WITN06650300

Witness Name: William Paul Patterson (on behalf of Fujitsu Services Limited)

Statement No.: Third

Dated: 14 September 2023

POST OFFICE HORIZON IT INQUIRY

THIRD CORPORATE STATEMENT OF FUJITSU SERVICES LIMITED

INTRODUCTION

1. I am a director of Fujitsu Services Limited ("**Fujitsu**") and am duly authorised to make this statement on its behalf. I make this statement in response to the Inquiry's Rule 9 Requests, dated 16 June 2023 and 31 July 2023, for a corporate statement addressing issues relevant to Phases 3 and 4 of the Inquiry (the "**Requests**"). In particular, the Requests focus on the provision and content of Audit Record Query ("**ARQ**") data by Fujitsu to Post Office Limited ("**POL**") over time.

2. As noted in the First and Second Corporate Statements dated 28 September 2022 and 29 December 2022 respectively (the "**First and Second Corporate Statements**"), I do not have first-hand knowledge of many of the matters which are set out in this corporate statement. For this reason, I wish to reiterate at the outset how the information in this statement has been compiled. As with the responses in the First and Second Corporate Statements, responses to

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questions set out in this statement are generally drawn from documentary sources. For the purposes of preparing this statement, I have been assisted by a team of individuals within Fujitsu and Morrison Foerster. This is due to the vast amount of documentation and sources of evidence which have had to be reviewed for a time period stretching over 25 years. This team has provided to me the documents which are referenced in this statement and exhibited in accordance with the index at the back of this statement, and which are the principal source of my knowledge of this statement's content. In addition to available documentary evidence, I have also been provided with the witness statements of three Fujitsu employees (John Simpkins, Jonathan Hulme and Gerald Barnes) who have also provided responses to the Requests based on their own personal knowledge or recollections (the "**Fujitsu Witness Statements**").

3. The responses provided in this third corporate statement represent Fujitsu's current understanding of the information available. Given that work in relation to Phase 4 and other phases of the Inquiry is still on-going, it may be that Fujitsu will need to supplement this corporate statement as further material is identified and made available to Core Participants.

4. Further, as noted in the First and Second Corporate Statements, I do not have a detailed technical knowledge of the Horizon IT System ("**Horizon**") and I am reliant upon Fujitsu staff with relevant technical expertise and knowledge of such matters.

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5. For ease of reference, in this statement:

    a. ICL Pathway Limited (which initially managed the Horizon contract, and later novating the contract to Fujitsu Services Limited) and Fujitsu Services Limited will be referred to collectively as "Fujitsu"; and

    b. Post Office Counters Limited (subsequently Post Office Limited) will be referred to collectively as "POL").

CONTRACTUAL BACKGROUND

6. From the outset of Horizon, Fujitsu has been required by contract to maintain an audit trail of "*all Transactions and Events*…" (see for example paragraph 3.1 of Schedule A03 to the Codified Agreement entered into between Fujitsu and POL on 28 July 1999 (the "**1999 Codified Agreement**"), and paragraph 3.1 of Schedule D5 to version 13 of the Codified Agreement which was entered into by Fujitsu and POL on 23 November 2020 (the "**2020 Codified Agreement**")).[1] This contractual obligation flowed from Requirement 699 contained at paragraph 1.102 of Schedule A15 to the 1999 Codified Agreement. In particular, Requirement 699 notes at:

    a. Paragraph 1.102.6: "*The content of the audit trail shall be agreed with POCL by a date consistent with the Project Plan.*"

    b. Paragraph 1.102.9: "*The audit trail shall have a level of security such that it cannot be altered or deleted.*"

[1] FUJ00000071; FUJ00000003

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c. Paragraph 1.102.11: "*The audit trail shall comply with Requirement 829*", namely the prosecution support Requirement set out at paragraph 1.133 of Schedule A15 to the 1999 Codified Agreement.

7. Fujitsu's solution for Requirement 699 is set out in Schedule A16 to the 1999 Codified Agreement. During the course of 1999-2000, this solution was amended by Change Control Notice ("**CCN**") 0423a to include the following additional wording "*[t]he audit trail is specified in the Audit Trail Functional Specification.*"[2] CCN 0423a also introduced the Audit Trail Functional Specification document (version 3.0 dated 1 July 1999 at the relevant time)[3] as a Contract Controlled Document ("**CCD**") to be agreed between Fujitsu and POL. In order to assist the Inquiry, Fujitsu sets out at Appendix 1 to this corporate statement a schedule of approved Audit Trail Functional Specification documents from version 3.0 onwards. In accordance with paragraph 3.3 of Schedule D5 to the 2020 Codified Agreement, the Audit Trail Functional Specification continues to be a CCD as agreed between Fujitsu and POL.

THE ARQ SPREADSHEET

8. With the first of the Requests, the Inquiry enclosed a spreadsheet containing transaction and event data for the Marine Drive Post Office branch with unique Financial Accounts Division ("**FAD**") Code 213337 ("**Marine Drive**") dating from 2 February 2004 (the "**ARQ Spreadsheet**",[4] pages 17 and 18 only). Fujitsu has now been made aware that the ARQ Spreadsheet forms part of a larger document. However, for the avoidance of doubt, in preparing this statement,

[2] See CCN 0423a at FUJ00000394, and confirmation that the CCN was approved in the document entitled 'Change Control Notices Applied' and dated 23 October 2010 (FUJ00001431)
[3] FUJ00001318
[4] LCAS0001383

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Fujitsu understands that the Inquiry requires consideration of pages 17 and 18 of LCAS0001383 only, and does not require consideration of the remaining pages of the document. Fujitsu also understands from the Inquiry that the ARQ Spreadsheet was provided to Mr Lee Castleton, a former postmaster of Marine Drive, by way of disclosure in the civil case of POL v Lee Castleton.[5]

9. By way of background, Fujitsu has to date identified two requests for Audit Request Queries (the "**ARQ Requests**") submitted by Graham Ward (Casework Manager, POL) to Fujitsu in relation to Marine Drive for Horizon data dating from the period in which Mr Castleton was postmaster at the branch. These ARQ Requests are dated 26 October 2005 and 4 November 2005,[6] and request various data from the period 1 January 2004 to 31 March 2004 (the "**ARQ Date Range**"). The first of the ARQ Requests includes a request for disclosure of the following information:

"*Please also conduct an analysis of all Helpdesk calls for the above period, commenting on any calls that may indicate faults / problems with the system*

Please also supply a report of all transactions and events for the office for the relevant days, including remittances received, transfers between stock units and error notices.

We would like the following format for logs (in Excel format with each category in a separate column):

[5] Case number HQ05X02706, Judgment Citation [2007] EWHC 5 (QB) (LCAS0000649)
[6] ARQ 0506/405 dated 26 October 2005 (FUJ00152562) and ARQ 0506/421-423 dated 4 November 2005 (FUJ00152564)

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Balancing Period; Cash Accounting Period; Session Type - i.e. Serve Customer, Reversal. Rem In etc Transaction No; Session Indicator; Date; Time; Stock; User ID; Transaction Type; Amount £p

2 columns specifying whether an OBCS (& state) of scan accompanied the transaction

(Session Indicator is whatever way the system has of indicating that individual transactions are linked)".

10. The second of the ARQ Requests does not include any reference to Helpdesk calls but otherwise appears to be substantially the same as the first. In each of the ARQ Requests, Mr Ward confirms that no witness statement is required.

11. It appears from contemporaneous records collected by Fujitsu that (i) the Helpdesk call logs requested were provided to POL on a CD on 2 November 2005 (see email correspondence from Brian Pinder (Security Manager, Fujitsu) to Mr Ward on 22 November 2005),[7] and (ii) the ARQ data requested was also provided to POL by CD during the course of November 2005 (see email correspondence from Mr Pinder to Penny Thomas (Security, Fujitsu) also on 22 November 2005).[8]

12. The ARQ extraction process that Fujitsu understands was in place in the context of prosecution support at the time the ARQ Requests were made is set out in version two of the 'Network Banking Management of Prosecution Support' procedure document dated 29 February 2005 (the "**2005 Prosecution Support**

[7] FUJ00152574
[8] FUJ00152569

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Process").[9] The originator of the 2005 Prosecution Support Process was recorded as being Beatrice Neneh Lowther (Security, Fujitsu), with additional contributors listed as Bill Mitchell (Security Manager, Fujitsu), Ms Thomas, Jan Holmes (Quality Assurance Manager, Fujitsu) and Alan Holmes (Audit, Fujitsu). The approval authorities for the 2005 Prosecution Support Process are listed as Mr J. Holmes, Mr Mitchell and Dave Baldwin (Customer Service Director, Fujitsu).

13. Section 7 of the 2005 Prosecution Support Process includes a graphic setting out the steps followed by Fujitsu when responding to ARQ requests from POL. This graphic is replicated below for ease of reference:

[9] FUJ00152209

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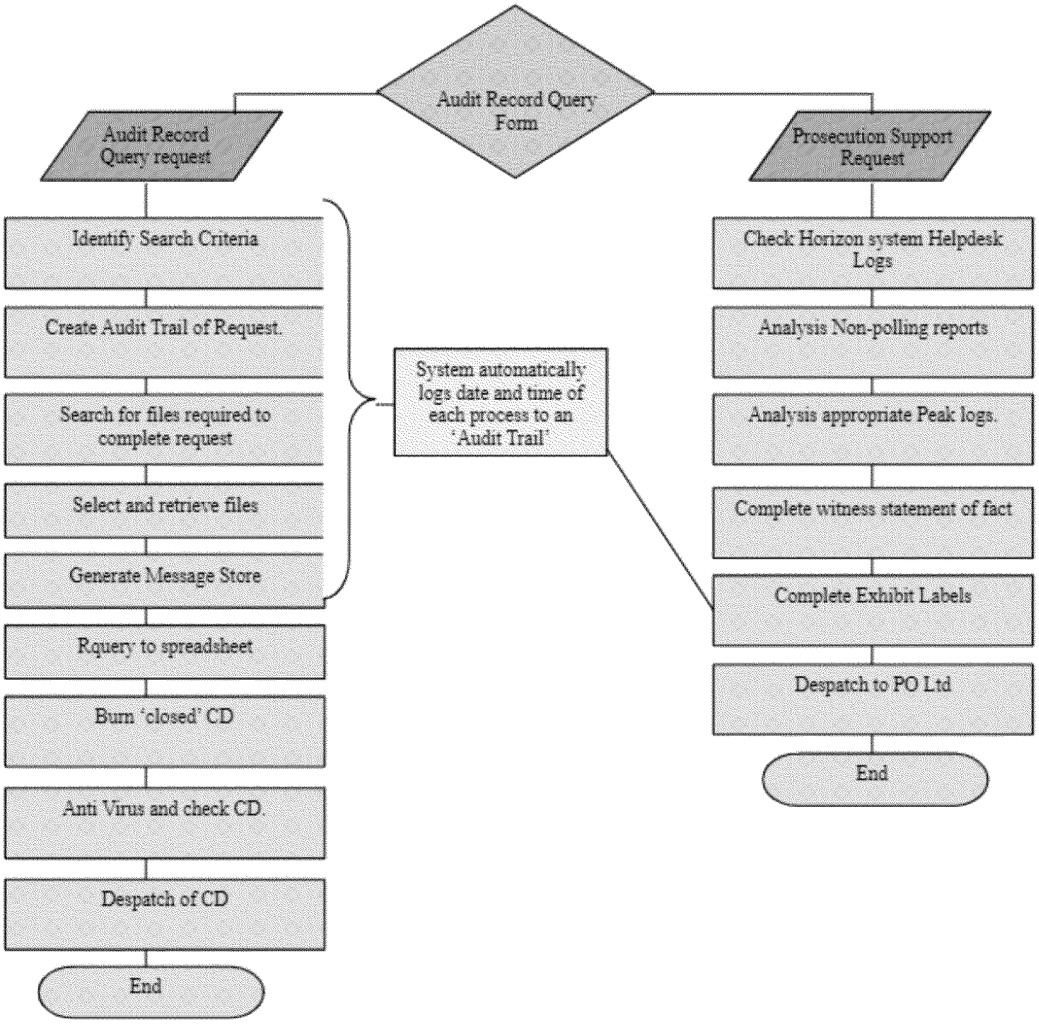

14. According to section 3.3 of the 2005 Prosecution Support Process, the initial step for responding to an ARQ request at the time was to identify the search criteria to be applied. These search criteria are said to generally have been limited to the data fields below, although Fujitsu understands that these fields could be varied by POL upon request in the ARQ request:

    a. the ID for the user logged-on;

    b. counter position ID;

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c. stock unit reference;

d. transaction ID;

e. transaction start time and date;

f. customer session ID;

g. mode (e.g., serve customer);

h. product number;

i. product quantity; and

j. sales value.

15. All of these fields appear to be contained within the ARQ Spreadsheet.

16. In order to obtain the relevant ARQ data, section 7.1 of the 2005 Prosecution Support Process explains the steps that the relevant Fujitsu analyst then had to take, including:

a. Searching and selecting the necessary files from audit archive and extract them to the audit server.

b. Generating a messagestore for the files extracted.

c. Using the RQuery tool to select the fields necessary for the relevant ARQ request and then exporting those fields to an Excel 95 document (or native format if requested).

d. Burning the exported data to a "*'closed' CD-W*" in addition to a Word document providing an explanation of the format in which the data was

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provided. According to section 7.1.7 of the 2005 Prosecution Support Process, the CD-W was to be labelled with the ARQ reference number, the FAD Code for the relevant branch, the name of the Fujitsu employee who compiled the data, the date on which compilation of the data was completed, the date range requested in the relevant ARQ request and the name of the Fujitsu employee who checked the data on the CD-W.

e. Checking the CD-W for viruses using anti-virus software.

f. Despatching the CD-W to the POL Casework Manager by Special Delivery.

17. If these steps were followed in relation to the ARQ Spreadsheet, it follows that the data it contained would have been provided to POL in an Excel 95 format on a CD-W which was delivered in hard copy by post. It does not appear from the contemporaneous process documents available that Fujitsu would have had sight of how the information was subsequently shared by POL (either in whole or part) with Mr Castleton.

18. Further detail in relation to the practical steps to be taken when extracting audit data are set out in the "ARQ Data Extraction Process" documents in place over time.[10] A schedule of the various ARQ Data Extraction Processes and prosecution support process documents that Fujitsu has identified to date and

[10] The ARQ Data Extraction Process in place at the time the ARQ Requests were made can be found at FUJ00176265

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which appear to have been in place over time is set out in Appendix 2 to this corporate statement.

19. The Inquiry has asked Fujitsu to confirm whether, in its view, the ARQ data provided to POL over time was sufficient to enable a postmaster to understand whether Horizon was operating correctly at their branch. In light of (i) the evidence heard by the Inquiry from postmasters during the Human Impact hearings, (ii) the evidence set out in the Fujitsu Witness Statements, and (iii) the matters set out in this corporate statement in relation to the ARQ Spreadsheet, Fujitsu cannot confirm that ARQ data on its own was sufficient to enable a postmaster to understand whether Horizon was operating correctly at the relevant branch in the time period covered by the ARQ data requested by POL.

AVAILABILITY OF ARQ DATA

20. In the first of the Requests, the Inquiry sought disclosure from Fujitsu of the "*original log files in their raw form*" for the data reflected in the ARQ Spreadsheet. The Inquiry also asked for confirmation as to whether the data had been reliably and accurately parsed from the "*original raw form*" to the ARQ Spreadsheet. In the context of the ARQ process, Fujitsu understands that "*original log data*" or "*raw data files*" may refer either to (i) data recorded in the audit archive from which the Riposte messagestore in Legacy Horizon and ARQs were extracted, or (ii) the Riposte messagestore itself.

21. Fujitsu understands that, until CCN 1122 dated 5 January 2004,[11] the retention policy for data stored in Fujitsu's audit archive was 18 months.[12] Following the

[11] FUJ00000918
[12] FUJ00001318

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introduction of CCN 1122, this data retention period was increased from 18 months to 7 years. It appears that this remained the policy until 2014, when Commercial Terms ("**CT**") 1542 dated 2 June 2014[13] was agreed between POL and Fujitsu. In accordance with CT 1542, from around June 2014, data purging activities in relation to audit and call data were suspended and this arrangement was envisaged to last for 12 months. Since then, the agreement to suspend data purging activities relating to audit and call data has been renewed periodically[14] and remains in place at the date of this corporate statement.[15] On this basis, Fujitsu has retained in its audit archive, audit data dating from around June 2007 onwards.

22. Fujitsu can therefore confirm that the audit data for Marine Drive within the ARQ Date Range is no longer available in its audit archive. The only way that audit data from during/before 2007 would now be available to Fujitsu is if employees at Fujitsu made copies of the relevant data and stored it separately from the audit archive.

23. To identify if any copies of audit data relating to Marine Drive from the time of Mr Castleton's tenure as postmaster there still exist outside of the audit archive, Fujitsu undertook searches of documents it has collected into hard copy archives and its Relativity platform. In doing so, Fujitsu identified a CD labelled "ARQs, Message store, Marine Drive, 12/03/04 – 02/04/04". The data from this CD, which consisted of two documents, had already been collected and processed into

[13] FUJ00156946
[14] FUJ00176279 ; FUJ00176274; FUJ00176278; FUJ00176275; FUJ00176276; FUJ00176277
[15] FUJ00176277

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Fujitsu's Relativity platform at the time of the Requests. The two documents contained on the CD are as follows:

a. a .txt file containing the Riposte messagestore for Marine Drive for the period 12 March 2004 to 2 April 2004;[16] and

b. an Excel spreadsheet which appears to split each of the messages in the messagestore described above into separate rows, with a column for each attribute.[17]

24. Although these documents do not contain the messagestore data for the 2 February 2004 date reflected in the ARQ Spreadsheet, Fujitsu has produced both the above-mentioned documents to the Inquiry and exhibits them to this statement.

25. As is clear from the messagestore that has been identified, each message relating to Marine Drive began with "<Message:<GroupId:213337>" (213337 being the FAD Code for the branch). Accordingly, Fujitsu ran searches for this identifier across its Relativity platform. Regrettably, no additional responsive documents were found. It follows that Fujitsu is unable to identify and produce Marine Drive messagestore data for 2 February 2004.

THE RELIABILITY OF ARQ DATA

26. The Inquiry has asked whether Fujitsu is aware of any cases where an ARQ log produced for the purpose of court proceedings against postmasters (i) may not

[16] FUJ00171957_001
[17] FUJ00171958

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have accurately matched the "*original log files*", or (ii) was, or may be, unreliable (together, "**ARQ Reliability**").

