing NHH Meter Reads & History from Old NHHDC to New NHHDC	P0235001
Standing Data		FILETYPE
DPI - Data Provider Information		P0135001
PARMS Market Domain Data		P0136001
Suppliers Trading / Ceased Trading in GSP Groups		P0127001

2. PHYSICAL FILE PRESENTATION

2.1 Media

Data files will be submitted into PARMS by the Data Provider (Supplier, Supplier Agent or BSC Agent) in the form of ASCII files. A separate data file is required for each Serial, although a number of files may be contained in one submission.

2.2 File Naming

An 8-character file naming convention will be used as follows:

- The 1st to 4th characters will be the participant ID of the Data Provider;
- The 5th to 7th will relate to the File Identifier that will be used in the SVA Data Catalogue; and
- The 8th will be the last digit of the year number (e.g. '2' for 2002, '3' for 2003).

The file extension will indicate the month to which the data pertains (JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC).

2.3 File Submission and Verification of Output Data

Data Providers should submit PARMS data +(x) WDs after the end of the reporting period as follows:

- Suppliers and Supplier Agents Routine Performance Monitoring Report: +20 WDs;
- SMRAs: +10 WDs; and
- SVAA: +7 WDs

All files will be submitted direct to PARMS by the Data Providers specified in the File Formats. Where there has been no occurrence of an event monitored by a Serial, Data Providers should reflect this by using zeros in place of the values for each Supplier and GSP Group. Where there has been no occurrence of an event, but appointments exist in for that Supplier and GSP Group combination, Data Providers should reflect this by submitting zero values against all the standards for these combinations. Failure to do so may result in missing data. **If no data is provided**

at all then PARMS will regard the submission as incomplete and apply Supplier Charges if appropriate. The process and timescale for submission is detailed in BSCP533 'PARMS Data Provision Reporting and Publication of Peer Comparison Data'.

Once received, BSCCo will distribute any Supplier-related data to the relevant Suppliers in order to allow them to verify the data submitted by its appointed agents, particularly where poor performance against a Serial may lead to Supplier Charges. Any queries raised will be dealt with between the Supplier and its Agent, and any resubmission of data should be by the specified Data Provider. (Suppliers can, of course, request that their agents provide copies of any files submitted to PARMS for checking, but this will not be assumed by BSCCo).

2.4 File Resubmission and Correction

Once a Data Provider has submitted a file, it may be resubmitted in order to correct errors subsequently identified in the file. **For each Serial, if a correction is required then a complete submission for the affected GSP Group must be provided**, such that it is made clear that the data that was originally correct should remain in the system. If a file is submitted containing only the corrected data, PARMS will assume that the rest of the data already stored in the system has been since been identified by the Data Provider as incorrect and that the data should be deleted from the system.

3. PHYSICAL FILE FORMATS

3.1 Pool File Format

The majority of the Data Output files will use the Pool file format. In this format, a file contains a number of records, each starting with a three-character identifier and ending with a Record Delimiter character. The first record of each file will be a header; the last a footer. The last record of a physical block will not require a Record Delimiter.

Each record contains fields of various types such as text, integer, date and time. The full range is described below:

Type	Format	Example
int (Integer)	ASCII representation, no leading zeros or spaces, leading “-” if negative (no sign if positive)	-1234 12
dec (Decimal)	ASCII representation. As for Integer, but with a decimal point and fixed number of decimal digits (including trailing zeros) dependent on precision	dec(4,2): -12.34 dec(3,2): 1.20
text	ASCII format, left aligned with trailing spaces stripped. Only includes printable characters excluding the separator	The quick fox
date	ASCII format as: YYYYMMDD	19961216
time	ASCII format as: HHMMSS (24 hour format). Note: both GMT and local time (e.g. British Summertime) will be used and will be indicated as necessary.	131501
date/time	ASCII format as: YYYYMMDDHHMMSS	19961216131501

Type	Format	Example
bol (Boolean)	One ASCII character: T for True, F for False (uppercase only)	T F

A Field Separator character separates each field (**with the exception of the last field of each record**). All fields are mandatory, unless specifically indicated as optional in the ‘comments’ column. A null submission is achieved by omitting any characters between the Field Separators.

All files sent or received by PARMS are structured as follows:

- Header - first record in file - record type = “ZHD”
- Body - other file records
- Footer - last record in file - record type = “ZPT”

For PARMS Output Data, the first record of the file “Body” is a subject participant header (record type “SUB”) containing information about the subject market participant.

