



End to End Reconciliation Reporting
**FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)**



Document Title: End to End Reconciliation Reporting

Document Type: Service Description

Release: Release Independent

Abstract: This document specifies the reconciliation report output to satisfy the end to end reconciliation of the Banking and related services and the Automated Payment Service (APS).

Document Status: APPROVED

Author & Dept: Pete Jobson /Torstein Godeseth

External Distribution: As Approver list

Information Classification: See section 0.9.

Approval Authorities:

Name	Role	Signature	Date
Steve Bansal	Fujitsu Senior Service Delivery Manager	See Dimensions for record	
Ryan Stanbrook	Post Office Ltd Horizon Commercial Manager	See Dimensions for record	

Note: See Post Office Account HNG-X Reviewers/Approvers Role Matrix (PGM/DCM/ION/0001) for guidance.



0 Document Control

0.1 Table of Contents

0.1	Table of Contents	2
0.2	Document History	3
0.3	Review Details	4
0.4	Associated Documents (Internal & External)	4
0.5	Abbreviations	5
0.6	Glossary	6
0.7	Changes Expected	7
0.8	Copyright	7
0.9	Information Classification	7
1	INTRODUCTION	8
2	SCOPE	8
3	NETWORK BANKING RECONCILIATION (INCLUDING PAYMENTS AND ETU)	8
3.1	Overview	8
3.2	Reconciliation Paths	9
3.2.1	Normal path	9
3.2.2	Zero value C12	9
3.2.3	C12 followed by a C12 reversal	9
3.2.4	C4 followed by a C4 refund	9
3.2.5	'D' record	10
3.3	State Tables	10
3.3.1	Non exception states	10
3.3.2	Exception states	12
3.3.3	State Transition Diagram	13
3.4	DRSv2 Reporting Framework	13
3.4.1	Reapportionment Reporting	14
3.4.2	Settlement Reports (NB101)	14
3.4.3	Exception Reports (NB102)	16
3.4.4	Re-Appportionment Exception Report Layout	21
4	APS RECONCILIATION	23
4.1	APS Reconciliation Report	24
4.2	APS Quarantined/Exceptioned Transaction Report	27
4.3	APS Report Delivery	28
4.4	External Transactions	28
ANNEX A	TRANSACTION TYPES	29



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)



0.2 Document History

Version No.	Date	Summary of Changes and Reason for Issue	Associated Change - CP/PEAK/PPRR Reference
0.1	22/11/06	First draft for review.	N/A
1.0	02/02/07	Issued for approval.	N/A
1.1	27/10/08	Change of owner and Reviewers for CCN	
1.2	07/05/11	Post HNG-X Migration and change of owner	N/A
1.3	22-Jun-2011	Revisions following internal review	
2.0	22 Jun 11	Document Approved	
2.1	23 Nov 11	Release 5.5 Review	
3.0	4 May 12	Annual Review	
3.1	18 March 2013	Annual Review	
3.2	14 th Oct 2016	Clarifications added	
4.0	04-Sep-2017	Approval version [replaces CS/SPE/011]	
4.1	4th Oct 2019	Changes due to HNG-X/POLSAP Application Separation Changes due to Banking Changes to accommodate Non-Link Transactions	CT2561 CT1436
4.2	27 th Jan 2020	Remove the TPS interface to DRS (Feed of C112 messages)	CWO189a (Release 20.35)
4.3	04-Feb-2020	Amended reviewers, labelled changes for review purposes.	
4.4	27-Feb-2020	Remove DRS State E25 in response to comments	CWO189a
4.5	24-Mar-2020	Added Steve Page as Post Office reviewer	
4.6	2-Apr-2020	Updated in response to comments	
4.7	7-Apr-2020	Replace section 4 (APS Reconciliation) with new reconciliation reports generated from the Branch Database. Remove Section 5 (TPS Reconciliation) since TPS no longer exists	CWO0189a (Release 20.45)
4.8	22-Apr-2020	Updated following comments from Steve Page, Bob Booth, Phil Boardman and SSC Team	
5.0	23-Apr-2020	Document Approved	
5.1	20-Apr-2021	Changes for PBS. Annex B introduced – this will replace the whole of Section 3 once PBS has been fully rolled out and DRS2 is responsible for all reconciliation.	CCN1676
5.2	13-May-2021	Changes as a result of Fujitsu review of revisions in v5.1	CCN1676
5.3	12-Aug-2022	Updated to reflect the completion of PBS roll out. Annex B removed and section 3 replaced as described at v5.1 above. Include states 5 and 108.	CCN1676
6.0	14-Dec-2022	Approval version. POL approver changed from Dionne Harvey to Ryan Stanbrook.	



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)



0.3 Review Details

Review Comments by :	
Review Comments to :	torstein.o.godeseth: GRO; POADocumentManagement: GRO
Mandatory Review	
Role	Name
POL Horizon Commercial Manager	Ryan Stanbrook < GRO >
POL Solution Architect	Steve Page < GRO > Bob Booth < GRO >
POL Horizon Chief Architect	Sally Rush < GRO >
Senior Commercial Manager	Helen Venters
SSC (for Configuration Management)	Adam Woodley: GRO
Reconciliation Team	Sandie Bothick
Service Architect	Phil Boardman
Optional Review	
Role	Name
Commercial Manager	Post Office Account Commercial Mailbox
POA CTO	Simon Wilson
Security Architect	Dave Haywood
Application Development Manager	Graham Allen
Business Continuity	Sidharth Singh
Network Operations Manager	Chris Harrison
Systems Management, Integration and SCM	Jerry Acton
Operational Change/Release Management	Matt Swain
Infrastructure Operations Manager	Andrew Hemingway
Service Architecture Manager	Alex Kemp
Information Security Management	Farzin Denbali; Chris Stevens
Document Manager	Matthew Lenton
Senior Service Delivery Manager	Steve Bansal
POL Solution Architect	Dmitry Barsukov < GRO >
POL Solution Architect	Krishna Kumar Paramasivam < GRO >
POL Business Analyst	Phil Elliott < GRO >
POL IT Document Specialist	Steven Vouthas < GRO >
Issued for Information – Please restrict this distribution list to a minimum	
Position/Role	Name
Post Office Ltd Architect mailbox	eag: GRO

(*) = Reviewers that returned comments

0.4 Associated Documents (Internal & External)

Reference	Version	Date	Title	Source
PGM/DCM/TEM/0001 (DO NOT REMOVE)			Fujitsu Services Post Office Account HNG-X Document Template	Dimensions
SVM/SDM/PRO/0012			Reconciliation and Incident Management - Joint Working Document	Dimensions
SVM/SDM/SD/0015			Reconciliation Service Description	Dimensions



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)



Reference	Version	Date	Title	Source
NB/SPE/002			Network Banking DRS On-line Workstation Specification	Dimensions (PWY)

Unless a specific version is referred to above, reference should be made to the current approved versions of the documents.

