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Document Title:	HNG-X Architecture - Reference Data
Document Reference:	ARC/APP/ARC/0001
Release:	N/A
Abstract:	This document describes the target solution architecture for delivery of reference data for the HNG-X programme.
Document Status:	APPROVED This document contains sections that have been identified to POL as comprising evidence to support the assessment of named Acceptance Criteria by Document Review. These sections must not be changed without authority from the FS Acceptance Manager.
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External Distribution:	
Security Risk Assessment Confirmed	YES, security risks have been assessed, see section 0.10 for details.

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

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0 Document Control

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0.1 Figures and Tables

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0.2 Document History

Version No.	Date	Summary of Changes and Reason for Issue	Associated Change - CP/PEAK/PPRR Reference
0.1	29/10/2006	First Draft.	
0.2	06/11/2006	Draft for review	
0.3	28/11/2006	For Review	
1.0	15/03/2007	For approval	
1.1	31/03/2008	Draft for submission of comments from group review of V1.0, held 05/12/2007	
1.2	14/01/2008	For Review. Changes were made to the document for Acceptance by Document Review with the insertion of the Section containing the table of cross references for Acceptance by Document Review.	
2.0	15/09/2009	For Approval	
2.1	05/08/2011	Updated for inclusion of Type G reference data.	
3.0	23/08/2011	Version for approval. Figures 3 and 15 amended to include Type G reference data.	

0.3 Review Details

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(*) = Reviewers that returned comments

0.4 Acceptance by Document Review

The sections in this document that have been identified to POL as comprising evidence to support Acceptance by Document review (DR) are listed below for the relevant Requirements:

POL NFR DR Acceptance Ref	Internal FS POL NFR Reference	Document Section Number	Document Section Heading
ARC-475	ARC-450	2.9	Service Level Targets
SEC-3178	SEC-3290	2.8	Memo Submission
SEC-3185	SEC-3291	2.8	Memo Submission
SEC-3187	SEC-3292	2.8	Memo Submission
SEC-3075	SEC-3262	2.5.2	Reference Data Flows to Counters (Checksum for data integrity)
SEC-3075	SEC-3262	2.6	Reference Data at Counters (CRC verification)
SER-2208	SER-2182	2.8	Memo Submission
POS-NFR-291	POS-NFR-291	7	Recovery and Resilience
POS-NFR-203	POS-NFR-315	7	Recovery and Resilience

0.5 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
ARC/GEN/TEM/0001 (DO NOT REMOVE)			Fujitsu Services Post Office Account HNG-X Architecture Document Template	Dimensions
ARC/GEN/REP/0001			HNG-X Glossary	Dimensions
ARC/SOL/ARC/0001			HNG-X Solution Architecture Outline	Dimensions
ARC/MIG/STG/0001			HNG-X Migration Strategy	Dimensions
ARC/PPS/ARC/0001			HNG-X Architecture - Platforms and Storage	Dimensions
DES/APP/IFS/0001			HNG-X Architecture - Reference Data	Dimensions
DES/APP/IFS/0002			HNG-X Architecture - Reference Data	Dimensions
DES/APP/IFS/0003			HNG-X:RDDS to System Management - Counters Reference Data Interface Specification	Dimensions

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DES/APP/IFS/0004			HNG-X Architecture - Reference Data	Dimensions
DES/APP/MAN/0001			HNG-X Architecture - Reference Data	Dimensions
DES/APP/MAN/0002			HNG-X Architecture - Reference Data	Dimensions
DES/APP/AIS/0008			HNG-X Help Data Delivery by Post Office	Dimensions
DES/APP/HLD/0004			HNG-X: RDMC Host High Level Design	Dimensions
DES/APP/HLD/0005			HNG-X: RDDS Host High Level Design	Dimensions
DES/APP/HLD/0019			HNG-X Architecture - Reference Data	Dimensions
DES/APP/HLD/0045			HNG-X Counter Applications: Reference Data Subsystem High Level Design	Dimensions
DES/APP/HLD/0097			HNG-X Host Reference Data Scheduling High Level Design	Dimensions
DES/APP/SPG/0005			HNG-X Host Reference Data Support Guide	Dimensions
DES/GEN/STD/0001			Host Applications Database Design and Interface Specifications	Dimensions
DEV/APP/WKI/0014			HNG-X RDT Platform Guidelines	Dimensions
SVM/SDM/SD/0013			Reference Data Service Management: Service Description	Dimensions
BP/IFS/010			Application Interface Specification Reference Data to Pathway for CSR+ (including Network Banking changes)	PVCS
CS/PRD/030			Process for Operational Business Change – Product	PVCS
CS/PRD/050			Process for Operational Business Change – Outlet Reference Data	PVCS
DW/IFS/025			RDDS to Data Warehouse – Data Interface Specification	PVCS
NB/IFS/023			RDDS to Transaction Enquiry Service (TES) Interface Specification	PVCS
RD/CCL/001			Reference Data Change Catalogue	PVCS
RD/CCL/002			Reference Data Change Catalogue Appendix – Basic Products (Offline Services)	PVCS
RD/CCL/003			Reference Data Change Catalogue Appendix – Branch/Outlet	PVCS
RD/CCL/004			Reference Data Change Catalogue Appendix – AP, ADC and APOP	PVCS
RD/IFS/018			RDDS – TPS Application Data Interface	PVCS
RD/IFS/019			RDDS – APS Application Data Interface for CSR+	PVCS

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RD/IFS/020			RDMC to Memo Submission – Data Interface Specification	PVCS
RD/IFS/021			RDDS – LFS Application Data Interface for CSR+	PVCS
RD/IFS/022			EPOSS Type C to RDMC Interface Specification (Legacy Horizon format)	PVCS
RD/IFS/023			Type B To RDMC Interface Specification	PVCS
RD/IFS/024			Rollout to RDMC Interface Specification	PVCS
RD/IFS/025			SYSMAN to RDMC – Data Interface Specification	PVCS
RD/IFS/026			RDMC to Dispatch 1- Data Interface Specification	PVCS
RD/IFS/029			RDMC – Communication Monitoring System Data Interface Specification	PVCS
RD/IFS/031			RDDS to DRS - Data Interface Specification	PVCS
RD/IFS/032			RDDS to MTAS – Data Interface Specification	PVCS
RD/IFS/033			PO LTD to Fujitsu Services Bureau de Change Rates Interface Specification	PVCS
RD/IFS/037			Post Office Ltd to Fujitsu Services EMV Retail PIN Pad Reference Data Interface Specification	PVCS
RD/IFS/038			Post Office Ltd to Fujitsu Services EMV Banking PIN Pad Reference Data Interface Specification	PVCS
RD/IFS/039			RDDS to APOP – Data Interface Specification	PVCS
TD/ION/004			FTMS Configuration for transferring Data between RDMC and POL RDS	PVCS
TD/ION/040			FTMS Configurations for Bureau de Change	PVCS

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

0.6 Abbreviations

Abbreviation	Definition
AP-ADC	Automated Payment – Advanced Data Capture
APOP	Automated Payment Out-pay
APS	Automated Payments Service
BTS	Branch Trading Statement – each Post Office branch produces a branch

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	trading statement at the end of each accounting period
CRC	Cyclic Redundancy Check
CSR+	(Horizon) Core System Release Plus
DCS	Debit Card System
DRS	Data Reconciliation Service - A new service introduced as part of network banking. Its main component is a new database running on the host.
DVLA	Driver and Vehicle Licensing Agency
DWH	Data Warehouse
EDG	External Data Gateway
EPOSS	Electronic Point of Sale Service
ETU	E-Top-Ups. Ability to credit money to a mobile phone account.
FAD	Unique identifier allocated by Post Office to branches
FRTS	First Rate Travel Services is the Post Office partner in the provision of currency and traveller's cheque sell and buy services
FTMS	File Transfer Management Service; Horizon process that provides configurable file transfer services between Horizon and Post Office Ltd's Clients. Services available include data compression and encryption
HNG-X	Horizon Next Generation – Plan X
HRDP	Horizon Next generation Reference Data Preparation System
HR SAP	Human Resources Standard Accounting Package - the SAP System used by Royal mail Group's Human Resources to pay sub-postmasters
IIN	Issuer Identification Number
LFS	Logistics Feeder Service
MID	Merchant Identifier issued by Streamline Merchant Services to identify the Branch from which a transaction originated
MIS	Management Information System
MTAS	MID / TID Allocation System.
NBS	Network Banking Service
NPS	Network Persistent Store
OBC	Operational Business Change (Reference Data)
PAF	Postal Address File. A service to allow post codes and addresses to be looked up.
PAN	Primary Account Number
PLU	Product Look Up Number – a means of selecting a product to be transacted by entering the unique product identifier. This facility is restricted to EPOSS products
PO	Post Office
POL	Post Office Limited
POL FS	SAP based system providing financial accounting for the branch based business.
PRDP	Pathway (Horizon) Reference Data Preparation Tool
RDDS	Reference Data Distribution System
RDMC	Reference Data Management Centre

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RDS	Post Office Reference Data System
RDT	Reference Data Team - the Post Office and Fujitsu Customer Services teams use the RDT environment to validate and verify the reference data associated with business changes.
RMG	Royal Mail Group
SAP	Integrated suite of applications providing financial accounting and other business functions.
SAPADS	POL' s Advanced Distribution System (based on the SAP package) that interfaces to LFS
SLA	Service Level Agreement
SU	Stock Unit
SYSMAN	The systems management environment.
TES	Transaction Enquiry Service
TID	Terminal Identifier issued by Streamline Merchant Services to identify the terminal from which a transaction originated
TPS	Transaction Processing System
XML	Extensible Markup Language

0.7 Glossary

See also DES/APP/MAN/0002.

Term	Definition
Accounting Node	The standard Post Office reporting requirement is defined through an Accounting Node hierarchy. This is a 5-tier hierarchy with level 5 being the top level. Products are mapped to accounting nodes at level 1 or level 2 in the hierarchy.
Accounting Period	Post Office branches work on 4, 4, 5 week accounting periods with a branch trading statement being produced by each branch at the end of the accounting period. POL RDS define the accounting period calendar. The actual production of the branch trading statement is staggered by each branch having an offset of 0, 1, 2 or 3 weeks from the end of the accounting period.
Additional Data	This is the mechanism by which POL RDS define the step by step flow for complex transactions such as AP ADC transactions
AP Token	An AP Token defines the data elements of a bar code or magnetic card which is used to initiate an AP transaction
Bank Card	Bank Card defines the data elements and IIN ranges for magnetic cards which are read through a PIN Pad or swiped so as to initiate a banking, retail or ETU transaction
Banking Operation	Banking Operation is a specific type of service (such as cash withdrawal) which is supported for a bank issuer scheme
Branch	Post Office outlet identified by a unique Branch Code. Within the HNG model, a Branch is a logical entity that can be composed of several physical locations at which business is transacted.
Branch Changes	Changes to the Post Office branches within the HNG-X estate. This includes introduction of new branches, termination of existing branches, changes to existing branches such as number of counter positions and network connection. The changes are notified by POL under operational business change and applied to the Estate Management system within HNG-X. Estate Management then notifies RDMC

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	of the changes.
Branch Opening Periods	Branch opening periods are the daily morning and afternoon opening hours for Post Office branches
Bureau	Bureau de Change
Bureau Rates	Bureau rates consist of spot rate, margin and commission rates. The data is delivered to HNG-X by First Rate Travel Services via POL.
Business Change Release Management	The association of all reference data for an operational business change into a reference data set and the release of the set of reference data through the various RDT verification steps and on to the live HNG-X system.
Business Change Verification	The process of confirming that a reference data change has worked correctly and achieved the required business effect
Client Account	Client Account is the account to which AP transactions for a specific AP Token are allocated
Commission	The commission rate appropriate to a particular bureau de change currency or traveller's cheque service
End of Session Prompts	A set of promotional products / services which are presented at the end of a customer session with the objective of the customer being encouraged to increase their purchases from Post Office
Exclusion List	A list of products which are excluded from a particular activity such as bank card settlement
Estate Management	This set of systems manages changes driven by POL Branch change requests. It maintains a database of Configuration Items for use in the configuration of end-point systems in the Data Centre and the configuration of Branch Router and Terminals within the Branch outlets.
Help Data	HNG-X counter help data is delivered by Post Office through the HNG-X reference data system
Help Desk	The HNG-X help desk. Branch details are supplied to the help desk via the Despatch-1 system.
HR SAP CTT Number	HR SAP Remuneration Number
HR SAP Schedule	HR SAP schedule for delivering aggregate transaction details
Hypercom	Hypercom supply HNG-X PIN Pads and software
IIN Range	The start and end range of valid issuer identification numbers for a specific bank card
Inclusion List	A list of products which are included for a particular activity such as bank card settlement
Issuer Scheme	The financial institution which owns a range of bank cards and banking operations
Margin	The margin rate appropriate to a particular bureau de change currency or traveller's cheque service
Memo Submission	HNG-X service that distributes operational messages from the centre to Post Office branches
Method of Payment (MOP)	A list of settlement products which are valid methods of payment for a specific service or set of services
Non-Core Product Links	Certain products are not transactable at all Post offices. These products are classed as non-core and their availability at Post Office branches is then controlled through non-core links (delivered as Type A reference data) which associate the product with the branch.

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Other Reference Data	The set of reference data objects which do not fall within Type A, Type B, Postal Services, Transaction Scripts, PIN Pad, Bureau Rate and Branch Changes reference data. The reference data consists of reference data objects and reference data files (e.g. bitmap files).
Pick List	The grouping of products for the proposes of presentation as a pick list
PIN Pad Reference Data	Reference Data which is required specifically to drive the PIN Pad at the counter. The data is delivered by the POL reference data team to RDT. RDT convert the data into the required format and deliver to RDMC.
POL Client	The client institution on behalf of which PO Ltd. provides a service to Customers at branches
POL FS Article	POL FS term used in SAP to represent a Product
POL FS Account	An account within POL FS into which Transactions or Summaries are posted.
POL Reference Data Team	A POL team which is dedicated to delivery of reference data and the verification of operational business change through reference data
Postal Services	The set of services associated with mail items (letters, packages and parcels). A specific set of reference data is delivered by the POL reference data team to support Postal Services. POL delivers the data to RDT. RDT manage the delivery of the data to RDMC.
Product	The basic transactable item – delivered as POL RDS Type A reference data
PRDP	Pathway (Horizon) Reference Data Preparation Tool
Settlement	Concluding of a customer transaction after provision of a service, with the payment or receipt of all funds due to or due from a customer. Also used for the settlement between PO Ltd. and Clients
Soft Launch	The ability to control the introduction of new functionality at the counters through reference data.
Spot Rate	The spot rate appropriate to a particular bureau de change currency or traveller's cheque service
Streamline	Merchant Acquirer for DCS.
SYSMAN	System Management Solution
Transaction Mode	The different ways in which a product can be transacted such as sell, remit in, remit out
Transaction Prompt	A message which is associated with a product or menu button at the counter and is presented when the product or menu button is selected.
Transaction Scripts Reference Data	The reference data that controls how products and services are transacted at the counters. AP ADC reference data is a sub-set of transaction script reference data. The data is delivered by the POL reference data team and delivered to RDT. RDT manage the data delivery to RDMC.
Type A Reference Data	Post Office supplied Reference Data. It is temporal data which is transmitted electronically over an automated interface from the Post Office RDS system, and loaded automatically into RDMC. Type A Reference Data supports both the Horizon and HNG-X Solution
Type B Reference Data	Type B reference data consists of the accounting node hierarchy and mapping of stack icons to products. The data is agreed between RDT and POL and delivered to RDMC by RDT. Type B Reference Data supports both the Horizon and HNG-X Solution
Type C Reference Data	Type C reference data is a legacy of the Horizon system where much of the data was delivered in attribute grammar format. Under HNG-X, APOP reference data continues to be delivered in attribute grammar format. This data is used for Horizon

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	counters only.
Type F Reference Data	Type F reference data is an HNG-X concept when enables the delivery of any computer file to the HNG-X counters through the reference data system.
Type G Reference	Type G reference data is HNG-X specific reference data which is delivered through RDMC and RDDS and can then be forwarded to any HNG-X platform via System Management, Branch Database or via an RDDS file share.
Type X Reference Data	Type X reference data is an HNG-X concept which enables the delivery of reference data objects which are in XML format to the HNG-X counters through the reference data system

0.8 Changes Expected

Changes
Response to review comments

0.9 Accuracy

Fujitsu Services endeavours to ensure that the information contained in this document is correct but, whilst every effort is made to ensure the accuracy of such information, it accepts no liability for any loss (however caused) sustained as a result of any error or omission in the same.

0.10 Security Risk Assessment

Security risks have been assessed and it is considered that there are no security risks relating specifically to this document.

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1 Scope

This document describes the architecture for reference data preparation, storage, release and distribution within the HNG-X solution.

The document consists of:

- A description of the various reference data required by the HNG-X system
- Identification of the reference data sources and description of the data preparation activities
- A description of the main components of the reference data system (RDMC database, RDDS database, RDMC work station and counter processing) which support the storage and distribution of HNG-X reference data
- A description of how reference data is distributed through the HNG-X domain with particular emphasis on distribution to HNG-X counters.
- A description of the reference data verification environment
- Non-functional aspects such as service level targets, security, performance etc
- A description of the activities involved in migrating from Horizon to HNG-X.
- Coverage of the reference data system support of the Memo View (Memo Submission) solution.

Associated Documents (Internal & External) are referenced at various points in this document.

The document identifies a number of new reference data interfaces - these are included in Section *0.6 Associated Documents (Internal & External)* and referenced at various points in this document.

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2 Architectural Description

2.1 Rationale

Post Office business requirements are changing continually and one of the fundamental requirements supported by both Horizon and, more so, by HNG-X is that most of these business requirements can be implemented through use of reference data to define new products and services without having to make any software changes. This requirement means that pretty well any system behaviour that is visible to end users, in particular at Post Office branches, can be altered through reference data. This includes:

1. Menu navigation
2. All user interface screens
3. All printed outputs (reports, receipts, vouchers)
4. The products and services available at each branch
5. How each product and service is transacted
6. The prices / rates charged for products and services.
7. The rules associated with product and service transactions
8. How products and services are accounted for
9. How product and service transactions are notified to and settled with Post Office clients
10. How branches are remunerated for transacting products and services
11. Help data which supports the transaction processing at Post Office counters

Overall, this reference data, excluding help data, amounts to over 3 million data records and should any one record be incorrect then there is likely to be some negative effect on the Post Office business.

