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Calculating Mean Time Between Failure and Availability

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

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0 Document Control

0.1 Table of Contents

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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	21/11/06	For review	
1.0	20/02/07	Reviewers comments included and document issued for approval	
1.1	19/06/07	Approvers comments included and document issued for review	
2.0	12/09/07	Further comments included and document issued for approval	

0.3 Review Details

Review Comments by :	N/A
Review Comments to :	Jan Ambrose & RMGADocumentManagement GRO

Mandatory Review	
Role	Name
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(*) = Reviewers that returned comments

0.4 Associated Documents (Internal & External)

Reference	Version	Date	Title	Source
PGM/DCM/TEM/0001 (DO NOT REMOVE)			Fujitsu Services Royal Mail Group Account HNG-X Document Template	Dimensions
SVM/SDM/SD/0002			Engineering Service: Service Description	Dimensions

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SVM/SDM/SD/0011			Branch Network: Service Description	Dimensions

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

0.5 Abbreviations

Abbreviation	Definition
CCD	Contract Controlled Document
FMS	Field Maintenance Services
HSD	Horizon Service Desk
LD	Liquidated Damages
MTBF	Mean Time Between Failure
PO	Post Office
POA	Fujitsu Services Post Office Account
SLT	Service Level Target
SMDB	Service Management Database

0.6 Glossary

Term	Definition

0.7 Changes Expected

Changes
Method of deriving component data from the SMDB data may require amendment in the future in respect of the network change programme.

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1 Summary

This document describes the procedure to calculate the Mean Time Between Failure (MTBF) for each component of hardware within the Branch Infrastructure as deployed within Branches.

The document describes:

- How the initial MTBFs have been calculated for the contract baseline at 31 March 2006;
- The procedure for calculating and validating the changes in the MTBF rate throughout the term of the contract.

2 Definition and Process

2.1 Baseline MTBF

The following formula has been used to create a baseline MTBF at 31 March 2006 for each component within the Branch Infrastructure. This baseline comprises the total number of failures and the average number of installed units from April 2005 to March 2006. Appendix 1 of this CCD shows the actual data used.

Baseline MTBFs have not been compiled in respect of:

- Optoma Flatscreens due to the lack of data for this component;
- Satellite base units due to the low and reducing number of installed units.

2.2 MTBF formula

For each component within the Branch Infrastructure, the MTBF is calculated as follows:

MTBF = L/N – expressed in years

where:

N = Total number of failures during the preceding twelve month period

L = Average number of units installed in the live environment in the same twelve month period

2.2.1 Number of failures

Components within the Branch Infrastructure that have failed and been replaced by a Support Engineer are recorded on two systems:

- the FMS Configuration Management System
- the HSD Call Management Service

2.2.1.1 FMS Configuration Management Service

Whilst in attendance at the Branch, the Support Engineer will signify that a spare has been used. This information will be forwarded to the FMS Configuration Management System.

Data from the FMS Configuration Management System will be extracted and used in MTBF calculations.

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2.2.1.2 HSD Call Management Service

In accordance with information received from FMS, the HSD will allocate the PowerHelp Repair Code R01 to signify that a component has been replaced.

Data from the HSD PowerHelp Management Service may be used to verify the FMS data if required. Post Office have web access to incidents logged within the PowerHelp Management Service using the standard dial up facility already in place. The procedure for extracting the relevant data from PowerHelp is detailed in Appendix 2.

2.2.2 Number of units installed

The number of units installed in the live environment is recorded on two systems:

- the Service Management Database (SMDB)
- the FMS Configuration Management System

2.2.2.1 SMDB

The SMDB records the number of base units installed in the live environment. The number of units installed in the live environment is obtained or derived from SMDB data as follows:

1. Base units

   Number of installed units taken from the SMDB.

2. Bar code readers, PINpads, Counter printers

   Number of installed units assumed to equal the total number of base units taken from the SMDB.

3. Keyboards, Monitors

   Number of installed units assumed to equal the number of non mobile base units taken from the SMDB.

4. Back office printers

   Number of installed units assumed to equal the number of Gateway base units taken from the SMDB.