0.5 Abbreviations

Abbreviation	Definition
APS	Automated Payment Service
BIN	Bank identification number - the initial set of six numbers that appear on a bank card; the first six digits of the PAN.
C12	A transaction record from the Horizon Counter or Self-Serve Kiosk
C12rev	A transaction record from the Horizon Counter or Self-Serve Kiosk with the reversal flag set indicating that it is a reversal of a previous transaction.
C12Zero	A transaction record from the Horizon Counter or Self-Serve Kiosk with zero value, usually indicating that the transaction failed
C112	A transaction record from the Horizon Counter or Self-Serve Kiosk that has been delivered to POLSAP. This transaction no longer exists
C4	A record of confirmation from a Financial Institution
C4undo	A C4 received which is equal and opposite to a C4 received previously. This is expected to occur, albeit rarely, with the introduction of PBS.
C4zero	A C4 with zero value
CTS	Client Transmission Summary
D	A transaction record received from a Financial Institution that advises of a discrepancy
DCP	Debit/Credit Card Payment
DCS	Debit/Credit Card System
DRSv2	The label for the new DRS system introduced in parallel (initially) with PBS. DRSv2 is responsible for reconciling Banking, Payments and ETU transactions only. It replaces the DRS(v1) system which will run in parallel with DRSv2 whilst payment and banking is supported by PBS and pre-PBS solutions.
DRS	Data Reconciliation Service
ETS	Electronic Top-Up Service
F99	A transaction state that indicates that a reconciliation error has been reported but POL has advised that the issue has subsequently been resolved. This state is set using the DRS Workstation application that is used by Fujitsu Security Operations team.
FI	Financial Institutions
ICC	Integrated Circuit Card
MA	Merchant Acquirer
PBS	Payment and Banking Service. This system was introduced in 2021 to handle payments (Debit Card and Credit card transactions) and Banking transactions at the Horizon counter In this system all transactions are authorised via messages sent from the PIN pad at the counter to the Ingenico data centre. Ingenico interface with the Merchant Acquirer for payments and Vocalink for banking transactions.
PAN	Primary account numbers are also called payment card numbers as they are found on payment cards like credit and debit cards. This account number is either embossed or laser-printed and is found on the front of the card.
PIN	Personal Identification Number
PODG	Post Office Data Gateway



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)



Abbreviation	Definition
POLDG	Post Office Limited Data Gateway – This is a platform that sits outside the Horizon system that is accessible by POL back office staff. PODG has a number of routes that deliver data files to and from this platform.
POLSAP	Post Office Ltd. Consolidated SAP System
S	A transaction record that is generated by the Debit Card Management server that advises DRS when the expected Settlement date is.
TIP	An identifier that is printed on some of the reconciliation reports. The meaning of this identifier is described in the descriptive text that immediately follows the report layout definition later in this document
TMS	Transaction Management Service Note that with the introduction of PBS there is an Ingenico solution component also labelled TMS. However, neither TMS is referenced in this document so this entry will be deleted in the next update to this document.
TPS	Transaction Processing Service. This system has been retired.

0.6 Glossary

Term	Definition
Bank_Transaction_Id	Message sequence number assigned by the message originator, to assist in identifying a transaction uniquely. Stays unchanged through the life of the transaction.
C4 Settlement Date	The Settlement Date provided on the C4 transaction.
Credence	Post Office Ltd. Management Information Service
Exception Types	Within all reports the 'Exceptions' category will include: <ul style="list-style-type: none"> 'Incomplete States', i.e. those transactions where one or more transaction component is missing – a C4 without a C12 etc Genuine exceptions where transaction components belonging to the same high level transaction are of different value, e.g. C12 (amount) not = to C4 (amount). Transaction corruptions
HNG-X_Txn_Num	Unique transaction number to be used in all messages between HNG-X and the FIs relating to the transaction. Generated by HNG-X and provided in the request message initiating the transaction.
LREC	The acronym for the reconciliation file received from Vocalink.
'New' Transactions	Transactions that have had a change of state since they were last reported, or have never been reported except in NB102 section 6. Note that if a transaction appears in NB102 section 6 it is future dated as is reported in that section for information only. Once future dated transactions become current dated, they must be reported as though they have not appeared on the reports before.
'Old' Transactions	Transactions that have NOT had a change of state since they were last reported.
POLSAP Transactions	POLSAP was retired in 2019 and POLSAP transactions do not exist
POLSAP	Post Office Ltd Consolidated SAP System. This system no longer exists
Receipt Date	Receipt Date is the Date as printed on the transaction Receipt at the Counter. It forms part of all transactions.
Receipt Time	Receipt Time is the Time as printed on the transaction Receipt at the Counter. It forms part of all transactions.
Reconciliation Date	The Reconciliation Date is the date attributed to a transaction to allow Post Office Ltd. to reconcile. It will be set the first available Bank Settlement date from the transaction elements (C12, C4, S & D) that make up a Network Banking transaction. If no Bank Settlement date is available, the Reconciliation Date will be set to the processing date that the Data Reconciliation Service first recorded any element of the transaction being received. If a Settlement date subsequently becomes available,



End to End Reconciliation Reporting
**FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)**



Term	Definition
	the first available Bank Settlement date will replace the processing date. However, once a transaction has been accounted for on the reconciliation reports, the Reconciliation Date will never change.
Routing Gateway	Historically (pre PBS) the Routing Gateway identified a system, where the authorisation for a specific transaction should be sought. It is now used to group NB101 and NB102 reports together. It is set up in Post Office reference data.
Run Date	This is the System Processing Date for which the report refers, i.e. all transaction components processed by the DRS on System Processing Date dd/mm/yyyy are accounted for on this report.
Settlement Date	Settlement Date is often the same as Run Date but some Financial Institutions may assign a Settlement Date in the future: e.g. the following Monday may be set on transactions processed on the preceding Friday, Saturday and Sunday.
Txn_Type	See Transaction Types
Vocalink	An organisation that connects to many banks routing authorisation requests to them and relaying the responses from the banks back. With the introduction of PBS all banking transactions are authorised via Ingenico and Vocalink. Vocalink confirm banking transactions in LREC files which are converted into C4 files.