On the Horizon system, the realisation that reference data was significant was gradual – usually learnt by hard lessons firstly during system testing and implementation and later in the Live system. There were instances of Post Office business being severely curtailed or even stopped at certain branches because of missing or incorrect reference data. The end result is that Horizon now has an experienced team within the Customer Services domain dedicated to successful implementation of business change through reference data and they work closely with a corresponding team of Post Office staff who are located alongside them, Business change through reference data occurs on a daily basis and the Customer Services team and the Post Office team work together to verify that each change achieves its business objective prior to release of the reference data to the Live counters. This reference data verification activity is quite separate from the software verification, which is carried out by the testing teams.

The same Customer Service and Post Office teams will support reference data business change on HNG-X and their expectation is that many of the lessons learnt on Horizon have been taken into consideration in the architecture and design for HNG-X reference data so that HNG-X business change is simpler, carries less risk and can be achieved at lower cost.

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2.2 Reference Data Overview

2.2.1 Reference Data Components

2.2.1.1 Reference Data Sources

The following diagram shows the main reference data sources:

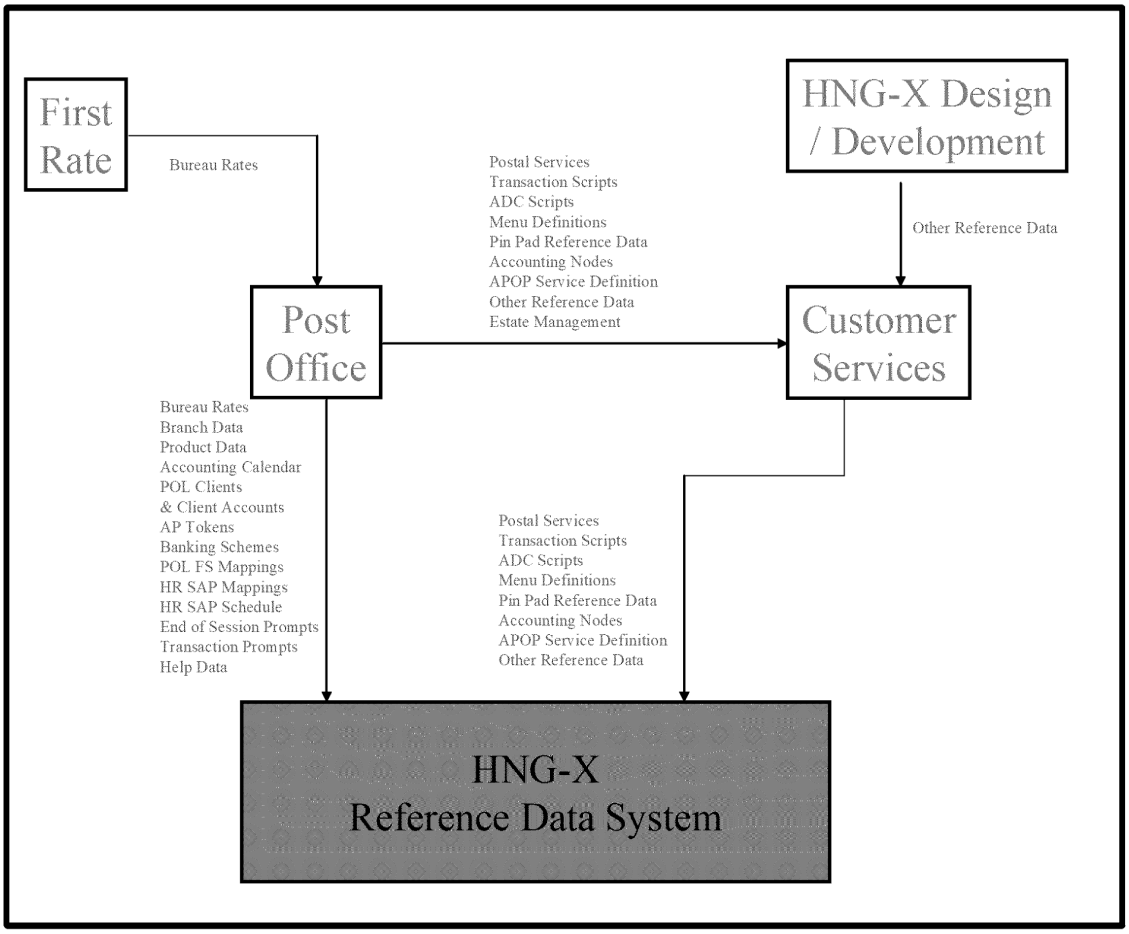

Figure 1 – Reference Data Sources

2.2.1.2 Key Players

2.2.1.2.1 Post Office

POL delivers the bulk of the HNG-X reference data, in particular, the data that is most subject to change. The POL role is divided into two main areas:

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- The staff associated with the operations of the automated POL reference data system (RDS) at Chesterfield
- The POL reference data team based on Fujitsu Services premises at Bracknell, who are responsible for co-ordination of POL reference data delivery and the verification and acceptance of operational business change through reference data.

2.2.1.2.2 First Rate

First Rate Travel Services are POL's business partner in supplying currency and traveller's cheque buy and sell services at branch counters. First Rate delivers bureau exchange rates to POL who then pass the data on to Fujitsu Services.

2.2.1.2.3 Customer Services

The Customer Services reference data team (RDT) within Fujitsu Services is responsible for the overall management of operational business change through reference data. They manage the day-to-day operations associated with agreement to business change, the preparation and delivery of reference data, the verification of the business change and the release of the business change to the live domain.

2.2.1.2.4 HNG-X Development Team

The HNG-X Development Team is responsible for delivery of certain types of reference data which is outside the scope of operational business change – a particular example might be reference data to support the soft launch of new functionality.

2.2.1.3 Deliverables Description

2.2.1.3.1 Bureau Rates

Bureau spot rates, margin rates and commission rates are produced by First Rate Travel Services and delivered to POL who sends them on directly to HNG-X. Spot rates are liable to change on a daily basis whereas margin and commission rates change less frequently.

2.2.1.3.2 Branch Data

Branch data consists of branch name and address details, branch opening periods and branch availability of non-core products.

2.2.1.3.3 Product Data

Product data contains the rules associated with the transaction of products such as the product price, maximum and minimum values, product name for receipts etc, the modes in which the product can be transacted, product to product relationships and the mapping of products to the accounting node hierarchy.

2.2.1.3.4 Accounting Calendar

Accounting Calendar defines the accounting periods for each financial year. Accounting periods are always 4 or 5 weeks and follow a 4 week, 4 week, 5 week sequence.

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2.2.1.3.5 Automated Payment Clients and Client Accounts

POL client data includes details such as identifiers and name for all business clients for which POL provide services at Post Office counters. Client Account data applies to automated payment clients only – it defines the accounts that the client transactions are allocated to.

2.2.1.3.6 AP Tokens

AP Tokens data defines the full set of AP tokens which are recognised by HNG-X. Tokens can be either bar codes or magnetic cards.

2.2.1.3.7 Banking Schemes

Banking Schemes Data defines all financial schemes for Banking transactions, bank card session settlement and ETU transactions. The data consists of card definition (PAN and IIN ranges) and definition of permitted services (e.g. cash withdrawal).

2.2.1.3.8 POL FS Mappings

POL FS Mappings define how HNG-X transactions are mapped to the POL FS system. The mapping is done by product and transaction mode to POL FS articles and accounts.

2.2.1.3.9 HR SAP Mappings

HR SAP Mappings define which HNG-X transactions are mapping to the HR SAP system. The mapping is done by product and transaction mode to HR SAP CTT numbers.

2.2.1.3.10 HR SAP Schedule

HR SAP schedule defines the reporting periods that are required by the HR SAP system

2.2.1.3.11 End of Session Prompts

End of Session Prompts Data defines a set of products and services which are the subject of sales promotions.

2.2.1.3.12 Transaction Prompts

Transaction prompts data defines sales promotion and operational messages and their association with products (in specific modes) and menu buttons.

2.2.1.3.13 Help Data

Help data consists of images and HTML text which supports the HNG-X counter processing.

2.2.1.3.14 Postal Services

Postal Services data defines the mails services and add-on services which are supported for each of the mail service providers and for mails carriers who collect or deliver mail through Post Office counters. Postal Services data supports service variation by country. The data also includes postal service administration reference data which supports services such as track and trace, mails despatch, local collect and priority mail.

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2.2.1.3.15 Transaction Scripts

Transaction scripts data define the sequence of activities involved in each different HNG-X transaction. This data does not include ADC scripts. Transaction script changes are outside the scope of operational business change.

2.2.1.3.16 ADC Scripts

ADC Transaction scripts data define the sequence of activities involved in each different HNG-X AP additional data transaction and EPOSS additional data transaction. This data is classed separately from other transaction scripts as ADC scripts can be changed as part of the reference data business change process.

2.2.1.3.17 Menu Definition

Menu Definitions specify the HNG-X menu hierarchy including the navigation to HNG-X product and service transactions. The data also includes user role access rules.

2.2.1.3.18 PIN Pad Reference Data

PIN Pad reference data defines the reference data that is required to drive the PIN Pad at the counters. Two PIN Pad reference data sets exist – one for Banking and one for Retail.

2.2.1.3.19 Accounting Nodes

Accounting nodes form a five tier reporting hierarchy which is used for all standard counter reports. Each node has a unique identifier and name.

2.2.1.3.20 APOP Service Definition

AP Out-Pay (APOP) Service Definition reference data is required when an AP service is authorised through the APOP database service. The data defines the authorisation transactions including input, validation, audit requirements and return data.

2.2.1.3.21 Other Reference Data

Other Reference Data is a bucket container for any reference data which is not included elsewhere. It can be seen as two distinct types: - individual reference data objects and reference data files. An example of an object might be a message text definition whereas a file might be a bitmap for an icon or logo.

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2.2.2 Reference Data Flows within HNG-X

Reference Data is distributed from the HNG-X Reference Data System to Branch counters and to many of the HNG-X host systems as shown in the diagram below:

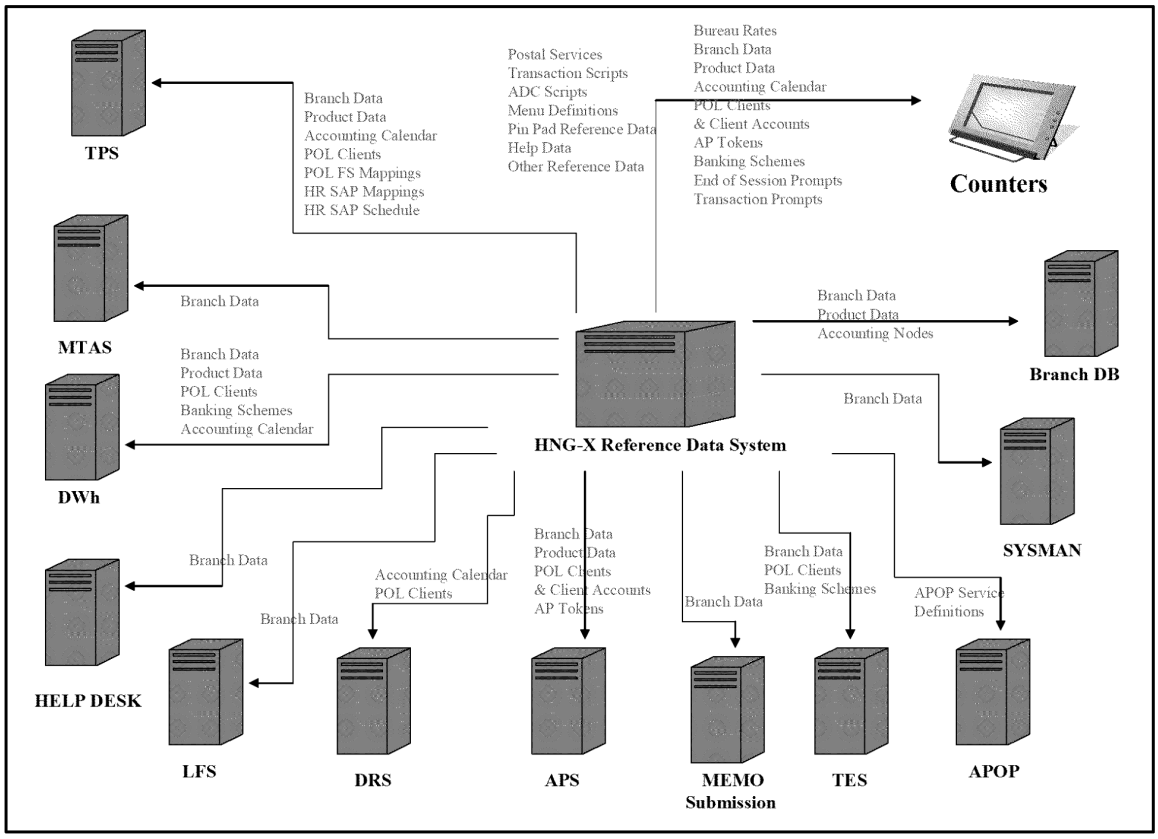

Figure 2 – Reference Data Flows within HNG-X

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2.3 Reference Data Preparation & Delivery

2.3.1 Mapping of Deliverables to Physical Interfaces

The following diagram shows the flow of reference data deliverables to the HNG-X reference data system:

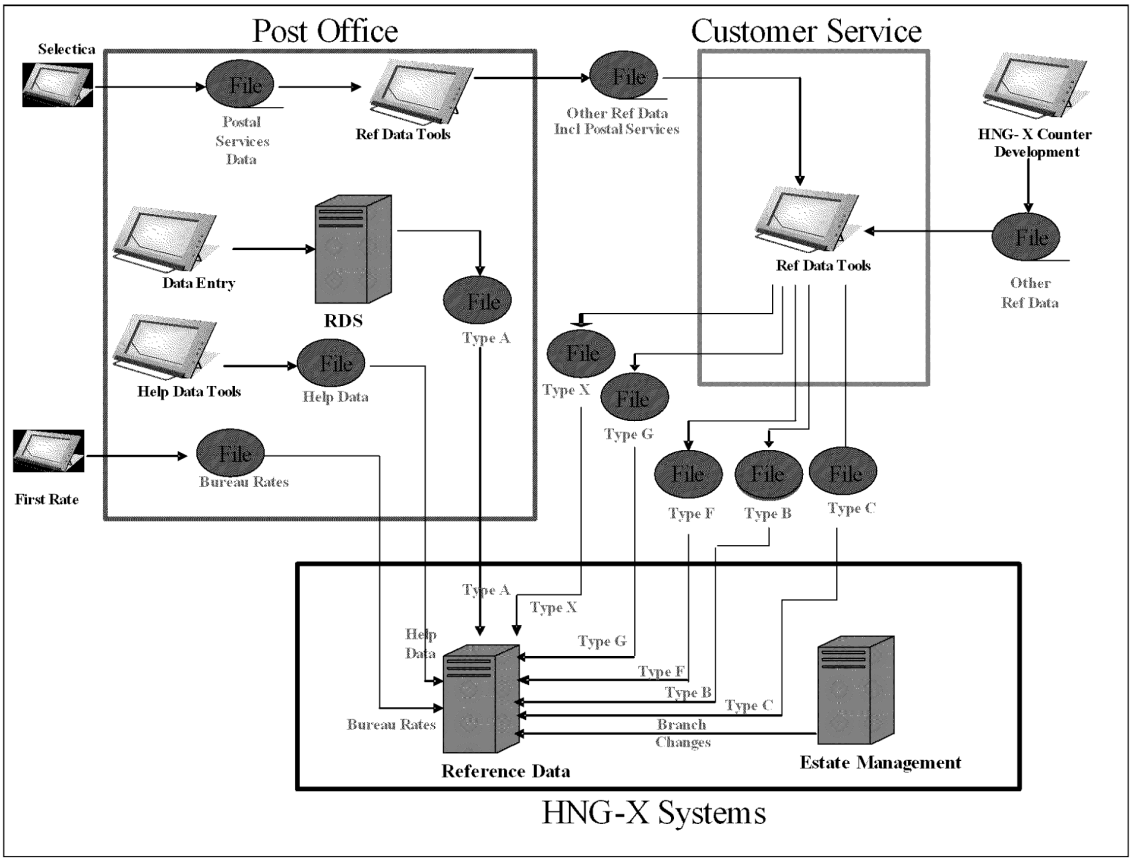

Figure 3 – Deliverables and Physical Interface

For the purposes of delivery to the HNG-X reference data system, the data is classified as follows:

Type A Reference Data: - Type A reference data is delivered from the POL RDS system which is the main source of HNG-X reference data. The reference data consists of

Branch Data
Product Data
Accounting Calendar
POL Clients and Client Accounts
AP Tokens
Banking Schemes
POL FS Mappings
HR SAP Mappings

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HR SAP Schedule
End of Session Prompts
Transaction Prompts

The data interface specification is defined in *Application Interface Specification Reference Data to Pathway for CSR+* (BP/IFS/010), which also describes the data files delivered to the HNG-X reference data system via an FTMS link.

Type B Reference Data: - Type B reference data consists of accounting nodes. The data is delivered in the format as defined in *Type B to RDMC Interface Specification* (RD/IFS/023) and delivered as HNG-X reference data.

Type C Reference Data: - Type C is reference data delivered in Horizon attribute grammar format. APOP service definitions continue to be delivered as Type C reference data. The data is delivered in the format as defined in EPOSS Type C *to RDMC Interface Specification* (RD/IFS/022) and delivered as HNG-X reference data.

Type X Reference Data: - Type X is reference data delivered in XML object format as defined in *HNG-X Specific Reference Data to RDMC Application Interface Specification* (DES/APP/IFS/0004) and delivered as HNG-X reference data. Type X reference data consists of

Postal Services
Transaction Scripts
ADC Scripts
Menu Definitions
Various Other Reference Data Objects
Including Message Definitions
Postal Service Tokens
Postal Service Administration Processes

Type F Reference Data: - Type F is reference data delivered as files with the reference data delivery system having no knowledge of the content or structure of the files. Type F is defined in *HNG-X Specific Reference Data to RDMC Application Interface Specification* (DES/APP/IFS/0004) and delivered as HNG-X reference data. Type F reference data consists of

Pin Pad Reference data
Various Logos and bitmaps

Type G Reference Data: - Type G is reference data delivered as files to any HNG-X platform with the system having no understanding of the file content. There are no restrictions on the content of a Type G reference data file (within normal constraints). This supports BAU deliverables such as encryption certificates and Generic Web Service definitions. Type G is defined in *HNG-X Specific Reference Data to RDMC Application Interface Specification* (DES/APP/IFS/0004).

Help Data: - Help data is maintained by POL and delivered as full baselines to Fujitsu Services. The interface is defined in HNG-X Help Data Delivery by Post Office (DES/APP/AIS/0008).

Bureau Reference Data: - Bureau rates are produced by First Rate Travel Services and delivered to the HNG-X reference data system via POL. The reference data consists of Bureau Spot Rates, Margin Rates and Commission Rates. The data interface specification is defined in PO Ltd to Fujitsu Services Bureau de Change Interface Specification (RD/IFS/033). Data files are delivered to the HNG-X reference data system via an FTMS link.