Note that there may be many SUB records (e.g. where a Supplier has a number of agents, or an agent contracted to many Suppliers, and where the Supplier is operating in more than one GSP Group).

The components of these three standard record types are defined in the following tables:

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	5 character type (ranges allocated for DTS, pool or internal use) plus 3 character version
3	From Role Code	text(1)	
4	From Participant Id	text(4)	
5	To Role Code	text(1)	‘Z’ (Non-Core - PARMS)
6	To Participant Id	text(4)	‘POOL’
7	Creation Time	date/time	Time file processing was started. Specified in GMT.

SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= H (half hourly) = N (non-half hourly)
3	Market Participant Role Code	text(1)	Role Code of the subject Market Participant
4	Market Participant Id	text(4)	Identifier of the subject Market Participant
5	Period End Date	date	Date of the last calendar day of the period (generally either a month or a quarter) to which the data applies.
6	Periodicity	text(1)	Indicates whether the Period End Date is 'W'weekly, 'M'onthly or 'Q'ually.

ZPT - File Footer			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZPT
2	Record count	int(10)	Includes header and footer
3	Checksum	int(10)	Although type is shown as int(10) the value is actually a 32-bit unsigned value and hence will fit in an "unsigned long" C variable.

The remaining component of the File is a body record containing the required PARMS information. These will be specific for each Serial and, like the SUB record, will be repeated in situations where, for example, an SMRS or a Supplier Agent is operating in a number of different GSP Groups, or where data is required for a number of different Settlement Run types.

Some files involve the reporting of a data item against a list of Settlement dates, such as for Serial SP07. **In these instances, the dates and the associated data items should be listed in ascending order.**

The character set used is based on the ISO Level B character set and will include the following characters:

Letters, upper case	A to Z
Letters, lower case	a to z
Numerals	0 to 9
Space character	
Full stop	.
Comma	,
Hyphen/minus	-
Opening parenthesis	(
Closing parenthesis)
Slash	/
Apostrophe	'
Plus	+
Colon	:
Equals	=
Question mark	?
Exclamation mark	!
Quotation mark	"
Percentage sign	%
Ampersand	&
Asterisk	*
Semi-colon	;
Less than	<
Greater than	>
Underscore	_

Field Separator: The vertical bar character '|' will be used as the separator.

Record Delimiter: The Line Feed character (hex "A") or a Carriage Return is used as the delimiter.

4. STANDING DATA FILE FORMATS

4.1 DPI - Data Provider Information

This file provides PARMS with the identities of Supplier Agents that will be providing Output Data for that Supplier in each relevant GSP Group.

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0135001
3	From Role Code	text(1)	= X (Supplier)
4	From Participant Id	text(4)	= ID of originating Supplier
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
DPI - Data Provider Information			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= DPI
2	GSP Group	text(2)	
3	Serial reference	text(4)	e.g. HM11, NM11, SP04, etc
4	Data Provider ID	text(4)	
5	Data Provider Role Code	text(1)	
6	Period end date	date	= Calendar date of end of reporting period
ZPT – File Footer			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZPT
2	Record count	int(10)	Includes header and footer
3	Checksum	int(10)	Although type is shown as integer(10) the value is actually a 32-bit unsigned value and hence will fit in an “unsigned long” C variable.

Backus-Naur Form:

Data Provider Information ::= ZHD {DPI} ZPT

4.2 PARMS Market Domain Data

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0136001
3	From Role Code	text(1)	= G (SVA Agent)
4	From Participant Id	text(4)	CAPG
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
VER : MDD version			
1	Record Type	text(3)	= VER
2	MDD Version Number	int(8)	
GSG : GSP Group			
1	Record Type	text(3)	= GSG
2	GSP Group Id	text(2)	
3	GSP Group Name	text(30)	
GGD : GSP Group Distributors			
1	Record Type	text(3)	=GGD
2	Distributor Id	int(2)	
3	Market Participant Role Code	text(1)	
4	Effective from Date {MPR}	date	
5	Effective from Settlement Date {GGD}	date	
6	Effective to Settlement Date {GGD}	date	optional
MRC : Market Participant Role Codes			
1	Record Type	text(3)	= MRC
2	Market Participant Role Code	text(1)	
3	Role Code Description	text(30)	
MAP : Market Participants			
1	Record Type	text(3)	= MAP