27. In the course of Fujitsu's investigations to date, a number of incidents that may have impacted either the underlying audit trail from which ARQ data is extracted or the ARQ extracts themselves have been identified. Fujitsu's investigations have included both document searches and discussions with relevant current employees. The incidents identified by Fujitsu to date are described in more detail below. Given the expansive period covered by the Inquiry's Requests, and the limitations of relying on and interpreting records of technical matters (some of which may be incomplete), without the benefit of guidance or explanation from relevant employees with contemporaneous knowledge, Fujitsu cannot be sure that the incidents contained in this corporate statement are exhaustive. To the extent that Fujitsu identifies further incidents relevant to the issue of ARQ Reliability after the date of this corporate statement, Fujitsu will inform the Inquiry as soon as possible. By way of summary, the incidents identified to date are as follows:

	Description	Paragraphs
a.	Broken Audit Trail	30 – 63
b.	Omissions in ARQ Data Caused by Operator Error	64 – 74
c.	2008 Incidents related to Riposte Lock Event	75 – 116
d.	Duplicate Transactions	117 – 152
e.	Historic Gaps in ARQ Data	153 – 159
f.	Other Potential Issues relating to ARQ Data	160 – 161

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28. During its investigations to date, I understand that Fujitsu has identified approximately 2,400 ARQ requests dating from November 2002 onwards. For the reasons highlighted in paragraph 27 above, it has not been possible to conduct a forensic investigation into the ARQ Reliability of the audit data supplied to POL in response to each ARQ request.

29. The following summaries of incidents which Fujitsu has identified as having a potential impact on the issue of ARQ Reliability have been prepared from documents produced to the Inquiry. The incidents addressed in these summaries are not within my personal knowledge or recollection.

BROKEN AUDIT TRAIL

Background

30. In or around May 2001, it was identified that there was a data loss in the audit trail for a six-day period in August 2000 (the "**Broken Audit Trail**").[18] At this time, audit data was gathered by an audit server and written to Digital Linear Tape ("**DLT**") tapes for long-term storage, to be retrieved when needed.[19] There were two "Data Centres", located at Bootle and Wigan, which contained the main Horizon servers.[20] Audit data could be accessed at audit workstations at either site or Fujitsu's Feltham HQ.[21]

31. According to PinICL PC0066318, which was opened on 24 May 2001, the Broken Audit Trail issue related to "*[a]n incomplete TMS audit trail for the period 8th to*

[18] FUJ00171959; FUJ00152184; FUJ00171967
[19] FUJ00201501
[20] FUJ00201501
[21] FUJ00201501

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14th August 2000 caused by coincidental DLT failure at both datacentres" in Bootle and Wigan.[22] The problem was compounded when one of the tapes from the Wigan Data Centre was lost in transit while in the possession of a courier company, TNT Couriers ("**TNT**") on its way to Feltham for further analysis.[23]

32. As set out below, Fujitsu took various actions to mitigate the impact of the Broken Audit Trail, including:

    a. Engaging with TNT regarding attempts to locate the tape from the Wigan Data Centre. Ultimately, neither Fujitsu nor TNT were able to locate the tape.[24]

    b. Attempting to recover the data from the Bootle tape, with the assistance of third-party data recovery specialists, Vogon Data Recovery ("**Vogon**"). Vogon concluded that there was a flaw in the DLT media, and that recovery would only be 85% successful.[25]

    c. Obtaining data from other archived sources. This was said to have reduced the break in the audit trail from 6 days to 1 day.[26]

    d. Introducing automated media management and a "read after write" process to mitigate the risk of the problem re-occurring.[27]

[22] FUJ00172093
[23] FUJ00152184
[24] FUJ00176297
[25] FUJ00152184
[26] FUJ00171967
[27] FUJ00120516; FUJ00116033

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Identification and notification of the Broken Audit Trail

33. According to a letter from Jan Holmes (Quality & Audit Manager, Fujitsu) to Sue Kinghorn (Consignia, later Royal Mail, Internal Audit) dated 23 May 2001, Fujitsu identified the Broken Audit Trail when undertaking an audit data extraction for Charles Leighton (Internal Crime Manager, POL), in relation to an ARQ request ("**ARQ 8**").[28] It appears that data for the period 8 to 14 August (the "**relevant period**") was held on four DLT tapes.[29] In order to retrieve the data, the tapes needed to be read by dedicated "Legato" equipment and software.[30] Legato failed to read one of the tapes held at the Wigan Data Centre, and retrieval of the data from that tape therefore failed. The tape was dispatched via TNT to Fujitsu's Feltham offices for further investigation and, although track and trace facilities were employed, the tape was lost in transit.[31]

34. Fujitsu subsequently attempted to source the outstanding data from the corresponding DLT tape held at the Bootle Data Centre for the same period. Recovery was attempted internally and externally using Vogon, "*a recognised industry expert in the field of data retrieval services*".[32] Vogon concluded that there was "*a flaw in the DLT media and recover would only be 85% successful. This is no more than [Fujitsu] could do ourselves…A similar scenario would have been expected from the lost Wigan tape*".[33]

[28] FUJ00171959
[29] FUJ00176297
[30] FUJ00176297; FUJ00152184
[31] FUJ00176297
[32] FUJ00176297
[33] FUJ00172093

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35. The Broken Audit Trail was initially reported to POL as follows:

    a. On 9 May 2001, Mr Leighton was notified that Fujitsu was unable to source the evidential data requested.[34]

    b. In a letter dated 23 May 2001, Mr J. Holmes informed Ms Kinghorn of the issue and explained that "*[t]he break has arisen due to a combination of events outside [Fujitsu's] immediate control but it does mean that we are not able to retrieve TMS records for that 6 day period. All other elements of the audit trail are complete.*[35]

    c. Also on 23 May 2001, the issue was discussed by representatives of Fujitsu and POL during a Contract Administration Meeting.[36]

36. According to the minutes of the 23 May 2001 Contract Administration Meeting, Keith Baines (Head of Commercial, POL) asked Colin Lenton-Smith (Commercial and Finance Director, Fujitsu) *"if a Security impact on the loss of the data had been performed and what validation process for the tapes was in place"*.[37]

37. Mr J. Holmes and Graham Hooper (Security Manager, Fujitsu) were the assigned Fujitsu Problem Managers for PinICL PC0066318.[38] On 24 May 2001, they prepared the following responses to the questions raised by Mr Baines at the 23 May 2001 Contract Administration Meeting:[39]

[34] FUJ00172093
[35] FUJ00171959
[36] FUJ00176285
[37] FUJ00176285
[38] FUJ00172093
[39] FUJ00152184

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a. In relation to the security impact of the data loss: "*In the event that a third party obtained the necessary Legato equipment and software, it is evident from the fact that the tape could not be read on the dedicated equipment at the datacentres that any attempt by a third party to do the same would not prove fruitful. Specialist data recovery equipment is available primarily to forensic recovery experts such as Vogon International, to whom Pathway referred the corrupted Bootle tape for analysis. These companies operate strict controls to ensure that data recovery is attempted only for legitimate reasons. Assuming a third party succeeded where Fujitsu failed or managed to utilise other specialist recovery services, the information on the tape is not in a readily interpretable format and it is not possible to infer to what it relates.*"

b. In relation to data validation: "*The validity of the data held, and subsequently retrieved, is proven through the generation of a ChecksumSeal at the time that the data is written to the DLT. This value is stored on a database, separate from the audit data, and subject to an entirely independent backup process. When data is retrieved from the DLT the Checksum Value is re-calculated and the result compared with the original value maintained in the database. The results are recorded in the database and these are checked as part of the Extraction process prior to despatch of data to PON."*

38. Mr Hooper notified Richard Benton (Problem Manager, POL) of the issue on 24 May 2001 and recorded his summary of this conversation in PinICL PC0066318

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as follows: "*I stressed that back-ups were taken and the problem resulted from a corruption of both tapes relevant to the period in question - a situation that could not reasonably have been foreseen. It is clear that Consignia's prime issue is in attempting to recover the lost data – primarily in respect of evidence to support potential prosecutions.…The cause of the read error on the Wigan tape is unknown and resulted in the decision to forward this to FEL01 for analysis (during which it was lost by TNT)...It was agreed that the only reasonable progression was to try and locate the lost Wigan tape so that an analysis and data recovery attempt could be performed. To this end I advised that I had been trying to get TNT to undertake a search but was not content that TNT were doing all they could to find the tape*".[40]

39. The Broken Audit Trail issue was also reported in a Customer Service Monthly Report dated 30 May 2001.[41] This report stated that "*[t]he issue has been raised with the Customer and will be managed under normal problem management procedures. The requirement to undertake large data extractions continues to have a detrimental effect on the availability of the audit servers*".

Attempts by Fujitsu to recover the lost audit data

Correspondence with TNT regarding the missing tape

40. In the first instance, as agreed during the call between Mr Hooper and Mr Benton on 24 May 2001, Fujitsu engaged with TNT in order to attempt to locate the lost Wigan tape. Accordingly, Mr Hooper wrote to TNT on 25 May 2011 requesting

[40] FUJ00172093
[41] FUJ00176282

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assistance with locating the package containing the missing tape.[42] Fujitsu has not to date identified copies of the correspondence with TNT but is aware of their existence from the extracts recorded within the relevant PinICL.

41. TNT responded to this letter on 3 June 2001, "*apologising for the loss and stating that there had been a discrepancy in the tracking system, which could have contributed to the problem*".[43] Mr Hooper reported in PinICL PC0066318 that he was "*convinced that they are not trying hard enough to locate this package which must be somewhere in their system. I propose to respond and to ask that a search of all unaccounted-for items be made*".[44] In the meantime, Fujitsu advised POL that TNT was "*no longer being used for the transport of media or other sensitive audit/security information*".[45]

42. On 20 June 2001, Mr Hooper again wrote to TNT "*stressing the importance of finding the missing item and offering assistance in attending TNT sites to identify the package*".[46] When no response was received from TNT by 26 June 2001, a "*[c]hase up letter*" was sent.[47]

43. TNT responded on 13 August 2001, stating that "*they have recently introduced a database of missing items, which can be searched against details of package contents.*"[48] Following an "*extensive check*" of this database, TNT confirmed on 23 August 2001 that the package containing the missing Wigan tape was not recorded on their system. TNT concluded that they had undertaken everything

[42] FUJ00172093
[43] FUJ00172093
[44] FUJ00172093
[45] FUJ00172093
[46] FUJ00172093
[47] FUJ00172093
[48] FUJ00172093

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possible to locate the lost tape and apologised for "*the difficulties this had caused Fujitsu and any other third party*".[49]

44. Following receipt of TNT's last letter, Mr Hooper reported in PinICL PC0066318 that he was "*now satisfied that there is no possibility of finding this tape. In any event it needs to be borne in mind that the tape in question was corrupt before despatch so the likelihood of data recovery from it was negligible*".[50]

Rebuilding the audit trail

45. Fujitsu also explored the possibility of re-constituting the missing data in the audit archive using back up tapes from the Correspondence Server ("**CS**").[51] This was discussed at a Joint Audit & Security Panel Meeting on 18 June 2001, attended by Mr Leighton and Gary Potts (PON Internal Audit, POL) on behalf of POL, and Mr J. Holmes and Mr Hooper on behalf of Fujitsu.[52] According to the minutes of this meeting, Mr J. Holmes and Mr Hooper explained the background to the Broken Audit Trial and informed Mr Leighton that:

    a. Fujitsu would be introducing a "read after write" procedure that would provide assurance that data is not corrupt when written to tape.[53] The purpose of the "read after write" activity was to protect against the accidental use of flawed media, but it would not guarantee that similar problems would not occur in the future as it would only provide assurance that the tape could be read at that moment in time.[54]

[49] FUJ00172093
[50] FUJ00152184
[51] FUJ00171971
[52] FUJ00171971
[53] FUJ00171971
[54] FUJ00176296; FUJ00171971

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b. Fujitsu was also exploring the possibility of recovering the missing data from Correspondence Server backup tapes.[55]

46. On 26 July 2001, Change Proposal ("**CP**") 3061, entitled "Rebuild broken Audit Trail due to Missing / Damaged tapes", was raised by Mr J. Holmes.[56] The purpose of the CP was to reconstruct the Broken Audit Trail using some old messagestore backup tapes from the NON-Live rig and, subsequently, store the data in the audit archive.[57] It was highlighted in the CP that, if it was not approved, Fujitsu would remain contractually non-compliant in the provision of the audit trail and unable to satisfy PON's requests for audit data in relation to the relevant period.[58]

47. CP 3061 was discussed by the Programme Change Control Board ("**PCCB**") on 2 and 16 August 2001.[59]

48. Following this, CP 3061 was escalated to the Change Control Board ("**CCB**") on 20 August 2001.[60] During the CCB meeting, when asked how the Broken Audit Trail could be prevented from happening again in future, Mr Hooper informed the CCB that a read after write mechanism had been introduced to check the data, but "*there was no way to guarantee that this won't happen again*".[61] CP 3061 was approved by the CCB on 20 August 2001.[62] However, it was reverted back to the PCCB on 18 October 2001 to consider an additional impact.[63] On 25

[55] FUJ00171971
[56] FUJ00155529
[57] FUJ00155530
[58] FUJ00155530
[59] FUJ00176286; FUJ00176287
[60] FUJ00176287; FUJ00176288
[61] FUJ00176288
[62] FUJ00176288
[63] FUJ00176291

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October 2001, the CCB noted the PCCB's decision to re-target CP 3061 for the CI4 S10R release.[64]

49. By October 2001, the CS backup tapes had also been recovered from the relevant Data Centre and held in secure fire-safe storage, pending attempted retrieval of the data for the relevant period.[65] In order to reconstitute the audit data from the CS backup tapes, a pseudo audit server was built which the backup tapes were to be loaded on to. As a result, by around 7 December 2001, Fujitsu had reportedly identified that approximately 66% of the missing data for the relevant period was available on the backup tapes.[66] The remaining 34% was not present on the tapes and was deemed irretrievable.[67] The gap in the audit trail was therefore said to have been reduced from a period of 6 days (7 to 14 August 2001) to less than 24 hours (19:27pm on Sunday, 6 August 2000 until 16:09pm on Monday, 7 August 2000).[68]

50. According to a report entitled "Audit Trail Break – Pathway Position" prepared by Mr Hooper, following identification of the available data on the CS backup tapes, Fujitsu's recommendation was to rebuild the audit trail using the CS backup tapes and provide POL with the available data for the period requested in ARQ 8.[69] In accordance with the agreed retention periods in place at the time, the data held on the back up tapes was due to expire on 14 February 2002.[70]

[64] FUJ00176292
[65] FUJ00152184
[66] FUJ00152184
[67] FUJ00152184
[68] FUJ00152184
[69] FUJ00176294
[70] FUJ00176294

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51. By 7 January 2002, Fujitsu had briefed Consignia Internal Audit and Security Managers on the outcome of the data recovery activities.[71] Consignia confirmed that the information requested by ARQ 8 was not, at that stage, required in support of a prosecution. It was agreed that Fujitsu would not need to retrieve the data from the CS backup tapes at that time but would take steps to ensure that the data relevant to ARQ 8 was stored and made available if requested.[72]

Audit of tape handling procedures

52. Although not solely relevant to the Broken Audit Trail, Fujitsu has disclosed correspondence relating to an audit that was conducted by Fujitsu, POL and Consignia of Fujitsu's management and operation at the Wigan and Bootle Data Centres. The audit also encompassed Fujitsu's Belfast Operations Centre, although Consignia did not participate in the audit visit to Belfast. The report of this audit does refer to the Broken Audit Trail issue.

53. In summary, a planned audit into the activities and operation of the Horizon Data Centres at Wigan and Bootle took place in October 2001 (the "**Data Centre Audit**").[73] This also included an audit of the Operations Centre in Belfast, which was where much of the work carried out in relation to Data Centres was controlled at that time.[74] It had been agreed at the Joint Security Audit meeting on 18 June 2001 that the Data Centre Audit would include tape-handling procedures and would be observed by a representative from POL, Rashpal

[71] FUJ00152184
[72] FUJ00152184
[73] FUJ00080514
[74] FUJ00080514

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Dhesi (Internal Audit, Consignia and later POL), to verify the tape-handling procedures in place.[75]

54. The Data Centre Audit was carried out by Mr J. Holmes, Mr Hooper, and Mark Ascot (Test Manager, Fujitsu) from Fujitsu, accompanied at Wigan and Bootle by Mr Dhesi. Fujitsu's findings from the Data Centre Audit were recorded in an internal report entitled "Audit of Horizon Data Centres and Belfast Operations Centre" dated 21 November 2001 (the "**Data Centre Audit Report**").[76] This report set out a number of recommendations for the management of the Data Centres.[77] A copy of the Data Centre Audit Report was provided to Mr Dhesi on 27 November 2001.[78]

55. Mr Dhesi subsequently summarised the Data Centre Audit Report in the format of a Consignia note (the "**Consignia Report**") which he proposed to distribute to Mike Hannon (Horizon Contract and Commercial Manager, POL), Dave Miller (Managing Director Post Office Network, POL), Paul Rich (Group Managing Director, POL), Peter Corbett (Finance Director, POL), Vince Mulholland (Head of Corporate and Strategic Finance, POL), David Lewington (Head of Group Internal Audit, POL), and Ernst & Young (External Auditors).[79] The Consignia Report and the extent of its distribution appears to have been a point of contention at that time. Whilst Fujitsu has not been able to find all relevant correspondence on this matter, Mr J. Holmes raised various concerns with Mr

[75] FUJ00171970; FUJ00171971; FUJ00171972; FUJ00171973
[76] FUJ00080514
[77] FUJ00080514
[78] FUJ00171974
[79] FUJ00171979

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Dhesi on 6 February 2002.[80] The correspondence that Fujitsu has identified to date in this regard is exhibited to this statement.[81]

Proposals to prevent re-occurrence of the Broken Audit Trail

56. The following measures were put in place by Fujitsu to mitigate the risk of the Broken Audit Trail re-occurring:

    a. The "read after write" mechanism was introduced in September 2001.[82]

    b. The Audit Panel was reintroduced to PON Internal Audit during June 2001 and expanded to include Security, to allow PON and Fujitsu security and audit staff to deal with day-to-day issues in an informal but professional manner.[83]

    c. Automated Media Management (to automate tape labelling) was scheduled to be introduced on 20 August 2001 "*to minimise manual tape intervention*".[84]

    d. In June 2001, Fujitsu proposed to introduce write failure checking on archive tapes in order to provide some assurances that other Legato tapes were not corrupted.[85]

[80] FUJ00171983
[81] FUJ00171978; FUJ00171980; FUJ00171983; FUJ00171981; FUJ00171982; FUJ00171970; FUJ00171968; FUJ00171984; FUJ00176754; FUJ00176756
[82] FUJ00152184; FUJ00176290
[83] FUJ00115976
[84] FUJ00152184; FUJ00176280
[85] FUJ00152184

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57. Notwithstanding the above-mentioned measures, in a letter dated 7 August 2001, Mr Lenton-Smith informed Mr Baines that Fujitsu had advised PON Audit and Security Managers that "*the measures to remove altogether the risk of future tape corruption can be achieved only by a complete re-design of the current solution*".[86]

58. Mr Baines responded to this letter on 29 August 2001, raising the following concerns:[87]

    a. The "read after write" process only deals with part of the problem – a more common fault with the media being used by Fujitsu is for the data to become corrupt after the "write" process. "*Normal working practice we believe is to keep 'parent', and 'grandparent' copies of tapes*".[88]

    b. Fujitsu "*should have in place a process which alerts POCL of any failure of their obligation to maintain a full audit trail*".[89]

    c. Mr Baines also sought confirmation of whether there were any alternative methods of extracting the data required to assist POL's investigations and prosecutions.[90]

59. Mr Lenton-Smith sought to respond to these concerns in a letter dated 19 September 2001, in which he confirmed that:[91]

[86] FUJ00176280
[87] FUJ00176289
[88] FUJ00176289
[89] FUJ00176289
[90] FUJ00176289
[91] FUJ00176290

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a. The purpose of maintaining 'parent' and 'grandparent' copies of data is to ensure there is always more than one copy of an archive from which recovery can be attempted. In fact, two copies of the audit archive were maintained by Fujitsu (one copy at each Data Centre).

b. In relation to Mr Baines' request for a process to alert POL of any failure in the audit trail, Fujitsu was not in a position to know whether data could not be recovered from either of the two Data Centres until recovery was attempted. The reason for any delay in notifying POL of the Broken Audit Trail "*was the result of our attempts to recover the situation without raising undue concern in POCL*" and "*[t]he unprecedented circumstances, including a protracted search by TNT for the lost tape, introduced greater delay*".

c. In relation to alternative methods of extracting the relevant data, Mr Lenton-Smith wrote that the audit archive "*is fully secure, duplicated across two locations and contains special integrity features to provide assurances that data written to DLT, and subsequently retrieved, have not been amended during storage. It is considered the only source capable of being presented in Court and the only one that Pathway would be prepared to use in those circumstances*".