Estate Changes: - Changes to the HNG-X branch estate are agreed with POL and implemented outside the scope of the HNG-X reference data system. The data consists of additions and deletions to POL branches within the HNG-X estate and changes to branches such as number of counter positions and network connections. Changes are delivered to the HNG-X reference data system by the HNG-X Estate

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Management systems via the Branch Database system. Interfaces are defined in HNG-X RDMC / RDDS to Branch Database Application Interface Specification (DES/APP/IFS/0001).

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2.3.2 Reference Data Preparation Tools

2.3.2.1 HNG-X Reference Data Preparation Tool (HRDP)

PRDP was developed within the Horizon system to support data preparation of reference data by Customer Services RDT. The tool consisted of a Microsoft Access database supported by a number of Visual Basic applications. PRDP has been enhanced into HRDP for HNG-X to support the data preparation and delivery of Type F, Type G and Type X reference data in addition to supporting the Horizon delivery requirements. This is a single user tool, so multiple instances may be in use at any point in time. Each version of the tool is synchronised regularly by importing the master version of the reference data from the live HNG-X reference data system.

The tool carries forward the main concepts within PRDP such as:

- File import and export capability
- Generation of delta files
- Data maintenance and export by business change
- Object effective date control
- Object cloning

2.3.2.2 APOP Excel Spreadsheet

On introduction of APOP within Horizon, RDT developed a Microsoft Excel spreadsheet interface between the POL data delivery and the PRDP tool. This Excel spreadsheet interface continues to be used for delivery of APOP Service Definitions to HNG-X. This is a single user tool, so multiple instances may be in use at any point in time.

2.3.2.3 PIN Pad Data Preparation Tool (PPPT)

A PIN Pad reference data preparation tool was developed within the Horizon system to support the preparation of PIN Pad reference data. The tool consisted of a Microsoft Access database supported by a number of Visual Basic applications. This tool is enhanced to generate HNG-X output format to support the preparation of PIN Pad reference data for HNG-X. Note that PPPT will become redundant once the last Hypercom PIN Pad has been replaced by an Ingenico PIN Pad.

2.3.2.4 HNG-X Postal Services Data Preparation Tool

This is a new reference data preparation tool at HNG-X. The tool receives as input an Excel workbook which defines the HNG-X Postal Services data (about 28 spreadsheets). It converts the data into XML format suitable for import into the HRDP tool (see 2.3.2.1).

2.3.2.5 HNG-X Menu Preparation Tool

This is a new reference data preparation tool at HNG-X. The tool receives as input an Excel workbook which defines the HNG-X menus. It converts the data in XML format suitable for import into the HRDP tool (see 2.3.2.1).

2.3.2.6 HNG-X ADC Preparation Tool

This is an HNG-X enhanced version of the Horizon ADC data preparation tool. The tool receives as input a set of Excel workbooks which defines the HNG-X ADC scripts. It converts the data into XML format suitable for import into the HRDP tool (see 2.3.2.1).

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2.3.2.7 Various Other Data Preparation Tool

There is a general focus within the RDT team to automate as much as possible of the reference data formatting processes. Consequently, a number of further tools have been developed (mainly using Microsoft Excel) to support the conversion of reference data from standard source tables to the XMIL format supported by HRDP (see 2.3.2.1).

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2.3.3 Delivery Process Description

2.3.3.1 Type A Reference Data

The following diagram shows the delivery process flows:

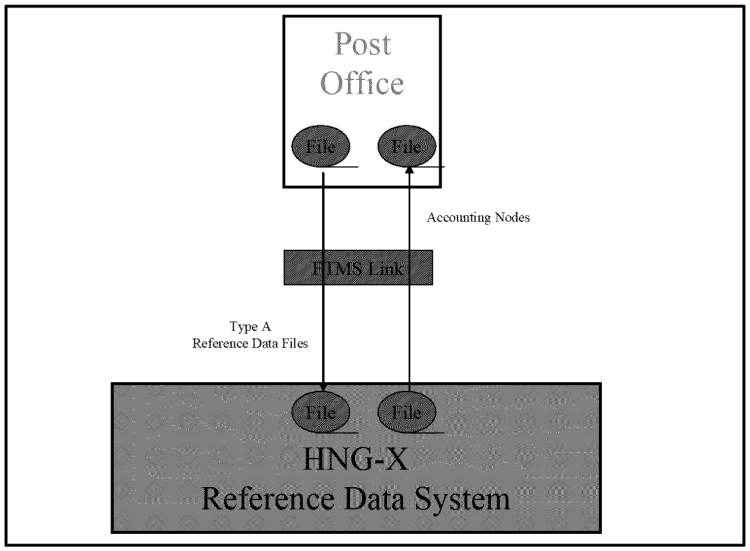

Figure 4 – Type A Reference Data Delivery

Type A reference data is keyed by POL staff into the POL RDS reference data system and delivered via an automated process to HNG-X as reference data files conforming to *Application Interface Specification Reference Data to Pathway for CSR+* (BP/IFS/010). Delivery is automated using FTMS as specified in *FTMS Configuration for transferring Data between RDMC and POL RDS* (TD/ION/004), and the data is loaded directly into the HNG-X reference data system. Each file is for a specific operational business change.

Details of accounting nodes are returned to POL RDS through a semi automated RDT process to support foreign key relationships within the RDS reference data. This return flow is operated and maintained by RDT staff. The AIS format is defined in *Application Interface Specification Reference Data to Pathway for CSR+* (BP/IFS/010).

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2.3.3.2 Type B Reference Data

The following diagram shows the delivery process flows:

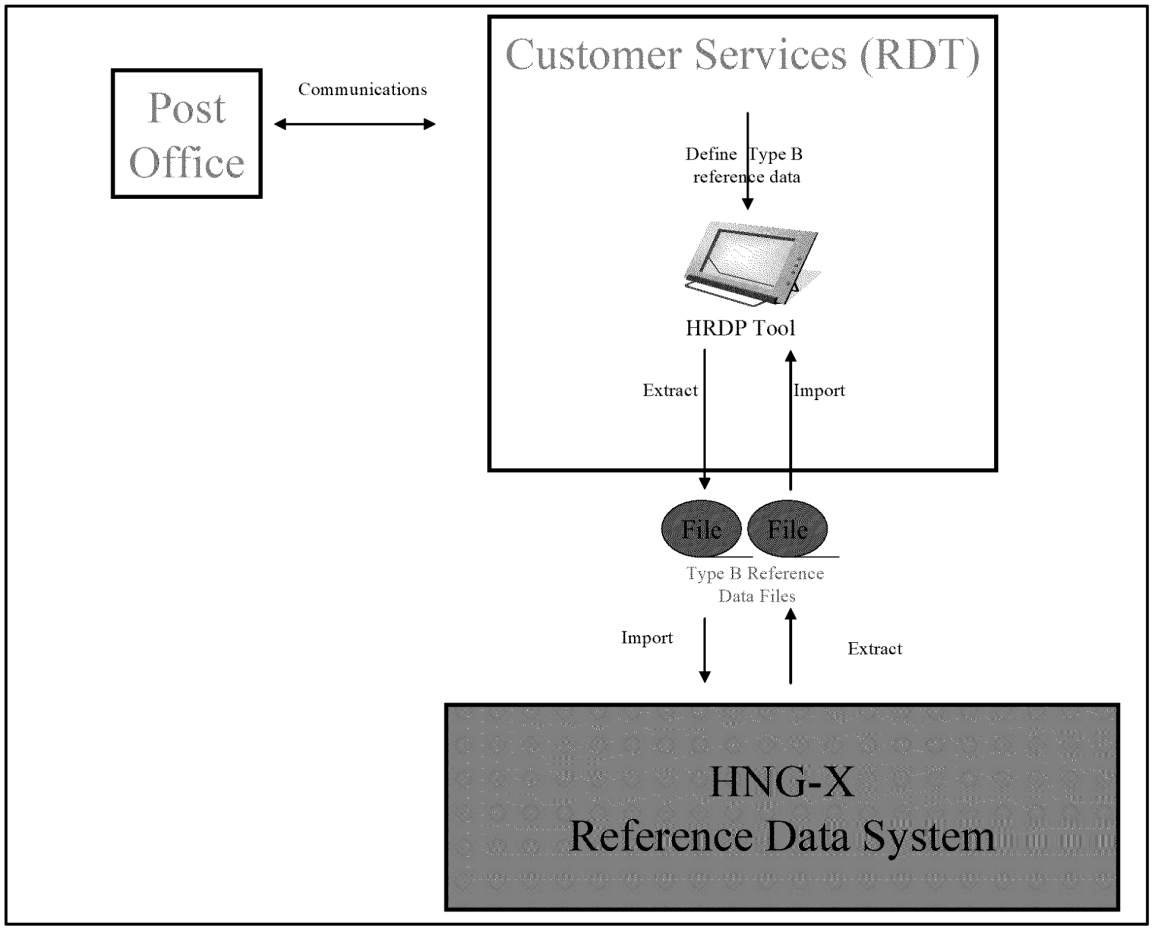

Figure 5 – Type B Reference Data Delivery

The HNG-x reference data preparation tool (HRDP) maintains details of all Type B reference data. The tool resides within the Customer Services (RDT) domain. RDT staff agree changes to Type B reference data with POL and apply the changes by updating the reference data within HRDP. The changed data is then extracted and delivered into the HNG-X reference data system in Type B AIS format – see *Type B To RDMC Interface Specification* (RD/IFS/023). Each file is for a specific operational business change.

An extract and import capability is also provided so that the HRDP data preparation tool can be aligned with the live reference data.

Details of accounting nodes are returned to POL RDS to support foreign key relationships within the RDS reference data. This return flow is operated and maintained by RDT staff utilising existing FTMS capabilities. The AIS format is defined in *Application Interface Specification Reference Data to Pathway for CSR+ (*BP/IFS/010).

All delivery activities are run by RDT staff using a mixture of manual and semi automated processes.

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2.3.3.3 Postal Services Reference Data

The following diagram shows the delivery process flows:

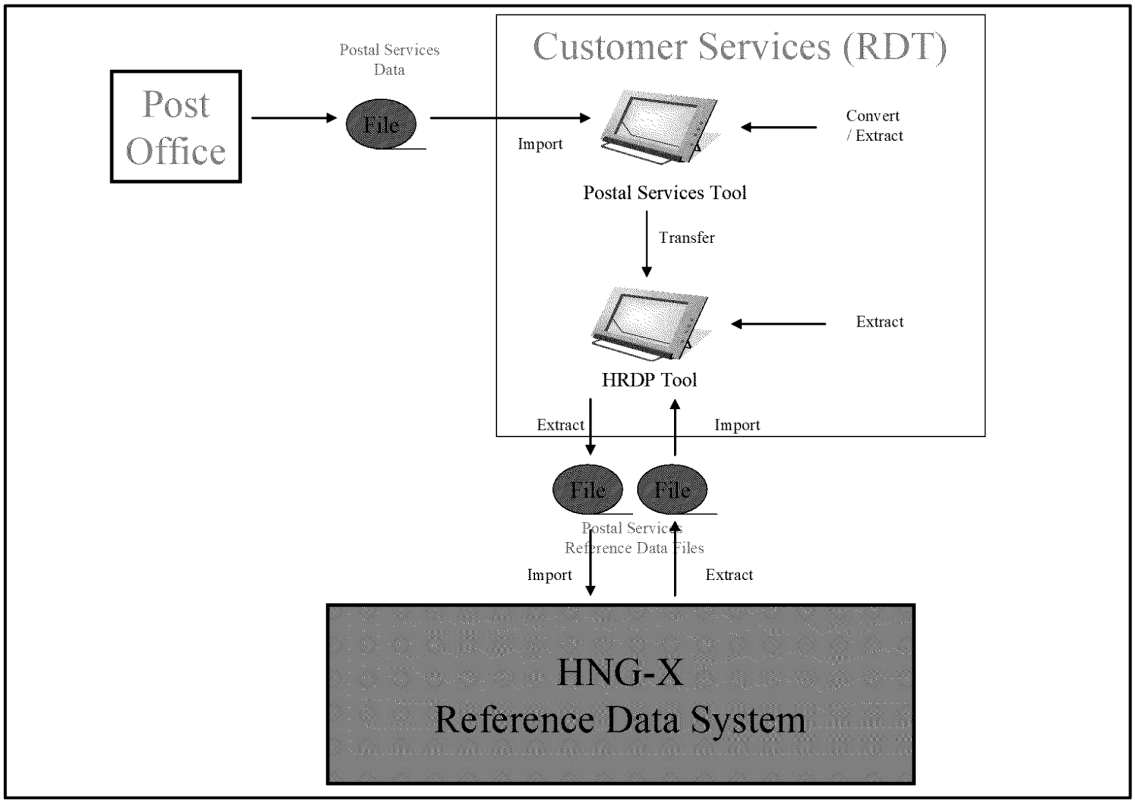

Figure 6 – Postal Services Reference Data Delivery

Postal Services reference data is based on the reference data which supports the Royal Mail and Parcel Force web services – supplied by a company called Selectica. This data is delivered to Post Office where it is enriched to include specific data required for support of Post Office services. Reference data baselines are then delivered to Fujitsu Services in an Excel workbook as defined in HNG-X Postal Service Reference Data Definition (DES/APP/MAN/0002). The Excel workbook is converted by an HNG-X Postal Services tool into XML format suitable for import to the HRDP data preparation tool. The HRDP import process generates a delta of changed data only within HRDP. This changed data is then extracted to file and delivered to the HNG-X Reference Data System.

The reference data Type X files are delivered in *HNG-X Specific Reference Data to RDMC Application Interface Specification* (DES/APP/IFS/0004). Each file is for a specific business change.

An extract and import capability is also provided so that the HRDP data preparation tool can be aligned with the live reference data.

All delivery activities are run by RDT staff using a mixture of manual and semi automated processes.

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2.3.3.4 Menu Definition

The following diagram shows the delivery process flows:

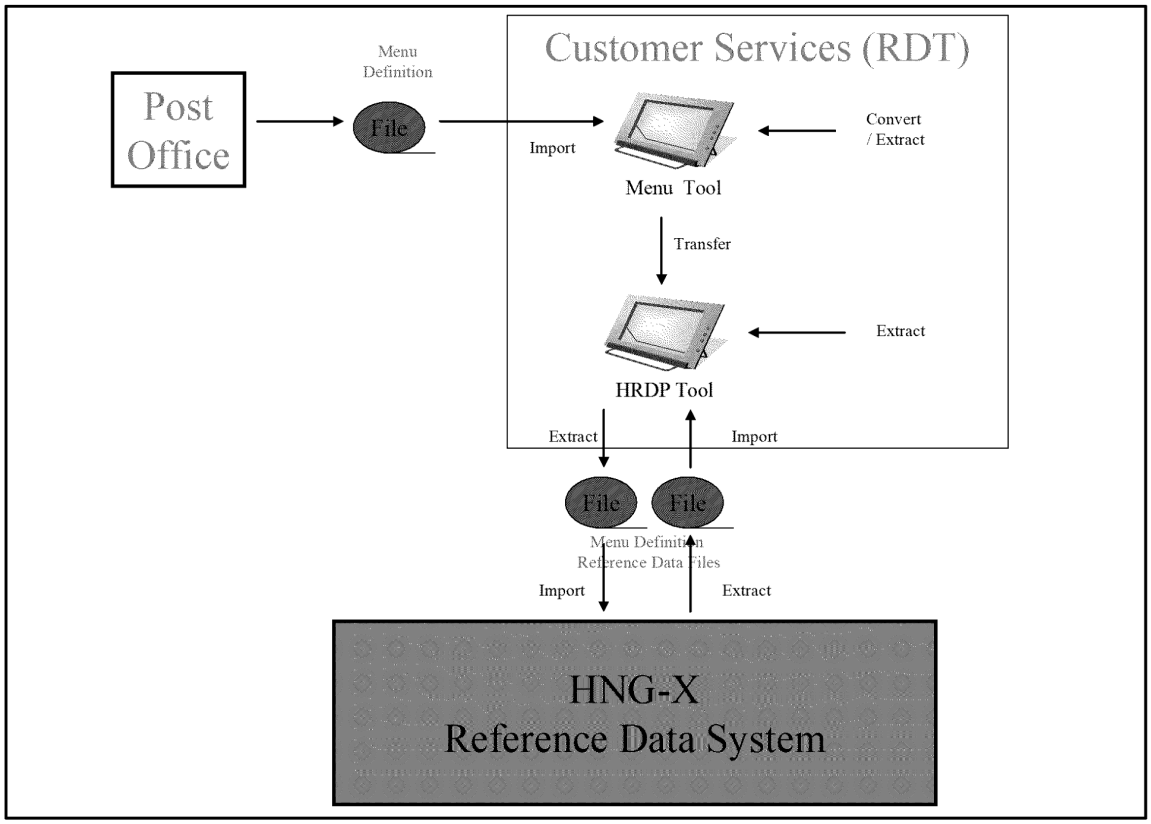

Figure 7 – Reference Data Delivery – Menu Definitions

POL deliver menu definitions to RDT either in document form or in Excel spreadsheet form. RDT then process menu definitions through a dedicated menu data preparation tool which converts it into XML format suitable for import to the HRDP data preparation tool. The HRDP import process generates a delta of changed data only within HRDP. This changed data is then extracted to file and delivered to the HNG-X Reference Data System.

The reference data Type X files are delivered in *HNG-X Specific Reference Data to RDMC Application Interface Specification* (DES/APP/IFS/0004). Each file is for a specific business change.

An extract and import capability is also provided so that the HRDP data preparation tool can be aligned with the live reference data.

All delivery activities are run by RDT staff using a mixture of manual and semi automated processes.