0.7 Changes Expected

Changes

0.8 Copyright

© Copyright Fujitsu Services Limited 2006-2022. All rights reserved. No part of this document may be reproduced, stored or transmitted in any form without the prior written permission of Fujitsu Services.

0.9 Information Classification

The author has assessed the information in this document for risk of disclosure and has assigned an information classification of FUJITSU RESTRICTED (COMMERCIAL IN CONFIDENCE).



1 Introduction

This document has been compiled to specify Fujitsu Services outputs from the Data Reconciliation Service (DRS) and the Automated Payment Service (APS) so as to enable a generic end to end reconciliation of

1. Banking and Related Services transactions, which includes DCS and ETS
2. Automated Payment System (APS)

2 Scope

This document defines the format and content of all reconciliation reports for HNG-X, which satisfies the DRS and APS reconciliation requirement. It does not attempt to define within the operating systems how the transactions are processed.

This document does not attempt to define the business processes undertaken within Fujitsu Services and Post Office Ltd. with respect to the resolution of any exceptions which may arise, nor does it scope the requirement for any systems that may be required to assist in this process. This information can be found in the associated documents, reference:-

- SVM/SDM/PRO/0012: Reconciliation and Incident Management - Joint Working Document

3 Network Banking Reconciliation (including Payments and ETU)

3.1 Overview

The purpose of Network Banking Reconciliation is twofold

- To provide information to Post Office Limited to allow them to settle with clients, and,
- To confirm that the Post Office view of transactions that have taken place matches the FI's view of transactions that have taken place. Where differences in these views occur then appropriate action is taken.

Settlement is based on the client's data. Post Office receive files from the clients (or their representative, Vocalink, in the case of Banking) providing their view of transactions that have been carried out and their financial values (described as C4 files). Post Office then settles with the clients using the total values within the C4 files. The DRS converts the C4 files into NB101 reports, ignoring any 'D' records.

The NB101 report for Banking is adjusted to reapportion transactions to the appropriate Post Office client using an input file received each day from Vocalink. This is needed as some Post Office clients share BINs so the total figure for a BIN as derived from the LREC file received from Vocalink must be split between the clients sharing the BIN.

Reconciliation hinges on a unique identifier, hereafter referred to as 'OTR', assigned to each transaction as it is carried out at the counter (or other device) within the Post Office estate. The DRS relies on this OTR being quoted within the C4 files to be able to match the transactions reported by the clients with the transaction records created with the Post Office estate known, as the C12 records.

Whenever the DRS receives the first transaction part for an OTR then a status record is created for that OTR.

When a further transaction part is received using that OTR then the status record is updated and a history record created showing the previous state,



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)



When, as does happen from time to time, DRS receives a further C4 with that OTR a child record is written to the status table. This ensures that there will be a record in the status table for every C4 record received in the files from the clients.

3.2 Reconciliation Paths

This section describes the expected paths through the state table which is shown in section 3.3 below.

3.2.1 Normal path

The 'normal path' for a transaction is that it is carried out at the counter, generating a C12, and a matching C4 record is received in a subsequent file from the FI shortly afterwards. Whilst the real sequence must always be that the C12 is generated before the C4 is received it is quite normal for the C4 to be loaded into the DRS before the C12 as DRS receives its data in batches rather than real time.

The happy path therefore covers both options, with DRS receiving the C12 before or after the C4, and the values on the C12 and the C4 match.

For these transactions the status recorded in the DRS is 100,

3.2.2 Zero value C12

Where a transaction at the counter or equivalent device does not proceed the technique of writing a zero value C12 may be used as a means of recording the fact. Depending on circumstances this may result in

- No C4 from the client (status 102)
- A zero value C4 from the client (status 103)
- A non zero value C4 from the client followed by an equal and opposite C4 cancelling out the first. This is explained further in section 3.2.4 below.

3.2.3 C12 followed by a C12 reversal

In some instances an initial C12 will be reversed by a C12 reversal (status 101).

Following this a zero value C4 may be generated (status 105).

3.2.4 C4 followed by a C4 refund

Following receipt of a zero value C12 from a PBS counter it is possible to receive a non zero value C4 from the FI followed by an equal and opposite C4, cancelling out the first, in the same or a subsequent C4 file.

The possibility of this path was introduced with PBS payments. When a payment is initiated by the counter but then fails to complete, a zero value C12 is written and a request to undo the transaction that was initiated is sent to the Ingenico data centre.

The state changes for the sequence where the zero value C12 arrives before the C4 and the C4 refund are:

0 -> 102 => 4 => 106/107

When the C4 and the C4 refund arrive before the C12 has been harvested then the state changes are:-

0 -> 2 -> 5 -> 108



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)



3.2.5 'D' record

An FI may include a failed transaction in the C4 file sent to DRS. This indicates a failed transaction and is converted into a D record in DRS. This is expected to match to a zero value C12 from the BRDB.

The normal path covers the options of DRS receiving the D before or after C12.

For these transactions the status recorded in the DRS is 99. These are monitored and manually cleared.

3.3 State Tables

This section lists the possible states that can be recorded against a transaction identifier.

3.3.1 Non exception states

This section identifies the states which are generated in DRS which are not Exception States.

States with values of 100 or greater are expected and/or benign and do not require monitoring.

States 1 – 5 do not indicate a problem unless an individual transaction stays in the state for too long.

This table identifies the NB102 series report section where incomplete and discrepancy States are reported in detail.