2.2.2.2 FMS Configuration Management Service

The FMS Configuration Management System records the number of hardware components in the live environment using information provided by Support Engineers. This data is used to break down the Monitor and Back office printer figures further into components e.g. Epson printers, OKI printers.

2.2.3 Adjustments to base data

Fujitsu Services may apply adjustments to the base data to account for known problems within the Branch Infrastructure which may cause spurious fluctuations and should be ignored for the purpose of forecasting changes. For example, failures due to software upgrades or the replacement of existing components with new products.

2.3 MTBF procedure

The following steps shall be followed:

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1. Data relating to the number of failures and number of installed units is compiled on a monthly basis.
2. MTBF is calculated on a rolling twelve month basis. Using the initial data which has been used to derive the baseline (see Appendix 1), this spreadsheet will be populated on a monthly basis and the revised MTBF calculated at the end of each month using the past 12 months data. For example, the April 2006 MTBF will be calculated using data from May 2005 to April 2006. The percentage change against the March 2006 MTBF will then be calculated.
3. Adjustments agreed between the Parties shall be applied to cater for unusual circumstances. All adjustments will be detailed in the MTBF calculation and agreed as part of the monthly validation process.
4. Using the resultant adjusted data, for each hardware component within the Branch Infrastructure, the MTBF shall be calculated using the formula described in 2.2.

2.4 MTBF validation

Fujitsu Services will provide Post Office with data relating to the total number of failures and the number of installed units at the end of each month.

Fujitsu Services shall provide Post Office with a calculation of the MTBF each month and compare with the contract baseline MTBF and the annual change in MTBF.

Should Post Office wish to dispute any calculation, Fujitsu Services and Post Office shall complete a review of the figures and agree the MTBF calculation which is to be taken forward. Such agreement shall not to be unreasonably withheld by either party.

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3 Supporting and Calculating Service Level Performance and Liquidated Damages

The MTBF calculations will be used for forecasts and setting targets as defined in 'Engineering Service: Service Description' [Ref. SVM/SDM/SD/0002] and 'Branch Network: Service Description' [Ref. SVM/SDM/SD/0011]. The extent to which Fujitsu Services will cover engineering costs associated with supporting the Branch Infrastructure or be entitled to SLT relief and to recovery from Post Office due to MTBF degradation is defined in paragraph 3.3 of Contract Schedule B3.4 of the Agreement.

4 Post Office / Fujitsu Services Interfaces

The MTBF calculations will be validated on a monthly basis by Fujitsu Services: POA Service Delivery and Post Office: Operations Support

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Appendix 1 MTBF Results: April 2005 – March 2006