Commercial resolution and closure of PinICL PC0066318

60. Issues surrounding the Broken Audit Trail gave rise to correspondence between POL and Fujitsu regarding alleged contractual breaches.

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61. On 6 February 2002, Mr Baines replied to Mr Lenton-Smith's 19 September 2001 letter alleging breaches by Fujitsu of "*various obligations in the Codified Agreement…which give rise to the right to terminate, and there is a risk of future similar defaults because the root causes have not been identified and corrected*".[92] Mr Baines further wrote that "*this incident and the issues arising from lost data represent significant risks to Post Office Limited's business. It compromises our ability to assure end to end financial integrity of our business*".[93]

62. Mr Lenton-Smith replied to Mr Baines on 15 February 2002. In this letter, Mr Lenton-Smith denied that the lost data incident demonstrated "*poor implementation of the audit trail and failure by Fujitsu to exercise appropriate management control in carrying out the procedures for servicing audit trail requests. This is the only incident of its kind since provision of this service since the Summer of 1999.*"[94] Mr Lenton-Smith further wrote that he "*cannot accept that the incident and subsequent developments makes [sic] you believe that there is a significant risk to your business which in turn makes you question the fitness of Fujitsu's infrastructure to deliver financial services*".[95] In relation to the remediation steps that had been taken to prevent the Broken Audit Trail from reoccurring, Mr Lenton-Smith wrote that following the introduction of the "read after write" checks and tape cloning at both Data Centres, "*there are two copies of all audit data at each centre…All audit DLTs are stored in the Data Centre*

[92] FUJ00176295
[93] FUJ00176295
[94] FUJ00176296
[95] FUJ00176296

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computer rooms, in their individual plastic cases, on correct storage racking, in line with recommendations for long-term storage of DLT media."[96]

63. Following further correspondence, POL and Fujitsu agreed to settle any claims regarding possible breaches by Fujitsu of its contractual obligations in return for a payment of £150,000.[97] One of the conditions on which Fujitsu agreed to this settlement was the approval of CCN 1019 "*documenting the necessary changes to be made to the Codified Agreement in respect of data storage*".[98] PinICL PC0066318 was closed on 6 November 2002 and CCN 1019 was approved on 21 November 2002.[99]

OMISSIONS IN ARQ DATA CAUSED BY OPERATOR ERROR

64. In 2003, it was identified that data had been omitted from ARQ reports provided in response to three requests (ARQs 198, 199 and 200) relating to the Forest Gate branch received by Fujitsu on 23 July 2003 ("**Forest Gate ARQs**") and one request (ARQ 320) relating to the Urmston branch received on 1 December 2003 (the "**Urmston ARQ**").

65. In response to the Forest Gate ARQs, ARQ data was provided to POL by Beatrice Neneh Lowther (IT Security Analyst, Fujitsu) on 29 August 2003.[100] In September 2003, Ms Lowther provided a witness statement relating to the data provided. Ms Lowther explained that she had "*access to reports that monitor faults, polling failures, equipment failures and calls for advice and guidance*

[96] FUJ00176296
[97] FUJ00176305
[98] FUJ00176298; FUJ00176299; FUJ00176300; FUJ00176301; FUJ00176303
[99] FUJ00176304
[100] FUJ00121987

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logged by the Horizon System Helpdesk. During the 01 October 2002 to 31 January 2003, there were 13 calls from Forest Gate (FAD 100002) to the Helpdesk. None of these calls relate to faults which would have had an effect on the integrity of the information held on the system."[101]

66. Ms Lowther also provided an explanation of the process of extracting data in response to ARQs, including that "*[i]nformation is presented in exactly the same way as the data held in the archive although it can be filtered depending upon the type of information requested*". Ms Lowther further explained that "*Extraction's [sic] are only made by authorised individuals*" and are logged on the audit workstation and supported by documented ARQs.[102]

67. According to Ms Lowther's witness statement, she undertook extractions of data held on the Horizon system on various dates and at various times between 21 August 2003 and 26 August 2003, in response to the Forest Gate ARQs. The resultant data was copied onto CDs and exhibited to her witness statement.[103]

68. Ms Lowther also extracted data in response to the Urmston ARQ. This was provided to POL on 8 December 2003.[104]

69. On 13 May 2004, Graham Ward (Casework Manager, POL) notified Fujitsu that Ms Lowther would be required to attend trial in relation to the Forest Gate ARQs during the week commencing 21 June 2004.[105] However, as Ms Lowther was on GRO during this period,[106] POL's legal services team subsequently

[101] FUJ00121891
[102] FUJ00121891
[103] FUJ00121891
[104] FUJ00121995
[105] FUJ00121975
[106] FUJ00121988

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requested that an alternative witness statement was provided by Penelope Anne Thomas (IT Security Analyst, Fujitsu). Ms Thomas's witness statement was also to include "*an explanation as to how days were omitted from the original data supplied*".[107]

70. Between 13 and 27 May 2004, Ms Thomas re-extracted the relevant ARQ data in response to the Forest Gate ARQs, copied this to a CD and submitted it to POL on 27 May 2004.[108] Ms Thomas also provided an accompanying witness statement, dated 17 June 2004. In this witness statement, Ms Thomas stated that the CD provided on 27 May 2004 contained "*additional transaction data to that which was originally supplied in August 2003*".[109] In March 2004, Fujitsu received the following ARQ requests: ARQ 455, 456, 457 458, 459 & 460 of 0304. The requests noted that the witness statement prepared in response to the request should also "*refer to previous data supplied iro. of ARQ's 320 & 321.*"[110] Ms Thomas therefore undertook a similar process in relation to the Urmston ARQ.

71. Between 25 and 28 May 2004, William Leslie Mitchell (Security manager, Fujitsu) performed a comparison of the data extracted by Ms Lowther in 2003 and by Ms Thomas in 2004 in response to the ARQ requests received in respect of the Forest Gate and Urmston branches.[111] According to witness statements later provided by Mr Mitchell, the "*recreation of the data and the check was due to Beatrice Neneh Lowther's absence* **GRO** *and the possibility of a*

[107] FUJ00121975
[108] FUJ00121987
[109] FUJ00121987
[110] FUJ00176306
[111] FUJ00121988

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witness being required to attend a planned court date." The comparison revealed a set of omissions in the data provided by Ms Lowther in 2003.[112]

72. In an email dated 1 June 2004, Mr Mitchell provided Mr Ward with an "*update as to the root cause*" of the omissions, as follows:

    a. ARQs 198 and 200: These requests related to the period 14/10/2002 to 13/11/2002 (totalling 31 query days) and 12/12/2002 to 08/01/2003, (28 query days) respectively. The root cause for the omission of data from the August 2003 retrievals was "*that the retrieval was executed as a single task*" resulting in the volume of data retrieved exceeding the "*available limit of the Message Store area on the Audit Server*". This caused the Audit Server to "*randomly drop 11,135 data entries*" in relation to ARQ 198, affecting 10 query days. One query day was affected by the same issue in relation to ARQ 200.

    b. ARQ 199: This request related to the period 14/11/2002 to 11/12/2002 (28 query days). "*The root cause for the omission of data from this ARQ is when an ARQ is retrieved it is necessary to add additional days to the end of the requested date span to ensure a full and complete capture of the data which may have been harvested at different times. The operator should then confirm that an end of day log off is present and extract only the required data files. In this case the operator added two additional days to each ARQ, which is normally sufficient, but it appears did not confirm that an end of day log off was present, consequently an additional 235 data entries were*

[112] FUJ00121988

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not included in the data extraction. The affected date was 27 November 2002 – Partial, no end of day".

c. ARQ 320: "*[t]he root cause for the omission of data from this ARQ was the same as ARQ 199 and 200 above*".[113]

73. Mr Mitchell also noted in the 1 June 2004 email that Fujitsu had conducted checks in relation to a number of other ARQs for 16 other branches "*for which statements have been requested. No discrepancies have been found*".[114]

74. Mr Mitchell provided a witness statement setting out the above-mentioned explanations in relation to the Urmston branch (dated 14 June 2004) and the Forest Gate branch (dated 17 June 2004).[115] In these witness statements, Mr Mitchell concluded that the omissions made within the data provided by Ms Lowther had not been repeated in the ARQ data provided by Ms Thomas and that the latter data was complete in accordance with the original ARQ.[116]

2008 INCIDENTS RELATED TO RIPOSTE LOCK EVENT

Peak PC0152376

75. In or around December 2007, an incident was reported by a Post Office branch to the Network Business Support Centre ("**NBSC**") operated by POL. As recorded in Peak PC0152376 ("**Peak PC0152376**"),[117] the call was referred by the NBSC to Fujitsu. The NBSC informed Katrina Brooks (Helpdesk Support Technician, Fujitsu) that a "*BM stock unit had a gain of £465.73"* which *"did not*

[113] FUJ00172020
[114] FUJ00172020
[115] FUJ00121979; FUJ00121988
[116] FUJ00121979; FUJ00121988
[117] FUJ00154684

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go to local suspense". When the stock unit rolled over, the local suspense was cleared and the gain was not accounted for. The value of the gain was shown on the trading position line on the branch's trading statement. According to Peak PC0152376, the trading position line "*should always show zero*".[118]

76. On 21 December 2007, David Seddon (Technical Support Product Specialist, Fujitsu) recorded in Peak PC0152376 that the incident was found to have been caused when two processes were run together: the rollover process on counter 1 and various end of day ("**EOD**") processes running in the background. This caused a timeout, also known as a 'Riposte lock' (the "**Riposte EOD lock**").[119]

77. On 2 January 2008, Gerald Barnes (Software Developer, Fujitsu) attributed the Riposte EOD lock to the EPOSS code, describing it as "*not resilient to errors*". Mr Barnes noted that the problem was identified to be caused by a fix made to the relevant EOD process (known as the "**CABSProcess**") as part of a previous Peak PC0140715,[120] which caused CABSProcess to write out messages *"atomically*".[121] As I explain below, the Riposte EOD lock problem could affect the completeness of ARQ data, which raised potential implications for witness statements that Fujitsu employees had provided or would provide in relation to prosecutions brought by POL (the "**2008 ARQ Issue**"). This problem was found by the Post Office Account team (the "**POA**") investigating this matter at the time to have existed in Horizon's live estate between May 2007 and November 2008.[122]

[118] FUJ00154684
[119] FUJ00154684
[120] FUJ00155207
[121] FUJ00154684; FUJ00155396
[122] FUJ00155396

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78. In January 2008, a fix for Peak PC0152376 was proposed; however, as noted in Peak PC0152376, it was decided that this would not be rolled out "*given the rarity of the problem*".[123] According to an entry by Mr Seddon in Peak PC0152376, the need for a fix would be reviewed if the problem became more prevalent. In the meantime, a Known Error Log ("**KEL**") was created in relation to the problem ("**KEL dsed5628Q**").[124] Mr Barnes provided input on KEL dsed5628Q, noting that the CABSProcess only ran on "node 1" (*i.e.* the first counter at the branch), and postmasters working after 7pm should use any counter other than the first counter.[125] Peak PC0152376 was closed on 10 January 2008.

79. Peak PC0152421, a duplicate of Peak PC0152376, records that the branch was not "*out of pocket*" as the recorded loss was written off by POL. Further, a Business Incident Management System ("**BIMS**") report was issued to POL.[126]

Peaks PC0153009 and PC0152828

80. Two other Peaks were raised in early 2008 and contain references to PC0152376. It is unclear whether they relate to the Riposte EOD lock issue but they have been included in this statement for completeness.[127] Peak PC0153009 was raised in January 2008 and related to a Post Office branch with FAD 226242, where the postmaster was having difficulty with rolling over. The call was cloned (i.e., linked) to Peak PC0152828.[128]

[123] FUJ00154684
[124] FUJ00130827
[125] FUJ00155209
[126] FUJ00154686
[127] FUJ00155224
[128] FUJ00155211

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81. The incident was discussed in an email chain by various members of POA team members, including Mr Barnes, Michael Peach (Software Support Centre ("**SSC**") Manager, Fujitsu) and Steve Parker (SSC Support Manager, Fujitsu).[129] Mr Barnes, who was assigned to the Peak, described the problem as the branch being unable to rollover a stock unit. Mr Barnes analysed the problem and found that it had been caused by one corrupt transaction. Mr Barnes proposed a general fix so that DataServer could correct corrupt transactions, though he noted that the frequency of the problem's occurrence would dictate whether the fix would be required[130]. Mr Barnes also recorded on the Peak that he was "*not sure it is worth spending time improving the EPOSS version which is shortly to be replaced; it would be better spending the same effort making the HNGX version better. I had already requested that this be advised to the HNGX team in PC0152376*".

82. As noted in Peak PC0152376, in this instance, Mr Barnes corrected the corrupt transaction at the affected branch by running a patched DataServer, and the Peak was closed later that month once the affected branch confirmed that they had rolled over successfully.[131]

Peak PC0155120

83. Peak PC0155120 was opened on 6 March 2008 after the NBSC informed Fujitsu that a Post Office branch with FAD 485611 had reported that the default stock unit (which usually rolled over automatically) had failed to roll over.[132] Peak

[129] FUJ00155210
[130] FUJ00155210
[131] FUJ00155211
[132] FUJ00154685

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PC0155120 included a reference to KEL dsed5628Q and stated that it appeared the problem related to "*a rare timing issue*" where a software process ran at the same time as rolling over.[133] An Operational Change Request ("**OCR**") was approved by Fujitsu to correct the problem and the Peak was subsequently closed.[134] KEL kiangl823S was raised on 6 March 2008, which recorded the incident as effectively being "*a specific instance of KEL dsed5628Q*".[135]

Incident at the Craigpark branch (PC0158102)

84. In or around July 2008, it appears that there was an issue relating to a discrepancy at the Craigpark branch with FAD 141832. The issue was discussed at a Product & Branch Accounting workshop attended by POL and Fujitsu on 1 August 2008.[136] According to the "Actions" report from this meeting, Mike Stewart (Service Delivery Manager for On Line Services, Fujitsu) noted that a fix could be introduced, but "*what is being proposed for the bug fix […] if it were to go wrong could impact the whole estate so avoiding such a fix sounds like the correct decision*". It appears from the Actions report that an associated BIMS report was issued to POL.

85. On the same day, 1 August 2008, Anne Chambers (SSC Systems Support Specialist, Fujitsu) emailed Gareth Jenkins (Distinguished Engineer, Fujitsu) and Mr Stewart regarding the incident at the Craigpark branch.[137] In her email, Mrs Chambers explained that the incident caused a Riposte lock and that it had occurred once before at the same branch, but did not affect the branch balance

[133] FUJ00154685
[134] FUJ00154685
[135] FUJ00130476
[136] FUJ00155230
[137] FUJ00155245; FUJ00154683

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on the earlier occasion. Mrs Chambers noted the underlying problem was known, citing Peak PC0152376. Mrs Chambers further explained that while there was a fix available, "*given the low incidence of problems (and the errors introduced on the back of other fixes) it was decided not to implement*". However, Mrs Chambers suggested that "*since [they] have no way of monitoring for it, and [receipts & payments] mismatches may not be reported by the [sub-postmaster], this decision should be reviewed*".[138]

86. Mr Jenkins responded to Mrs Chambers on 4 August 2008 noting that he understood similar incidents would be flagged to Fujitsu through various processes, including generating a 'red event'.[139] Mr Jenkins suggested it might be more practical for Fujitsu to carry out weekly manual checks for the issue, and that this "*would be significantly less risky than a bug fix given the low number of occurrences.*" In particular, Mr Jenkins noted that he understood "*what is being proposed for the bug fix and if it were to go wrong [it] could impact the whole estate so avoiding a fix sounds like the correct decision*". However, given discussions that had taken place on 1 August 2008, Mr Jenkins explained that "*we need to be able to re-assure POL that we would spot any further occurrences and have a mechanism to correct the accounts (if necessary) even if we don't fix the root cause*".[140]

87. In a separate email chain, on 11 August 2008, Mr Jenkins notified Peter Sewell (Security Operations Manager, Fujitsu) of the issue at the Craigpark branch, stating "*Given we only have a couple of instances, and a fix is as likely to cause*

[138] FUJ00155245
[139] FUJ00155245
[140] FUJ00155245

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further problems, then we're reluctant to make a change to Horizon. However, if Horizon data is being used in evidence for the prosecution of a Postmaster, it is probably wise to check to see if any such events were produced during the period in question. Is this something that can / should be built into the ARQ process?".[141]

88. It appears that a meeting took place on 13 August 2008 attended by Mr Jenkins, Mr Sewell, Alan Holmes (Technical Design Authority, Fujitsu), Steven Meek (System Developer, Fujitsu) and Penelope Thomas (Security Analyst, Customer Services, Fujitsu) "*to discuss the issue of errors produced by [R]iposte […] in relation to the validity and integrity of data provided to [POL] under the ARQ agreement*." Ms Thomas prepared a note of the meeting dated 14 August 2008 ("**13 August Meeting Note**").[142]

89. According to the 13 August Meeting Note[143], Mr Jenkins explained the issue as follows: "*An EOD process (CABSProcess) was being run between 1900 and 2000 hours, and at the same time the user was performing a balancing process on the gateway PC. During the EOD operation the CABSProcess created a 'lock' on the messagestore during which time (30 seconds) causing any other message writes to wait, subject to a 10 second timeout, until the lock was released. The balancing operation attempted to write messages to the messagestore but this operation timed out and the messages were discarded. Due to a deficiency in the implementation of the counter code the end user was not informed of the failure and the transaction (the balancing operation) appeared to complete successfully. When this type of error happens Riposte records an event to the*

[141] FUJ00155233
[142] FUJ00154823; FUJ00154824
[143] FUJ00154824

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event log. It was said that this type of error could happen with any type of transaction."