State	Description	Appears in NB102 section (Uncleared)	Appears in NB102 section (Cleared)
0	Start condition		
1	Exactly one C12 has been received Expect a matching C4 to complete (state 100)	1 & 5	7 & 11
2	Exactly one C4 has been received Expect a matching C12 to complete (state 100)	1 & 5	7 & 11
3	Exactly one D has been received Expect a C12 to complete (state 99)	2	8
4	This state is expected, albeit rarely, for PBS payment transactions as explained in section 3.2.4, above. This state is generated when, following a zero value C12 a non-zero value C4. Expect an equal and opposite C4 to complete (state 106) plus generate a 107.	1 & 5	7 & 11
5	This state is expected when a C4 reversal is received following a C4 (but no zero value C12 has been harvested). Expect a zero value C12 to complete (state 108)	1 & 5	7 & 11
99	Any transaction where a D record has been received should end in this state; D records may also lead to an Exception state. A D record will have no impact on any settlement figures.	2	8



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)



100	Matching C12 and C4 received. This is the normal reconciled state		
101	A C12 has been received followed by an equal and opposite C12 indicating that the transaction has been reversed at the counter. This is an acceptable end state which does not require investigation. A zero value C4 may be received in this state (resulting in state 103).		
102	A zero value C12 has been received indicating a transaction cancelled at the counter. This does not require investigation A zero value C4 may be received in this state (resulting in state 105) In the case of PBS payments a non zero value C4 may be received resulting in state 4.		
103	A zero value C4 has been received following a cancelled C12		
104	This indicates a duplicate zero value C4 following a zero value C12. This indicates a technical problem in that duplicate C4s are being generated but as the value is zero there is no financial impact and so this does not require investigation. This state occurs reasonably regularly for ETU transactions.		
105	This indicates that a zero value C4 has arrived after a reversed C12. This does not require investigation		
106	This state arises for a PBS payment transaction which was cancelled at the counter where the 'undo' message did not get to the Ingenico data centre in time and a payment request was sent to the FI resulting in a C4. The payment was subsequently refunded resulting in a second C4 for an equal and opposite amount – and this state. This does not require investigation		
107	An entry in this state is created at the same time as a state 106 is registered for technical reasons. Its purpose is to ensure that the OTR Status table is consistent with the C4 tables in terms of volumes.		
108	This is the final state when a C4, a C4 reversal and then a C12 arrive in that order. It will occur when a payment is made and then reversed at the counter, resulting in a zero value C12 being sent to the data centre, but the C12 is not harvested before the C4 and C4 reversal are received.		



End to End Reconciliation Reporting
**FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)**



3.3.2 Exception states

This section identifies all the Exception States that can be generated by DRS.

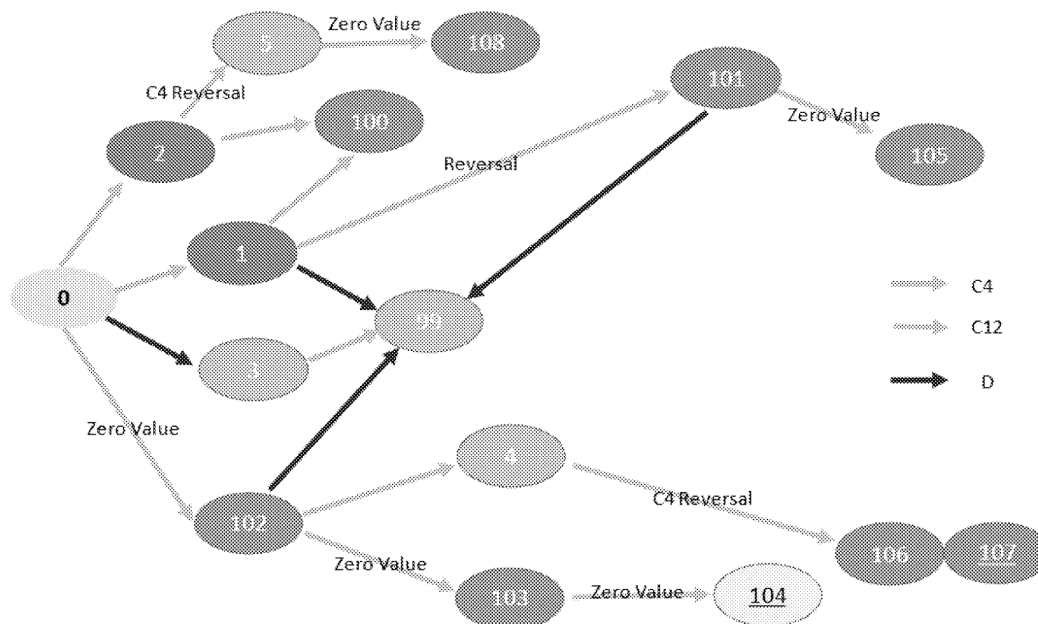
This table identifies the NB102 series report section where an exception is reported in detail.

Any transaction resulting in one of these states must be investigated and cleared through F99.

Exception State	Description	Exception report NB102 Section	
		Uncleared	Cleared
E01	A duplicate C12 with non-zero value received.	1 & 5	7 & 11
E02	A duplicate C4 with non-zero value and not a reversing C4 (see state 04) received	1 & 5	7 & 11
E03	A duplicate D received	2	8
E04	A C4 received after a D and not a C12	2	8
E05	A D received after a C4	2	8
E06	An unexpected C12 received	1 & 5	7 & 11
E07	An unexpected C4 received	1 & 5	7 & 11
E08	An unexpected D received	2	8
E09	The amount on a C12 reversal did not match the amount on the C12	1 & 5	7 & 11
E10	An unexpected C12 reversal received	1 & 5	7 & 11
E23	The amount on a C4 did not match the amount on a C12 when the C12 has a non-zero value.	1 & 5	7 & 11

3.3.3 State Transition Diagram

The diagram below shows the states expected to be encountered when following the reconciliation paths. Exception states are not shown as by definition they indicate that an inconsistency has arisen which requires investigation.



Key:

Acceptable final state – does not need monitoring
Whilst this indicates an error it is benign (no financial implication) – does not need monitoring.
An interim state with high volume. Monitor for items staying in the state for too long.
An interim state with low volume. Monitor for items staying in the state for too long.
Expected final state – but does need monitoring and manual clearing

3.4 DRSv2 Reporting Framework

With the introduction of DRSv2 reports are designed to reflect the three applications/lines of business reconciled by the system. These are

- Banking
- Payments
- ETU

All reports produced by DRSv2 are comma separated (.csv) files delivered to Post Office via PODG.



End to End Reconciliation Reporting
**FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)**



3.4.1 Reapportionment Reporting

PCI rules dictate that only the first 6 digits of a PAN (known as the BIN) can be stored and processed within the Horizon system.

Some of the BINs supported by PBS are shared between different Post Office banking clients necessitating a mechanism to reapportion transactions to the correct client(s).

Therefore, for Banking transactions, a reapportionment report (RAR) is received each day from Vocalink covering banking transactions for the period of the corresponding LREC file which have a BIN which is shared between Post Office clients. This file indicates which client the specific transaction is attributable to.