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2.3.3.5 ADC Script Definitions

The following diagram shows the delivery process flows:

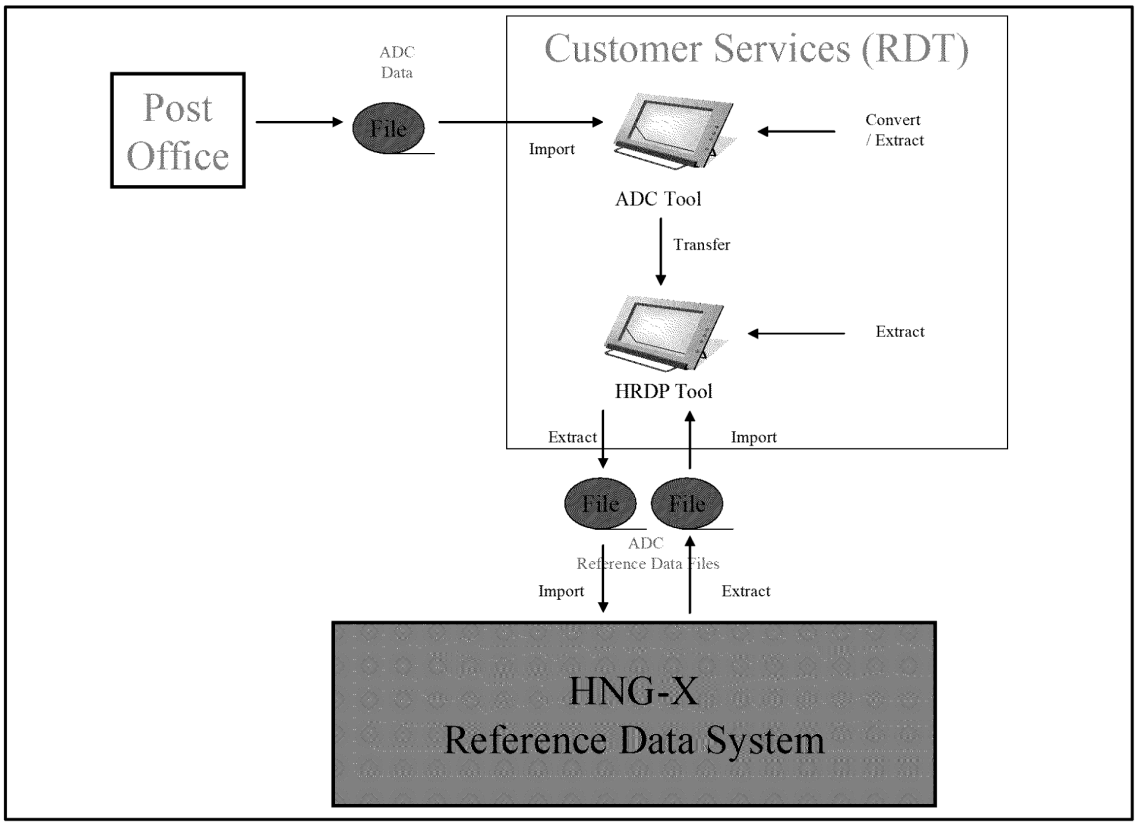

Figure 8 – Reference Data Delivery – ADC Definitions

POL deliver ADC script definitions to RDT either in document form or in Excel spreadsheet form. RDT then process menu definitions through a dedicated ADC data preparation tool which converts it into XML format suitable for import to the HRDP data preparation tool. The HRDP import process generates a delta of changed data only within HRDP. This changed data is then extracted to file and delivered to the HNG-X Reference Data System.

The reference data Type X files are delivered in *HNG-X Specific Reference Data to RDMC Application Interface Specification* (DES/APP/IFS/0004). Each file is for a specific business change.

An extract and import capability is also provided so that the HRDP data preparation tool can be aligned with the live reference data.

All delivery activities are run by RDT staff using a mixture of manual and semi automated processes.

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2.3.3.6 APOP Service Definition

The following diagram shows the delivery process flows:

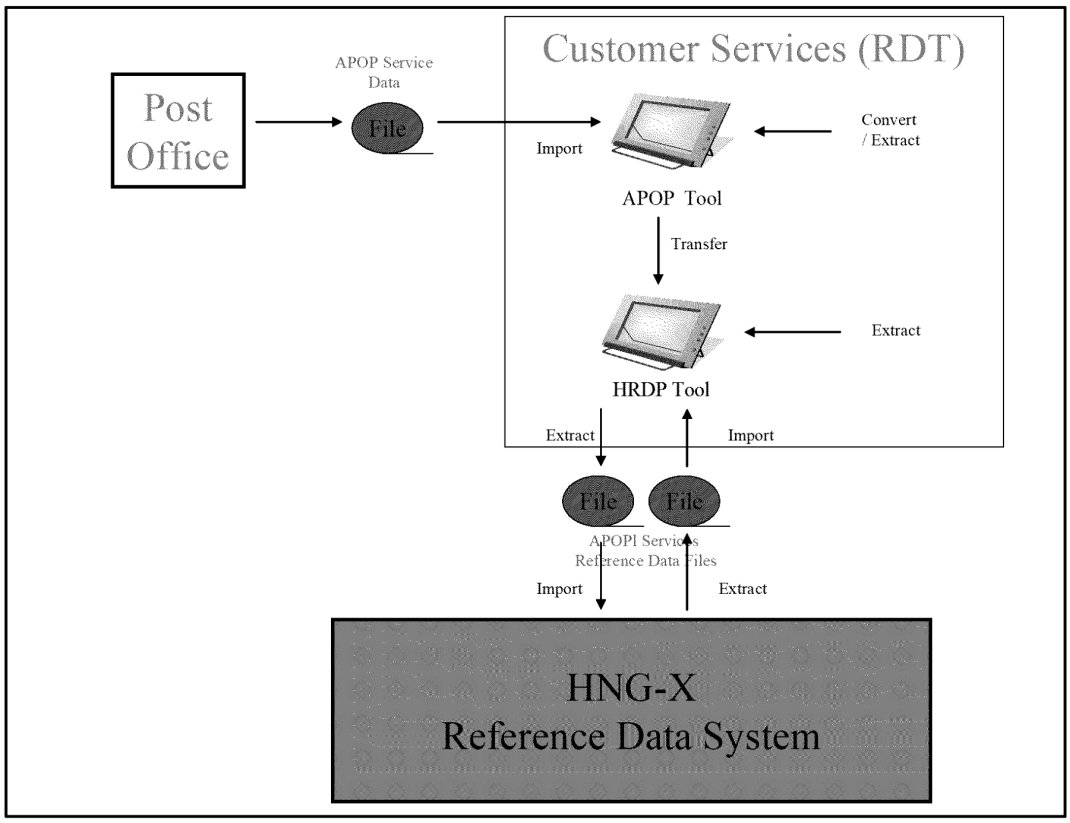

Figure 9 – Reference Data Delivery – APOP Services

POL deliver changes to APOP services to Customer Services (RDT) either in document form or in Excel spreadsheet form as defined in *APOP Authorisation Service Reference Manual* (AP/MAN/004) and *APOP User Guide* (AP/MAN/005). RDT enter the data into an APOP Service Preparation Tool. A separate instance of this tool exists for each APOP Service. On completion of the data changes, a full extract of the APOP Service Definition is generated and imported into the Reference Data Preparation tool (HRDP). The HRDP import process generates a delta of changed data only within HRDP. This changed data is then extracted to file and delivered to the HNG-X Reference Data System.

The reference data Type C files are delivered in Type C Reference Data format (RD/IFS/022). Each file is for a specific operational business change.

An extract and import capability is also provided so that the HRDP data preparation tool can be aligned with the live reference data.

All delivery activities are run by RDT staff using a mixture of manual and semi automated processes.

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2.3.3.7 Other Reference Data Objects

The following diagram shows the delivery process flows:

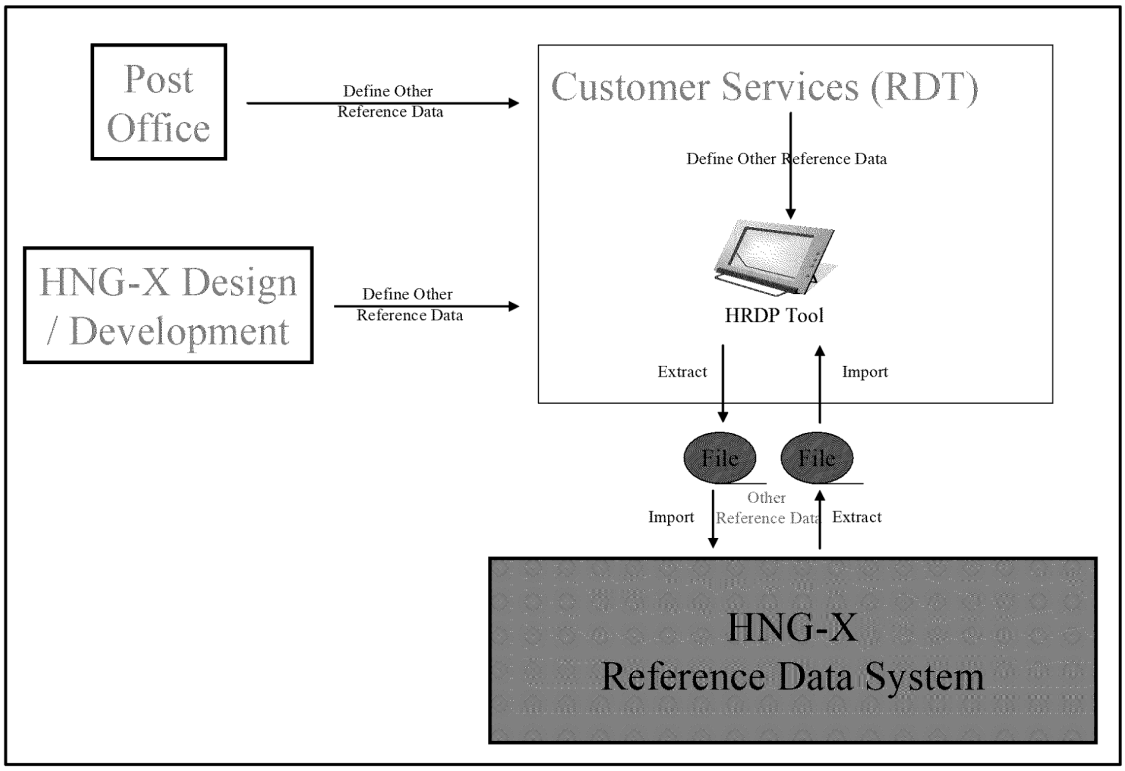

Figure 10 – Other Reference Data Delivery

It is not cost justifiable to create dedicated tools for all reference data object maintenance and, in a number of cases, it is sufficient to use the file level capabilities built into the HRDP tool to import, generate deltas and export and the object level capabilities to create, update or delete XML objects. In other cases, ad-hoc tooling (usually in Microsoft Excel) is used to generate the HRDP input.

Source files may be delivered from Post Office or from the HNG-X Counter design / development area.

The output reference data Type X files are delivered as defined in the HNG-X Specific Reference Data to RDMC Application Interface Specification (DES/APP/IFS/0004). Each file is for a specific business.

An extract and import capability is also provided so that the HRDP data preparation tool can be aligned with the live reference data.

All delivery activities are run by RDT staff using a mixture of manual and semi automated processes.

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2.3.3.8 PIN Pad Reference Data

The following diagram shows the delivery process flows:

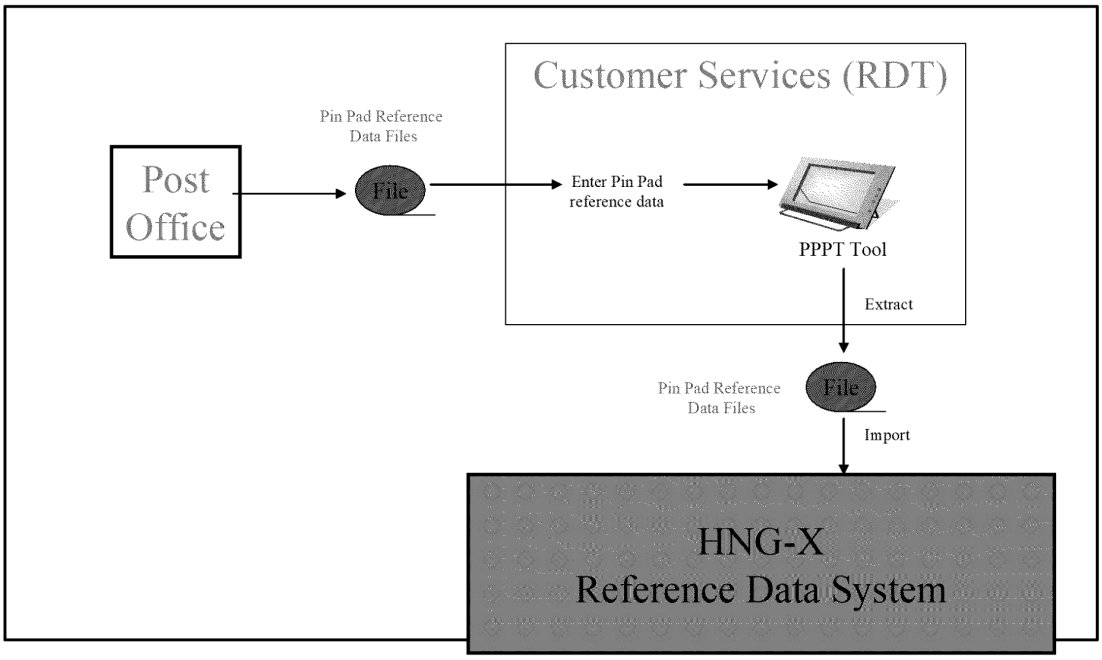

Figure 11 – Reference Data Delivery – PIN Pad

POL deliver changes to PIN Pad Reference Data to Customer Services (RDT) in document form as defined in *Post Office Ltd to Fujitsu Services EMV Retail PIN Pad Reference Data Interface Specification* (RD/IFS/037) and *Post Office Ltd to Fujitsu Services EMV Banking PIN Pad Reference Data Interface Specification* (RD/IFS/038). RDT enter the data into the PIN Pad Preparation Tool, which has been updated to generate output in HNG-X format.

The reference data output Type F files are delivered in HNG-X Specific Reference Data to RDMC Application Interface Specification format (DES/APP/IFS/0004). Each file is for a specific business change.

All delivery activities are run by RDT staff using a mixture of manual and semi automated processes.

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2.3.3.9 Miscellaneous Files

The following diagram shows the delivery process flows:

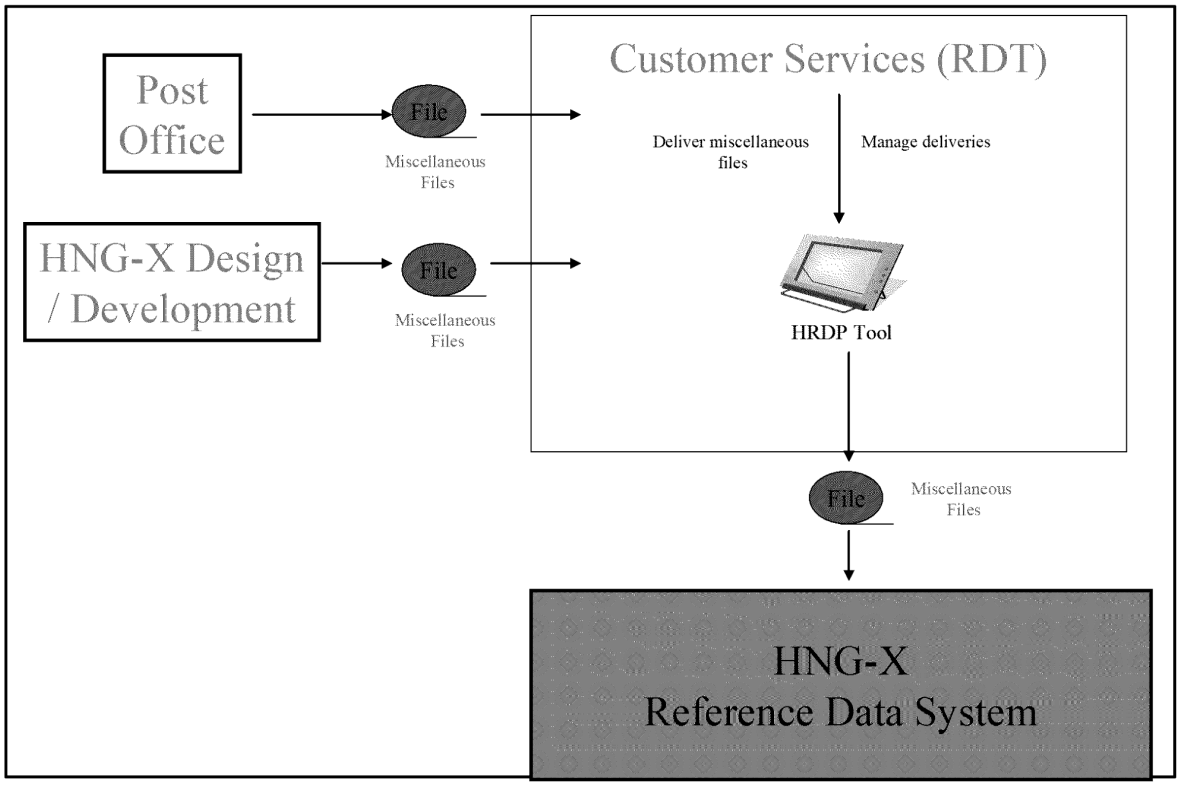

Figure 12 – Reference Data Delivery – Other Files

The HNG-X reference data system has the capability to accept and store reference data files which contain other than XML documents:

- Delivery of reference data as Type F files instead of as objects is necessary to support deliverables such as logo bitmaps.
- Delivery of reference data as Type G files is necessary to support deliverables of any type such as encryption certificates or Generic Web Service definitions.

The HNG-X reference data interface specification is defined in HNG-X Specific Reference Data to RDMC Application Interface Specification format (DES/APP/IFS/0004).

Each file is for a specific operational business change.

All delivery activities are run by RDT staff using a mixture of manual and semi automated processes.

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2.3.3.10 Bureau Reference Data

The following diagram shows the delivery process flows:

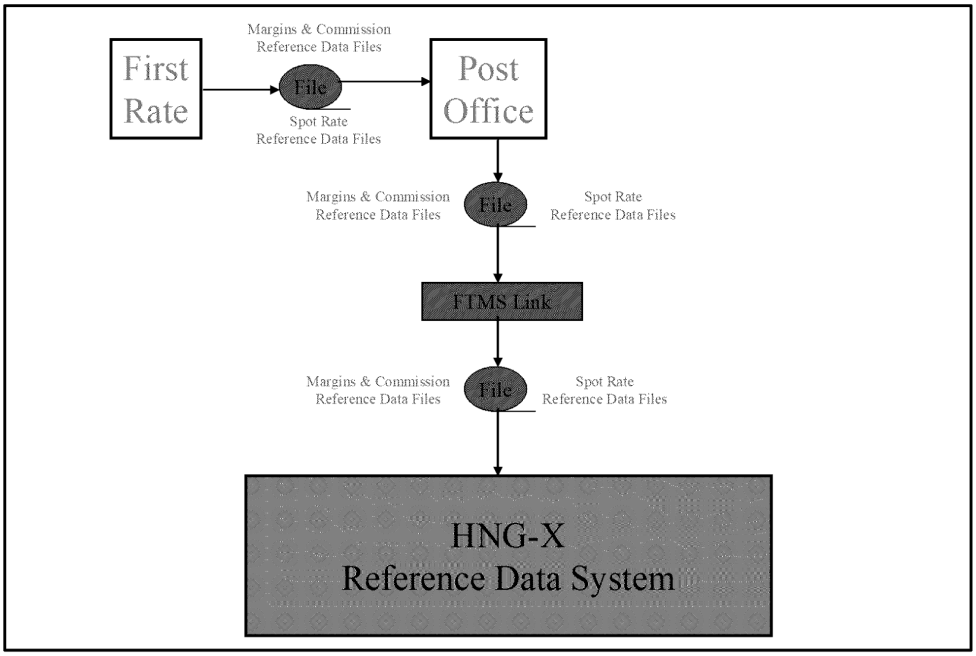

Figure 13 – Bureau Rates Reference Data Delivery

Bureau Reference Data is supplied by First Rate Travel Services to POL from where the data files are transferred directly into the HNG-X Reference Data System using FTMS. The data interface is described in *PO LTD to Fujitsu Services Bureau de Change Rates Interface Specification* (RD/IFS/033) and the FTMS interface is described in *FTMS Configurations for Bureau de Change* (TD/ION/040).