90. The 13 August Meeting Note recorded, *inter alia*, (i) a set of follow-up actions that were agreed during the meeting to understand the types of transactions that were subject to the 2008 ARQ Issue, and (ii) that Fujitsu *"cannot provide any further ARQs until this exercise is complete as the audit server is being fully utilised retrieving the 5.5 years worth of Event log data. We must question whether it is advisable to provide further ARQ data or witness statements until we have a process in place to fully validate our returns. It was agreed that the process of retrieving all of the available Event logs would be carried out and this would start immediately.*"[144]

91. On 22 August 2008, Mr Stewart emailed Mr Jenkins and Mrs Chambers providing an update on his interactions with Shaun White (Branch Systems IT Advisor, POL) regarding the incident. In his email, Mr Stewart noted that Mr White was seeking further clarification of the causes of the Riposte EOD lock event at Craigpark to pass onto the POL Fraud team. On the same day, Mr Jenkins replied to Mr Stewart and noted that he and Roy Birkinshaw (Software and Solutions Development Manager, Fujitsu) would provide an update to Mr Stewart and Mrs Chambers in terms of communicating with POL.[145]

92. On 28 August 2008, Mr Birkinshaw circulated to Mr Jenkins and David Johns (Operations Manager, Fujitsu) a draft description of the Riposte EOD lock issue, which was purportedly targeted at the "*initial goal of defining the problem for*

[144] FUJ00154824
[145] FUJ00155245; FUJ00155238

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R&RMG management" and it was not intended for Post Office in its initial draft form.[146] The document noted the following: "*If the counter were to mis-handle a financial transaction, whilst simultaneously failing to write to the Riposte Message Store, this could have potentially serious implications on the integrity of the audit information supplied to Post Office.*"

93. On or around 3 September 2008, members of POA, including Mr Jenkins, Mrs Chambers, Mr Stewart and Mr Peach prepared an explanation of the incident at the Craigpark branch as requested by Mr White.[147] The agreed draft explanation included the following: "*We have identified two occurrences of this event in the last 2 years which have resulted in an accounting problem and the rest appear to be benign or had a minor effect which did not impact the branch accounts…We have a possible mitigation for the timing problem which has been identified. However, since there had only been 2 occurrences of the accounting problem in two years, it had been the decision of the Release Management Forum that the cost of implementing the mitigation would outweigh the potential benefit. This decision will be reviewed in the light of recent evidence as part of the normal process*".

Investigation and remediation of the 2008 ARQ Issue

Fixing the Riposte EOD lock problem

94. By reference to various email correspondence, during September 2008, it appears it was decided that a fix should be issued in relation to the underlying

[146] FUJ00155241; FUJ00155242
[147] FUJ00155246; FUJ00155247; FUJ00155252; FUJ00155248

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software bug relating to the Riposte EOD lock.[148] Mr Barnes, Mr Birkinshaw, John Burton (Programme Manager, Fujitsu), Mrs Chambers, Steve Evans (Systems Integration Team Leader, Fujitsu), Mr Jenkins, Mr Peach and Mr Seddon appear to have been involved in the decision and/or subsequent work that was undertaken to develop, prepare, test, and release a software code fix to the live estate (which was operating Legacy Horizon at the relevant time).[149]

95. As noted at paragraphs 75 to 79 of this statement, the Riposte EOD lock appears to have been first recorded in Peak PC0152376. Due to administrative reasons, however, related Peak PC0164429 was used as a means of delivering the software code fix.[150]

96. As the software code fix involved changes to Horizon's live estate, the creation and implementation of the fix was decided as part of the release management process, and authorisation to release the fix was given on 29 September 2008.[151]

97. As noted in the relevant Release Note[152], in or around October 2008, the software code fix was tested, and the fix was delivered to the Horizon live estate via release "T86" (Release number reference RNT8601).[153]

Review of the audit mechanism

98. In September 2008, the POA conducted a "*review of the audit mechanism and of the Horizon counter's behaviour*" (see, for example, FUJ00155253 and

[148] FUJ00155396
[149] FUJ00155258; FUJ00155259; FUJ00155261
[150] FUJ00155366; FUJ00155258; FUJ00155261
[151] FUJ00155366; FUJ00155486; FUJ00155258; FUJ00155261
[152] FUJ00155486
[153] FUJ00155486

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FUJ00155257).[154] The review involved Peter Ambrose (Technical Manager, Fujitsu), Mr Birkinshaw, Mr Burton, Mrs Chambers, Andrew Dunks (Information Technology Security Analyst, Fujitsu), Mr Evans, Mr A. Holmes, Mr Jenkins, Mr Johns, Mr Meek, Mr Sewell and Ms Thomas. The review appears to have involved (i) an analysis of some of the branches and counters with high incidents of the Riposte EOD lock problem, (ii) identifying, *inter alia*, where the problems associated with the Riposte EOD lock did and did not occur, and (iii) the SSC checking ARQs to determine whether the Riposte EOD lock had resulted in any financial or operational impact on the branch for the time period relating to the ARQ.[155] A working paper, titled "Analysis of Audit timeouts" appears to have been prepared as a result of the work undertaken as part of the review.[156]

99. In an email from Mrs Chambers to Ms Thomas dated 16 September 2008, Mrs Chambers explained that the Riposte EOD lock event would occur when one process had 'locked' the Riposte messagestore and another process tried to access the messagestore at the same time.[157] The CABSProcess, which would run at 7.00pm during the EOD procedures at the branch, was the "*worst offender*" for causing 'locking' to occur; however, event locks could occur in other ways.[158] Whether or not the Riposte EOD lock event could cause a financial or operational impact depended on what the second process was attempting to do, and whether the process handled the error situation appropriately.[159] Therefore, Mrs Chambers checked the ARQs provided by Ms Thomas to (i) identify the two

[154] FUJ00155253; FUJ00155257
[155] FUJ00155264
[156] FUJ00155256
[157] FUJ00155264
[158] FUJ00155264
[159] FUJ00155264

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processes involved, and (ii) assess whether the second process "*could conceivably have failed to handle the situation, and if so would it have any financial or operational impact*." It also appears that subsequent investigations into the Riposte EOD lock found that the "*atomic transaction*" that caused the CABSProcess to lock was not attempted in any other part of the EPOSS code.[160]

The change proposal for HNG-X

100. In or around October 2008, a change proposal was prepared in relation to HNG-X, which proposed the creation of an automated solution in HNG-X for the Riposte event log checks that were undertaken manually when ARQ requests were made by POL.[161] It is understood that these manual checks of the Riposte event log were introduced as a result of the 2008 ARQ Issue. The change proposal was titled "Enable analysis of Horizon Counter event messages within the HNG-X Audit solution", and it was later given the reference number CP0336 (also referred to as CP4867) ("**CP0336**"). CP0336 was also referred to as the "Counter Audit Change Proposal" or "Audit Strengthening Change Proposal". CP0336 was approved and implemented in or around July 2009, which is explained further at paragraph 116 of this statement.

101. CP0336 noted the "*current horizon tactical solution*" for retrieving archived data to respond to ARQ requests from POL was largely a manual process which was "*error prone & time consuming*", and that it required "*local & insecure storage of event audit data, invalidating certain standards made within the current witness statement*".[162] It appears, CP0336 proposed a more automated solution be

[160] FUJ00155396
[161] FUJ00155272
[162] FUJ00155272

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implemented in the HNG-X audit server and workstation applications to automatically retrieve and filter Horizon counter event log data when performing data retrievals in relation to branches operating Legacy Horizon or HNG-X. At the time, it also appears that those individuals involved in CP0336 considered that it was impracticable to introduce this change into the Legacy Horizon audit server given it was being replaced by HNG-X.[163]

102. CP0336 cited Peak PC0152376 as an example of the potential for the audit trail to contain instances of event messages which, in the event of an ARQ retrieval, needed to be analysed to understand if they were significant or not. CP0336 introduced a change in HNG-X's audit retrieval tooling.

103. The changes proposed in CP0336 in relation to the audit system included amending the audit server and workstation applications to automatically retrieve and filter event data when performing branch data retrievals (*i.e.* ARQs) in relation to branches operating Legacy Horizon and HNG-X.[164]

104. Mr Birkinshaw, Mr A. Holmes, Mr Evans, Mr Jenkins, Mr Meek, Howard Pritchard (Principal Security Consultant, Fujitsu), Mr Sewell and Ms Thomas were involved in the initial drafting and/or discussions in relation to CP0336 (see, for example, FUJ00155271, FUJ00155278, FUJ00155373 and FUJ00155380).[165]

The December 2008 Presentation

105. According to an email from Ms Thomas to Mr Sewell dated 1 December 2008, CP0336 raised concerns in relation to the ARQ process and provision of witness

[163] FUJ00155272
[164] FUJ00155272
[165] FUJ00155271; FUJ00155274; FUJ00155278; FUJ00155373; FUJ00155380

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statements provided by Fujitsu to POL as part of the prosecution support service.[166] It appears the persons involved in the initial drafting and discussions regarding CP0336 (noted above at paragraph 104) agreed that the proposed changes to the event checking process needed to be implemented.[167] As a result, in December 2008, a PowerPoint presentation was prepared titled "Prosecution Support Urgent Issue" ("**December 2008 Presentation**")[168], which appears to have been prepared in order to:

a. internally escalate the 2008 ARQ Issue and the concerns regarding the completeness of the transaction data on Horizon's audit archive that was being provided to POL as part of Fujitsu's prosecution support service (*i.e.* as part of the ARQ process); and

b. support the sponsorship within Fujitsu of budget to fund the developments summarised in CP0336.

106. It appears Ms Thomas prepared the December 2008 Presentation. Graham Allen (Application Development Manager, Fujitsu), Adam Cousins (Application Development Manager, Fujitsu), Mr Evans, David Hinde (Project Manager, Fujitsu), Mr A. Holmes, Mr Jenkins, Mr Pritchard and Mr Sewell also appear to have been involved or otherwise had sight of the December 2008 Presentation during its preparation.[169]

107. The December 2008 Presentation was presented to Steve Denham (Head of Service Management, Royal Mail Group Account, Fujitsu) at a meeting on 17

[166] FUJ00155373
[167] FUJ00155373; FUJ00155378; FUJ00155380
[168] FUJ00154835
[169] FUJ00155387; FUJ00154834

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December 2008.[170] Mr Denham attended the meeting on behalf of Wendy Warham (Operations Director, Royal Mail Group Account, Fujitsu).[171] Other attendees of the meeting appear to have included Mr Allen, Mr Cousins, Mr Evans, Mr A. Holmes, Mr Pritchard and Mr Sewell. [172]

108. Following the meeting, it appears Mr Denham was going to speak with "*Legal*" about the 2008 ARQ Issue[173]; however, to date, Fujitsu has not identified any documents or records as to whether Mr Denham contacted Fujitsu's in-house legal team or external legal advisors, and if so, what was discussed.

109. In January 2009, the POA team prepared a revised draft of the "standard witness statement" that Fujitsu provided POL in relation to ARQ data. This contained proposed amendments in relation to the 2008 ARQ Issue ("**Proposed Witness Statement**") (see, for example, FUJ00122592, FUJ00122593, FUJ00122596 and FUJ00122597).[174] Mr Allen, Mrs Chambers, Mr Denham, Mr Evans, Mr A. Holmes, Mr Jenkins and Ms Thomas were primarily involved in drafting or reviewing the proposed amendments, which included adding (i) an explanation of the event checking process, and (ii) a description of the 2008 ARQ Issue.

Fujitsu's notification to POL

110. On 7 January 2009, Ms Warham notified Sue Lowther (Head of Information Security, POL) and David Gray (Chief Technical Architect, POL) about the 2008 ARQ Issue via email[175]. In the email, Ms Warham provided a summary of the

[170] FUJ00155392; FUJ00155394; FUJ00155395
[171] FUJ00155385; FUJ00155394; FUJ00155395
[172] FUJ00154834
[173] FUJ00155394; FUJ00155395
[174] FUJ00122592; FUJ00122593; FUJ00122596; FUJ00122597
[175] FUJ00155399

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2008 ARQ Issue in similar terms to the description provided in the Proposed Witness Statement, and set out various steps that should be taken by Fujitsu and POL to address the issue, including:

a. checking the ARQs and confirming the data integrity in the period May 2007 to November 2008;

b. discussing and agreeing on how they disclose the 2008 ARQ Issue in the witness statements provided by Fujitsu to POL;

c. identifying witness statements Fujitsu had previously supplied and were still awaiting a court appearance to (i) confirm whether they were impacted by the 2008 ARQ Issue, and (ii) recall and replace impacted witness statements;

d. automating the messagestore alerts on the Horizon system so that manual intervention was not required, with apparent reference to CP0336; and

e. providing education to ensure that these types of incidents were raised as a major incident so that the communication and management of the incident was undertaken within relevant timescales.

111. On 7 January 2009, Ms Thomas forwarded Ms Warham's email to Dave Posnett (Casework Manager, Investigation Team, POL), attaching the Proposed Witness Statement.[176] Later that day, Mr Posnett emailed Ms Thomas, forwarding an

[176] FUJ00155399

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email exchange between Mr Posnett and Rob Wilson (Head of Criminal Law Team, POL) regarding the 2008 ARQ Issue.[177] Referring Ms Thomas to his email exchange with Mr Wilson, Mr Posnett stated: "*I would say Business As Usual re witness statements ie don't include the two additional paragraphs on the last page. If any issues materialize in due course, we can address then - suggest the ARQs for these 4 cases are assessed first.*"

112. On 8 January 2009, Ms Thomas forwarded Mr Posnett's email of 7 January 2009 to Ms Warham and Mr Denham (copying Mr Pritchard and Mr Sewell).[178] Referring the email recipients to Mr Posnett's email, Ms Thomas noted that "*POL clearly do not want the specific details of this incident included in the witness statement. I will hold off providing the 4 outstanding statements until our review is complete.*"

113. On 8 January 2009, it appears that relevant members of the POA also held a meeting where it was decided that POA would conduct a review to identify ARQs that may have been affected by the 2008 ARQ Issue (see, for example, FUJ00155402 and FUJ00155400).[179] Mr Allen, Mr Barnes, Mrs Chambers, Mr Denham, Mr Evans, Mr A. Holmes, Mr Peach, Mr Pritchard, Ms Thomas and Ms Warham were primarily involved in this review, which included the following steps:

    a. Fujitsu's audit team compared a list of ARQs prepared by the Security team with relevant event data limited to events occurring between 1 May 2007 and 30 November 2008 that were logged between 7pm and

[177] FUJ00155400
[178] FUJ00155400
[179] FUJ00155402; FUJ00155400

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7.10pm, which were logged by counter one at the relevant branch[180]. As a result of this work, 27 instances of the 2008 ARQ Issue were identified[181]; and

b. the SSC then undertook further checks in relation to these 27 instances to confirm whether the Riposte EOD lock had impacted the transactions or balancing carried out by the Post Office branch. To undertake these checks, the SSC reviewed the SSC event archives, Riposte messagestores, and Riposte event/transaction logs (where these were available).[182] Following these checks, it appears the SSC concluded none of the 27 instances of the 2008 ARQ Issue identified by the audit team had impacted the transactions or balancing carried out at the relevant branches.[183]

114. On 4 February 2009, Ms Thomas emailed Mr Posnett[184] and confirmed the following:

a. Fujitsu's checks in relation to the ARQs for the period 1 May 2007 to 30 November 2008 had been completed, which involved checking the event logs in relation to 195 ARQs that fell within this timeframe;

b. 27 instances of concern had been identified, which had been fully analysed, and Fujitsu could confirm the locking issue had been

[180] FUJ00155418
[181] FUJ00155418; FUJ00155419
[182] FUJ00155422; FUJ00155418; FUJ00154839; FUJ00155409
[183] FUJ00155418
[184] FUJ00155420

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caused by "*contention between the EOD process and a Riposte checkpoint being written*";

c. following the analysis of the 27 instances of concern, no transactions or balancing activities carried out at the relevant branches had been found to have been affected;

d. a change proposal had been raised to "*automate the event checking process*", which appears to be a reference to CP0336; and

e. the "*standard witness statement*" had been reviewed and no reference had been made to the "*locking issue*", but minor revisions had been made.[185]

115. Mr Denham, Mr Pritchard and Mr Sewell were involved in drafting or otherwise had sight of Ms Thomas' email to Mr Posnett (see, for example, FUJ00155422).[186]

The implementation of CP0336

116. CP0336, which is described at paragraphs 104 to 108 above, was finalised and passed in March 2009. Mr Denham, Mr Hinde, Mr A. Holmes, Mr Sewell, Ms Warham and Guy Wilkerson (Commercial Director, Royal Mail Group Account, Fujitsu) appear to have been primarily involved in the preparation and approval of CP0336, which was raised on or around 26 February 2009 and approved internally by Fujitsu on or around 31 March 2009[187]. The changes referred to in

[185] FUJ00155421
[186] FUJ00155422
[187] FUJ00155474

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CP0336 appear to have been implemented as part of HNG-X Release 2 in or around July 2009[188], following a period of testing which involved teams at Fujitsu and POL[189].

DUPLICATE TRANSACTIONS

117. The Inquiry has asked for details of the Duplicate Transactions incident, first identified in 2010. I also address apparent known recurrences of the incident in 2014 and 2016.

2010 Incident

118. On 21 June 2010, Penny Thomas (Security Analyst, Fujitsu) raised Peak PC0200468 'Horizon Audit Spreadsheet Producing Duplicate Transactions' as an 'A priority', as she had identified duplicate transaction records in an ARQ return during an audit retrieval for branch 072128.[190] The Peak was assigned to Gerald Barnes (Software Engineer, Fujitsu).