It is expected that for every transaction in the RAR there must be a corresponding LREC file where the record is a payment or a receipt. The RAR file will also include non-financial transactions (Balance Enquiries and PIN changes) which are not in the LREC.

It is expected that for every record in the LREC file which has one of the shared BINs there must be a record in the RAR.

DRSv2 processes the RAR file and records the following exceptions in its internal tables:

Exception Type	Meaning
1	Record found in the RAR with no matching record in the corresponding LREC file.
2	Record in the RAR for which the corresponding record was in an earlier LREC file.
3	Record in the LREC file with no matching record in the RAR.
4	Record found in the LREC file for which the corresponding RAR record was in an earlier RAR.

3.4.2 Settlement Reports (NB101)

DRSv2 produces a Settlement report (NB101) for each application each day to include all C4 files which have been received since the last NB101 report was produced.

The report is broken down into sections according to Routing Gateway which is maintained in Post Office reference data. Many Post Office clients can map to a Routing Gateway, with a row in the report for each client.

Where the NB101 covers multiple Settlement dates each Settlement date is listed separately within Routing Gateway.

3.4.2.1 NB101: Rules

- NB101 is run daily
- NB101 is broken down by Routing Gateway
- NB101 is broken down by Client within Routing Gateway
- NB101 will show 'C4' transactions received for ONE day only – breaking these down into individual 'C4 Settlement Dates'. There will be one line for each 'C4 Settlement Date'
- NB101 will show Deposit and Withdrawal transactions in separate columns, (headed 'Receipts' and 'Payments' respectively) derived from 'Txn_Type'
- NB101 will show a final settlement column derived in the following way:



End to End Reconciliation Reporting
**FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)**



- Volume: Volume of Deposits plus Volume of Withdrawals
- Value: Value of Deposits minus Value of Withdrawals
- Where the net total is negative i.e. the Value of Withdrawals exceeds the Value of Deposits, the total will be shown as negative
- Where the volume for a given 'C4 Settlement Date' is nil, the date will not be reported.

3.4.2.2 NB101: Reapportionment

The position with regard to the RAR is reported on the Banking NB101 report in a column headed RAR_Status. The following values may be reported:

Value	Meaning
<blank>	No RAR is needed for this LREC client, or the RAR was received for the LREC client and there were no errors.
Waiting RAR	The RAR file has not been received for this LREC client.
Missing RAR	The RAR file was received for the LREC client, the RAR had some exceptions of type 3.



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)



3.4.2.3 NB101: Report Layout

NB101: Settlement Statement for XXX Produced on DD/MMM/YYYY AT HH:MM:SS									
Run Date: DD/MMM/YYYY									
GATEWAY_NAME	C4_SETTLEMENT_DATE	RECEIPTS_VOLUME	RECEIPTS_VALUE	PAYMENTS_VOLUME	PAYMENTS_VALUE	NET_VOLUME	NET_VALUE	CLIENT_NAME	RAR STATUS
Routing Gateway: DESC (nnnnn)	DD/MMM/YYYY	nn	nn	nn	nn	nn	nn	XXXXXXXXXXXXXXXXXX	TTTT
	DD/MMM/YYYY	nn	nn	nn	nn	nn	nn	XXXXXXXXXXXXXXXXXX	TTTT
	DD/MMM/YYYY	nn	nn	nn	nn	nn	nn	XXXXXXXXXXXXXXXXXX	TTTT
Sub-Total		nn	nn	nn	nn	nn	nn		
Routing Gateway: DESC (nnnnn)	DD/MMM/YYYY	nn	nn	nn	nn	nn	nn	XXXXXXXXXXXXXXXXXX	TTTT
	DD/MMM/YYYY	nn	nn	nn	nn	nn	nn	XXXXXXXXXXXXXXXXXX	TTTT
	DD/MMM/YYYY	nn	nn	nn	nn	nn	nn	XXXXXXXXXXXXXXXXXX	TTTT
Sub-Total		nn	nn	nn	nn	nn	nn		
Overall-Total		nn	nn	nn	nn	nn	nn		

Note that the column RAR_STATUS will only appear on the Banking NB101 report.

3.4.3 Exception Reports (NB102)

NB102 reports are produced to detail exceptions which may require investigation and resolution. Historically NB102 reports were produced with 12 sections, but with the introduction of DRsv2 this has been rationalised to eight.

Original section numbers are used to maintain continuity.

- Section 1: All Uncleared Confirmed & Unconfirmed exceptions
- Section 2: Uncleared Exceptioned Client Transactions
- Section 5: Uncleared Confirmed & Unconfirmed exceptions >24 hours
- Section 6: Uncleared Future Dated Transactions by Client
- Section 7: All Cleared Confirmed & Unconfirmed exceptions



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN CONFIDENCE)



- Section 8: Cleared Exceptioned Client Transactions
- Section 11: Cleared Confirmed & Unconfirmed exceptions >24 hours
- Section 12: Cleared Future Dated Transactions by Client

Many exceptions reported in Sections 1 to 6 will be resolved automatically when further C12 and C4 files arrive. Those that don't will be investigated and then 'Cleared' manually and given a state of F99. Where an exception has been manually cleared it will be reported in Sections 7 to 12

With the introduction of DRSv2 sections will be produced as follows:

Sections 1,2,5 and 7,8,11

One report for each application broken down by Routing Gateway (as for NB101) will be produced daily for each section, giving a total of 18 reports.

Sections 6 and 12

One report covering all applications will be produced daily for each section - i.e. 2 reports. These reports will normally be empty.