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2.3.3.11 Help Data

The following diagram shows the delivery process flows:

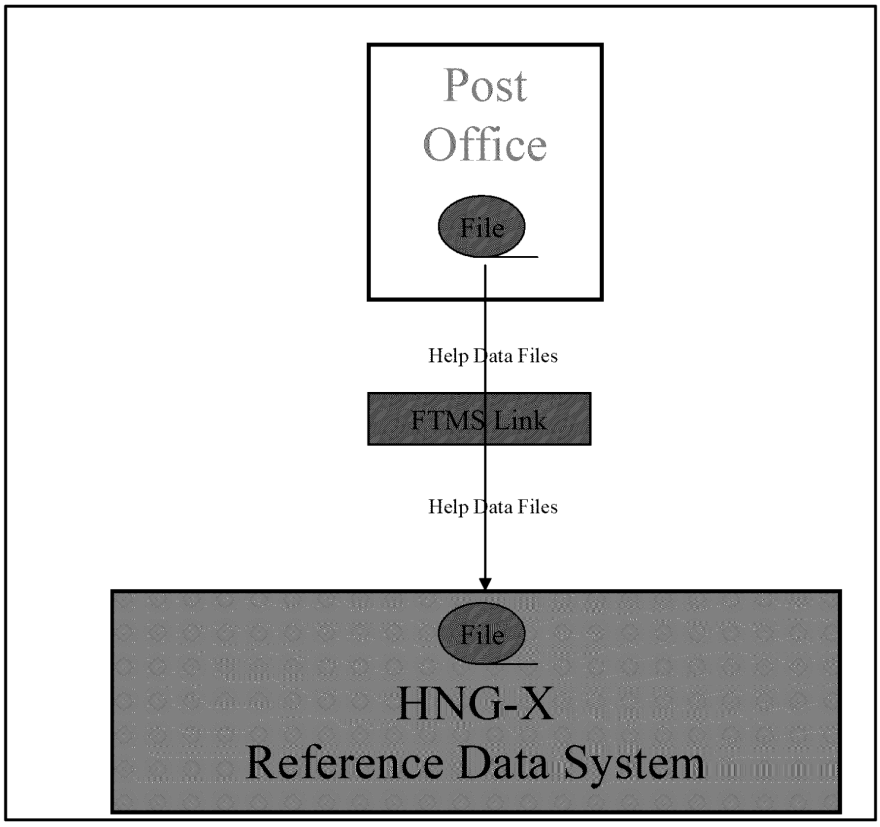

Figure 14 –Help Data Delivery

Help data is maintained by Post Office and delivered as zipped baseline file via an automated interface to HNG-X as reference data files conforming to HNG-X Help Data Delivery By Post Office Application Interface Specification (DES/APP/AIS/0008). Delivery is automated using FTMS as specified in *FTMS Configuration for transferring Data between RDMC and POL RDS* (TD/ION/004), and the data is loaded directly into the HNG-X reference data system. Each file is for a specific operational business change.

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2.4 HNG-X Reference Data System

2.4.1 Overview

The following diagram introduces three of the main components of the HNG-X reference data system, the RDMC database, the RDDS database and the RDMC workstations, and shows the flows of reference data to and from these systems:

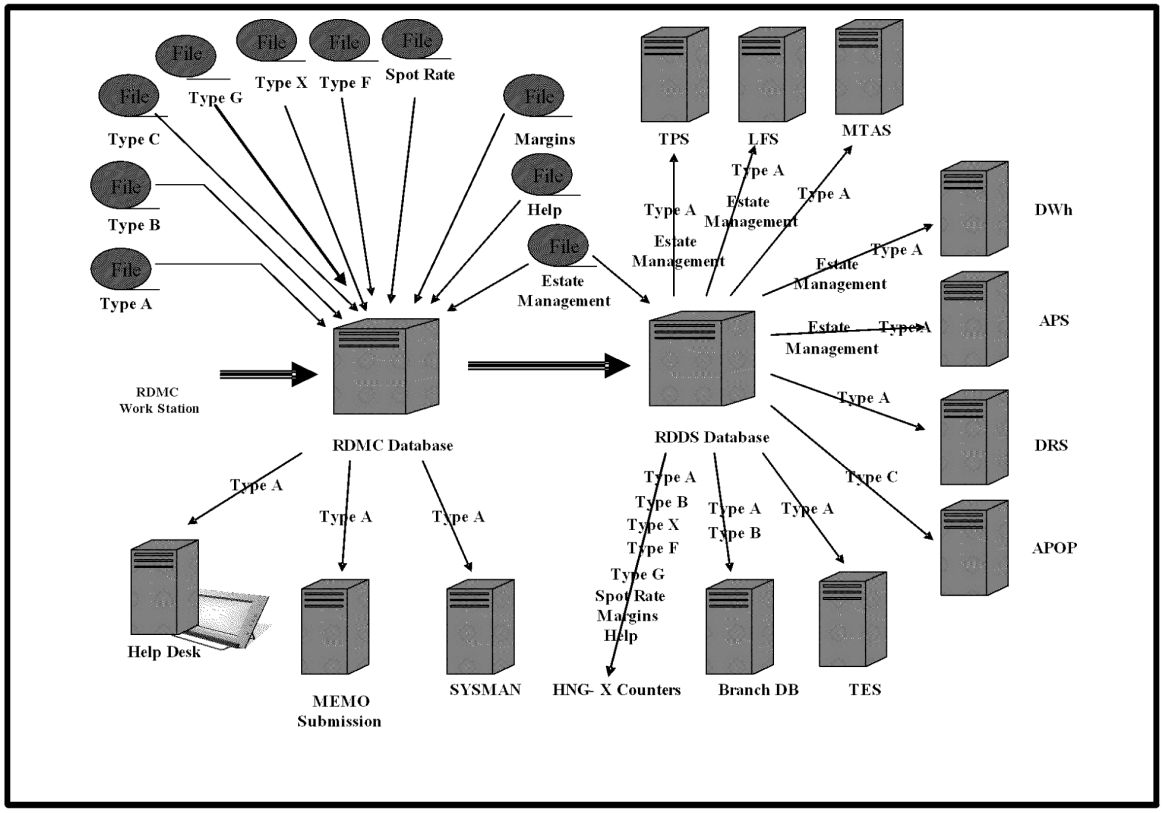

Figure 15 – HNG-X Reference Data Delivery

The HNG-X reference data system is responsible for receipt and distribution of reference data across the HNG-X domain. The system consists of two databases:

- RDMC is an Oracle database resident on a Solaris platform. It is primarily a batch processing system which receives reference data files from a number of sources and stores the data in database tables which generally reflect the input structure of the data. RDMC supports the concept of operational business change with each received file being associated with a specific business change. Through a number of RDMC work stations, RDT staff manage the association of files with business changes, the prioritising of business changes, and the release of the reference data for a business change to the rest of the HNG-X domain. Three HNG-X systems are exceptions to the release process – Memo Submission, Help Desk and SYSMAN have access to the RDMC branch data as soon as it is received within RDMC.

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- RDDS is another Oracle database resident on a Solaris platform. RDDS has access to the reference data within RDMC only when RDT staff release the associated business change to the live domain. At that point, the RDDS batch processing copies the released reference data from RDMC to equivalent database tables in RDDS and then distributes the data to the rest of the HNG-X domain. This distribution process is a mixture of dedicated 'push' batch processes where RDDS prepares the reference data in the format required by the target system and a number of 'pull' processes where the target system copies the data it requires from RDDS.

Branch reference data only is delivered from RDMC to a subset of host systems rather than from RDDS, so this means that it is made available prior to verification by POL. This is because the verification activity can often lead to delays and it is considered better to make the data available on time – accepting that there may be occasional corrections.

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2.4.2 RDMC Database

2.4.2.1 Design Principles

RDMC is the repository for all HNG-X reference data.

The HNG-X system is configurable to support new services, products and outlets by use of reference data. The system is able to respond to changing POL requirements and enables much of the operation of the system to be managed by reference data – delivered either from POL of from within Fujitsu Services

Fujitsu Services provide services to POL to implement operational changes to their business through reference data, without necessitating POL to raise a contractual change request each time. The Reference Data Change Catalogues, *Process for Operational Business Change – Product* (CS/PRD/030) and *Process for Operational Business Change – Outlet Reference Data* (CS/PRD/050) define the product and outlet changes which are supported by this business change.

The business change process requires Fujitsu Services to support:

- receipt, validation, correction and storage of reference data from POL to implement the business change
- preparation, validation, correction and storage of any supporting Fujitsu Services reference data
- verification that the supplied reference data implements the change correctly
- POL verification and authorisation of the change
- Fujitsu Service release of the business change reference data to the Live domain

RDMC has the concept of release environments to which reference data can be released and proved. In all, there are 4 environments:

RDDT	- RDT testing counters
RDDIV	- RDT verification counters
RDDOV	- POL verification counters
RDDS	- Live environment

See *Reference Data Proving / Verification* (section 2.7) for further details on how these different environments support reference data verification, proving and release.

When a business change occurs, reference data may be received from various different sources to fully implement the business change. All this reference data is received into RDMC where it must be associated with the business change and all the reference data must then be released together to the rest of the HNG-X domain so that the business change is implemented fully and at the same time.

RDMC development and implementation is based on an Oracle 10g database.

RDMC software is developed using Unix scripting, Pro*C and PL/SQL.

The RDMC Host system processing consists predominantly of a daily batch schedule.

Online functionality is provided via an RDMC work station on a Windows XP environment to support the loading of reference data files, the release of reference data to the HNG-X domain and the production of reports on reference data changes.

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FTMS manages the transfer of reference data files from POL to the RDMC Host.

System exception events are monitored using Oracle Enterprise Manager

2.4.2.2 Input Interfaces

2.4.2.2.1 Type A Reference Data Files

Type A reference data is keyed into the POL RDS reference data system and delivered to RDMC via FTMS as reference data files conforming to *Application Interface Specification Reference Data to Pathway for CSR+* (BP/IFS/010).

2.4.2.2.2 Type B Reference Data Files

Type B reference data is maintained in the HRDP data preparation tool by RDT staff, changes extracted and delivered to RDMC in the Type B interface format – see *Type B To RDMC Interface Specification (*RD/IFS/023).

2.4.2.2.3 Type C Reference Data Files

Type C reference data is maintained in the HRDP data preparation tool by RDT staff, changes extracted and delivered to RDMC in the Type C interface format – see *EPOSS Type C To RDMC Interface Specification (*RD/IFS/022).

2.4.2.2.4 Type X Reference Data Files

Type X reference data is maintained in the HRDP data preparation tool by RDT staff, changes extracted and delivered to RDMC in the Type X interface format – see HNG-X Specific Reference Data to RDMC Application Interface Specification (DES/APP/IFS/0004).

2.4.2.2.5 Type F Reference Data Files

Type F reference data is maintained in the HRDP data preparation tool by RDT staff, changes are extracted and delivered to RDMC in the Type F interface format – see *HNG-X Specific Reference Data to RDMC Application Interface Specification* (DES/APP/IFS/0004).

2.4.2.2.6 Type G Reference Data Files

Type G reference data is maintained in the HRDP data preparation tool by RDT staff, changes are extracted and delivered to RDMC in the Type G interface format – see *HNG-X Specific Reference Data to RDMC Application Interface Specification* (DES/APP/IFS/0004).

2.4.2.2.7 Help Data Files

Help data is maintained by POL and delivered to RDMC via FTMS as reference data files conforming HNG-X Help Data Delivery by Post Office (DES/APP/AIS/0008).

POL always deliver help data as a complete new baseline in compressed form.

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2.4.2.2.8 Bureau Reference Data

Bureau Reference Data is supplied by First Rate Travel Services to POL from where the data files are transferred directly into the HNG-X Reference Data System using FTMS. The data interface is described at *PO LTD to Fujitsu Services Bureau de Change Rates Interface Specification* (RD/IFS/033).

2.4.2.3 Output Interfaces

2.4.2.3.1 Memo Submission Interface

RDMC makes POL branch details available to the Memo Submission system by providing three views of the RDMC branch data (see *RDMC to Memo Submission – Data Interface Specification* (RD/IFS/020)). These views contain:

- A list of POL branch types
- A list of POL regions
- Branch to region and branch type mapping.

2.4.2.3.2 SYSMAN Interface

RDMC makes POL branch details available to SYSMAN by providing SYSMAN with four views of the RDMC branch data (see *RDMC – Communication Monitoring System Data Interface Specification* (RD/IFS/029)). These views contain:

- Branch identifiers, name, address, office open status and daily opening hours
- Bank holiday regions
- Bank holidays for each region
- Branches in each bank holiday region.

SYSMAN accesses RDMC using database to database links and copies the data views as required.

2.4.2.3.3 Help Desk Interface

RDMC provides details to Help Desk of changes to branch reference data which affect

The interface consists of a daily delta file (see *RDMC to Dispatch 1 – Data Interface Specification* (RD/IFS/026)), which is made available on a file store share to the Dispatch 1.

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2.4.3 RDDS Database

2.4.3.1 Design Principles

RDDS is the repository for all HNG-X reference data that has been verified and released to the RDDS environment through the RDMC business change management processes.

RDDS accesses the reference data in RDMC using database to database links.

RDMC controls the release of reference data to RDDS

Development and implementation is based on an Oracle 10g database

RDDS software is developed using UNIX scripting, Pro*C and PL/SQL.

The RDDS Host system processing consists of a regular batch schedule.

System exception events are monitored using Oracle Enterprise Manager.

2.4.3.2 Input Interfaces

RDDS has only one input interface – from RDMC via database to database links. When reference data is released by RDMC to the RDDS environment, an RDDS process copies the released data into corresponding tables within RDDS. The RDDS tables mirror the RDMC tables from which the data is copied. The reference data is then converted into the required output formats and available for distribution across the HNG-X domain.

2.4.3.3 Output Interfaces

2.4.3.3.1 Counter Deliverables

RDDS breaks the reference data to be delivered to counters into six reference data delivery types with each type being delivered separately:

- **Common Reference Data**: - This contains of all POL Type A reference data (except branch specific data), Type B reference data and all Type X reference data. The delivery consists of baseline files and delta files. Each file contains reference data objects in XML document format. This delivery type is common to all POL branches. RDDS compresses the reference data files so as to reduce network overheads in delivering the files.
- **Branch Specific Data**: - This contains branch specific reference data only. The delivery consists of baseline files only. Each file contains reference data objects in XML document format. This delivery type is branch specific and a new branch baseline is produced only when there is a change to the branch specific reference data. RDDS compresses the reference data files so as to reduce network overheads in delivering the files. .
- **Bureau Spot Rates**: - This contains bureau spot rates only. The delivery consists of baseline files only. Each file contains reference data objects in XML document format. This delivery type is common to all branches. RDDS compresses the reference data files so as to reduce network overheads in delivering the files.
- **Bureau Margins**: This contains bureau margin and commission rates only. The delivery consists of baseline files and delta files. Each file contains reference data objects in XML document format. This delivery type is common to all branches. RDDS compresses the reference data files so as to reduce network overheads in delivering the files.

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- **Type Reference Data Files (Non-XML)**: This contains reference data files containing data not in XML format. The concept of baselines and deltas does not apply to this delivery type – each file delivery is seen as independent. This delivery type is common to all branches. RDDS compresses the reference data files so as to reduce network overheads in delivering the files.
- **Help Reference Data (Non-XML):** RDDS breaks help data down by business area (about 10). It unpacks help data baselines and identifies business areas where help data has changed as compared with the previous delivery. New help data packages are then generated for the changed business areas only. Each business area is further broken down by sub-area with actual new baseline files generated only for the sub-areas that have changed.

Distribution of reference data to Counters is either via the Branch Database or via System Management. For further details of reference data delivery to Counters, see *Reference Data Distribution to Counters* (section 2.5).

2.4.3.3.2 Branch Database Interface

RDDS makes POL branch, product and accounting node details available to the Branch Database system by providing three views of the RDDS reference data (see HNG-X RDMC / *RDDS to Branch Database Reference Data Interface Specification (DES/APP/IFS/0001)*). These views contain:

- Branch identifiers mapping – fad code / org unit id
- Branch addresses and opening times
- Product identifiers, names and accounting node mapping
- Accounting node identifiers, names and hierarchy

The Branch Database system accesses RDDS using database to database links and copies the data views as required.

2.4.3.3.3 TPS Interface

RDDS makes a number of reference data views available to TPS (see *RDDS – TPS Application Data Interface* (RD/IFS/018)). These views contain:

- Details of all POL branches
- Details of all POL clients
- Accounting calendar
- Product and transaction mode data
- POL FS mappings
- HR SAP mappings
- HR SAP schedules

TPS accesses RDDS using database to database links and copies the data views as required.

2.4.3.3.4 LFS Interface

RDDS makes a view of POL branch reference data available to LFS (see *RDDS – LFS Application Data Interface for CSR+* (RD/IFS/021)).

LFS accesses RDDS using database to database links and copies the data views as required.

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2.4.3.3.5 MTAS Interface

RDDS makes a view of POL branch reference data available to MTAS (see *RDDS to MTAS – Data Interface Specification* (RD/IFS/032). Post Office training branches are not included in this view.

MTAS accesses RDDS using database to database links and copies the data views as required.

2.4.3.3.6 Data Warehouse Interface

RDDS provides details to Data Warehouse of changes to reference data which affect

- Branch data
- Product data
- Client data
- Banking Schemes
- Accounting Calendar

The interface consists of a daily set of files (see *RDDS to Data Warehouse – Data Interface Specification* (DW/IFS/025)), which is made available on a file store share to the Data Warehouse System

2.4.3.3.7 APS Interface

RDDS makes a number of reference data views available to APS (see *RDDS – APS Application Data Interface for CSR+* (RD/IFS/019). These views contain:

- Details of all POL branches
- Details of all POL AP clients
- Details of POL Client Accounts
- Details of POL AP Products

APS accesses RDDS using database to database links and copies the data views as required.