119. On 23 June 2010, Ms Thomas shared an initial report on the Peak with Graham Welsh (Application Services, Post Office Account, Fujitsu), Gaetan Van Achte (Service Director, Royal Mail Group Account, Fujitsu), Donna Munro (Security Operations Manager, Fujitsu), Peter Thompson (Head of Service Operations and Applications, Fujitsu), Gareth Jenkins (Applications Architect, Fujitsu) and Alan Holmes (Service Delivery Manager, Fujitsu).[191] The report noted that under Legacy Horizon, duplicate records were held in the source Transaction

[188] FUJ00155490
[189] FUJ00155511
[190] FUJ00097038; FUJ00097058; FUJ00172183
[191] FUJ00097038; FUJ00097057; FUJ00097058

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Management Service ("**TMS**") file on the Audit server under "*what was thought to be 'exceptional circumstances'*";[192] when the Audit application was in use, Riposte would not record duplicate messages in the reconstructed message store, and so transactions were not duplicated on the ARQ returns. However, the HNG-X application did not identify or discard duplicated records, resulting in the problem of duplicate transactions appearing in ARQ returns (Peak PC0200468).

120. Ms Thomas' report further stated that an analysis conducted the day before (22 June 2010) had identified that one third of ARQ returns generated under the HNG-X application had duplicate transactions.[193]

121. Ms Thomas' report recorded that a discussion had taken place between Mr A. Holmes, Mr Jenkins and Ms Thomas. The various actions agreed during that discussion were:

    a. To report Peaks PC0200468 and PC0194639 (see paragraph 123) to Pat Lywood (Service Implementation Manager, Fujitsu) "*to be identified in CS Prayers as urgent*".[194]

    b. As an interim measure, to incorporate the unique identifier NUM in ARQs to identify duplicate transactions / unique sequence numbers.[195]

    c. Mr Jenkins was to draft a statement for management review detailing the issue for transmission to POL.[196]

[192] FUJ00097058
[193] FUJ00097058; FUJ00172183
[194] FUJ00097058
[195] FUJ00097058
[196] FUJ00097058

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d. A separate issue was identified whereby a duplicated transaction had a different 'NUM', which Mr Jenkins agreed to review. [197] With respect to this particular issue:

(i) In an email of 23 June 2010, Mr Jenkins wrote to Ms Thomas and Mr A. Holmes, "*I've had a look at the Mails duplicate. I think it is OK. I've sent the extract to Richard O'Neil in Crew to confirm that this is normal*."[198] In a summary of the duplicate transaction issue he wrote "*we have identified scenarios with Postal services transactions where (details tbs) which result in different transactions appearing to be duplicates*".[199]

(ii) On 24 June 2010, Mr Jenkins emailed both again, "*I've now confirmed that the Mails duplicate is OK*" and amended the summary of the duplicate transaction issue:

"*we have identified a scenario with Post Services transactions where multiple, identical mails items are accepted (ie the Quantity button is set to greater than 1), but Postage Labels are printed for each individual item. This results in separate transactions being generated for each item, which are identical in the ARQ extracts (there is another minor different [sic] in the raw data apart from the*

[197] FUJ00097058
[198] FUJ00172043
[199] FUJ00172043

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<Num< attribute, but this different attribute is not currently included in the ARQ extract)".[200]

122. The report also noted the need to identify the cases which had progressed to prosecution since HNG-X had been live, and whether duplicate records had been included in support evidence. The report references an initial review in which West Byfleet (R v Misra) and Porters Avenue (R v Hosi) had been identified.[201]

123. In an internal Fujitsu email chain on 23 June 2010, Ms Thomas reported Peak PC0200468 to Ms Lywood. In her email, Ms Thomas noted that the problem recorded in Peak PC200468 was a "*very significant problem*", and that "*In a nut shell the HNG-X application is not removing duplicate transactions (which may have been recorded twice on the Audit Server) and they are appearing in the ARQ returns*".[202] She also noted that the steps taken following a previous Peak (PC0194639) were supposed to highlight any duplication of records, but this did not appear to be happening.[203]

124. Peak PC0194639 had been raised on 16 February 2010 by Andrew Mansfield (Audit Development, Fujitsu) as there had "*been cases recently of HNG-X messages appearing in the audit files with duplicate JSNs (Journal Sequence Numbers – message numbers)*" as a result of "*an issue with the counter software*" but not being reported clearly to the audit client user.[204] A fix was attributed to the Peak "*to highlight any problem with duplicate message numbers and make it*

[200] FUJ00176310
[201] FUJ00097058
[202] FUJ00097038
[203] FUJ00097038
[204] FUJ00176307

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obvious to the user".[205] On 14 June 2010, the same fix was attributed to the Peak again. Documents relating to the underlying issue in Peak PC0194639 (i.e., the duplicate JSN issue) have been separately disclosed to the Inquiry.[206] Copied in this email chain, Graham Allen (Applications Engineering Manager, Fujitsu) asked Mr A. Holmes, Adam Spurgeon (Data Centre Development Manager, Fujitsu), and Mr Mansfield whether there were fixes for the Peaks, and if not, how long it would be before they would be ready.[207] With respect to Peak PC0200468, Mr Mansfield responded that Mr Barnes had started testing a fix to remove the duplicated messages from the Horizon transaction data.[208] With respect to Peak PC0194639, he noted that the Peak was less serious as the purpose of the Peak was to clearly highlight where duplicates had been found.[209] A fix would take two to three days and would require a change to workstation applications only.

125. On 24 June 2010, Ms Thomas updated various members of the Fujitsu team working on this issue with a more detailed analysis of the ARQs that had been affected by email. This analysis stated that:

    a. 112 ARQs had been affected;

    b. 17 ARQs highlighted one or two instances which indicated bona fide activity;

    c. 7 ARQs were works in progress;

[205] FUJ00176307
[206] FUJ00165083; FUJ00165082; FUJ00157889; FUJ00170220; FUJ00093048; FUJ00142164; FUJ00142160; FUJ00172032; FUJ00142157; FUJ00091790; FUJ00172090; FUJ00142162; FUJ00142158; FUJ00097072; and FUJ00172031
[207] FUJ00097038
[208] FUJ00097038
[209] FUJ00097038

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d. 12 ARQs had been involved in two court cases;

e. 8 ARQs had been involved in three court cases where witness statements had been requested by POL, but not yet provided; and

f. Court activity was not known in relation to 76 ARQs.[210]

126. In the same email, Ms Thomas also provided an explanation of the problem and suggested a workaround that had been drafted by Mr Jenkins for POL.[211] Mr Welsh responded that he saw no issue with the content of the report and was pleased to have a workaround.[212]

127. Guy Wilkerson (Commercial Director, Fujitsu) responded by asking whether the duplicated transactions would affect charges against Sub-Postmasters,[213] and Mr Jenkins advised that "*any detailed analysis of the finances of a Branch which is done with duplicate transactions without realising that there are duplicates (and so removing them) will give incorrect results*" (including analysis of stock units, cash on hand analysis and possibly the sum of all transactions).[214] Mr Wilkerson recommended that Alan D'Alvarez (Programme Director, Fujitsu) or Geoff Butts (HNG-X Release 1 Programme Manager, Fujitsu) of the HNG-X team look at the issue, and agreed with Ms Thomas that she should "*hold off*" advising her counterpart at POL of the issue "*just until [they] get a chance to speak the HNG-X team tomorrow*". [215]

[210] FUJ00097039
[211] FUJ00097039
[212] FUJ00172044
[213] FUJ00097039
[214] FUJ00097039
[215] FUJ00097039; FUJ00153121

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128. After Ms Thomas confirmed to Mr Butts and Mr Wilkerson that she would not communicate with POL regarding the issue, she expressed her assumption that any duplicate records presented to court would need to be replaced.[216] Attached to her email was a list of ARQs and witness statements, highlighting the then ongoing cases relating to Porters Avenue (R. v Hosi) and West Byfleet (R. v Misra).[217] Additional Post Office branches (High Wycombe, Kirkoswald, New Cheltenham, Castleton, Rinkfield, Shefford and Wokingham) were highlighted green with the note: "*1 or 2 instances which indicates bone fide activity*".[218]

129. Mr Welsh forwarded Ms Thomas' email to Ms Lywood describing the problem to a wider Fujitsu team (including Mr D'Alvarez, Mr Allen, Mr Van Achte, Mr Butts, Mr Thompson, Mark Andrews (Account Manager, Fujitsu), Vince Cochrane (Head of Infrastructure and Migration, Royal Mail Group Account, Fujitsu), James Davidson (Operations Executive, Fujitsu), and Debbie Richardson (Programme Test Manager, Post Office Account, Fujitsu)).[219] Mr Welsh wrote of the problem, "*duplicate records that can not [sic] be differentiated are supplied as evidence. Thus could allow for legal challenge to the integrity of the system*".[220] Mr Allen copied Mr Jenkins into the email chain as he had "*identified a workaround*".[221] Mr Jenkins responded that he was not sure whether the workaround would be acceptable to POL prior to review by the HNG-X team.[222]

130. Mr Wilkerson forwarded the email exchanges on the issue to Peter Beresford (Sourcing Manager, Fujitsu) (also on 25 June 2010), stating, "*I don't want to be*

[216] FUJ00153121
[217] FUJ00153122
[218] FUJ00153122
[219] FUJ00097038
[220] FUJ00097038
[221] FUJ00097038
[222] FUJ00097038

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telling POL that they can't rely on Branch numbers or that there's a risk of more complaints from Post masters. They could regard this as a serious issue and delay acceptance on HNG-X. Geoff Butts tells me he's aware and that they are working on a permanent fix."[223] Mr Butts forwarded this to David Cooke (Service Level Manager, Fujitsu) (with Mr Andrews, Mr Allen, Mr Welsh and Mr Jenkins in copy) warning, "*this may become an Acceptance Incident*" and explaining that Mr Jenkins was assessing the viability of the workaround but there was no capacity to include a fix within HNG-X Release 1.[224] Mr Jenkins confirmed that the workaround would require Fujitsu to inform POL of the problem and "*since this does relate to evidence used for prosecutions, […] now we know there is an issue we do need to tell POL about it asap*."[225]

131. On 30 June 2010, Ms Thomas emailed Sue Lowther (Head of Information Security, POL), Mark Dinsdale (Security Programme Manager, POL) and Jane Owen (Security Team Advisor, POL) informing them of the duplicate transaction records problem.[226] She explained that with the upgrade from Legacy Horizon to HNG-X, the HNG-X data retrieval mechanism did not remove duplicated data in the ARQ extracts and, from a review of the ARQs provided to POL since the change to HNG-X, it had been indicated that approximately 35% of the ARQs might contain some duplicate data.[227]

132. Following a call with Mr Dinsdale, Ms Owen and Alan Simpson (Information Security Incident Senior, POL) on 2 July 2010, Ms Thomas forwarded notes of

[223] FUJ00097061
[224] FUJ00097061
[225] FUJ00097071
[226] FUJ00121097
[227] FUJ00121097

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the call to the Fujitsu team (Tom Lillywhite (Principal Security Consultant, Fujitsu), Ms Munro, Mr Thompson, Mr Welsh and Mr Jenkins).[228] The notes of the call confirmed that affected ARQs were used in the Porters Avenue and West Byfleet cases (R. v Hosi and R. v Misra).[229] The notes state that ARQs had been provided to the defence expert in the cases, but there was uncertainty about whether the ARQs had been presented to the Court already, which may have necessitated the provision of replacement data.[230]

133. On 1 July 2010, Mr Allen followed up with Mr Mansfield regarding the fix for Peak PC0200468.[231] The Peak was with the Release Management Forum for approval and scheduling, as it was reported that Mr Barnes had produced a fix for HNG-X Release 1 which was ready to go.[232] He had added an impact statement to the Peak, including a brief statement on testing.[233] Mr Mansfield further noted that a possible workaround, being discussed by Ms Thomas and POL, involved "*modifying the audit queries so that the message numbers are included in the output to the spreadsheets (currently they are not). This would allow the duplicate messages to be identified and removed by running a macro on the final spreadsheet generated by the application.* "[234]

134. Ms Thomas asked Mr Welsh for his help with Peak PC0200468 on 5 July 2010 as "*POL have gone to POL legal for guidance and further returns have been identified this morning as bound for Court.*"[235] Mr Welsh forwarded this request

[228] FUJ00121097
[229] FUJ00121097
[230] FUJ00121097
[231] FUJ00172046
[232] FUJ00172046
[233] FUJ00172046
[234] FUJ00172046
[235] FUJ00172046

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to Mr Butts and Sheila Bamber (Release Manager, Fujitsu) (copying Mr Lillywhite) asking for confirmation as to when the fix could be fitted, as "*there are more court cases pending and whilst the Briefing to the Investigation has taken place they are coming back requesting help due to the level of activity and nervousness regarding the current work-a-round.*"[236] Ms Bamber responded that it would take three days' work to take the fix with HNG-X Release 2.[237] Mr Mansfield confirmed that Mr Barnes could merge the fix into the HNG-X Release 2 code and deliver the fix by 7 July 2010.[238] Chris Hammond (Major Release Manager, Fujitsu) confirmed this would be deployed on 10 July 2010 with all other HNG-X Request 2 baselines.[239] On 7 July 2010, Mr Barnes emailed a wider Fujitsu team (Ms Bamber, Mr A. Holmes, Mr Mansfield, Mr Spurgeon, Peter Okely (Application Services, Fujitsu), Vijesh Pandya (Integration Team Leader, Fujitsu), Matthew Swain (Integration Team, Post Office Account, Fujitsu) and Nigel Taylor (Integration Team, Fujitsu)) stating that an Audit baseline for Peak PC0200468 was ready for build.[240]

135. On 7 July 2010, FSL and POL agreed to amend the standard FSL witness statement (the "**Amended Standard Witness Statement**") that accompanied ARQ data to include the wording: "*the duplication of audited records has not, in any way, affected actual physical transactions recorded on any counter at any outlet. The duplication of records has occurred during the auditing process when records were in the process of being recorded purely for audit purposes from the correspondence servers to the audit servers. It should be noted that this*

[236] FUJ00172046
[237] FUJ00172046
[238] FUJ00172046
[239] FUJ00172046
[240] FUJ00172045

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duplication of data in the audit stream has always been happening. However the Horizon retrieval process automatically discarded duplicate records before creating the ARQ spreadsheets, while the current HNG-X retrieval process for Horizon data does not do so".[241]

136. Ms Thomas and Mr Jenkins reviewed this updated language and shared it with Mr Lillywhite and Mr Wilkerson.[242] POL had also suggested that Mr Jenkins complete the witness statement as the Fujitsu expert witness, to which Ms Thomas commented that this would not fit into the current service agreement and it would not be feasible for him to provide all witness statements going ahead.[243] Attached to her email was a standard witness statement including the modified wording regarding duplicate transactions,[244] which had previously been reviewed by Mr Jenkins.[245]

137. In the 7 July 2010 email correspondence, POL also requested that Fujitsu "*provide a witness statement to quantity the above that [they] could attach to each case (as appropriate), and treat each case where this is not accepted individually*".[246] On 8 July 2010, Ms Thomas informed Mr Jenkins that she and Mr Wilkerson had discussed an "*additional statement regarding duplicate records*".[247] Mr Wilkerson had initially suggested that Ms Thomas include the following statement in her witness statement: "*The Audit Mechanism cannot alter the base information and therefore a re-running of the audit process will always produce the same result*", which she incorporated in an updated pro forma

[241] FUJ00122901
[242] FUJ00122901
[243] FUJ00122901
[244] FUJ00122902
[245] FUJ00122899
[246] FUJ00122901
[247] FUJ00122907

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witness statement.[248] However, Ms Thomas noted to Mr Jenkins that that Mr Wilkerson was of the view that "*if [POL] wanted an expert witness statement we should provide* [sic]*".* In addition, Mr Wilkerson had "*said that a CR would need to be raised by POL but when he realised it would only be for a short while and that we needed one pretty soon for Kirkoswald he though[t] we could provide this FOC*."[249] Ms Thomas explained that if Mr Jenkins was happy to provide such a statement (the "**Draft Additional Duplicate Transactions Witness Statement**"), she would remove the extract Mr Wilkerson had proposed from the standard statement.[250]

138. In addition to various drafting notes, the Amended Standard Witness Statement included the below wording, which explains that HNG-X did not de-duplicate records in ARQ extracts as Legacy Horizon had:[251]:

> *"With Horizon counters, the mechanism by which Data is audited has always worked on the principle that it is acceptable to audit the same data more than once – in particular if in doubt as to whether or not it has been previously audited successfully. The Mechanism used on Horizon to retrieve the audit data took this into account and only presented one instance of such duplicate data in the ARQ extracts. The Audit Mechanism cannot alter the base information and therefore a re-running of the audit process will always produce the same result.*
>
> *In January 2010 a new HNG-X application was introduced to filter transaction records for presentation to Post Office Limited. It has recently been noticed that*

[248] FUJ00122908
[249] FUJ00122907
[250] FUJ00122907
[251] FUJ00176311; FUJ00122907

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this HNG-X retrieval mechanism does not remove such duplicates. An enhancement to the extraction toolset will be developed, tested and deployed and will remove such duplicate data in the future. However until this enhancement is deployed, there is a possibility that data is duplicated. The reliable way to identify a duplicate transaction is to use the <Num> attribute that is used to generate the unique sequence numbers. This will be included in all future transaction record returns until the retrieval mechanism is enhanced. A semi-automated process to copy the returned data, and then to identify and remove any duplicated records which may be present from this copy by using the <NUM> attribute, has been agreed with Post Office Limited for use in the interim period. It is emphasised that the duplication of audited records has not, in any way, affected actual physical transactions recorded on any counter at any outlet. The duplication of records has occurred during the auditing process when records were in the process of being recorded purely for audit purposes from the correspondence servers to the audit server."[252]

139. Later the same day (8 July 2010), Ms Thomas emailed Mr Jenkins that she had prepared a Draft Additional Duplicate Transactions Witness Statement for him, [253] to which he responded, "*that looks fine and I would be happy to sign that if needed*"[254]. The statement included the wording set out at paragraph 138 above.