3.4.3.1 NB102 Sections 1 & 7 : Report Layout

NB102 Section 1/7: All Cleared/Unleared Confirmed Unconfirmed & POLFS exception. Application:XXX Produced on DD/MMM/YYYY						
Run Date: DD/MMM/YYYY						
GATEWAY_NAME	RECONCILIATION_DATE	EXCEPTION_TYPE	VOLUME	C12_CONFIRMED	C4_CONFIRMED	D_CONFIRMED
Routing Gateway: DESC (nnnnn)	DD/MMM/YYYY	State:xx (Description)	nn	nn	nn	nn
	DD/MMM/YYYY	State:xx (Description)	nn	nn	nn	nn
	DD/MMM/YYYY	State:xx (Description)	nn	nn	nn	nn
	DD/MMM/YYYY	State:xx (Description)	nn	nn	nn	nn
Sub-Total			nn	nn	nn	nn
Routing Gateway: DESC (nnnnn)	DD/MMM/YYYY	State:xx (Description)	nn	nn	nn	nn
	DD/MMM/YYYY	State:xx (Description)	nn	nn	nn	nn
Sub-Total			nn	nn	nn	nn
Overall-Total			nn	nn	nn	nn



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)



3.4.3.2 NB102 Sections 2 & 8 : Report Layout

NB102 Section 2/8: Cleared/Uncleared Excepted Client Transactions Application:XXX Produced on: DD/MMM/YYYY AT HH:MM:SS									
Run Date: DD/MMM/YYYY									
GATEWAY_NAME	EXCEPTION_TYPE	RECONCILIATION_DATE	TRANSACTION_ID	TRANSACTION_TYPE	TXN_TYPE_DESCRIPTION	RECEIPT_DATE	C12_CONFIRMED	C4_CONFIRMED	D_CONFIRMED
Routing Gateway: DESC (nnnnn)	State:xx (Description)	DD/MMM/YYYY	xxxxxxxxxxxxxx	nn	DD/MMM/YYYY	DD/MMM/YYYY	nn	nn	nn
	State:xx (Description)	DD/MMM/YYYY	xxxxxxxxxxxxxx	nn	DD/MMM/YYYY	DD/MMM/YYYY	nn	nn	nn
Sub-Total							nn	nn	nn
Routing Gateway: DESC (nnnnn)	State:xx (Description)	DD/MMM/YYYY	xxxxxxxxxxxxxx	nn	DD/MMM/YYYY	DD/MMM/YYYY	nn	nn	nn
	State:xx (Description)	DD/MMM/YYYY	xxxxxxxxxxxxxx	nn	DD/MMM/YYYY	DD/MMM/YYYY	nn	nn	nn
	State:xx (Description)	DD/MMM/YYYY	xxxxxxxxxxxxxx	nn	DD/MMM/YYYY	DD/MMM/YYYY	nn	nn	nn
Sub-Total							nn	nn	nn
Overall-Total							nn	nn	nn



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)



3.4.3.3 NB102 Sections 5 & 11 : Report Layout

NB102 Section 5/11: Cleared/Uncleared Confirmed Unconfirmed & POL FS Exceptions > 24 hours Application:XXX Produced on DD/MMM/YYYY								
Run Date: DD/MMM/YYYY								
GATEWAY_NAME	EXCEPTION_TYPE	RECONCILIATION_DATE	TRANSACTION_ID	TXN_TYPE_DESCRIPTION	RECEIPT_DATE	C12_CONFIRMED	C4_CONFIRMED	D_CONFIRMED
Routing Gateway: DESC (nnnnn)	State:xx (Description)	DD/MMM/YYYY	xxxxxxxxxxxxx	RECEIPTS/PAYMENTS	DD/MMM/YYYY	nn	nn	nn
	State:xx (Description)	DD/MMM/YYYY	xxxxxxxxxxxxx	RECEIPTS/PAYMENTS	DD/MMM/YYYY	nn	nn	nn
	State:xx (Description)	DD/MMM/YYYY	xxxxxxxxxxxxx	RECEIPTS/PAYMENTS	DD/MMM/YYYY	nn	nn	nn
Sub-Total						nn	nn	nn
Routing Gateway: DESC (nnnnn)	State:xx (Description)	DD/MMM/YYYY	xxxxxxxxxxxxx	RECEIPTS/PAYMENTS	DD/MMM/YYYY	nn	nn	nn
	State:xx (Description)	DD/MMM/YYYY	xxxxxxxxxxxxx	RECEIPTS/PAYMENTS	DD/MMM/YYYY	nn	nn	nn
	State:xx (Description)	DD/MMM/YYYY	xxxxxxxxxxxxx	RECEIPTS/PAYMENTS	DD/MMM/YYYY	nn	nn	nn
Sub-Total						nn	nn	nn
Overall-Total						nn	nn	nn



End to End Reconciliation Reporting
**FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)**



3.4.3.4 NB102 Sections 6 & 12 : Report Layout

NB102 Section 6/12: Cleared/Uncleared Future Dated Transactions by Client. Application:ALL Produced on DD/MMM/YYYY AT HH:MM:SS					
Run Date: DD/MMM/YYYY					
GATEWAY_NAME	RECONCILIATION_DATE	VOLUME	C12_CONFIRMED	C4_CONFIRMED	D_CONFIRMED
Routing Gateway: DESC (nnnnn)	DD/MMM/YYYY	nn	nn	nn	nn
	DD/MMM/YYYY	nn	nn	nn	nn
	DD/MMM/YYYY	nn	nn	nn	nn
Sub-Total		nn	nn	nn	nn
Routing Gateway: DESC (nnnnn)	DD/MMM/YYYY	nn	nn	nn	nn
	DD/MMM/YYYY	nn	nn	nn	nn
	DD/MMM/YYYY	nn	nn	nn	nn
Sub-Total		nn	nn	nn	nn
Overall-Total		nn	nn	nn	nn



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)



3.4.4 Re-Appportionment Exception Report Layout

excep tion_ type	reporting_ date	rar_milestone_ date	rar_ stan	rar_ am ount	rar_ terminal_ id	rar_ transac tion_id	rar_ transac tion_ type	rar_ issu er_ scheme	rar_ ban k_ client	rar_ otr	rar_ settle ment_ date	c4_ horizon_ transa ction_id	c4_ receipt_ date	c4_ mes sage_ type	c4_ tran saction_ type	c4_ amo unt_ con firmed	c4_ settle ment_ date	c4_ d _am ount	c4_ ba nk_ cli ent_id
1	30/03/2021	29/03/2021 10:08	999999	1000	28840602	15583	1	41	24237	8PKMA2015583	30/03/2021								
1	30/03/2021	29/03/2021 10:24	999999	2000	28840602	15592	21	185	24232	8PKMA2015592	30/03/2021								
2	30/03/2021	29/03/2021 10:08	999999	1000	28840602	15583	1	41	24237	8PKMA2015583	30/03/2021	8PKMA2015583	29/03/2021 10:08	C4	83	1000	29/03/2021	0	24237
2	30/03/2021	29/03/2021 10:24	999999	2000	28840602	15592	21	185	24232	8PKMA2015592	30/03/2021	8PKMA2015592	29/03/2021 10:24	C4	82	2000	29/03/2021	0	24232
3	30/03/2021										30/03/2021	8PKMA2015581	29/03/2021 10:04	C4	83	1000	29/03/2021	0	24231
3	30/03/2021										30/03/2021	8PKMA2015591	29/03/2021 10:22	C4	82	2000	29/03/2021	0	24229
4	30/03/2021	29/03/2021 10:04	999999	1000	28840602	15581	1	4	24231	8PKMA2015581	30/03/2021	8PKMA2015581	29/03/2021 10:04	C4	83	1000	29/03/2021	0	24231
4	30/03/2021	29/03/2021 10:22	999999	2000	28840602	15591	21	2	24229	8PKMA2015591	30/03/2021	8PKMA2015591	29/03/2021 10:22	C4	82	2000	29/03/2021	0	24229