2	Market Participant Id	text(4)	
3	Market Participant Name	text(40)	
4	Pool Member Id	text(4)	optional
MPR : Market Participant Roles			
1	Record Type	text(3)	= MPR
2	Market Participant Role Code	text(1)	
3	Effective from Settlement Date {MPR}	date	
4	Effective to Settlement Date {MPR}	date	optional
SSR : SSR Run Type			
1	Record Type	text(3)	= SSR
2	SSR Run Type	text(2)	
3	SSR Run Type Name	text(40)	
SSC : Settlement Calendar			
1	Record Type	text(3)	= SSC
2	SSR Run number	int(7)	
3	Settlement Date	date	
4	SSR Run Type	text(2)	
5	SSR Run Date	date	

Note

- 1 there is a one to many relationship between Meter asset provider (MAP) and market participant role (MPR) record types
- 2 the VER record type denotes which version of MDD was used for the source of this file

Backus-Naur Form:

PARMS Market Domain Data ::= ZHD VER {GSG {GGD}} {MRC} {MAP {MPR}} {SSR} {SSC} ZPT

4.3 Suppliers Trading / Ceased Trading in GSP Groups

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0127001
3	From Role Code	text(1)	= G (SVA Agent)
4	From Participant Id	text(4)	CAPG
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SPT : Supplier Trading / Ceased Trading in GSP Group			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SPT
2	GSP Group Id	text(2)	
3	Supplier Id	text(4)	
4	Effective from Date Supplier Trading in GSP Group	date	Calendar date started trading in GSP Group
5	Effective to Date Supplier Trading in GSP Group	date	Optional. Calendar date ceased trading in GSP Group

Backus-Naur Form:

Suppliers Trading / Ceased Trading in GSP Groups ::= ZHD {SPT} ZPT

5. OUTPUT DATA FILE FORMATS

5.1 TA01 – GSP Group Correction Factor

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0137001
3	From Role Code	text(1)	= G (SVAA)
4	From Participant Id	text(4)	= CAPG
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= B (indicates HH and NHH data)
3	Market Participant Role Code	text(1)	= NULL
4	Market Participant Id	text(4)	= NULL
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
TA1 Trading Arrangements Serial 1 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= TA1
2	Number of GCF queries raised	int(5)	

5.2 TA02 – Annual Demand Ratio

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0138001
3	From Role Code	text(1)	= G (SVAA)
4	From Participant Id	text(4)	=CAPG
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= B (indicates HH and NHH data)
3	Market Participant Role Code	text(1)	Not applicable
4	Market Participant Id	text(4)	Not applicable
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
TA2 Trading Arrangements Serial 2 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= TA2
2	Annual Demand Ratio	dec(5,4)	

Backus-Naur Form:

Annual Demand Ratio ::= ZHD SUB TA2 ZPT

5.3 CM01 – CVA MOA Proving Tests

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0133001
3	From Role Code	text(1)	= Z
4	From Participant Id	text(4)	= CDCA
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SB1
2	Market Sector	text(1)	= H
3	Market Participant Role Code	text(1)	= M (MOA)
4	Market Participant Id	text(8)	ID of CVA MOA
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
CM01 CVA MOA Serial 1 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= CM1
2	GSP Group Id	text(2)	= 'NULL' if directly-connected site
3	Number of MSIDs affected in period	int(7)	
4	Average number of working days Proving Test is outstanding after Effective From Date at time of report	dec(4,1)	
5	Count of faults outstanding after Effective From Date	int(7)	

Backus-Naur Form:

CVA MOA Proving Tests ::= ZHD {SB1 {CM1}} ZPT

5.4 CM02 – CVA MOA Fault Resolution

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0134001
3	From Role Code	text(1)	= Z
4	From Participant Id	text(4)	= CDCA
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SB2
2	Market Sector	text(1)	= H
3	Market Participant Role Code	text(1)	= M (MOA)
4	Market Participant Id	text(8)	ID of CVA MOA
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
CM02 CVA MOA Serial 2 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= CM2
2	GSP Group Id	text(2)	= 'NULL' if directly-connected site
3	Number of MSIDs affected in period	int(7)	
4	Count of faults identified	int(7)	
5	Average number of working days faults outstanding at time of report	dec(4,1)	
5	Average number of working days taken to resolve faults	dec(4,1)	

Backus-Naur Form:

CVA MOA Fault Resolution ::= ZHD {SB2 {CM2}} ZPT

5.5 SP11 – Timely Appointment of Agents

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0224001
3	From Role Code	text(1)	= C, D, M
4	From Participant Id	text(4)	ID of Supplier Agent
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= N (NHH data) or H (HH data)
3	Market Participant Role Code	text(1)	= X (Supplier)
4	Market Participant Id	text(4)	ID of Supplier
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
SP11 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= X11
2	GSP Group Id	text(2)	Where unknown '_U' should be used
3	Count of D0155s received within Reporting Period	int(7)	
4	Count of D0155s not received before Agent EFD	int(7)	
5	Count of D0155s received before SF	int(7)	
6	Count of D0155s received before R1	int(7)	
7	Count of D0155s received before R2	int(7)	
8	Count of D0155s received before R3	int(7)	
9	Count of D0155s received before RF	int(7)	
10	Count of D0155s received after RF	int(7)	

Backus-Naur Form:

Timely Appointment of Agents::= ZHD {SUB {X11}} ZPT

5.6 SP12 – Timely Notification of Changes of the Data Aggregator via D0148

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0225001
3	From Role Code	text(1)	= C or D
4	From Participant Id	text(4)	ID of Supplier Agent
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= N (NHH data) or H (HH data)
3	Market Participant Role Code	text(1)	= X (Supplier)
4	Market Participant Id	text(4)	ID of Supplier
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
SP12 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= X12
2	GSP Group Id	text(2)	Where unknown '_U' should be used
3	Count of D0148s received within Reporting Period	int(7)	
4	Count of D0148s not received before DA EFD	int(7)	
5	Count of D0148s received before SF	int(7)	
6	Count of D0148s received before R1	int(7)	
7	Count of D0148s received before R2	int(7)	
8	Count of D0148s received before R3	int(7)	
9	Count of D0148s received before RF	int(7)	
10	Count of D0148s received after RF	int(7)	

Backus-Naur Form:

Timely Notification of Changes of the DAs via D0148::= ZHD {SUB {X12}} ZPT

5.7 SP13 - Timely Notification of Changes of the SVA Meter Operator Agent via D0148

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0226001
3	From Role Code	text(1)	= C or D
4	From Participant Id	text(4)	ID of Supplier Agent
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= N (NHH data) or H (HH data)
3	Market Participant Role Code	text(1)	= X (Supplier)
4	Market Participant Id	text(4)	ID of Supplier
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
SP13 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= X13
2	GSP Group Id	text(2)	Where unknown '_U' should be used
3	Count of D0148s received within Reporting Period	int(7)	
4	Count of D0148s not received before SVA MOA EFD	int(7)	
5	Count of D0148s received before SF	int(7)	
6	Count of D0148s received before R1	int(7)	
7	Count of D0148s received before R2	int(7)	
8	Count of D0148s received before R3	int(7)	
9	Count of D0148s received before RF	int(7)	
10	Count of D0148s received after RF	int(7)	

Backus-Naur Form:

Timely Notification of changes of the SVA MOAs via D0148::= ZHD {SUB {X13}} ZPT

5.8 SP14 - Timely Notification of Changes of the Data Collector via D0148

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0227001
3	From Role Code	text(1)	= M
4	From Participant Id	text(4)	ID of Supplier Agent
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= N (NHH data) or H (HH data)
3	Market Participant Role Code	text(1)	= X (Supplier)
4	Market Participant Id	text(4)	ID of Supplier
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
SP14 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= X14
2	GSP Group Id	text(2)	Where unknown '_U' should be used
3	Count of D0148s received within Reporting Period	int(7)	
4	Count of D0148s not received before DC EFD	int(7)	
5	Count of D0148s received before SF	int(7)	
6	Count of D0148s received before R1	int(7)	
7	Count of D0148s received before R2	int(7)	
8	Count of D0148s received before R3	int(7)	
9	Count of D0148s received before RF	int(7)	
10	Count of D0148s received after RF	int(7)	

Backus-Naur Form:

Timely Notification of changes of the DCs via D0148::= ZHD {SUB {X14}} ZPT

5.9 SP04 – Installation of HH Metering

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0142001
3	From Role Code	text(1)	= X (Supplier)
4	From Participant Id	text(4)	ID of Supplier originating file
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= H (indicates HH data)
3	Market Participant Role Code	text(1)	= X (Supplier)
4	Market Participant Id	text(4)	ID of Supplier
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
SP4 Supplier Serial 4 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SP4
2	GSP Group Id	text(2)	
3	MSID	int(13)	
4	Aggregated Standard Installed MSID-Days in Month HH 100kW Site	int(4)	
5	Aggregated Not Installed MSID-Days in Month HH 100kW Site	int(4)	Cannot exceed field 4
6	Percentage Not Installed MSID-Days in Month HH 100kW Site	dec(4,1)	