140. In response to POL's email on 7 July 2010 agreeing to the amended witness statement wording and the introduction of the Draft Additional Duplicate Transactions Witness Statement, Ms Thomas emailed to POL a copy of the Draft

[252] FUJ00122908
[253] FUJ00122914; FUJ00122915
[254] FUJ00176312

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Additional Duplicate Transactions Witness Statement for POL's review.[255] Ms Thomas forwarded this correspondence to John Longman (Security Advisor, POL), who responded that he was happy with the statement as "*it confirms that [the duplicate transactions issue] has no affect [sic] on Horizon's accuracy. I have added an extra paragraph to tie it in with the trial of Seema Misra and confirm that only ARQ447 has any duplications within the disc you produced as PT/02*."[256] Ms Thomas forwarded Mr Longman's comment to Mr Jenkins with a revised copy of the Draft Additional Duplicate Transactions Witness Statement,[257] noting that the additions made related directly to West Byfleet (R v Misra).[258] Mr Jenkins responded "*This look[s] fine. Do you want me to pop up and sign it with you as a witness?*" and Ms Thomas confirmed that was okay.[259] On 15 July 2010, Ms Thomas replied to Mr Longman "*we're happy with your addition*" and arranged for postage of the signed Draft Additional Duplicate Transactions Witness Statement to POL.[260]

141. The fix to Peak PC0200468 was successfully deployed with HNG-X Release 2 and the Peak was closed on 1 September 2010. Peak PC0194639 was closed on 16 December 2010.[261]

2014 Incident

142. On 19 May 2014, Kathryn Alexander (Network Support BAU Area Manager, POL) emailed Alistair Kay (Project Manager, Post Office Account, Fujitsu) asking

[255] FUJ00122928; FUJ00122929
[256] FUJ00122928
[257] FUJ00122929
[258] FUJ00122928; FUJ00122929
[259] FUJ00153145; FUJ00176313
[260] FUJ00153133
[261] FUJ00176307

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for help as ARQs for Caereithin FAD 166642 "*appear to have duplications on certain months and from certain time in the day [sic]*".[262]

143. On 20 May 2014, Jason Muir (Security Operations Analyst, Fujitsu) emailed Mr Barnes and Mr A. Holmes for advice as six ARQs he had run "*returned duplicate data*".[263] Mr Barnes responded, "*duplicates are OK for Horizon – sometimes multiple copies of the data were stored*".[264]

144. On 21 May 2014, Mr Muir asked Mr Barnes to prepare an explanation for Fujitsu to share with POL explaining the reason for duplicate data that had arisen in ARQ data sent and "*alleviate any fears that may have arisen over the data*".[265] Mr Muir reported that the latest occurrence of this was in ARQ 051-056 Caereithin FAD 166642 on 9 May 2014. Mr Barnes described the issue (with Mr Kay, Andy Dunks (Associate Service Manager, Fujitsu), Kumudu Amaratunga (Security Operations Manager, Royal Mail Group Account, Fujitsu), Mr Spurgeon and Brain Lea (Software and Solution Developer, Post Office Account, Fujitsu) in copy) as being a problem with Riposte where transactions were occasionally duplicated in different files, adding "*it is almost certain that all the other duplicates are identical too but to be thorough you should really check each and every one*."[266] He emphasised "*The key point is duplicate identical transactions are a known issue which does not matter. However you need to confirm that you have*

[262] FUJ00176323
[263] FUJ00176322
[264] FUJ00176322
[265] FUJ00172085
[266] FUJ00172085

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not got duplicate transactions which are not identical because that would be a new issue of concern".[267]

145. Mr Kay asked Mr A. Holmes whether he had anything to add to Mr Barnes' statement, bearing in mind this would be reported to POL.[268] Mr A. Holmes added more detail on the reason for duplicates: "*Under old Horizon, Riposte Audit data was extracted from the correspondence servers (central transaction data repositories) by an agent harvester process. These were then written as flat files which were picked up and secured by the audit server. The design of this harvester was such that duplicate records were allowed to be included in the files. This would only happen in exception conditions and basically operated as a fail safe i.e. err on the side of including duplicates rather than potentially losing data. The design of this harvester, and the fact that duplicates may appear is described in a very old Horizon document: "High Level Design of Common Agents" AD/DES/042 §2*".[269]

146. On 22 May 2014, Mr Kay replied to Ms Alexander's email of 19 May 2014, "*we identified two files containing the duplicate transactions and confirmed that the first 4 duplicates and the last duplicate were all identical transactions. It is almost certain that all the other duplicates are identical too.*"[270] He further included the explanations provided by Mr Barnes at 144, specifically that "*the key point is duplicate identical transactions are a known issue that does not matter*", and by Mr A. Holmes as outlined in 145 above.[271]

[267] FUJ00172085
[268] FUJ00172085
[269] FUJ00172085
[270] FUJ00176323
[271] FUJ00176323

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2016 Incidents

147. On 7 April 2016, Mr Dunks emailed Mr Barnes and Mr Muir (with Steve Goddard (Software Development Manager, Fujitsu) copied) noting that a duplicate was showing on a summary sheet, copied in the email.[272] Mr Barnes responded, "*it is something to be concerned about*", and a Peak should be raised.[273] He added "*I am copying all the transaction files to the local disk of an audit workstation right now. I have already got on a USB stick two files which contain the first set of duplicates so that can be examined […] I have studied the first message, 5026965, in detail and it looks like the complete and same transaction is in both files.*"[274]

148. Mr Dunks raised Peak PC0250729 on 8 April 2016 with the comment "*some of the data spread sheets that are generated via the audit retrieval process are showing a number of duplicates on the summary sheet*".[275] The Peak was allocated to Mr Barnes who added "*the reason for these duplicates needs to be identified before the prosecution team submits its spreadsheets*".[276] On 11 April 2016, Mr Barnes investigated the 'AUD' files generated on the 24 October 2015, and found they had gathered twice "*due to an error in the process of migrating the share on which they lay from one platform to another*".[277] Peak PC0250729 was closed on 26 April 2016 by Mr Muir with the comment "*ARQ data sent to POL*".[278]

[272] FUJ00172086
[273] FUJ00172086
[274] FUJ00172086
[275] FUJ00173072
[276] FUJ00173072
[277] FUJ00173072
[278] FUJ00173072

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149. On 14 July 2016 Farzin Denbali (Security Operations Analyst Post Office Account, Fujitsu) wrote to Mr A. Holmes, "*as we discussed a few days ago, there are a large number of duplicate records in an ARQ output for FAD 173458*" and asked him to investigate the issue.[279] Mr Denbali also asked whether he could send the ARQ to POL, to which Mr A. Holmes replied "*no, don't send the stuff to POL until we know what's going on.*"[280] Later the same day (14 July 2016) Mr Denbali shared a file with Mr A. Holmes in an email chain entitled 'duplicate records in ARQ output'.[281]

150. On 14 July 2016, Mr Goddard forwarded Mr Dunks' email and the subsequent correspondence regarding duplicate transactions (document FUJ00172086) to Mr A. Holmes and noted "*it turned out that the share on which they sat was migrated that day and the audit configuration file was modified by hand with two separate paths to the same migrated share which caused the files to be copied twice. It was incorrect procedure to modify the audit configuration files by hand.*"[282] Mr A. Holmes forwarded the correspondence again, to Mr Denbali, adding "*Farzin – your problem with duplicates in an ARQ is another occurrence of the problem detailed below*", and asked Mr Dunks how the issue was "*worked around last time*".[283] Mr Dunks could not remember and deferred to Mr Barnes, but Mr A. Holmes responded "*there a couple of approaches we could take to work around this and get the ARQ completed, but I think that it is better that we wait until Gerald comes back on Monday and check what we did last time so we can adopt a consistent approach. This problem is going to occur again for any*

[279] FUJ00176324
[280] FUJ00176326
[281] FUJ00176327; FUJ00176328
[282] FUJ00172086
[283] FUJ00172086

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ARQs that overlap the date range 23rd – 25th Oct 2015. It would be a good idea to add this, and the eventual workaround, to your list of 'problem cases' for reference the next time it crops up."[284]

151. On 15 July 2016, Mr Muir responded to the email chain attaching emails relating to the 2014 Incident.[285] He wrote that the reason for the duplicate records in 2014 appeared to be different to the reason for the 2016 duplicate records, but that Fujitsu "*never highlighted the duplicates to them back in 2014 and I don't recall they ever queried it*".[286] While Mr Muir made this statement at the time, it is apparent from the contents of FUJ00176323 that Fujitsu did provide POL with an explanation as to the duplications in the 2014 Incident.[287] Mr Muir suggested completing a check that had been suggested by Mr Barnes at the time of the 2014 Incident, and confirm that the duplicate transactions were identical, as if they were not identical, this would be "*a new issue of concern*".[288] Mr A. Holmes responded "*the reason behind the 2014 duplicates will be different to this case.*"[289]

152. On 18 July 2016, Mr Barnes replied to Mr Dunks' email of 14 July 2016 asking him how the 2014 Incident had been resolved, "*if you redo the queries as slow ARQs then you can produce the spreadsheets but with the duplicates listed. You then need a separate explanation to be [sent] to the Post Office as to why there are dupplicates* [sic] *in this case.*"[290] Mr Muir replied, "*far as we can see the*

[284] FUJ00172086
[285] FUJ00172086; FUJ00172087
[286] FUJ00172086
[287] FUJ00176323
[288] FUJ00172086
[289] FUJ00176329
[290] FUJ00216439

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duplicate records are already showing in the ARQ data. We will send the data to POL with a covering statement to explain why there are duplicate records."[291]

HISTORIC GAPS IN ARQ DATA

153. In preparing this corporate statement, Fujitsu has identified a small number of documents in relation to this topic that had not previously been disclosed to the Inquiry. These documents are exhibited to this statement.[292]

154. On 1 December 2021, Paul Gauntlett (Customer Solution Architect, Fujitsu) emailed Steven Browell (Chief Information Security Officer, Fujitsu), with other Fujitsu personnel in copy (namely Gerald Barnes (Software Engineer, Fujitsu), Manisha Mistry (Service Delivery Manager, Fujitsu) and Phil Boardman (Service Architect, Fujitsu)) regarding a "*Historical Issue with Audit Data*" (the "**Historic ARQ Gaps Issue**"). Mr Gauntlett explained that, during a meeting with John Nelis (Problem Manager, POL) and Dean Bessell (POL) the previous day, an issue was discussed regarding audit data gathered prior to 2010 existing only on one audit server and not both. Mr Gauntlett was asked to write up what was communicated to POL during this meeting, so POL could discuss this with their legal team. Mr Gauntlett prepared a draft write-up, in relation to which Mr Boardman, Mr Barnes and Mr Browell provided input.[293] According to this write-up:[294]

    a. Riposte was used in Legacy Horizon "*to gather audit transactions from all the Post Office counters… deployed in the Bootle & Wigan data*

[291] FUJ00216439
[292] See the documents listed at Exhibit numbers 199 to 270 in this regard
[293] FUJ00176507
[294] FUJ00176508

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centres and on the Post Office counters… Each evening the Riposte databases in each data centre were copied to the local Audit Archive – this was done by the local Harvester…there were occasions when the Harvester in one data centre would exhibit faults which would interrupt the process of copying the transaction data to the Audit Archive resulting in some data not being copied to the Audit Archive. There is no recorded instance of both harvesters failing at the same. Although data may be missing from one Audit Archive server, it will be present on the other Audit Archive in the other data centre (and the ARQ process checks for this when retrieval requests are processed)".[295]

b. Riposte was not deployed in the HNG-X solution, and the Wigan and Bootle Data Centres were migrated to the IRE11 and IRE19 audit servers. From 2010 onwards, "*all transaction and non-transaction files [were] gathered in IRE11 and harvested to the IRE11 Audit Archive only. Live data is automatically mirrored to IRE19 – including to the IRE19 Audit Archive. Under HNG-X, all audit files (transaction and non-transaction) are consistent across both Audit Archive servers*".

c. In terms of the potential impact of this issue on ARQ Reliability, "*ARQ queries are run against one of the Audit Archives. In the unlikely event that the results show any gaps, the query is run against the other Audit Archive to add the missing data and provide a holistic response to the requestor. There have been no reported instances of gaps in ARQ*

[295] See for example FUJ00176543

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retrievals once a query has been executed against both Audit Archives".

155. On the same day, Simon Oldnall (Horizon IT Director, POL) emailed Mr Browell noting that "*[t]he PCI team have flagged an issue to me around potential issues with the data integrity of the audit San. The initial feedback I'm hearing is that this is a historical issue, however this does raise a number of concerns*". Mr Oldnall asked Mr Browell to provide Mr Bessell with a "*more detailed brief on what the issues were, the history of these issues and any ongoing concerns that may exist*".[296]

156. On 3 December 2021, Mr Browell circulated his working notes on the Historic Gaps Issue to a number of Fujitsu recipients, including Mr Barnes, Mr Gauntlett, Jason Muir (Information Security Manager, Fujitsu) and Geoff Baker (Information Security Manager, Enterprise & Cyber Security, EMEIA, Fujitsu). Mr Browell explained that ARQ retrievals can be run as a "Fast" retrieval or a "Slow" retrieval. The Slow ARQ process would look for and handle gaps in the sequencing of JSNs. The Fast ARQ process, in contrast, "*will abort if the sequence of JSNs has gaps*" (see CP 4867, FUJ00155474[297]). If the operator of the ARQ retrieval was alerted to gaps[298]:

    a. In Legacy Horizon, "*they should rerun the SLOW query against the other archive as it is unlikely that BOTH archives will have gaps*".

    b. In HNG-X, "*they should raise an Incident as this is not expected*".

[296] FUJ00176487
[297] FUJ00155474
[298] FUJ00176516

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c. In relation to both (a) and (b) above, Mr Browell's notes included a comment that "*[this relies on [the operator] deciding to do this and could be subject to human error]*".

157. On 6 December 2002, Mr Browell sent an email to Fujitsu personnel including Mr Barnes, Mr Muir and Mr Gauntlett with the subject "*CONFIDENTIAL - Audit Archive – The action plan*[299]. According to this email, Fujitsu's investigation into potential gaps in the audit data included (i) confirming whether incomplete ARQ transaction responses have ever been sent to POL, and whether POL have always been aware of any such gaps, (ii) confirming whether there were any gaps in the audit data being stored by Fujitsu at that time, (iii) understanding how harvester issues were recorded/actioned, and if there were any current harvester issues that needed to be addressed, and (iv) confirming that Fujitsu is confident in the design of the HNG-X harvester.

158. Mr Browell provided Fujitsu's response to the Historic ARQ Gaps Issue on 11 January 2022[300]. This included a summary of the issue in similar terms to paragraph 154 above. In relation to the ARQ process, Mr Browell's email stated:

a. "*There have been a small number of suspected gap issues investigated. It is understood that all investigations were resolved, including by re-running the ARQ against the second data store (Horizon) or by extending the date ranges (HNG-X) resulting in no gaps in any ARQ responses.*"

[299] FUJ00176528
[300] FUJ00176487

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b. "*The ARQ process includes the adding of warnings for gaps in the resulting files sent to POL. If there had been any gaps, POL would have been made aware within the ARQ responses supplied.*"

c. "*One known gap (for a specific FAD and date) was identified as part of ARQ extracts performed against the Bootle archive. That gap is not in the Wigan audit archive though. Therefore, Fujitsu is not aware of any gaps in the audit archive data for Horizon when both archives are used*".

d. "*There have been no gaps identified as part of any ARQ extracts performed against the HNG-X audit archive*".

159. Mr Oldnall responded to Mr Browell's email on 14 February 2022 seeking further information including (i) an explanation of the harvesting process and the parameters used when running ARQs, and (ii) an explanation of how gaps in the audit archives manifest in the ARQ data sent to POL and how they are brought to POL's attention.[301] Mr Browell responded to these questions on 17 March 2022, as follows:

a. As a general point, "*In the unlikely event that there are gaps in the Audit Archive, the ARQ process would spot it and if this could not be reconciled by using the second Audit Archive store, POL would be notified of the true gap found. POL would be aware of the gap"*.

b. In relation to the harvesting process, this "*archives the data from BRDB to flat files which are then stored in the Audit Archive. The*

[301] FUJ00176487

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method of doing this has changed over the years as data storage changed".

c. In relation to the parameters used when running ARQs, these are "*the provided FAD code and date range requested for the type of content requested (typically branch transaction and event data*".

d. In relation to how gaps are identified and notified to POL, the application used to run the ARQ requests, AEClient, "*checks the transaction sequence numbers which are the unique and sequential identifiers of transactions made at a branch. If any gaps in the sequence numbers are identified, this signals that there is a gap in the IRE11 audit archive data. The presence of a gap is presented to the operator…If this happens for pre HNG-X then the audit archive in IRE19 is checked. If that also shows a gap for the matching search criteria, then a true gap will have been found. If a true gap had been found, then the ARQ response spreadsheet would highlight this to POL*".

OTHER POTENTIAL ISSUES RELATING TO ARQ DATA

160. In addition to the issues identified in this statement, I understand that Fujitsu disclosed to the Inquiry 102 documents from its Peak, PinICL and Known Error Log ("**KEL**") databases on 14 July 2023. These documents were identified by Fujitsu as records of incidents referring to the ARQ process in the context of court proceedings.

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161. Many of the documents disclosed relate to system changes and support issues rather than issues with the ARQ data that was extracted and provided to POL. However, there are certain Peaks set out below that could be relevant to the issue of ARQ Reliability. In the time available, Fujitsu has not been able to investigate these Peaks in any detail but would be willing to do so if the Inquiry requests that it does.

    a. PC0088573[302] (Audit Data Extraction Problems) relates to a risk that incorrect data may be used in an ARQ report for branches with two leading zeros in their FAD codes.

    b. PC0272681[303] records that only "fast ARQs" can be reliably run in the evening when the SQL server is shutdown. Running "slow ARQs" at this time may give rise to unpredictable results.

    c. PC0205806[304] relates to duplicate transaction records not being reported to POL in ARQ reports.

    d. PC0206923[305] relates to errors in the filtering process, meaning that data was returned for one day less than the data range specified. Fujitsu's prosecution support service stopped processing ARQs until this was resolved.

    e. PC0280793[306] relates to issues experienced when running audit queries for an entire month.

[302] FUJ00172096
[303] FUJ00173183
[304] FUJ00172221
[305] FUJ00172215
[306] FUJ00173184

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f. PC0241862[307] relates to issues with audit data accidentally "*purging*".

g. PC0225656[308] relates to a loophole which could potentially result in missing transactions on ARQ reports.

h. PC0211833[309] relates to a number of ARQ returns which did not identify transaction reversals.

Statement of Truth

I believe the content of this statement to be true.