MTBF figures																
Product													Current	Current	Current AVG	Current
	Apr-05	May-05	Jun-05	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Total Failures	Avg Failures	Installed Units	MTBF (years)
Single Counter Gateway Base Unit	85	61	69	74	62	67	46	63	28	66	74	65	**760**	**63**	**5055**	
	5185	5170	5143	5114	5097	5057	5028	5004	4995	4972	4954	4944				
Multi Counter Gateway Base Unit	134	158	137	146	116	128	129	126	90	177	148	133	**1622**	**135**	**8912**	
	8927	8921	8913	8906	8903	8900	8899	8909	8913	8915	8918	8914				
Slave Counter Base Unit	233	210	251	222	220	209	188	205	205	249	182	260	**2634**	**220**	**20889**	
	20862	20873	20861	20845	20873	20857	20871	20892	20907	20929	20945	20950				
Total Base Units (Non SAT/Mobile PC)	*452*	*429*	*457*	*442*	*398*	*404*	*363*	*394*	*323*	*492*	*404*	*458*	***5016***	***418***	***34856***	***6.95***
	34974	*34964*	*34917*	*34865*	*34873*	*34814*	*34798*	*34805*	*34815*	*34816*	*34817*	*34808*				
Mobile PC ISDN	22	20	26	26	30	35	34	44	23	32	40	48	**380**	**32**	**230**	**0.60**
	217	218	220	221	228	234	236	238	238	238	235	234				
Installed units:																
Gateway Base Unit (SAT)	153	150	150	149	148	147	145	143	143	143	141	141				
Mobile PC SAT	10	10	10	10	9	9	9	9	9	9	9	8				
Total Base Units (All)	*35354*	*35342*	*35297*	*35245*	*35258*	*35204*	*35188*	*35195*	*35205*	*35206*	*35202*	*35191*				
Total Base Units (Non mobile)	*35127*	*35114*	*35067*	*35014*	*35021*	*34961*	*34943*	*34948*	*34958*	*34959*	*34958*	*34949*				
Total Base Units (Gateway & Mobile)	*14492*	*14469*	*14436*	*14400*	*14385*	*14347*	*14317*	*14303*	*14298*	*14277*	*14257*	*14241*				
CTX Flatscreen	231	233	248	193	245	257	265	301	205	265	237	337	**3017**	**251**	**32179**	**10.67**
	31613	31711	31809	31907	32031	32133	32351	32513	32636	32621	32418	32409				
Optoma Flatscreen				No Data					2	1	3	5	**132**	**11**	**2832**	**21.46**
									172	304	874	1483				
Essex and ETC Screen, McPherson	124	123	82	77	105	93	92	67	60	46	22	16	**907**	**76**	**2586**	**2.85**
	3514	3403	3258	3107	2990	2828	2592	2435	2150	2034	1667	1057				
Devlin Keyboard	463	406	431	372	408	422	435	470	453	550	396	530	**5336**	**445**	**35002**	**6.56**
	35127	35114	35067	35014	35021	34961	34943	34948	34958	34959	34958	34949				
Ithaca Printer	1605	1482	1656	1534	1479	1661	1562	1774	1792	1647	1591	2053	**19836**	**1653**	**35241**	**1.78**
	35354	35342	35297	35245	35258	35204	35188	35195	35205	35206	35202	35191				
Welch Allen Barcode Reader	118	142	133	108	118	114	169	161	121	187	136	203	**1710**	**143**	**35241**	**20.61**
	35354	35342	35297	35245	35258	35204	35188	35195	35205	35206	35202	35191				
Pinpads	470	446	470	460	461	507	427	478	390	658	517	978	**6262**	**522**	**35241**	**5.63**
	35354	35342	35297	35245	35258	35204	35188	35195	35205	35206	35202	35191				
Epson Printer	78	76	78	57	52	15	34	26	15	20	18	7	**476**	**40**	**560**	**1.18**
	904	827	750	673	634	574	446	422	401	377	362	347				
OKI Printer	241	199	275	224	224	245	195	207	121	189	151	192	**2463**	**205**	**13792**	**5.60**
	13588	13642	13686	13727	13751	13773	13871	13881	13897	13900	13895	13894				

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Appendix 2 Procedure for extracting data from PowerHelp

1. From the PowerHelp Web Tools screen select the **'live'** database.
2. On the next menu select the **'Call search'** option.
3. The next screen will be the call search screen. It is here where criteria is selected to bring back desired call results. Call volume totals or itemised calls can be extracted from the database.
4. From the PowerHelp call search screen select the following options for the following criteria. Note the if any criteria is not specified then the default value is used, usually "All"
   - **Status:** "Closed"
   - **Closed date**: Select appropriate dates to match those calls listed in the FMS data
   - **Repair code**: "R01"
5. Select the following output options at the bottom of the search screen:
   - "**Output list header**"
   - "**Hide output parameters**"
   - "**csv output**"
   - "**Call Number**"
   - "**Product ID**".
   - Other output fields can be selected, however those mentioned are the minimum needed.
6. Once the results are returned from the Tool bar menu select File; Save as; (Rename file as appropriate); and save as file type "**text"**.
7. Open this new file. Some editing of this will be needed to remove the words 'Call List' before the first Open quote of the first call number. Once removed save and close.
8. Open this text file with Excel.
9. Select the "**Delimited**" option on the import Wizard (step 1), select "**Comma**" on step two of the Wizard, and select "**Finish**" on the third step of the import Wizard.
10. Once completed the spreadsheet will be easily manipulated through filtering or sorting to provide the amount of units replaced per hardware item.