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)



Note that where a column heading starts with 'rar' this indicates that the data comes from the Vocalink RAR file; where a column heading starts with 'c4' this indicates that the data comes from the LREC file.

except ion_ty pe	reporti ng_dat e	rar_mile stone_d ate	rar_ st an	rar_a mou nt	rar_ter minal_ id	rar_tran saction_ id	rar_trans action_ty pe	rar_issu er_sche me	rar_ba nk_clie nt	rar_ otr	rar_settl ement_d ate	c4_horizon_ transaction_ _id	c4_rec eipt_d ate	c4_mes sage_ty pe	c4_trans action_ty pe	c4_amour t_confirm ed	c4_settle ment_da te	c4_d_ amou nt	c4_bank _client_ id
1	#####	#####	9999 99	1000	28840602	15583	1	41	24237	8PKMA 20155 83	#####								
1	#####	#####	9999 99	2000	28840602	15592	21	185	24232	8PKMA 20155 92	#####								
2	#####	#####	9999 99	1000	28840602	15583	1	41	24237	8PKMA 20155 83	#####	8PKMA2015583	#####	C4	83	1000	#####	0	24237
2	#####	#####	9999 99	2000	28840602	15592	21	185	24232	8PKMA 20155 92	#####	8PKMA2015592	#####	C4	82	2000	#####	0	24232
3	#####										#####	8PKMA2015581	#####	C4	83	1000	#####	0	24231
3	#####										#####	8PKMA2015591	#####	C4	82	2000	#####	0	24229
4	#####	#####	9999 99	1000	28840602	15581	1	4	24231	8PKMA 20155 81	#####	8PKMA2015581	#####	C4	83	1000	#####	0	24231
4	#####	#####	9999 99	2000	28840602	15591	21	2	24229	8PKMA 20155 91	#####	8PKMA2015591	#####	C4	82	2000	#####	0	24229



End to End Reconciliation Reporting
**FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)**



4 APS Reconciliation

On-line Counter, SSK and HiH Automated Payment transactions are committed to the Branch Database during the customer session settlement process at the same time that the Auditable Journal records are written. The Journal Records contain a dense set of Journal Sequence Numbers that prove no transaction is missing or duplicated.

Offline/External Automated Payment transactions (such as Paystation transactions) are delivered in file(s) via PODG on a daily basis. These files contain a sub-file for each Branch that contain value and volume totals that ensure the integrity of the data contained therein. These are validated during the transaction posting process to ensure no data loss or duplication.

The AP transactions from all data-sources are copied to a dedicated APS data store where they are held pending their delivery to the AP Client via AP Client Files.

Note 1: AP Transactions that are mapped to Client Account No "9999" do not get delivered to any Client.

Note 2: AP transaction performed on certain devices (Such as Payzone) do not get delivered to any Client.

At the end of each Trading Day, all transactions for the day are validated and any transactions failing validation will be moved to a Quarantine area. Validation failures include the following scenarios:

Invalid Negative Value

Negative values are only allowed for reversal records or if the Delivery Agreement indicates that the transaction is an Out-payment transaction.

Unmatched Reversal

This is a reversal record where the corresponding original transaction is not present on the current Trading Day. This may occur in certain counter recovery scenarios.

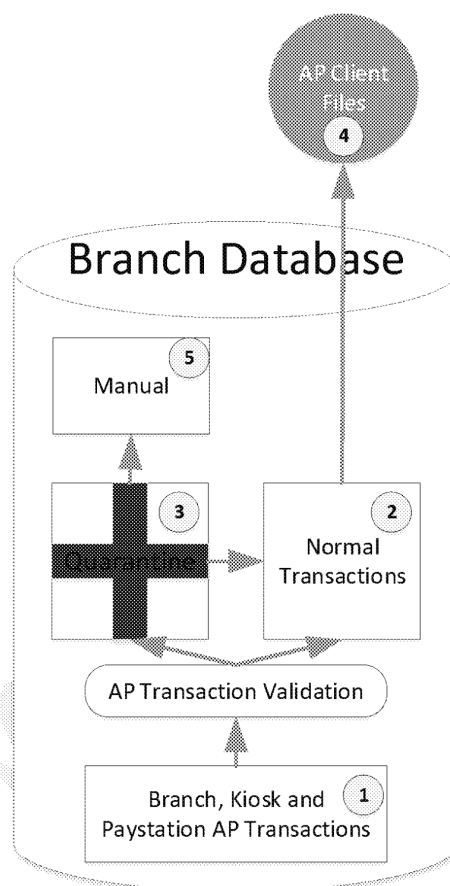
Missing Delivery Agreement

Delivery Agreement reference data controls the creation of AP Client Files. If the data is missing for any client then the transactions cannot be delivered and will be quarantined.

Duplicate Transaction

Duplicate transactions are not expected and can only occur in the case of system bugs.

Quarantined transactions can be viewed and processed using a Graphical User Interface available to Fujitsu's third-line support team. Where transactions were quarantined due to missing or invalid reference data then the transactions can be moved back into the main processing stream once that reference data has been corrected. These transactions will then be delivered to the AP Client. In the case of an unmatched reversal, since the original transaction will almost certainly have been sent to the AP Client then a manual activity must be in place to inform the AP Client that the payment has been reversed. The transaction will then be archived as "manually processed"



Automated Payment Transaction Data Flows

Reconciliation is performed by ensuring that all transactions received at (1) are eventually delivered to either (4) or (5) in the diagram above.