2.4.3.3.8 DRS Interface

RDDS makes a number of reference data views available to DRS (see *RDDS to DRS - Data Interface Specification* (RD/IFS/031). These views contain:

- Details of all POL clients
- Accounting calendar

DRS accesses RDDS using database to database links and copies the data views as required.

2.4.3.3.9 APOP Interface

RDDS makes details of APOP service definitions available to APOP (see *RDDS to APOP – Data Interface Specification (*RD/IFS/039)).

APOP accesses RDDS using database to database links and copies the data views as required.

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2.4.3.3.10 TES Interface

RDDS makes a number of reference data views available to TES (see RDDS to Transaction Enquiry Service (TES) Interface Specification (NB/IFS/023)). These views contain:

- Details of all POL branches
- Details of all POL clients
- Details of Banking Schemes

TES accesses RDDS using database to database links and copies the data views as required.

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2.4.4 RDMC WorkStation

2.4.4.1 Overview

The RDMC Workstation is used by RDT to manage the delivery and release of reference data. It is a standard networked PC using Windows XP. It runs a number of bespoke VB applications which link to the RDMC Oracle database using ODBC over SQL*Net.

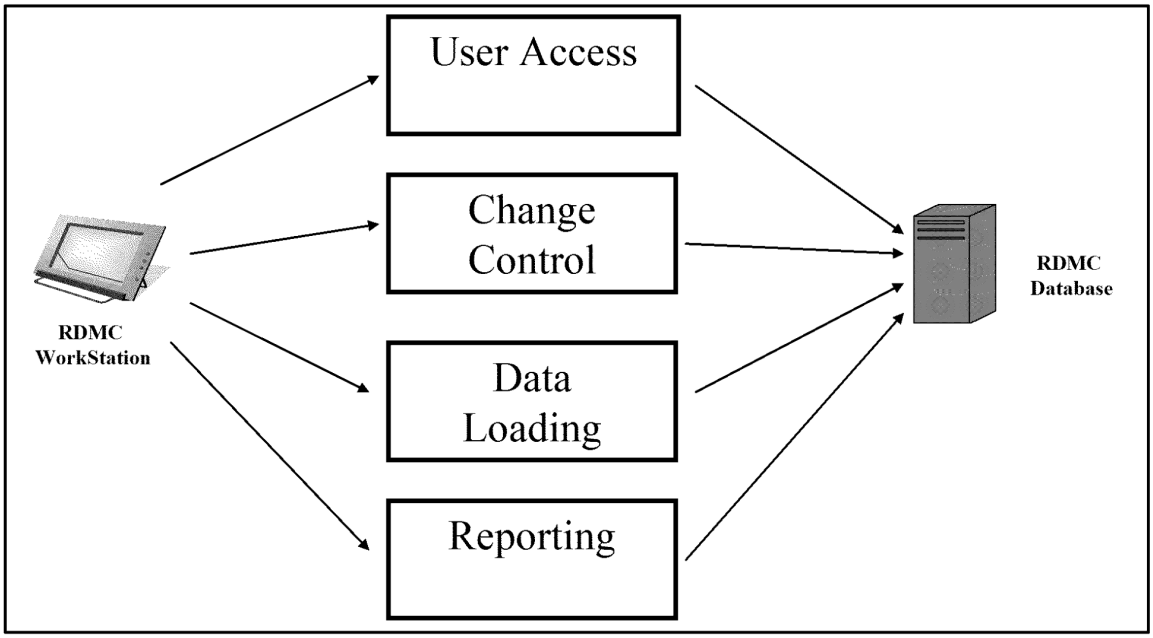

Figure 16 – RDMC WorkStation

2.4.4.2 User Access

The User Access application manages the set up of users and user privileges. The application supports:

- Addition of new users and update and deletion of existing users
- Assignment of passwords to users.
- Assignment and revocation of roles to users. Roles provide access to the different applications

2.4.4.3 Change Control

Change control is the means of managing the release of reference data to the live HNG-X domain. Each file of reference data received into RDMC is delivered to achieve a particular business objective and needs to be associated with the business change identifier for that objective. This application supports the definition of business changes, the association of reference data files with the business change and the release of the business change through a number of verification steps through to the live domain.

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Customer Services manage the release of reference data to the HNG-X domain. The reference data release management process firstly enables data files loaded into the RDMC to be associated with a business change request and secondly allows all supporting reference data to be released in a controlled fashion.

2.4.4.4 Data Loading

The data loading application supports the uploading of reference data files to the RDMC Unix platform, via a networked file share, and then running the standard RDMC batch loading process to load the files to RDMC. It is used only for reference data files which are delivered by RDT, i.e. Other Reference Data and Type B reference data.

2.4.4.5 Reporting

The reporting application enables the production of reference data reports by business change. The report process identifies the differences between the RDMC reference data prior to the change and the reference data after application of the change. The report output is in Excel spreadsheet format. Access to the generated reports is via a networked file share.

2.4.4.6 Other Capabilities

The RDMC work station has been adopted over the years to support non-reference data services such as maintenance of APS client requirements and message submission. Theses requirements continue to be supported. In addition, the RDMC work station plays a key part in supporting specific RDT requirements such as being the main gateway between the live data centre systems and the RDT environments.

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2.5 Reference Data Distribution to Counters

2.5.1 Reference Data Inventory and Packages

When a business change is released through reference data then that change may involve introduction of a new baseline and / or delta for a number of the reference data delivery types. This creates a relationship between the generated versions of the reference data delivery types in that they must all be present to guarantee that the business change is fully supported. The relationship is maintained by the concept of reference data packages – a reference data package is the full set of reference data delivery types that support the business changes released at a specific point. The concept of reference data packages applies to only two of the delivery types: - Common Reference Data and Branch Specific Data. It does not apply to Bureau Spot Rates and Margin Rates as this data is delivered separately by First Rate and becomes effective immediately on receipt. Reference Data Files (Non-XML) contains a set of independent deliverables from a delivery viewpoint.

The outline data model for reference data delivery is shown below:

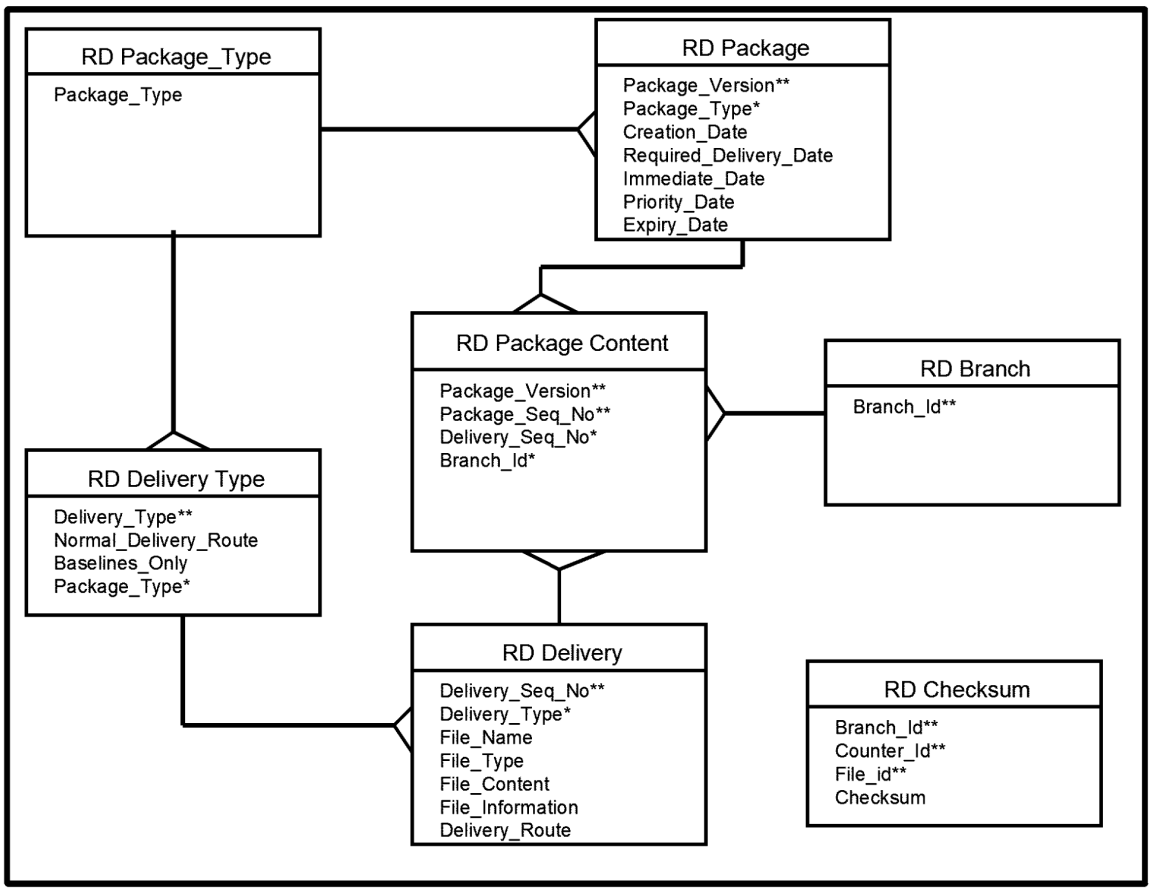

Figure 17 – Reference Data Inventory and Packages

HNG-X reference data is allocated to six delivery types for the purposes of delivery to counters:

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COMMON	-	Common reference data
SPOTRATE	-	Bureau Spot Rate reference data
MARGINS	-	Bureau Margins reference data
BRANCH	-	Branch Specific reference data
OTHER	-	Type F and Type G Reference Data
HELP	-	Counter Help Data

Delivery Types are grouped into Package Types – supporting the dependent relationships between Delivery Types. There are five Package Types:-

MAIN
SPOTRATES
MARGINS
OTHER
HELP

Package Types map to Delivery Types as follows:-

Package Type	Delivery Type
MAIN	COMMON BRANCH
SPOTRATES	SPOTRATES
MARGINS	MARGINS
OTHER	OTHER
HELP	HELP

The Package table defines each reference data package which is to be delivered to the counters.

The Package Content table defines the content of each reference data package.

The Delivery table defines each reference data deliverable.

The data model enables RDDS to maintain a reference data inventory of deliverables and their association to reference data packages.

Expiry date is the date on which the package content can no longer be used at the counters. Superseded packages are expired a number of days (metadata setting) after a replacement package is delivered.

Immediate date is also the date that the package should be applied by. It is normally set to the package creation date and time so the reference data package will be implemented at the counters at the end of the current customer session. However, for spot rate packages it is set to 30 minutes after the package creation date and time so as to guarantee that all counters implement the package at the same time.

This RDDS inventory is shared with the Branch Database and is used by counter applications to verify their reference data status. The inventory within the Branch database is treated as the master database by all the counter processes which manage the download of reference data.

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2.5.2 Reference Data Flows to Counters

The diagram below shows the reference data flow to counters at HNG-X.

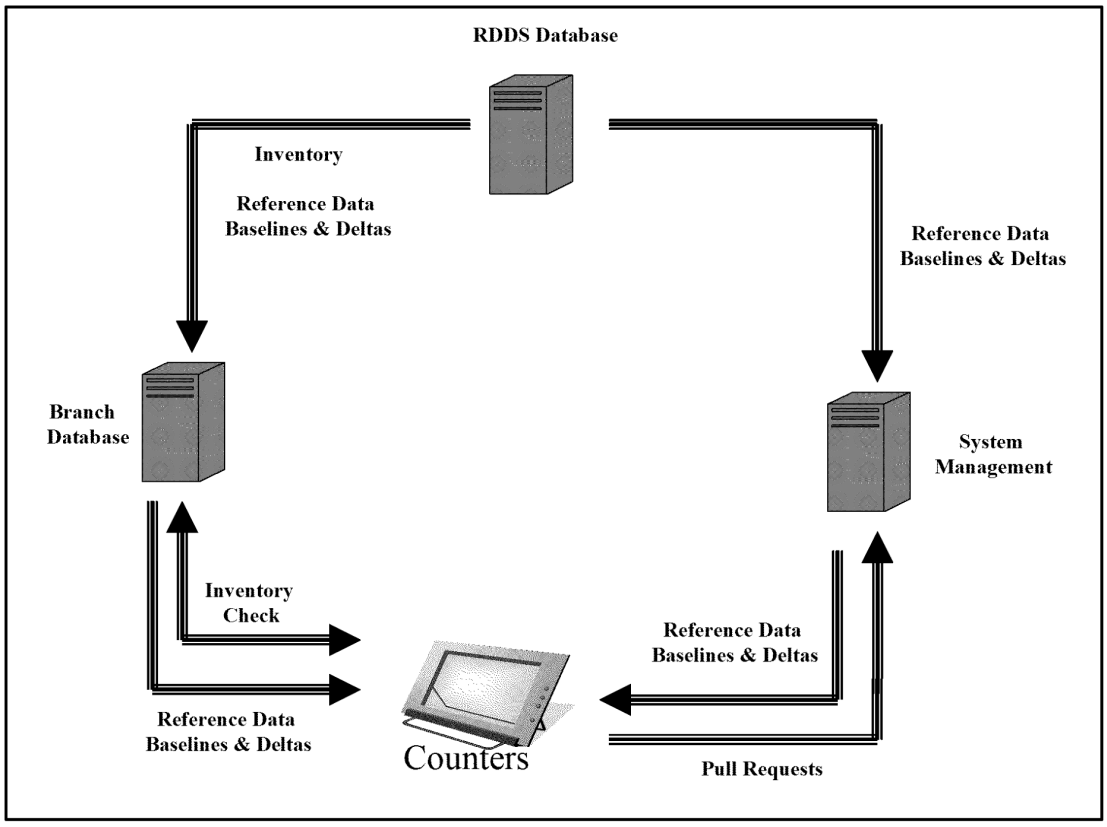

Figure 78 – HNG-X Reference Data Flows to Counters

Reference data can be delivered to counters either via the Branch Database or via SYSMAN (System Management). The delivery architecture is based on the assumption that both delivery paths will see the reference data purely as files and will require no awareness of the file contents

The RDDS reference data deliverables to counters consist of six reference data delivery types:

- Common Reference Data
- Branch Specific Reference Data
- Bureau Spot Rates Reference Data
- Bureau Margins Reference Data
- Other Reference Data (Type F and Type G)
- Help Data

RDDS is configured to define the delivery path to be followed for each reference data delivery type. The normal configuration is that the following reference data delivery types are delivered via SYSMAN:

- Common Reference Data Baselines

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- Help Data

and that the following reference data delivery types are delivered via the Branch Database:

- Common Reference Data Deltas
- Branch Specific Reference Data
- Bureau Spot Rates Reference Data
- Bureau Margins Reference Data
- Other Reference Data (Type F and Type G)

This is a soft configuration that is defined through RDDS metadata. Certain test environments may not include SYSMAN so the configuration will be set to deliver all reference data via the Branch Database.

Various situations may arise in the live HNG-X system where reference data will be required to be delivered to counters urgently. Examples are

- A counter has been switched off overnight and, on powering up and a user logging on, the reference data is found to be out of date and an urgent update is required
- At start of day, the reference data at the counters is incorrect and is leading to a significant processing problem

To support these situations, the following additional features are provided:

- An update can be made to the reference data in RDMC and the data released to RDDS. An emergency RDDS processing schedule then generates new reference data files and delivers this data to System Management or the Branch Database. The reference data inventory in the Branch Database is also updated with the delivery being marked as priority.
- When a counter is unable to trade because of out-of-date reference data it may send a priority 'pull' request to System Management to request a reference data update. System Management must respond to this priority message and deliver the reference data as quickly as possible.

RDDS delivers reference data files and inventory updates to the Branch Database by invoking a Branch Database reference data delivery service. The reference data file details contains information which is used at the counters to process the file. For example, it will define which baseline a delta is to be applied to, it will define the baseline that is generated by applying the delta and it will define the checksum validation required by the counter to confirm that the generated baseline content is correct and has not been corrupted in any way. The interface is defined is defined in *HNG-X RDDS to Branch Database – Counter Reference Data and Memo Submission Interface Specification (DES/APP/IFS/0002).*

System Management accesses the RDDS database to identify and copy the reference data files which are to be delivered through System Management. The interface is defined in HNG-X *RDDS to System Management – Counter Reference Data Delivery Interface Specification* (DES/APP/IFS/0003).

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2.5.3 Reference Data Download to Counters

2.5.3.1 Main Reference Data Download (Reference Data Manager)

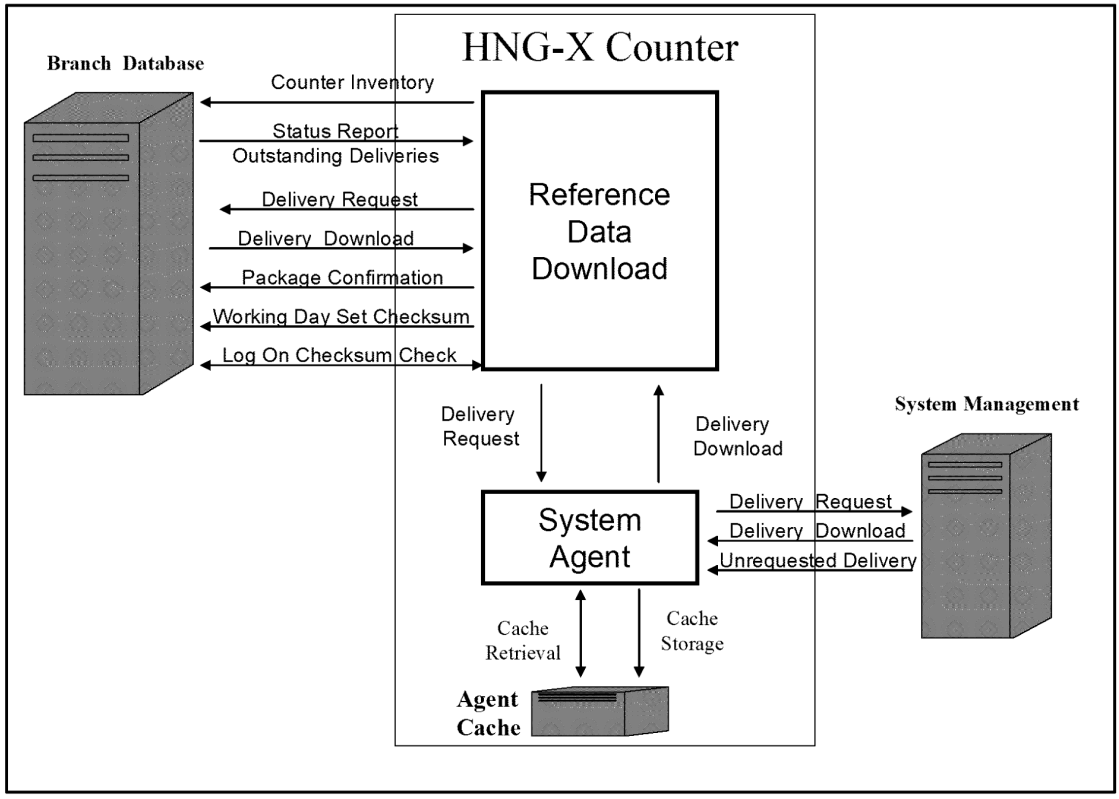

Figure 19 – HNG-X Main Reference Data Download

A reference data manager application forms part of the HNG-X counter application. This application is responsible for responding to all requests for reference data by other counter applications and also for ensuring that up-to-date reference data is in place to support these applications. The reference data manager is described in HNG-X Counter Applications: Reference data Sub System High Level design (DES/APP/HLD/0045).