Backus-Naur Form:

Installation of HH Metering ::= ZHD { SUB { SP4 } } ZPT

5.10 SP15 - Missing Appointments of Agents

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0228001
3	From Role Code	text(1)	= C, D or M
4	From Participant Id	text(4)	ID of Supplier Agent
5	To Role Code	text(1)	= Z (Non-Core -PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= N (NHH data) or H (HH data)
3	Market Participant Role Code	text(1)	= X (Supplier)
4	Market Participant Id	text(4)	ID of Supplier
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
SP15 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= X15
2	GSP Group Id	text(2)	Where unknown '_U' should be used
3	Count of D0155s held in the previous 14 months	int(7)	
4	Count of D0155s for which no D0148s are held	int(7)	
5	Count of D0148s missing before R1	int(7)	
6	Count of D0148s missing before R2	int(7)	
7	Count of D0148s missing before R3	int(7)	
8	Count of D0148s missing before RF	int(7)	
9	Count of D0148s missing after RF	int(7)	

Backus-Naur Form:

Missing Appointments of Agents::= ZHD {SUB SP5X15} ZPT

5.11 Not Used

5.12 SP07 – SMRA & SVAA MSID Count – SMRA File

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0045002
3	From Role Code	text(1)	= P (SMRA)
4	From Participant Id	text(4)	ID of originating SMRA
5	To Role Code	text(1)	= Z (Non-Core -PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= B (indicates HH and NHH data)
3	Market Participant Role Code	text(1)	= X (Supplier)
4	Market Participant Id	text(4)	ID of Supplier
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
SP7 Supplier Serial 7 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SP7
2	GSP Group Id	text(2)	
3	Market Participant ID	text(4)	ID of Data Aggregator
4	Market Participant Role Code	text(1)	A (Half Hourly Data Aggregator) or B (non-Half Hourly Data Aggregator)
5	Date	date(8)	yyyymmdd
6	Energised MSID Count	int (10)	
7	De-energised MSID Count	int(10)	

Backus-Naur Form:

SMRA/SVAA MSID Count– SMRA File::= ZHD {SUB {SP7}} ZPT

5.13 SP07 – SMRA & SVAA MSID Count – SVAA File

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0164001
3	From Role Code	text(1)	= G (SVAA)
4	From Participant Id	text(4)	= CAPG
5	To Role Code	text(1)	= Z (Non-Core -PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= B (indicates HH and NHH data)
3	Market Participant Role Code	text(1)	= X (Supplier)
4	Market Participant Id	text(4)	ID of Supplier
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
SP7 Supplier Serial 7 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SP7
2	GSP Group Id	text(2)	
3	Market Participant ID	text(4)	ID of Data Aggregator
4	Market Participant Role Code	text(1)	A (Half Hourly Data Aggregator) or B (non-Half Hourly Data Aggregator)
5	Settlement Date	date(8)	yyyymmdd
6	Settlement Type	text(2)	
7	MSID Count	int(10)	

Backus-Naur Form:

SMRA/SVAA MSID Count– SVAA File::= ZHD {SUB {SP7}} ZPT

5.14 SP08 – Energy and MSIDs on Actuals

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0145002
3	From Role Code	text(1)	= G (SVAA)
4	From Participant Id	text(4)	= CAPG
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= B (indicates HH and NHH data)
3	Market Participant Role Code	text(1)	= X (Supplier)
4	Market Participant Id	text(4)	ID of Supplier
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
SP8 Supplier Serial 8 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SP8
2	Settlement Day	date	
3	Settlement Type	text(2)	SF, R1, R2, R3 and RF run types
4	GSP Group Id	text(2)	
5	% NHH Energy Aggregated on Actuals	dec(4,1)	The type 'dec 4,1' allows for percentage values up to, and including, 999.9% in this data field
6	% NHH MSIDs Aggregated on Actuals	dec(4,1)	
7	Total Actual NHH Energy	dec(10,2)	
8	Total NHH Energy	dec(10,2)	
9	% non-100kW HH Energy Aggregated on Actuals	dec(4,1)	The type 'dec 4,1' allows for percentage values up to, and including, 999.9% in this data field