4.1 APS Reconciliation Report

This can be represented in a single report as follows:



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)



		Transaction Totals for Trading Date						Outstanding Balances			
		BRDB	Delivered to APS		Delivered						
Trading Date	Brought Fwd	Transacted ①	Normal ②	Quarantine ③	Discrepancy	Client Files ④	Manual ⑤	Carry Fwd	Normal	Quarantine	Discrepancy
01/06/2019	0.00	25,000.00	23,000.00	2,000.00	0.00	20,000.00	0.00	5,000.00	3,000.00	2,000.00	0.00
02/06/2019	5,000.00	30,000.00	29,000.00	1,000.00	0.00	25,000.00	1,000.00	9,000.00	7,000.00	2,000.00	0.00
03/06/2019	9,000.00	20,000.00	20,000.00	0.00	0.00	25,000.00	1,000.00	3,000.00	2,000.00	1,000.00	0.00
04/06/2019	3,000.00										
05/06/2019											
06/06/2019											
07/06/2019											
08/06/2019											
09/06/2019											

Report aps_reconciliationyyyyymmdd.txt

Where

the first discrepancy is ① minus ② minus ③

the second discrepancy is Carry Fwd minus Normal Balance minus Quarantine Balance

Transaction Totals for Current Trading Date

Column	Type	Description
Trading Date	Date	The Trading Date for which these totals apply
Brought Fwd	Number(12,2)	Taken from the Carry Fwd recorded from yesterday's reconciliation
BRDB Transacted	Number(12,2)	The total value of APS transactions performed on the current Trading Date. Ie: the total value at ① today. (see Note 1)
Normal	Number(12,2)	The total value of valid AP Transactions for the current Trading Date. Ie: the total value at ② today



End to End Reconciliation Reporting
**FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)**



Quarantine	Number(12,2)	The total value of transactions in Quarantine for the current Trading Date. I.e: the total value at ③ today
Client Files	Number(12,2)	The total value of transactions delivered in Client Files on the current Trading Date. I.e: the total value at ④ today
Manual	Number(12,2)	The total value of transactions manually processed on the current Trading Date. I.e: the total value at ⑤ today

Outstanding Balances

Column	Type	Description
Carry Fwd	Number(12,2)	Equals Brought Fwd + BRDB Transacted – Client Files - Manual
Normal	Number(12,2)	The sum of all non-delivered validated APS transactions. I.e: the total amount outstanding in ③
Quarantine	Number(12,2)	The sum of all outstanding APS transactions in Quarantine. I.e: the total amount outstanding in ④

Note 1: The BRDB Transacted value will not include transactions for Client Account = "9999" or those transactions where the Device Type signifies that the transactions are not to be delivered.

Note 2: The Value delivered in Client Files is summed-up during the client file creation as each record is written to the file. The total for each file is recorded in the file audit trail. Some client files include the reversals and reversed transactions and some do not. Either way, these transactions balance-out in the calculated totals. This is not the case for File-type "BT" that includes the reversed transaction only and these have to be taken into account during the calculation of the Client Files value.

The discrepancy columns should always be zero and an automated alert will be raised if ever this is not the case. The alert will cause an incident to be raised for investigation.

In addition to reporting transaction values, the Branch Database also records transaction counts and raises an alert if the transaction counts do not tally. The counts can be reported using HORIce.



End to End Reconciliation Reporting
FUJITSU RESTRICTED (COMMERCIAL IN
CONFIDENCE)



When adding up transaction counts, the transacted reversals are added as positive values. However, in many cases, reversals and their reversed counterparts are not delivered to the AP Client. This is a recognised scenario during the production of a Client File and Reversed/Reversing transactions that are withheld from the Client Files are updated to status "Reversed (Not delivered)". During the reconciliation of transaction counts, these transactions are counted as being dealt with appropriately (ie: seen, understood and marked as processed).

4.2 APS Quarantined/Exceptioned Transaction Report

Transactions that failed validation and were placed in Quarantine are reported daily in the following form.

Client Acc No	Client Account Name	Item Id	FAD Code	Txn Timestamp	Customer Reference	Receipt Ref	Receipt Serial No	Reversing Receipt Ref	Reversing Serial No	Value	Reason
3094	United Utilities Water	36398	4025113	01/11/2018 21:09	63314030041988800000	68001	5470			1500.00	No Delivery Agreement
3094	United Utilities Water	36398	4025113	01/11/2018 21:17	63314030041988900000	67001	8767			1500.00	No Delivery Agreement
3094	United Utilities Water	36398	4025113	01/11/2018 21:33	63314030041988600000	67001	8772			1500.00	No Delivery Agreement
3131	Parcelforce Contract Accept	39192	548324	07/11/2018 14:45	9826935101260	7016	1978			-1.00	Invalid Negative Value
3131	Parcelforce Contract Accept	39192	548324	07/11/2018 14:45	ED808529215GB	7019	1978			-1.00	Invalid Negative Value
3131	Parcelforce Contract Accept	39192	548324	07/11/2018 14:45	9826935101260	7020	1978			-1.00	Invalid Negative Value
3147	Royal Mail	45342	2307049	30/10/2018 10:23	01Label=1~QRC	2001	6671	2001	6673	0.00	No Delivery Agreement
3147	Royal Mail	41637	548324	07/11/2018 14:43	XC422747100GB	7004	1978			0.00	No Delivery Agreement
3147	Royal Mail	41637	548324	07/11/2018 14:44	LU422747100GB	7008	1978			0.00	No Delivery Agreement
3240	Welsh Water	43747	4025113	02/11/2018 10:11	6331428366843200000	78001	4316			-102.00	Unmatched Reversal

Report aps_exceptionsyyyymmdd.txt



Annex A Transaction Types

The following banking and payment card transaction types are supported:

Txn Type	Description	Accounting Description	Accounting Sign	Application
51	ETU Purchase	DEPOSITS	1	ETS
52	ETU Refund	WITHDRAWALS	-1	ETS
71	Purchase	DEPOSITS	1	DCS
72	Refund	WITHDRAWALS	-1	DCS
73	Cash Purchase(with EMV)	DEPOSITS	1	DCS
82	Deposit	DEPOSITS	1	PBS
83	Withdrawal	WITHDRAWALS	-1	PBS
91	Purchase	DEPOSITS	1	PBS/DCS
92	Refund	WITHDRAWALS	-1	PBS/DCS
93	Cash Purchase	DEPOSITS	1	PBS/DCS
94	Cash Refund	WITHDRAWALS	-1	PBS/DCS