Two branch access layer services support the reference data manager in downloading reference data from the Branch Database:-

- A status query service which runs every 20 minutes (controlled by parameter) which checks the Branch database as to whether any reference data downloads are outstanding and, if so, returns a list of deliverable identifiers and the delivery route (Branch Database or System Management)
- A file download service which retrieves a reference data file from the Branch database and downloads it to the counter.

A similar download service supports delivery of reference data files from System Management. The reference data manager interacts with a System Management agent process at the counter. This agent requests reference data file from System Management and delivers them to the reference data management. The agent supports both priority and standard delivery. Priority delivery is requested when the reference data file is essential for the counter to trade and results in a near immediate System

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Management response. Standard delivery will result in System Management adding the file to its next scheduled delivery.

It is important that currency spot rates, used on different counters within a branch and displayed on the branch rates board, are kept in step. To support this requirement, the spot rates reference data will be delivered with a delayed immediate date which is a few minutes greater than the frequency of the counter polling for new reference data.

2.5.3.2 Counter Recording of Reference Data Versions Used

Each time reference data package is implemented at a counter the counter invokes a branch access layer service which records the date and time of the package implementation within the Branch database.

In addition, reference data package versions will also be included in transaction details written to the Branch Database to support SLA measurement and general traceability.

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2.6 Reference Data at Counters

2.6.1 Processing of Reference Data Files

Each reference data file is downloaded to the counter either from the Branch Database or through System Management. File details within the Branch Database inventory, provides information on:

- The location where the file is placed
- Whether the file is a baseline or delta
- Whether the file is downloaded from the Branch Database or from System Management
- If the file is a delta, the baseline version that the delta is to be applied to, the baseline version that is to be generated, and the CRC verification required on the generated baseline.

Should a delta update to a baseline fail the counter will request a new baseline. The counter will maintain a current baseline file for each of the following delivery types:

- Common Reference Data
- Branch Reference Data
- Bureau Spot Rate
- Bureau Margins
- All Other Reference data Files (Type F and Type G)
- All Help data files

Reference Data objects are stored in each baseline in ascending object class, object instance and effective date order. A delta file is a set of edit instructions which need to be applied to the previous baseline so as to generate the new baseline – using a dedicated Diff / Patch concept.

Reference Data Files (Type F) are a set of independent deliverables where the concept of baselines and deltas does not apply. Should a file have the same name as an existing file in the same location then it will supersede that file.

Help Data baselines are maintained by business area and sub-area with new baselines being applied whenever a change takes place to a sub-area.

A set of commands exist to support the downloading of reference data files to counters. These commands are define din the HNG-X RDDS High Level Design (DES/APP/HLD/0005).

2.6.2 Generation of Working Reference Data

2.6.2.1 Common Reference Data

The current baseline for Common Reference Data contains both current and future reference data changes. Each reference data object is an XML document with an object class, an object instance identifier, action and effective date – the counter will generally store and access this reference data using these identifiers and dates.

Some Common Reference Data is non-core and its availability is restricted to branches that are enabled for the associated non-core functionality – all the non-core reference data objects have a data tag of 'ENABLE' which is set off. Enablement of such reference data is done through receipt of ENABLER objects which contain the identifiers of objects that are to be enabled. A further concept of DISABLER

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objects is used to disable objects that are enabled by default. These objects will remain enabled unless they are disabled by Branch Reference Data. An example of this is transaction mode disablement for a product when the ability to transact the product is removed gradually by removing certain transaction mode capability.

Reference data objects may also contain embedded rules which define that the object is enabled or disabled dependent on whether the rule is true or false. The rule will point to the existence or non-existence of another reference data object or a code module.

Stand alone rule objects may also be defined. These support the creation, enablement or disablement of other objects based on whether the rule is true or false.

2.6.1.2 Branch Specific Reference Data

The current baseline for Branch Specific Reference Data contains both current and future reference data changes. Each reference data object is an XML document with an object class, an object instance identifier, action and effective date – the counter will generally store and access this reference data using these identifiers and dates.

The branch reference data contains details of which non-core objects are available at each branch. This is done by defining ENABLER objects that contain the identifiers of non-core objects to be enabled.

The branch reference data also contains details of objects that are to be disabled when they would normally be enabled. This is done by defining DISABLER objects that contain the identifiers of core objects to be disabled.

2.6.1.3 Bureau Spot Rate Reference Data

The current baseline for Bureau Spot Rate Reference Data contains current reference data only. Each reference data object is an XML document with an object class and an object instance identifier – the counter will generally store and access this reference data using these identifiers.

No enablement / disablement rules apply to Bureau Spot Rate reference data.

2.6.1.4 Bureau Margins Reference Data

The current baseline for Bureau Margins Reference Data contains current reference data only. Each reference data object is an XML document with an object class and an object instance identifier – the counter will generally store and access this reference data using these identifiers.

No enablement / disablement rules apply to Bureau Margins reference data.

2.6.1.5 Other Reference Data Files (Type F)

Other reference data files do not have effective dates so, where effective date control is required over their usage, this must be done through changing the Common reference data objects which reference them.

2.6.1.6 Help Data

Help data is implemented at the counters by business area so as to ensure consistency across help links within an area. This is achieved by RDDS generating all help data for a business area within the same package and the counter implementing the complete package rather than individual files.

2.7 Reference Data Proving / Verification

2.7.1 HNG-X RDT Environment

The HNG-X RDT environment is managed and operated by RDT and is used by both RDT and the Post Office reference data team at Bracknell to verify business change through reference data.

The RDT architecture has the following properties:

- There are four separate RDT environments. They are all linked to the live RDMC instance. RDMC supports the concept of releasing reference data change to different verification environments with each environment representing a step in the overall validation / verification process. Reference data is progressively released to each environment in turn, although some changes are fast tracked straight to Live. Each RDT environment is configured as shown below.

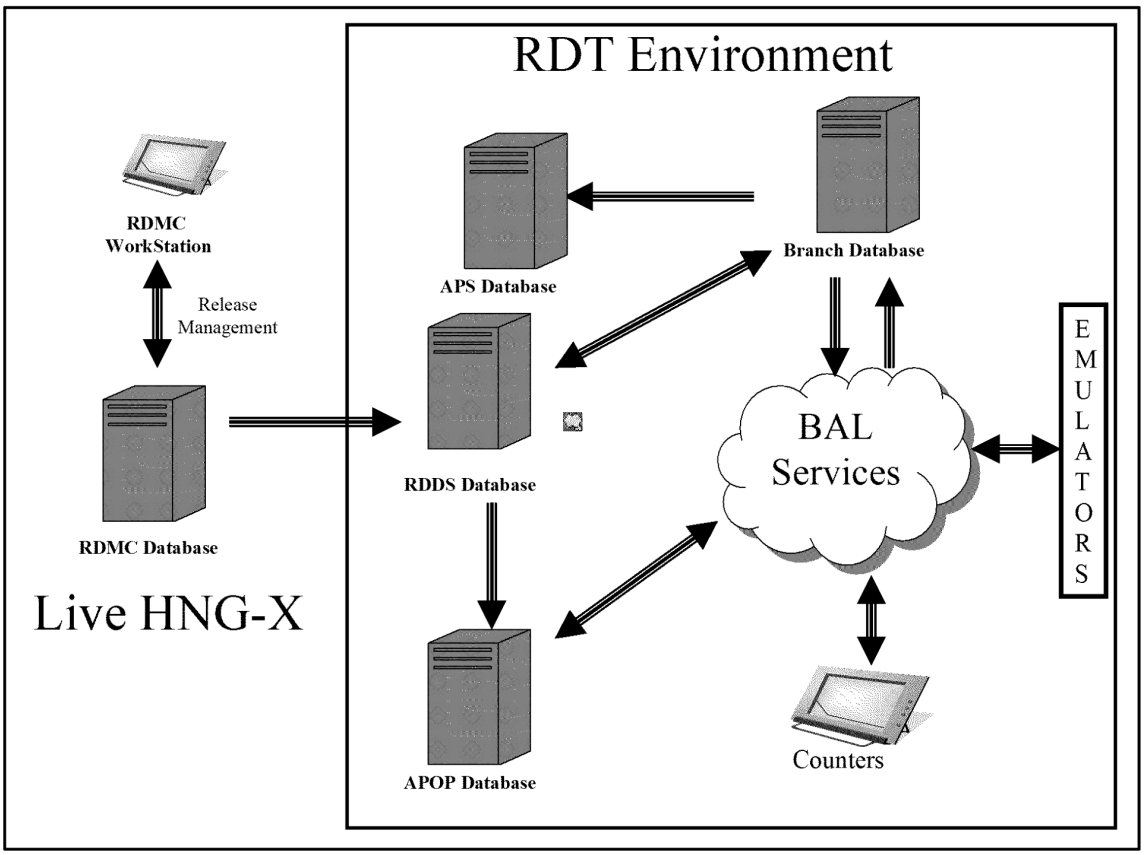

Figure 20 – HNG-X RDT Environment

- The RDMC workstation provides the interface for releasing reference data based on business changes and individual file change identifiers.
- The environment contains RDT database instances of the RDDS database, Branch Database, APOP Database and APS Database
- Each RDT environment has a number of counters attached to it to support validation / verification

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- Counters are configured to operate a number of weeks in the future so that temporal reference data becomes effective in advance of its true date.
- Counter service emulation is required for some external services.
- Each environment is configured to have about 10 test branches with branches generally configured to have all non-core products available. Details of test branches are not known to POL RDS.
- Each environment runs a cut down version of the Live processing schedules
- The RDT environments only have sufficient infrastructure to support the reference data validation / verification process and APS CTO activities. In particular, the environments are not system managed.
- As RDT is not system managed all reference data is configured within the RDDS database instances to be delivered through Branch Database.

In all, there are four RDT verification environments:

- RDDT: This is the initial RDT validation environment where primary checks are made to confirm that all reference data is in place to validate / verify the change. This environment does not contain an APS database.
- RDDIV: This is the main RDT validation / verification environment
- RDDOV: This is the POL Reference Data Team verification environment.
- RDDPL: This is a pseudo live environment where the delivered reference data is the same as on Live.

Further details on the RDT environments are contained in HNG-X RDT Platform Guidelines (DEV/APP/WKI/0014).

The RDMC work station also supports a number of tools which have been developed by the RDT team to assist them in their day to day reference data verification activities.

A number of other counters / PCs exist within RDT to support activities such as

- AP automated transaction verification
- AP client take verification
- AP harvesting
- Template development
- Postal services development

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2.7.2 Access Control

Access from the RDT environment is controlled through a number of firewalls as shown in the following diagram:-

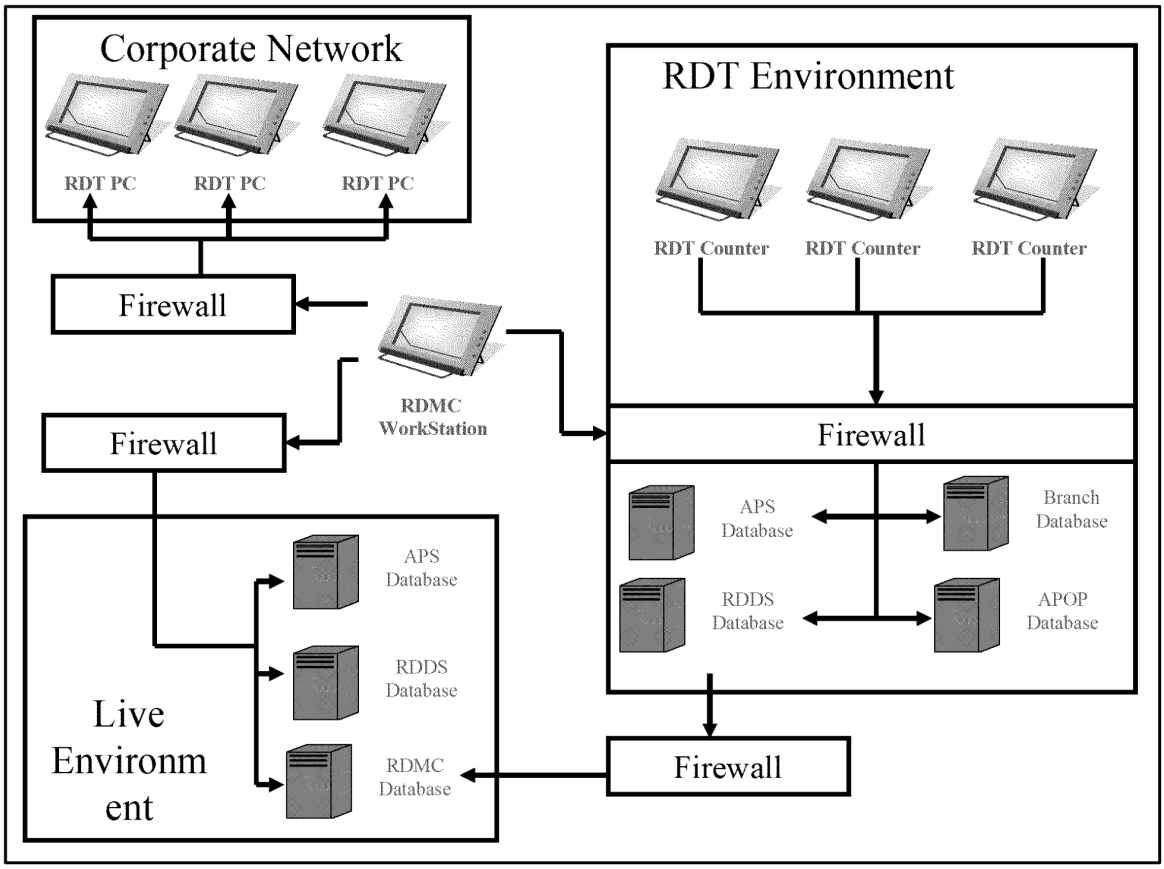

Figure 21 –RDT Access Control

RDMC workstations requires access to

1. The corporate network so as to pull reference data files from PCs within the RDT area.
2. The Live Environment so as to perform the main workstation processing activities both on the RDMC database and on the APS database. It also requires read access to the RDDS database.
3. The RDT databases – APS, RDDS, APOP and the Branch database

RDT counters (located at Bracknell) require access to the RDT databases.

The RDDS databases within the RDT environment require access to the Live RDMC to pull released reference data.

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2.8 Memo Submission

Memo submission supports the POL requirement to deliver operational messages from the centre to branches – either to the whole branch estate or to specific branches. This requirement was supported under Horizon within the RDMC system and much of the same host solution is carried forward into HNG-X.

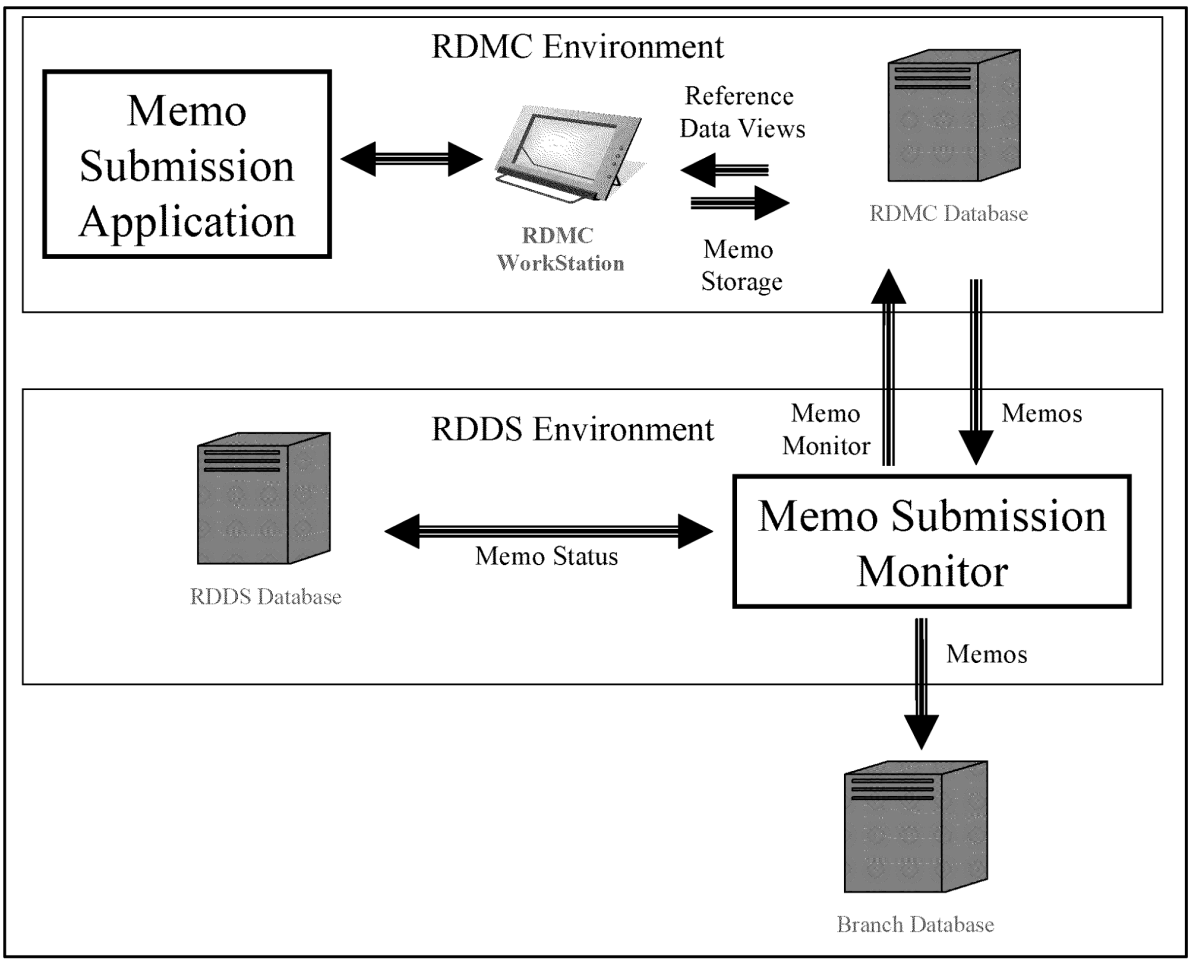

Figure 22 – Memo Submission

Memo Submission is seen as a separate system which, for historical reasons, runs on the RDMC environment; it has direct access to RDMC reference data views and stores Memo Submission data within the RDMC database. Because Memo Submission is seen as a separate system, all references to it in this document other than in this section, treats it in the same way as it treats all other systems that RDMC or RDDS interface with. If Memo Submission were to be removed from within RDMC and relocated, there would be no change to this document other than to this section.