Signed: GRO

W. P. Patterson

Dated: 14 September 2023

[307] FUJ00173063
[308] FUJ00172286
[309] FUJ00172241

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INDEX TO THE THIRD CORPORATE STATEMENT OF FUJITSU SERVICES LIMITED

Exhibit no.	Document Description	Control No.	URN
	CONTRACTUAL BACKGROUND		
1.	Codified Agreement between Fujitsu and POL dated 28 July 1999	POINQ0006242F	FUJ00000071
2.	Codified Agreement between Fujitsu and POL dated 23 November 2020	POINQ0003098F	FUJ00000003
	THE ARQ SPREADSHEET		
3.	ARQ Spreadsheet of Marine Drive transactions and events from 2 February 2004	VIS00011623 pages 17 and 18 only	LCAS0001383 pages 17 and 18 only
4.	CCN 0423a dated 1 July 1999	POINQ0006565F	FUJ00000394
5.	Service Architecture Design Document Change Control Notices Applied v 6.0 dated 23 October 2000	POINQ0007602F	FUJ00001431
6.	Audit Trail Functional Specification v 3.0 dated 1 July 1999	POINQ0007489F	FUJ00001318
7.	ARQ 0506/405 dated 26 October 2005	POINQ0158757F	FUJ00152562
8.	ARQ 0506/421 - 423 dated 4 November 2005	POINQ0158759F	FUJ00152564
9.	Email from 'Brian' to 'Peter' with subject line "FW: Torquay Road ARQ 0506/368" dated 23 December 2005	POINQ0158769F	FUJ00152574
10.	Email from 'Brian' to 'Penny' with subject line "FW: Mr L Castleton - Marine Drive Post Office, Bridlington" dated 22 November 2005	POINQ0158764F	FUJ00152569
11.	Network Banking Management of Prosecution Support Procedure v 2.0 dated 29 February 2005	POINQ0158403F	FUJ00152209
12.	Audit Data Extraction Process v 3.0 dated 1 February 2005	POINQ0230499F	FUJ00176265
	AVAILABILITY OF ARQ DATA		
13.	CCN 1122 dated 5 January 2004	POINQ0007089F	FUJ00000918
14.	CT 1542 dated 29 May 2014	POINQ0163141F	FUJ00156946
15.	CT 1922 dated 15 October 2015	POINQ0230513F	FUJ00176279
16.	CT 2616a dated 10 September 2018	POINQ0230508F	FUJ00176274
17.	CWO 0251a dated 2 July 2020	POINQ0230512F	FUJ00176278
18.	CWO 0395b dated 26 March 2021	POINQ0230509F	FUJ00176275
19.	CWO 0560a dated 28 February 2022	POINQ0230510F	FUJ00176276
20.	CWO 0725 dated 23 February 2023	POINQ0230511F	FUJ00176277
21.	Extract of Messagestore for Marine Drive for the period 12 March 2004 to 2 April 2004	POINQ0178138F	FUJ00171957_001
22.	Excel spreadsheet containing data from Marine Drive for the period 12 March 2004 to 2 April 2004	POINQ0178139F	FUJ00171958

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Exhibit no.	Document Description	Control No.	URN
BROKEN AUDIT TRAIL			
23.	Letter from J. Holmes to S. Kinghorn with subject “Broken Audit Trail” dated 23 May 2001	POINQ0178140F	FUJ00171959
24.	Document titled “PROBLEM REF PC0066318 - Incomplete TMS Audit Trail” dated 24 May 2001	POINQ0158378F	FUJ00152184
25.	Network Banking Internal Audit Requirements v 2.0 dated 13 July 2001	POINQ0178148F	FUJ00171967
26.	Technical Environment Description v 4.8 dated 22 October 2002	POINQ0207221F	FUJ00201501
27.	PC0066318	POINQ0178274F	FUJ00172093
28.	Letter from C. Lenton-Smith to K. Baines with subject “Lost Data and Audit Requests” dated 15 August 2002	POINQ0230531F	FUJ00176297
29.	Customer Service Monthly Report - July 2001 v 1.0 dated 31 July 2001	POINQ0126708F	FUJ00120516
30.	Document titled “ICL Pathway Monthly Progress Report - September 2001” dated 10 October 2001	POINQ0122204F	FUJ00116033
31.	Contract Administration Meeting Minutes dated 23 May 2001	POINQ0230519F	FUJ00176285
32.	Customer Service Monthly Report - May 2001 v 1.0 dated 30 May 2001	POINQ0230516F	FUJ00176282
33.	Pathway/Consignia Audit & Security Panel Meeting Minutes dated 18 June 2001	POINQ0178152F	FUJ00171971
34.	Letter from C. Lenton-Smith to K. Baines with subject “Lost Data and Audit Requests” dated 15 February 2002	POINQ0230530F	FUJ00176296
35.	Email from A. Clarke to zDL UKS PATCPImpactNotOnline, J. Holmes and C. Lenton-Smith with subject “FOR IMPACT - URGENT- CP 3061 - Rebuild broken Audit Trail due to Missing / Damaged tapes” dated 27 July 2001	POINQ0161723F	FUJ00155529
36.	CP 3061	POINQ0161724F	FUJ00155530
37.	Programme Change Control Board Meeting Minutes dated 2 August 2001	POINQ0230520F	FUJ00176286
38.	Programme Change Control Board Meeting Minutes dated 16 August 2001	POINQ0230521F	FUJ00176287
39.	Change Control Board Meeting Minutes dated 20 August 2001	POINQ0230522F	FUJ00176288
40.	Programme Change Control Board Meeting Minutes dated 18 October 2001	POINQ0230525F	FUJ00176291
41.	Programme Change Control Board Meeting Minutes dated 25 October 2001	POINQ0230526F	FUJ00176292
42.	Document titled “Audit Trail Break - Pathway Position” dated 5 December 2001	POINQ0230528F	FUJ00176294

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Exhibit no.	Document Description	Control No.	URN
43.	Audit of Horizon Data Centres and Belfast Operations Centre v 2.0 dated 21 November 2001	POINQ0086685F	FUJ00080514
44.	Pathway/Consignia Audit & Security Panel Meeting Minutes dated 12 October 2001	POINQ0178153F	FUJ00171972
45.	Email chain from J. Holmes to R. Dhesi copying S. Gardiner with subject “RE: Consignia IA Involvement” dated 26 October 2001	POINQ0178154F	FUJ00171973
46.	Email from J. Holmes to R. Dhesi with subject “Data Centre Audit Report” dated 27 November 2001	POINQ0178155F	FUJ00171974
47.	Document titled Review of Horizon Data Centres -November 2001 dated January 2001	POINQ0178160F	FUJ00171979
48.	Email from J. Holmes to R. Dhesi copying C. Lenton-Smith and G. Hooper with subject “Data Centre Report - POL Distribution” dated 6 February 2002	POINQ0178164F	FUJ00171983
49.	Email from R. Dhesi to J. Holmes with subject “Audit Report - Data Centre Review” dated 31 January 2022	POINQ0178159F	FUJ00171978
50.	Email chain from J. Holmes to R. Dhesi with subject “RE: Audit Report – Data Centre Review” dated 31 January 2002	POINQ0178161F	FUJ00171980
51.	Email from R. Dhesi to J. Holmes copying H. Stewart with subject “RE: Data Centre Report – POL Distribution” dated 28 February 2002	POINQ0178162F	FUJ00171981
52.	Email chain from J. Holmes to R. Dhesi copying G. Hooper and H. Stewart with subject “Data Centre Report - POL Distribution” dated 11 February 2002	POINQ0178163F	FUJ00171982
53.	Email chain from J. Holmes to C. Lenton-Smith with subject “Subject to Legal Professional Privilege - in contemplation of Legal proceedings - RE: Audit Report” dated 13 February 2002	POINQ0178151F	FUJ00171970
54.	Email chain from J. Holmes to C. Lenton-Smith and M. Blewett copying G. Hooper with subject “Subject to Legal Professional Privilege - in contemplation of Legal proceedings - RE: The missing date” dated 11 February 2002	POINQ0178149F	FUJ00171968
55.	Document titled “Review of Horizon Data Centres - November 2001” dated January 2001	POINQ0178165F	FUJ00171984
56.	Email from J. Holmes to C. Lenton-Smith and G. Hooper with subject “Data Centre Report” dated 31 January 2002	POINQ0230989F	FUJ00176754

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Exhibit no.	Document Description	Control No.	URN
57.	Email from J. Holmes to G. Hooper and C. Lenton-Smith with subject “DC Audit Report Issue” dated 5 February 2002	POINQ0230991F	FUJ00176756
58.	Letter from C. Lenton-Smith to K. Baines with subject “Loss Data & Audit Requests” dated 19 September 2001	POINQ0230524F	FUJ00176290
59.	Document titled ICL Pathway Monthly Progress Report - May 2001 dated 6 June 2001	POINQ0122147F	FUJ00115976
60.	Letter from C. Lenton-Smith to K. Baines with subject “Lost Data” dated 7 August 2001	POINQ0230514F	FUJ00176280
61.	Letter from K. Baines to C. Lenton-Smith dated 29 August 2001	POINQ0230523F	FUJ00176289
62.	Letter from K. Baines to C. Lenton-Smith with subject “Lost Data & Audit Requests” dated 6 February 2002	POINQ0230529F	FUJ00176295
63.	Email chain from C. Lenton-Smith to I. Monaghan with subject “RE: Settlement of disputes” dated 16 December 2002	POINQ0230539F	FUJ00176305
64.	Letter from M. Hannon to C. Lenton-Smith with subject “Lost Data and Audit Trail” dated 30 August 2002	POINQ0230532F	FUJ00176298
65.	Letter from C. Lenton-Smith to M. Hannon with subject “Lost Data and Audit Trail” dated 13 September 2002	POINQ0230533F	FUJ00176299
66.	Letter from C. Lenton-Smith to M. Hannon with subject “Lost Data and Audit Trail” dated 13 September 2002	POINQ0230534F	FUJ00176300
67.	Email from C. Lenton-Smith to H. Forrest copying P. Purewal with subject “Lost Audit data changes” dated 3 October 2002	POINQ0230535F	FUJ00176301
68.	Email chain from J. Holmes to G. Hooper and P. Lywood with subject “Single data centre” dated 24 October 2002	POINQ0230537F	FUJ00176303
69.	Email from A. Clarke to zDL UKS PATCCBMinutes/Agenda, zDL UKS PATPCCBMinutes/Agenda, and zDL UKS PATCPCommunication copying in P. Purewal with subject “CCN 1019 (Release:N/A) - APPROVED” dated 21 November 2002	POINQ0230538F	FUJ00176304
OMISSIONS IN ARQ DATA CAUSED BY OPERATOR ERROR			
70.	Witness Statement of P. Thomas dated 17 June 2004	POINQ0128201F	FUJ00121987
71.	Witness Statement of N. Lowther dated 1 September 2003 (unsigned)	POINQ0128105F	FUJ00121891
72.	Witness Statement of P. Thomas dated 15 April 2004	POINQ0128209F	FUJ00121995

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Exhibit no.	Document Description	Control No.	URN
73.	Email chain from G. Ward to Fujitsu@royalmail.com and M. William with subject “Witness Statement request & Forest” dated 25 May 2004	POINQ0128189F	FUJ00121975
74.	Witness Statement of W. Mitchell dated 17 June 2004	POINQ0128202F	FUJ00121988
75.	Audit Record Query request dated 10 March 2004	POINQ0230540F	FUJ00176306
76.	Email chain from M. William to G. Ward copying P. Thomas with subject “Revised ARQ Issues (Forest gate & Urmston)” dated 1 June 2004	POINQ0178201F	FUJ00172020
77.	Witness Statement of W. Mitchell dated 14 June 2004	POINQ0128193F	FUJ00121979
2008 INCIDENTS RELATED TO RIPOSTE LOCK EVENT			
78.	PC0152376	POINQ0160879F	FUJ00154684
79.	PC0140715	POINQ0161401F	FUJ00155207
80.	Email chain from S. Evans to S. Denham copying G. Allen, P. Sewell, A. Holmes, P. Thomas and G. Jenkins with subject “Audit and PC01152376” dated 19 December 2008	POINQ0161590F	FUJ00155396
81.	KEL dsed5628Q	POINQ0137022F	FUJ00130827
82.	Email from G. Barnes to D. Seddon with subject “dsed5628Q” dated 17 January 2008	POINQ0161403F	FUJ00155209
83.	PC0152421	POINQ0160881F	FUJ00154686
84.	PC0153009	POINQ0161418F	FUJ00155224
85.	PC0152828	POINQ0161405F	FUJ00155211
86.	Email chain from R. Gelder to D. Wilcox and K. McKeown with subject “FW: 153009” dated 17 January 2008	POINQ0161404F	FUJ00155210
87.	PC0155120	POINQ0160880F	FUJ00154685
88.	KEL kiangl823S	POINQ0136671F	FUJ00130476
89.	POL/Fujitsu Product & Branch Accounting Workshop Action report dated 1 August 2008	POINQ0161424F	FUJ00155230
90.	Email chain from M. Stewart to G. Jenkins and A. Chambers copying R. Birkinshaw with subject “RE: Branch 141832 Craigpark” dated 3 September 2008	POINQ0161439F	FUJ00155245
91.	PC0158102	POINQ0160878F	FUJ00154683
92.	Email chain from P. Thomas to G. Jenkins, A. Holmes, S. Meek and P. Sewell with subject “FW: Branch 141832 Craigpark” dated 12 August 2008	POINQ0161427F	FUJ00155233

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Exhibit no.	Document Description	Control No.	URN
93.	Email chain from P. Thomas to G. Jenkins, A. Holmes, S. Meek and P. Sewell copying H. Pritchard and B. Pinder with subject “RE: Branch 141832 Craigpark” dated 14 August 2008	POINQ0161018F	FUJ00154823
94.	Note of meeting held on 13 August 2008 prepared by P. Thomas dated 14 August 2008	POINQ0161019F	FUJ00154824
95.	Email chain from R. Birkinshaw to G. Jenkins with subject “RE: Branch 141832 Craigpark” dated 25 August 2008	POINQ0161432F	FUJ00155238
96.	Email from G. Jenkins to R. Birkinshaw and D. Johns with subject “RE: Potential Audit Issue.doc” dated 28 August 2008	POINQ0161435F	FUJ00155241
97.	Document titled “Potential Audit Issue - Horizon” dated 28 August 2008	POINQ0161436F	FUJ00155242
98.	Email chain from J. Burton to G. Jenkins copying A. Chambers with subject “RE: Response to Action AP0108003 from POL/Fujitsu P&BA Workshop 1 August 2008” dated 3 September 2008	POINQ0161440F	FUJ00155246
99.	Email chain from A. Chambers to G. Jenkins copying M. Peach and J. Burton with subject “RE: Response to Action AP0108003 from POL/Fujitsu P&BA Workshop 1 August 2008” dated 3 September 2008	POINQ0161441F	FUJ00155247
100.	Email chain from M. Stewart to G. Jenkins copying J. Burton, A. Chambers and M. Peach with subject “RE: Response to Action AP0108003 from POL/Fujitsu P&BA Workshop 1 August 2008” dated 4 September 2008	POINQ0161446F	FUJ00155252
101.	Email chain from A. Chambers to G. Jenkins with subject “FW: Response to Action AP0108003 from POL/Fujitsu P&BA Workshop 1 August 2008” dated 4 September 2008	POINQ0161442F	FUJ00155248
102.	Email chain from G. Barnes to D. Seddon, S. Evans, G. Jenkins and R. Birkinshaw copying J. Burton and A. Chambers with subject “RE: Peak 152376: CAPS Process Locking the messagestore PC0164429” dated 5 September 2008	POINQ0161452F	FUJ00155258
103.	Email from M. Peach to J. Budworth, S. Evans, S. Bamber, M. Cumming and G. Jenkins with subject “RE: Peak 152376: CAPS Process Locking the messagestore PC0164429” dated 9 September 2008	POINQ0161453F	FUJ00155259

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Exhibit no.	Document Description	Control No.	URN
104.	Email chain from J. Budworth to S. Evans copying G. Barnes, D. Seddon, M. Peach, G. Jenkins and others with subject “RE: Peak 152376: CAPS Process Locking the messagestore PC0164429” dated 10 September 2008	POINQ0161455F	FUJ00155261
105.	PC0164429	POINQ0161560F	FUJ00155366
106.	Post Office Account Release Note (RNT8601) raised on 29 September 2008	POINQ0161680F	FUJ00155486
107.	Email chain from D. Johns to A. Chambers copying R. Birkinshaw, A. Holmes and G. Jenkins with subject “RE: Audit Review” dated 4 September 2008	POINQ0161447F	FUJ00155253
108.	Email from R. Birkinshaw to P. Sewell, A. Holmes, S. Meek, P. Ambrose, S. Evans, A. Chambers, D. Johns, A. Dunks, P. Thomas and J. Burton with subject “Recent Exercise to review Audit in Horizon” dated 5 September 2008	POINQ0161451F	FUJ00155257
109.	Email from A. Chambers to P. Thomas copying G. Jenkins and P. Sewell with subject “Riposte Timeout waiting for lock events” dated 16 September 2008	POINQ0161458F	FUJ00155264
110.	Document titled “Analysis of Audit timeouts” dated 3 September 2008	POINQ0161450F	FUJ00155256
111.	HNG-X Change Proposal raised on 13 October 2008	POINQ0161466F	FUJ00155272
112.	Email from A. Holmes to P. Sewell, R. Birkinshaw and G. Jenkins with subject “Counter Audit CP” dated 13 October 2008	POINQ0161465F	FUJ00155271
113.	Email chain from G. Jenkins to P. Thomas with subject “RE: Event Errors - ARQ Service” dated 15 October 2008	POINQ0161468F	FUJ00155274
114.	Meeting invite from P. Thomas to A. Holmes, R. Birkinshaw, P. Sewell and S. Meek with subject “Updated: Audit CP - Words” scheduled on 24 October 2008	POINQ0161472F	FUJ00155278
115.	Email from P. Thomas to P. Sewell copying H. Pritchard with subject “ARQ Service” dated 1 December 2008	POINQ0161567F	FUJ00155373
116.	Email chain from P. Sewell to D. Hinde copying P. Thomas with subject “RE: Audit Strengthening - potential CP” dated 8 December 2008	POINQ0161574F	FUJ00155380
117.	Email chain from P. Thomas to H. Pritchard with subject “RE: ARQ Service problem” dated 4 December 2008	POINQ0161572F	FUJ00155378
118.	Slide deck titled “Prosecution Support Urgent Issue”	POINQ0161030F	FUJ00154835

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Exhibit no.	Document Description	Control No.	URN
119.	Email chain from P. Thomas to G, Allen, D. Hinde, A. Cousins, S. Evans, P. Sewell and A. Holmes copying H. Pritchard and S. Denham with subject "RE: Proposed Slides for ARQ Service Issue" dated 15 December 2008	POINQ0161581F	FUJ00155387
120.	Email chain from P. Thomas to G. Jenkins with subject "RE: Audit Issue" dated 17 December 2008	POINQ0161029F	FUJ00154834
121.	Meeting invite from S. Denham to G. Allen, A. Cousins, S. Evans, P. Sewell, A. Holmes, P. Thomas, W. Warham and H. Pritchard with subject "Updated: ARQ Aervice issue" scheduled on 17 December 2008	POINQ0161586F	FUJ00155392
122.	Email chain from P. Sewell to D. Hinde, G. Allen, P. Thomas, A. Cousins, S. Evans and Alan Holmes copying H. Pritchard and S. Denham with subject "RE: Proposed Slides for ARQ Service Issue" dated 19 December 2008	POINQ0161588F	FUJ00155394
123.	Email chain from D. Hinde to S. Denham, G. Allen, P. Thomas, A. Cousins, S. Evans, P. Sewell and A. Holmes copying H. Pritchard and J. Jukes with subject "RE: Proposed Slides for ARQ Service Issue" dated 19 December 2008	POINQ0161589F	FUJ00155395
124.	Email from P. Thomas to D. Hinde, G. Allen, A. Cousins S. Evans, P. Sewell and A. Holmes with subject "Proposed Slides for ARQ Service Issue" dated 11 December 2008	POINQ0161579F	FUJ00155385
125.	Email from S. Evans to P. Thomas, G. Jenkins and A. Holmes copying S. Denham and G. Allen with subject "Standard_Fujitsu_WS_V8_Jan 2009_SAE .doc" dated 5 January 2009	POINQ0128806F	FUJ00122592
126.	Draft template witness statement (undated)	POINQ0128807F	FUJ00122593
127.	Email chain from P. Thomas to S. Evans, G. Jenkins and A. Holmes copying S. Denham and G. Allen with subject "RE: Standard_Fujitsu_WS_V8_Jan 2009_SAE .doc" dated 6 January 2009	POINQ0128810F	FUJ00122596
128.	Draft template witness statement (undated)	POINQ0128811F	FUJ00122597
129.	Email chain from P. Thomas to D. Posnett copying H. Pritchard and P. Sewell with subject "FW: Security Incident" dated 7 January 2009	POINQ0161593F	FUJ00155399