10	% non-100kW HH MSIDs Aggregated on Actuals	dec(4,1)	
11	Total Actual non-100kW HH Energy	dec(10,2)	
12	Total non-100kW HH Energy	dec(10,2)	
13	% 100kW HH Energy Aggregated on Actuals	dec(4,1)	The type 'dec 4,1' allows for percentage values up to, and including, 999.9% in this data field
14	% 100kW HH MSIDs Aggregated on Actuals	dec(4,1)	
15	Total Actual 100kW HH Energy	dec(10,2)	
16	Total 100kW HH Energy	dec(10,2)	

Backus-Naur Form:

Energy and MSIDs on Actuals::= ZHD {SUB {SP8}} ZPT

5.15 SP09 – NHH Defaults

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0146001
3	From Role Code	text(1)	= G (SVAA)
4	From Participant Id	text(4)	= CAPG
5	To Role Code	text(1)	= Z (Non-Core -PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= N (indicates NHH data)
3	Market Participant Role Code	text(1)	= X (Supplier)
4	Market Participant Id	text(4)	ID of Supplier
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
SP9 Supplier Serial 9 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SP9
2	Settlement Day	date	
3	Settlement Type	text(2)	SF, R1, R2, R3 and RF run types
4	GSP Group Id	text(2)	
5	% NHH MSIDs Settled using Default EACs	dec(4,1)	
6	Number of NHH MSIDs Settled using Default EACs	int(7)	

Backus-Naur Form:

NHH Defaults ::= ZHD { SUB { SP9 } } ZPT

5.16 HM11 - Timely Sending of HH MTDs to HHDCs

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0229001
3	From Role Code	text(1)	= C
4	From Participant Id	text(4)	ID of Supplier Agent
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= H (indicates HH data)
3	Market Participant Role Code	text(1)	= M
4	Market Participant Id	text(4)	ID of HH SVA MOA
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
HM11 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= 1HM
2	GSP Group Id	text(2)	Where unknown '_U' should be used
3	Supplier Id	text(4)	The Market Participant ID of the associated Supplier
4	Count of D0268s received	int(7)	
5	Count of D0268s received, following a material change to the Metering System, after the MSMTD EFD before SF	int(7)	
6	Count of D0268s received, following a material change to the Metering System, before R1	int(7)	
7	Count of D0268s received, following a material change to the Metering System, before R2	int(7)	
8	Count of D0268s received, following a material change to the Metering System, before R3	int(7)	
9	Count of D0268s received, following a material change to the Metering System, before RF	int(7)	
10	Count of D0268s received, following a material change to the Metering System, after RF	int(7)	

Backus-Naur Form:

Timely Sending of HH MTDs to HHDCs::= ZHD { SUB { 1HM } } ZPT

5.17 HM12 - Missing HH MTDs

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0230001
3	From Role Code	text(1)	= C, M
4	From Participant Id	text(4)	ID of Supplier Agent (Current HHDC reporting on new HH SVA MOA; new HHDC reporting on current HH SVA MOA; new HH SVA MOA reporting on current HH SVA MOA)
5	To Role Code	text(1)	= Z (Non-Core -PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= H (indicates HH data)
3	Market Participant Role Code	text(1)	= M
4	Market Participant Id	text(4)	Where unknown enter 'UUUU' (New HH SVA MOA if reported by current HHDC; current HH SVA MOA if reported by new HHDC or new HH SVA MOA)
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
HM12 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= 2HM
2	GSP Group Id	text(2)	Where unknown '_U' should be used
3	Supplier Id	text(4)	The Market Participant ID of the associated Supplier
4	Count of unique registrations held in previous 14 months	int(7)	
5	Count of registrations where no D0268 held	int(7)	
6	Count of D0268s missing before R1	int(7)	
7	Count of D0268s missing before R2	int(7)	
8	Count of D0268s missing before R3	int(7)	
9	Count of D0268s missing before RF	int(7)	
10	Count of D0268s missing after RF	int(7)	

Backus-Naur Form:

Missing HH MTDs ::= ZHD {SUB {2HM}} ZPT

5.18 HM13 – Quality of HH MTDs

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0231001
3	From Role Code	text(1)	= C
4	From Participant Id	text(4)	ID of HHDC
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= H (indicates HH data)
3	Market Participant Role Code	text(1)	= M
4	Market Participant Id	text(4)	ID of HH SVA MOA
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
HM13 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= 3HM
2	GSP Group Id	text(2)	Where unknown '_U' should be used
3	Supplier Id	text(4)	The Market Participant ID of the associated Supplier
3	Count of D0268s received within Reporting Period	int(7)	
4	Count of D0268s with same EFD but with a key data field change	int(7)	
5	Count of affected re-sent MSIDs per MSMTD	int(7)	

Backus-Naur Form:

Quality of HH MTDs ::= ZHD {SUB {3HM}} ZPT

5.19 HM14 - Timely HH Meter Investigation Requests

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0232001
3	From Role Code	text(1)	= C
4	From Participant Id	text(4)	ID of HHDC
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= H (indicates HH data)
3	Market Participant Role Code	text(1)	= M
4	Market Participant Id	text(4)	ID of HH SVA MOA
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
HM14 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= 4HM
2	GSP Group Id	text(2)	Where unknown '_U' should be used
3	Supplier Id	text(4)	The Market Participant ID of the associated Supplier
3	Count of D0002s received in Reporting Period	int(7)	
4	Count of D0002s received before SF	int(7)	
5	Count of D0002s received before R1	int(7)	
6	Count of D0002s received before R2	int(7)	
7	Count of D0002s received before R3	int(7)	
8	Count of D0002s received before RF	int(7)	
9	Count of D0002s received after RF	int(7)	

Backus-Naur Form:

Timely HH Meter Investigation Requests::= ZHD { SUB { 4HM } } ZPT

5.20 NM11 - Timely Sending of NHH MTDs to NHHDCs

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0233001
3	From Role Code	text(1)	= D (NHHDC)
4	From Participant Id	text(4)	= ID of NHHDC
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= N (indicates NHH data)
3	Market Participant Role Code	text(1)	= M
4	Market Participant Id	text(4)	ID of NHH SVA MOA
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
NM11 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= 1NM
2	GSP Group Id	text(2)	Where unknown '_U' should be used
3	Supplier ID	text(4)	The Market Participant ID of the associated Supplier
4	Count of D0150s received within the Reporting Period	int(7)	
5	Count of D0150s received, following a material change to the Metering System, before SF	int(7)	
6	Count of D0150s received, following a material change to the Metering System, before R1	int(7)	
7	Count of D0150s received, following a material change to the Metering System, before R2	int(7)	
8	Count of D0150s received, following a material change to the Metering System, before R3	int(7)	
9	Count of D0150s received, following a material change to the Metering System, before RF	int(7)	
10	Count of D0150s received, following a material change to the Metering System, after RF	int(7)	

Backus-Naur Form:

Timely Sending of NHH MTDs to NHHDCs::= ZHD { SUB { 1NM } } ZPT

5.21 NM12 – Missing NHH MTDs

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0234001
3	From Role Code	text(1)	= D or M (NHHDC or NHH SVA MOA)
4	From Participant Id	text(4)	= ID of Supplier Agent(Current NHHDC if reporting on new NHH SVA MOA; new NHHDC if reporting on current NHH SVA MOA; new NHH SVA MOA if reporting on current NHH SVA MOA)
5	To Role Code	text(1)	= Z (Non-Core – PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= N (indicates NHH data)
3	Market Participant Role Code	text(1)	=M
4	Market Participant Id	text(4)	ID of NHH SVA MOA, where unknown enter 'UUUU' (New NHH SVA MOA if reported by current NHHDC; current NHH SVA MOA if reported by new NHHDC or by new NHH SVA MOA)
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
NM12 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= 2NM
2	GSP Group Id	text(2)	Where unknown '_U' should be used
3	Supplier ID	text(4)	The Market Participant ID of the associated Supplier
4	Count of unique registrations held in previous 14 months	int(7)	
5	Count of registrations where no D0150 held	int(7)	
6	Count of D0150s missing before R1	int(7)	
7	Count of D0150s missing before R2	int(7)	
8	Count of D0150s missing before R3	int(7)	
9	Count of D0150s missing before RF	int(7)	
10	Count of D0150s missing after RF	int(7)	

Backus-Naur Form:

Missing NHH MTDs ::= ZHD { SUB { 2NM } } ZPT

5.22 NC11 - Missing NHH Meter Reads & History from Old NHHDC to New NHHDC

ZHD - File Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= ZHD
2	File Type	text(8)	= P0235001
3	From Role Code	text(1)	= D (new NHHDC)
4	From Participant Id	text(4)	= ID of new NHHDC
5	To Role Code	text(1)	= Z (Non-Core - PARMS)
6	To Participant Id	text(4)	= POOL
7	Creation Time	date/time	Date & time of file generation
SUB - Subject Participant Header			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= SUB
2	Market Sector	text(1)	= N (indicates NHH data)
3	Market Participant Role Code	text(1)	= D (old NHHDC)
4	Market Participant Id	text(4)	ID of old NHHDC, where unknown enter 'UUUU'
5	Period End Date	date	Date of last day of calendar month
6	Periodicity	text(1)	'M'onthly
NC11 Data			
Field	Field Name	Type	Comments
1	Record Type	text(3)	= 1NC
2	GSP Group Id	text(2)	Where unknown '_U' should be used
3	Supplier ID	text(4)	The Market Participant ID of the associated Supplier
4	Count of unique registrations held in previous 14 months	int(7)	
5	Count of registrations where no D0010 and D0152 held	int(7)	
6	Count of D0010 and D0152s missing before R1	int(7)	
7	Count of D0010 and D0152s missing before R2	int(7)	
8	Count of D0010 and D0152s missing before R3	int(7)	
9	Count of D0010 and D0152s missing before RF	int(7)	
10	Count of D0010 and D0152s missing after RF	int(7)	

Backus-Naur Form:

Missing NHH Meter Reads & History from Old NHHDC to New NHHDC ::= ZHD {SUB {1NC}} ZPT

APPENDIX 1: ALGORITHM FOR CHECKSUM REQUIRED FOR BSCCO DEFINED SOFTWARE

Introduction

In order to meet the Auditor requirements for a method of ensuring file integrity, a checksum algorithm was agreed that provides a signature for files coming into, and out from, the three Business Process Operations (BPO) Service developed systems.

The purpose of the algorithm is to provide a reasonable degree of assurance that the binary nature of the file has not changed. It does not provide any assurance as to the accuracy of the data within the file.

Requirement

The checksum algorithm is defined as follows:

$W_{j,k}$ is the k th 4-byte word of the J th record.

Therefore the function can be defined as:

$((W_{1,1} \text{ XOR } W_{1,2}) \text{ XOR } W_{1,3}) \dots \text{ XOR } W_{1+n,m})$

n = the total number of records (less the footer record)

m = the number of 4 byte words in the last record

Key points to note are that the algorithm:

- excludes line terminators
- excludes the last record
- where the last word of a record is less than 4 bytes then it is padded with binary zeroes.

Pseudo-Code

The detail of the algorithm is as follows (note that this assumes that each record is submitted one by one):

This takes four byte sections (excluding the end of line character), padded with nulls if required, and exclusive OR (XOR) them into checksum. The algorithm for this is illustrated by the following 'C-like' pseudo code.

```
num_chars = strlen (context.record buffer)
FOR (i = 0; i < num_chars;)
    value = 0
    FOR (j = 0; j < 4; i++, j++)
        IF i < num_chars
            value = ((value << 8) + context.record_buffer[i])
        ELSE
            value = value << 8
        END IF
    ENDFOR
    context.checksum = context.checksum XOR value
ENDFOR
```

Example Algorithm

This algorithm has been produced by the BSCCo in Visual Basic. This routine has been used in the generation of test data and the output of the routine has been checked against BPO Service data.

```
Public Function Calc(sFile As String) As Long
'Algorithm to Calculate Checksum from G. Swinton, 23/04/97.
  On Error GoTo c1_Error

  Dim i As Integer
  Dim j As Integer
  Dim chksum As Long
  Dim bytes(4) As Integer
  Dim sLine As String

  ' validate that the file exists
  Open sFile For Input As #1
  Do While Not EOF(1)
    Line Input #1, sLine
    i = 1
    If Left$(sLine, 3) <> "ZPT" Then
      For j = 1 To Len(sLine)
        bytes(i) = bytes(i) Xor Asc(Mid$(sLine, j, 1))
        i = i + 1
        If i = 5 Then i = 1
      Next
    End If
  Loop
  For j = 1 To 4
    chksum = chksum + (256 ^ (4 - j) * bytes(j))
  Next
  Calc = chksum
c1_Exit:
  Close #1
  Exit Function
c1_Error:
  MsgBox Error$()
  Calc = -1
  Resume c1_Exit

End Function
```