A Memo Submission application runs on the RDMC WorkStation and supports entry of memos for transmission to targeted branches and user roles. The entered memo data is stored in the RDMC database. A Memo Submission Monitor application runs on the RDDS database, has database to database links to the memo submission data in RDMC, and monitors for receipt of new memos within

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RDMC. On identification of a new memo, the application invokes a Branch Database memo submission interface application, which transfers the memo details from the RDMC database to the Branch Database. Functionality at the counter polls regularly for the existence of new memos in the Branch Database

The Memo Submission application is unchanged from Horizon in the facilities that it offers; specifically it restricts the content of the message to exclude active or scripted code within the Memo Submission data and does not allow attachments to the Memo.

The Memo Submission application, the RDMC system, the Branch Database and the counter and their dependent systems or services are only usable by authorised users from within the HNG-X environment.

2.9 Service Level Targets

The HNG-X counter reference data distribution system maintains version control of reference data deliverables so that a consistent version of reference data is used at each counter position. The counter will always operate using a complete set of the deliverables for a reference data package.

Each reference data package has an associated 'Required Delivery Date' – see section 2.5.1 *Reference Data Inventory and Packages*. This is always set to the day after the set of operational business changes, contained in the package, have been released to Live. This data is stored in the Branch database and is harvested as the SLA request message.

When a counter implements a reference data package the implementation date and time is written to the Branch Database. This is harvested as the SLA acknowledgement message.

Each package contains both currently active and future dated reference data. This means that future dated changes are distributed to counters in advance of the effective date. The reference data package also contains any previously released reference data that is still active. Each reference data package contains one or more file deliverables. As each new Reference Data Package Version is created, the HNG-X reference data distribution system automatically allocates an appropriate expiry date for earlier reference data package versions.

The counter regularly polls the Branch Database to check for outstanding reference data. Where a current reference data package is expired the counter will not be able to trade until an up-to-date package is downloaded.

Reference data must be delivered to counters within the agreed service level targets as set out in the service description for the Reference Data Management Service – see *Reference Data Service Management: Service Description* (SVM/SDM/SD/0013). This specifies the percentage of counters that have received the correct version of the reference data by the start of Post Office Core Day on the days following the Agreed Release Date. Agreed Release Date is Required Delivery Date within the reference data package definition. Specific targets are set for days B, C, D and J varying from 96% to 100%.

The service level target reports for HNG-X counters reference data delivery will be HNG-X counters only and will not include details on reference data delivery to Horizon counters.

2.10 Scheduling

The reference data schedules are defined in HNG-X Host Reference Data Scheduling High Level Design (DES/APP/HLD/0097).

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3 Platforms

3.1 RDMC / RDDS Databases

This is the existing Horizon RDMC and RDDS Databases migrated to HNG-X. They are to be based on an Oracle 10g database in a UNIX environment on a Solaris platform.

3.2 RDMC Workstation

This is the existing Horizon RDMC workstation platform. It is updated to Windows XP platform and to the latest versions of Microsoft Office products (Microsoft Access and Excel). The upgraded platform continues to support all other existing Customer Services tooling which is located on the workstation. The RDMC workstation platform also hosts the APS workstation and the Memo Submission entry application.

3.3 RDT Environments

Each of the four RDT environments is upgraded to include an instance of the Branch Database, Branch Access Layer and client service emulation.

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4 Networks

4.1 Source Reference Data to RDMC

4.1.1 POL Type A Reference Data & Help Data

Delivery of Type A reference data and Help data is supported by an FTMS link between the POL environment and the RDMC environment

4.1.2 Bureau Reference Data

Delivery of Bureau reference data is supported by an FTMS link between the POL environment and the RDMC environment

4.1.3 Customer Service Supplied Reference Data

Delivery of reference data by Customer Service RDT staff continues to be done via the RDMC workstation as per Horizon

4.2 Provision of Reference Data to Other Systems

4.2.1 Database Links

Access to RDMC by RDDS so as to replicate released reference data is supported by granting RDDS permission to access the required reference data within RDMC via database to database links.

Access to RDMC by the Memo Submission and SYSMAN systems is supported by granting these systems permission to access the required reference data within RDMC via database to database links.

Access to RDDS by the TPS, LFS, MTAS, APS, DRS, APOP, TES and Branch Database systems is supported by granting these systems permission to access the required reference data within RDDS via database to database links.

4.2.2 Data Warehouse

Delivery of reference data to Data Warehouse involves RDDS creating files in a Data Warehouse share and Data Warehouse copying these files to its own environment.

4.2.3 Help Desk (Dispatch 1)

Delivery of reference data to the Help Desk involves RDMC creating files in a Dispatch 1 share the RDDS environment and Dispatch 1 copying these files to its own environment.

4.3 Delivery of Reference Data to Counters

4.3.1 Branch Database Route

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RDDS uses database to database links to support delivery of counter reference data files to the Branch database. Files are stored within database tables on the Branch Database. A counter Reference Data Manager application then accesses the Branch Database and copies required reference data files down to the counter.

4.3.2 System Management Route

RDDS uses database to database links to support delivery of counter reference data files to the System Management. System Management accesses the RDDS database and 'pulls' reference data files which are to be delivered to counters via the System Management route.

4.4 RDT Requirements

RDT staff require full access to all platforms in all of the RDT environments. In addition, a data exchange proxy capability is required to support transfer of reference data from the RDT corporate domain to the live environment and transfer of reports from the live environment to the RDT corporate domain.

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5 Manageability

All components can produce diagnostic trace and other output such as diagnostic events. Both Data Centres will contain all the appropriate management systems to allow for the management of all storage platforms from either Data Centre.

All the batch applications will have Host Support Guides which will include details of the schedule and action to be taken in the event of stops, e.g. which modules can be re-run, what to do in the event of late arrival of data etc.

All of the batch applications have jobs which are controlled by the Tivoli Workload Scheduler. The schedule documents for all of these are specified in the HLD for the relevant system.

The RDMC and RDDS databases will be managed within the monitoring framework described in ARC/SYM/ARC/0003.

The manageability conformance required will include:

- Documenting the use of SYSLOG and or diagnostic logs
- Documenting recommendations for forwarding of any information in these logs to the Enterprise management system and the subsequent operational action required.
- Documenting the use of the Oracle Enterprise Manager (OEM) Grid Control with the diagnostics pack.
- Documenting recommendations for forwarding of any alerts from the OEM to the Enterprise management system and the subsequent operational action required.

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6 Security

All host systems will run in the DMZ in the Data Centre. All Batch Host Applications should conform to *HNG-X Host Applications Database Design and Interface Standards* (ARC/PPS/ARC/0001).

6.1 Application

Applications using the Batch Applications Databases connect using an Oracle user configured with the minimum privileges necessary to function. Refer to *HNG-X Host Applications Database Design and Interface Standards* (DES/GEN/STD/0001) for more details. Oracle database connectivity and access control will be through defined Oracle Users and the Roles granted to those Users would only be those that are necessary to run the application.

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7 Recovery and Resilience

Data for all the host database systems will be replicated via a synchronous link to the second Data Centre. This guarantees that no transactions will be lost. Failover will be manually controlled on servers. There will be a standby Solaris server at each site that can take over in the event of a failure of the Solaris host. Failover to the DR failover site is an all or nothing operation. All the requisite software will be in place at the failover site and in the event of failover, Oracle instances for each of the host servers will be brought up at the failover site.

Both Data Centres will contain all the appropriate management systems to allow for the management of all storage platforms from either Data Centre.

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8 Performance

The key performance area is the distribution of reference data to counters.

The main issues with Horizon reference data performance were caused by complex relationships between source entities and counter object structures causing multiplying factors to be applied in determining the impacted counter objects and a consequential large increase in the number of objects deemed to have been affected by the data change. This is being overcome by simplifying the relationship between source entities and target objects and also by generating deltas which contain only changed objects. In addition, all reference data objects will contain an effective date and action indicator as against a start and end date as was used on Horizon. Use of start and end date meant that two versions of an object always needed to change when a business change was applied whereas use of effective date only means a new object version is created but no existing objects are affected.

The above factors reduce the volume of reference data to be distributed to counters as compared to Horizon.

All reference data files are compressed for delivery to counters. Data volumes are estimated as follows:-

Delivery Type	Baseline Size	Delta Size
Common	2.5 MB	0.2 MB
Branch	0.1 MB	--
Spot Rate	0.1 MB	--
Margins	0.2 MB	0.05 MB
Other	2 MB	--
Help	100 MB	5 MB

Help data volumes are the obvious problem. As help data is not essential for counters to trade, delivery of help data is being removed from the normal counter 'pull' processes and, instead, being supported by introduction of dedicated System Management data delivery schedules which will utilise low network usage times such as weekend.

The normal delivery of reference data to counters will occur overnight when the overall HNG-X system is relatively quite. However, should counters be switched off overnight, they will require to have their reference data downloaded during the main working day. System management will control in-day downloading of reference data and, where necessary, will restrict it so that it does not have any significant impact on the overall HNG-X service.

RDMC Batch processing is always comparatively low volumes and should never cause wider performance issues.

The main RDDS Batch schedules are the nightly data extract processes which prepare reference ready for delivery to counters. This runs about 20:00 each evening and is expected to complete by 22:00 normally. The main performance areas on Horizon have been the subsequent agent loader processes which have been known to overrun into the next day schedule when a particularly high volume of reference data is being delivered. These processes disappear with HNG-X and are replaced by RDDS processes which generate reference data files for delivery by SYSMAN or via the Branch Database. Here, instances of high levels of change to branch specific reference data is an area where processing performance should be monitored. This could involve RDDS having to generate up to 12,000 files and then writing the file contents to the Branch Database. However, initial views are that this should not cause any problems.

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Downloading and processing of reference data files at the counters is done as a background activity which is designed to have minimal impact on the main counter processing. The main consideration at the counter is generation of the 'working day reference data set' which contains both the common reference data and the branch specific data. Once that data has been processed in background, the counter converts to using it via a simple switch mechanism. Downloading of spot rates and margins are very low volume. Counter switch over to using new reference data files (Type F, Type G and Help data) happens only on counter start-up.

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9 Migration

RDMC and RDDS are host database applications which run under Solaris in the Horizon system. Migration from the two current Horizon data centres at Wigan and Bootle to the two new data centres at IRE11 and IRE19 will involve:-

- Copying the databases from the old to the new data centre platform
- Migrating the databases to Oracle 10g
- Upgrading the databases to HNG-X software levels
- Maintaining both the old and new versions of the databases in line using SharePlex capabilities
- Continuing to run the RDMC and RDDS schedule at the old data centres until 'Weekend B'
- At 'Weekend B', switching of the Horizon schedule and switching on the HNG-X schedule

9.1 Data Migration

9.1.1 Common Feeds

Type A Reference Data is supplied by Post Office Ltd. It is transmitted electronically via an automated interface from the Post Office RDS system. It is loaded automatically into the Fujitsu Services RDMC system, before being automatically distributed to the branches. Because Horizon and HNG-X branches will run in parallel for a period during the migration, the existing Reference Data feed from Post Office Ltd will be used for both Horizon and HNG-X branches. The format of the data is already conformant with the RDS AIS document, and will not need to change for HNG-X.

Mappings of Products to Accounting Nodes are managed by Post Office Ltd using the Type A interface (see above). Fujitsu Services create new Accounting Nodes as requested by Post Office Limited. The same data will be used to drive both Horizon and HNG-X, hence only a single source of data is required in the branch migration period.

APOP Service Definitions are specific to APOP host, and so the same data will be used for both Horizon and HNG-X. Post Office Ltd is responsible for producing this data.

Bureau Spot Rates and Margins Files are received from FRTS and will be automatically distributed to both systems during branch migration.

9.1.2 Dual Feeds

All other types of Reference Data will need to be supplied as separate dual feeds to support both Horizon and HNG-X:

Postal Services Reference Data will need to be supplied separately from the Mails Reference Data used by Horizon branches. The new Reference Data feeds for these Postal Services data will use new interfaces into HNG-X specific systems, which will be defined in the detailed design. Post Office Ltd will manage this data and are responsible for providing dual feeds.

Reference Data for Smart Post Admin and T&T is relatively static. It is managed by Fujitsu Services for Horizon, with direction from Post Office Ltd. Equivalent data for HNG-X will be generated and any changes will need to be maintained in parallel in both data sets. .

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Menu Hierarchy and Associated Attributes data will differ between Horizon and HNG-X. Horizon data is managed by Fujitsu Services with direction from Post Office Ltd. A new data format will be defined by Fujitsu for HNG-X, and a dual feed will be required. Fujitsu Services will maintain both data feeds with direction from Post Office Ltd during the branch migration period.

Sales Prompts are supplied by Post Office Ltd using the Type A interface, however due to the potentially different menu structure format for HNG-X, it may be necessary for Post Office Ltd to supply some of the sales prompt Reference Data separately for Horizon and HNG-X.

Bureau Currency Services Reference Data is maintained by Fujitsu Services under direction from Post Office Ltd. The data change relatively infrequently – only when new currencies are introduced or old ones are removed. The distribution format will be different between Horizon and HNG-X, and a dual feed will be required. Fujitsu Services will maintain both data feeds with direction from Post Office Ltd during the branch migration period.

Client Specific System and Receipt Text Messages data is maintained by Fujitsu Services under direction from Post Office Ltd. The distribution format will be different between Horizon and HNG-X, and a dual feed will be required. Fujitsu Services will maintain both data feeds with direction from Post Office Ltd during the branch migration period.

PIN Pad Reference Data is maintained by Fujitsu Services with direction from Post Office Ltd. The distribution format will be different between Horizon and HNG-X, however Fujitsu will modify the PIN Pad Reference Data editing tool to generate both formats, so that both forms can be generated from a single source. Fujitsu Services will maintain both data feeds with direction from Post Office Ltd during the branch migration period.

XSL Templates define the customised receipt templates for use in bespoke transaction receipts. This data will be significantly different between Horizon and HNG-X, and dual feeds of this data will be needed for changes during the branch migration period. Fujitsu Services is responsible for this data.

Soft Launch data is application-specific and provides the enabling mechanism for Soft Launch. This category does not include the associated Non-Core Trigger Product Reference Data which is delivered through the type A interface (see above). Fujitsu Services is responsible for this data.

Application Specific Reference Data will be significantly different between Horizon and HNG-X. Fujitsu Services is responsible for this data.

The **Help Content** for Horizon and HNG-X are separate deliverables from Post Office. They are both delivered to RDMC and are delivered to counters via different delivery processes.

Stack Icon Mappings apply specifically to Horizon at this stage.

Estate Management defines the branch status within the Horizon and HNG-X estate. Dual feeds of this data are seen as being required during the migration period with the HNG-X feed being an automated transfer of data from the Branch database.

Transaction Scripts are required as separate feeds to Horizon and HNG-X.

9.1.3 Delivery of Reference Data Back to POL RDS

RDT deliver regular updates of the menu hierarchy reference data to POL to support the mapping of sales and transaction prompts. Following migration to HNG-X, this requirement will disappear as POL already have details of HNG-X menus available to them.

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9.2 HNG-X Rollout and Horizon Rollback

As HNG-X rolls out to Post Office branches there will be a corresponding rollback of branches within the Horizon system. The reference data system must be notified of both the HNG-X and the Horizon activities and it must then control the distribution of branch specific reference data within both systems. The migration status of Post Office branches is also likely to be of significance to various existing data centre system such as TPS, APS, LFS and Data Warehouse.

HNG-X roll out requires that RDDS generates reference data prior to a branch being migrated to HNG-X. Horizon rollback requires that branches are rolled out of RDDS at the same time as they are removed from the Horizon Agent distribution layer.

9.3 RDMC Work Station

The RDMC work station is migrated to Windows XP for HNG-X.

9.4 RDT System

Under Horizon, the main RDT system is located up at BRA01 with the disaster recovery system located at Lewes. The objective is that both systems will be relocated at Belfast by the time HNG-X is introduced with the exception of legacy platforms (agents and correspondence servers) which will remain at Bracknell and Lewes.

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10 Testing and validation

Testing and validation of reference data involves two main activities:

1. Testing and validation of the reference data processes which receive and distribute reference data within HNG-X and confirmation that the HNG-X changes to the reference data systems have no regressive impact on the Horizon system. This involves
    - Verification of all new RDMC input interfaces
    - Verification of all changes to the RDMC work station
    - Verification that business change processing continues to work correctly within RDMC
    - Verification that the reference data release processes continue to work correctly within RDMC
    - Verification that the distribution of reference data between RDMC and other systems continues to work correctly
    - Verification that RDDS copies released reference data correctly from RDMC
    - Verification that RDDS does all necessary formatting / enrichment of reference data ready for distribution to the HNG-X domain
    - Verification that RDDS distributes reference data files correctly to SYSMAN
    - Verification that RDDS distributes reference data files and inventory correctly to the Branch database
    - Verification that RDDS distributes reference data correctly to all other systems
    - Verification that the HNG-X counter reference data processes manage the download of reference from the Branch Database and SYSMAN to the counter taking account of situations such as normal overnight download, Bureau spot rate download, emergency reference data download, out of date counter, start up counter etc.
    - Verification that the HNG-X counters builds its working set of reference data correctly taking account of current and future data, baselines and deltas, branch specific data, branch enablement and disablement
    - Verification of the end to end Horizon system, in particular, taking account of any areas which are changing as a result of the HNG-X migration
2. Verification that the actual HNG-X reference data supports the Post Office business requirements. This is likely to mean that tests are required to prove that each individual Post Office product (about 4,500) transacts correctly in all its different modes. This is likely to be a very onerous activity but POL is likely to insist that it is completed before the first counter migration to HNG-X. HNG-X specific reference data preparation is likely to be a drawn out activity which will start off in design / development in a prototype form. Once proved, necessary documentation will be produced and the responsibility for preparation of the live targeted reference data is likely to be a joint design, development and Customer Services RDT activity.
3. Initial testing activities are likely to have to test with sub-sets of the target reference data. If this is the case, then it is likely that the onus for defining consistent / complete sub sets will fall on the testing teams. In addition, this reference data may need to be prepared and delivered without having all supporting reference data systems in place- creating a need to fill processing gaps through alternative processes.