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Exhibit no.	Document Description	Control No.	URN
130.	Email chain from P. Thomas to H. Pritchard, W. Warham and S. Denham copying P. Sewell with subject “RE: Security Incident” dated 8 January 2009	POINQ0161594F	FUJ00155400
131.	Email chain from S. Evans to G. Barnes with subject “FW: Audit Issue” dated 8 January 2009	POINQ0161596F	FUJ00155402
132.	Email chain from A. Chambers to P. Thomas copying H. Pritchard, P. Sewell, A. Holmes, S. Evans, G. Allen, M. Peach and S. Denham with subject “RE: Outlet Checking List - Audit Issue” dated 3 February 2009	POINQ0161612F	FUJ00155418
133.	Spreadsheet titled “Outlet Checking List” (undated)	POINQ0161613F	FUJ00155419
134.	Email chain from P. Thomas to S. Denham copying H. Pritchard and P. Sewell with subject “FW: Outlet Checking List - Audit Issue” dated 4 February 2009	POINQ0161616F	FUJ00155422
135.	Email chain from P. Thomas to A. Chambers with subject “RE: Outlet Checking List - Audit Issue” dated 3 February 2009	POINQ0161034F	FUJ00154839
136.	Email chain from P. Thomas to S. Denham copying H. Pritchard, P. Sewell and W. Warham with subject “FW: Outlet Checking List - Audit Issue” dated 27 January 2009	POINQ0161603F	FUJ00155409
137.	Email from P. Thomas to unknown recipients with unknown subject attaching a draft template witness statement (undated)	POINQ0161614F	FUJ00155420
138.	Email from P. Thomas to S. Denham and P. Sewell with subject “FW: Security Incident” dated 4 February 2009	POINQ0161615F	FUJ00155421
139.	HNG-X Change Proposal (CP 4867) raised on 26 February 2009	POINQ0161668F	FUJ00155474
140.	Email chain from K. Westfield to D. Hinde and Wendy Warham copying G. Allen and J. Burton with subject “RE: HNG-X CP0336” Enable analysis of Counter event messages within the HNG-X Audit solution” dated 17 July 2009	POINQ0161684F	FUJ00155490
141.	Email from C. Maving to numerous POL and Fujitsu personnel including S. Jones, A. Fisher, A. Spencer, T. Baker, N. Taylor and F. Denbali with subject “Testing progress 06/07/10” dated 6 July 2010	POINQ0161705F	FUJ00155511

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Exhibit no.	Document Description	Control No.	URN
	DUPLICATE TRANSACTIONS		
142.	Email chain from G. Jenkins to G. Allen, A. Holmes, A. Mansfield and A. Spurgeon, with subject "RE: PC0200468 - Duplication of Transaction Records" dated 24 June 2010	POINQ0103209F	FUJ00097038
143.	Document titled Duplication of Transaction Records Contained in ARQ Returns dated 23 June 2010	POINQ0103229F	FUJ00097058
144.	PC0200468	POINQ0178364F	FUJ00172183
145.	Email chain from P. Thomas to G. Wilkerson with subject "FW: Duplication of Transaction Records on ARQ Returns" dated 24 June 2010	POINQ0103228F	FUJ00097057
146.	Email chain from G. Jenkins to P. Thomas and A. Holmes, with subject "RE: Duplicate Messages in ARQ" dated 23 June 2010	POINQ0178224F	FUJ00172043
147.	Email from G. Jenkins to P. Thomas and A. Holmes with subject "Duplicate Messages in ARQ (updated) dated 24 June 2010	POINQ0230544F	FUJ00176310
148.	PC0194639	POINQ0230541F	FUJ00176307
149.	Email chain from T. Godeseth to J. Gribben, copying M. Lenton, D. Ibbett and P. Newsome, with subject "RE: Questions from Counsel on Comments on Day 7 and 8" dated 10 April 2019	POINQ0171261F	FUJ00165083
150.	Document titled "Questions on RW and SSC Comments on Days 7 and 8" (undated)	POINQ0171260F	FUJ00165082
151.	Email chain from M. Underwood to L. Keating, T. Godeseth, M. Westbrook, P. Newsome. E. Iosifidou, copying in L. Wolstencroft and J. Gribben, with subject "RE: Bramble: call to discuss analytics (Privileged & Confidential)" dated 28 February 2017	POINQ0164065F	FUJ00157889
152.	Email chain from T. Godeseth to L. Keating, M. Underwood, M. Westbrook, P. Newsome. E. Iosifidou, copying in L. Wolstencroft and J. Gribben, with subject "RE: Bramble: call to discuss analytics (Privileged & Confidential)" dated 1 March 2017	POINQ0176401F	FUJ00170220
153.	RMGA HNG-X Counter Application Review dated 9 February 2010	POINQ0099219F	FUJ00093048

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Exhibit no.	Document Description	Control No.	URN
154.	RMGA HNG-X Counter Application Review dated 9 February 2010 with mark up by G. Jenkins and comments by D Johns	POINQ0148361F	FUJ00142164
155.	RMGA HNG-X Counter Application Review dated 9 February 2010 with mark up by G. Jenkins	POINQ0148357F	FUJ00142160
156.	Email chain from J. Ballantyne to G. Jenkins, S. Parker, M. Wright and A. Holmes, copying in J. Simpkins, I. Turner, G. Allen, S. Goddard, A. Beardmore and S. Porter, with subject "RE: Peak PC0196948" dated 12 April 2018	POINQ0178213F	FUJ00172032
157.	RMGA HNG-X Counter Application Review, v 1, dated 9 February 2010	POINQ0148354F	FUJ00142157
158.	HNG-X Counter Application High Level Design v 1 dated 23 August 2010	POINQ0097961F	FUJ00091790
159.	Email from Peak to A. Dunks, with subject "Complete Call Update PC0257379: Peak calls assigned to Sec Opps" dated 23 November 2018	POINQ0178271F	FUJ00172090
160.	RMGA HNG-X Counter Application Review, v 1, dated 9 February 2010 with comments by G. Jenkins and D. Johns	POINQ0148359F	FUJ00142162
161.	RMGA HNG-X Counter Application Review, v 1, dated 9 February 2010 with comments by G. Jenkins	POINQ0148355F	FUJ00142158
162.	Email chain from G. Butts to D. Cooke, copying M. Andrews, G. Allen and G. Jenkins, with subject "FW: ARQs" dated 26 June 2010	POINQ0103243F	FUJ00097072
163.	RMGA HNG-X Counter Application Review, v 1, dated 9 February 2010 (scanned) with comments	POINQ0178212F	FUJ00172031
164.	Email chain from G. Wilkerson to P. Thomas and G. Jenkins, copying A. D'Alvarez and G. Butts, with subject "RE: Duplication of Transaction Records on ARQ Returns" dated 24 June 2010	POINQ0103210F	FUJ00097039
165.	Email chain from G. Welsh to P. Thomas, G.V. Achte, D. Munro, P. Thompson, and G. Wilkerson, copying G. Jenkins and A. Holmes with subject "RE: Duplication of Transaction Records on ARQ Returns" dated 24 June 2010	POINQ0178225F	FUJ00172044
166.	Email chain from P. Thomas to G. Wilkerson, G. Butts, G. Jenkins, copying A. D'Alvarez with subject "RE: Duplication of Transaction Records on ARQ Returns" dated 25 June 2010	POINQ0159316F	FUJ00153121
167.	Spreadsheet titled "ARQ Report" dated 24 June 2010	POINQ0159317F	FUJ00153122

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Exhibit no.	Document Description	Control No.	URN
168.	Email chain from G. Butts to D. Cooke, copying M. Andrews, G. Allen, G. Welsh and G. Jenkins with subject "FW: ARQs" dated 25 June 2010	POINQ0103232F	FUJ00097061
169.	Email chain from G. Jenkins to G. Butts and D. Cooke, copying M. Andrews, G. Allen and G. Welsh, with subject "RE: ARQs" dated 25 June 2010	POINQ0103242F	FUJ00097071
170.	Email chain from P. Thomas to T. Lilywhite, P. Thompson, G. Welsh, D. Munro copying G. Jenkins with subject "FW: Duplication of Transaction Records in ARQ Returns - Discussion with POL" dated 2 July 2010	POINQ0127290F	FUJ00121097
171.	Email chain from G. Barnes to P. Thomas with subject "FW: PC0200468 - Duplication of Transaction Records" dated 21 July 2010	POINQ0178227F	FUJ00172046
172.	Email from G. Barnes to S. Bamber, P. Okely, V. Pandya, J. Rogers, M. Swain and N. Taylor, with subject "Audit baseline AUDIT_EXTRACT_SVR_0207_V051-V050 now RFB - PC0200468 'A' priority" dated 7 July 2010	POINQ0178226F	FUJ00172045
173.	Email chain from P. Thomas to T. Lillywhite, G. Jenkins, G. Wilkerson, copying G. Welsh with subject "FW: Duplicatation of Transaction Records in ARQ Returns" dated 7 July 2010	POINQ0129115F	FUJ00122901
174.	Draft Witness Statement of P. Thomas (undated and unsigned)	POINQ0129116F	FUJ00122902
175.	Email from P. Thomas to G. Jenkins with subject "Duplicate Records - Amended Witness Statement" dated 7 July 2010	POINQ0129113F	FUJ00122899
176.	Email from P. Thomas to G. Jenkins copying G. Wilkerson with subject "Duplicate Records - Witness Statement" dated 8 July 2010	POINQ0129121F	FUJ00122907
177.	Draft Witness Statement of P. Thomas (undated and unsigned)	POINQ0129122F	FUJ00122908
178.	Email from G. Jenkins to P. Thomas and A. Holmes, with subject "Duplicate Messages in ARQ (updated)" dated 24 June 2010	POINQ0230545F	FUJ00176311
179.	Email from P. Thomas to G. Jenkins with subject "Duplicated Records - WS" dated 8 July 2010	POINQ0129128F	FUJ00122914
180.	Witness Statement of G. Jenkins dated 8 July 2010 (unsigned)	POINQ0129129F	FUJ00122915

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Exhibit no.	Document Description	Control No.	URN
181.	Email chain from P. Thomas to G. Jenkins with subject “RE: Duplicated Records - WS” dated 8 July 2010	POINQ0230546F	FUJ00176312
182.	Email chain from P. Thomas to G. Jenkins with subject “FW: Duplicatation of Transaction Records in ARQ Returns” dated 15 July 2010	POINQ0129142F	FUJ00122928
183.	Witness Statement of G. Jenkins dated 8 July 2010 (unsigned)	POINQ0129143F	FUJ00122929
184.	Email chain from P. Thomas to G. Jenkins with subject “RE: Duplicatation of Transaction Records in ARQ Returns” dated 15 July 2010	POINQ0230547F	FUJ00176313
185.	Email chain from P. Thomas to J. Longman copying J. Owen with subject “RE: Duplicatation of Transaction Records in ARQ Returns” dated 15 July 2010	POINQ0159328F	FUJ00153133
186.	Email chain from G. Jenkins to P. Thomas with subject “RE: Duplicatation of Transaction Records in ARQ Returns” dated 15 July 2010	POINQ0159340F	FUJ00153145
187.	Email chain from A. Kay to CSPOA Security with subject “ARQ 051-056 Caereithin FAD 166642, returned on 9th May 14” dated 22 May 2014	POINQ0230557F	FUJ00176323
188.	Email chain from G. Barnes to J. Muir and A. Holmes with subject “RE: Issues with a Slow ARQ” dated 20 May 2014	POINQ0230556F	FUJ00176322
189.	Email chain from A. Holmes to A. Kay copying G. Barnes with subject “RE: ARQ - Duplicate Data” dated 22 May 2014	POINQ0178266F	FUJ00172085
190.	Email chain from J. Muir to A. Holmes, A. Dunks, F. Denbali, copying G. Barnes, S. Goddard and S. Godfrey with subject “RE: Duplicates” dated 15 July 2016	POINQ0178267F	FUJ00172086
191.	PC0250729	POINQ0179253F	FUJ00173072
192.	Email from F. Denbali to A. Holmes with subject “Duplicate records in ARQ output” dated 14 July 2016	POINQ0230558F	FUJ00176324
193.	Email chain from A. Holmes to CSPOA Security with subject “RE: Duplicate records in ARQ output” dated 14 July 2016	POINQ0230561F	FUJ00176326
194.	Email from F. Denbali to A. Holmes with subject “RE: Duplicate records in ARQ output” dated 14 July 2016	POINQ0230562F	FUJ00176327
195.	Document attached to email correspondence from F. Denbali to A. Holmes dated 14 July 2016	POINQ0230563F	FUJ00176328

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Exhibit no.	Document Description	Control No.	URN
196.	Email chain from G. Barnes to CSPOA Security with subject “RE: ARQ - Duplicate Data” dated 21 May 2014	POINQ0178268F	FUJ00172087
197.	Email from A. Holmes to J. Muir, A. Dunks and F. Denbali, copying G. Barnes, S. Goddard and S. Godfrey with subject “RE: Duplicates” dated 15 July 2016	POINQ0230564F	FUJ00176329
198.	Email chain from J. Muir to G. Barnes, A. Dunks, A. Holmes and F. Denbali with subject “RE: Duplicates” dated 19 July 2016	POINQ0222161F	FUJ00216439
HISTORIC GAPS IN ARQ DATA			
199.	Email chain from S. Browell to G. Barnes, P. Gauntlett and P. Boardman copying M. Mistry with subject “Historical Issue with Audit Data” dated 2 December 2021	POINQ0230745F	FUJ00176510
200.	Audit Extractor Support Guide v 1 dated 21 August 2000	POINQ0230774F	FUJ00176539
201.	Audit Data Extraction Process v 1 dated 29 May 2002	POINQ0230775F	FUJ00176540
202.	Audit Data Extraction Process v 2.1 dated 26 October 2004	POINQ0230778F	FUJ00176543
203.	Audit Data Retrieval Low Level Design v 1 dated 8 June 2010	POINQ0230780F	FUJ00176545
204.	Audit Trail Functional Specification v 11.0 dated 4 August 2006	POINQ0008190F	FUJ00002019
205.	PC0206479	POINQ0230565F	FUJ00176330
206.	PC0268776	POINQ0230566F	FUJ00176331
207.	PC0230183	POINQ0230567F	FUJ00176332
208.	PC0162602	POINQ0230568F	FUJ00176333
209.	PC0186750	POINQ0230569F	FUJ00176334
210.	PC0277613	POINQ0230571F	FUJ00176336
211.	PC0290357	POINQ0230572F	FUJ00176337
212.	PC0093837	POINQ0230573F	FUJ00176338
213.	PC0089043	POINQ0230574F	FUJ00176339
214.	PC0290571	POINQ0230575F	FUJ00176340
215.	PC0133634	POINQ0230576F	FUJ00176341
216.	PC0095192	POINQ0230577F	FUJ00176342
217.	PC0089033	POINQ0230716F	FUJ00176481
218.	PC0286014	POINQ0230717F	FUJ00176482
219.	PC0187097	POINQ0230718F	FUJ00176483
220.	PC0133534	POINQ0230719F	FUJ00176484
221.	PC0289422	POINQ0230720F	FUJ00176485
222.	PC0189343	POINQ0230782F	FUJ00176547
223.	PC0200501	POINQ0230783F	FUJ00176548

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Exhibit no.	Document Description	Control No.	URN
224.	Email chain from S. Browell to S. Oldnall and W. Warham with subject “Horizon Audit San” dated 17 March 2022	POINQ0230722F	FUJ00176487
225.	Email chain from P. Gauntlett to G. Barnes, P. Boardman and S. Browell with subject “Historical issues with Audit Data” dated 1 December 2021	POINQ0230725F	FUJ00176490
226.	Email chain from P. Gauntlett to G. Barnes, P. Boardman and S. Browell copying M. Mistry with subject “Historical Issue with Audit Data”, dated 1 December 2021	POINQ0230727F	FUJ00176492
227.	Email chain from G. Barnes to P. Gauntlett with subject “Summary of Riposte and HNGx” dated 1 December 2021	POINQ0230728F	FUJ00176493
228.	Email chain from P. Boardman to P. Gauntlett and S. Browell, copying G. Barnes and M. Mistry with subject “Historical Issue with Audit Data”	POINQ0230729F	FUJ00176494
229.	Email chain from G. Barnes to P. Gauntlett with subject “Summary of Riposte and HGNx” dated 30 November 2021	POINQ0230730F	FUJ00176495
230.	PC0268776	POINQ0230731F	FUJ00176496
231.	Email chain from G. Barnes to P. Gauntlett with subject “Summary of Riposte and HNGx” dated 30 November 2021	POINQ0230732F	FUJ00176497
232.	Email chain from G. Barnes to P. Boardman, P. Gauntlett and S. Browell copying M. Mistry with subject “Historical Issue with Audit Data” dated 1 December 2021	POINQ0230733F	FUJ00176498
233.	Email chain from G. Barnes to F. Denbali copying P. Gauntlett with subject “Horizon Queries” dated 29 November 2021	POINQ0230734F	FUJ00176499
234.	Email from F. Denbali to G. Barnes copying P. Gauntlett with subject “Horizon Queries” dated 29 November 2021	POINQ0230735F	FUJ00176500
235.	Email chain from G. Barnes to F. Denbali copying P. Gauntlett with subject “Horizon Queries” dated 29 November 2021	POINQ0230736F	FUJ00176501
236.	Email chain from S. Browell to G. Barnes, P. Gauntlett, P. Boardman copying M. Mistry with subject “Historical Issue with Audit Data” dated 2 December 2021	POINQ0230737F	FUJ00176502

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Exhibit no.	Document Description	Control No.	URN
237.	Email chain from G. Barnes to S. Browell, P. Gauntlett and P. Boardman copying M. Mistry with subject “Historical Issue with Audit Data” dated 2 December 2021	POINQ0230738F	FUJ00176503
238.	Archive Server Configuration v 1.0 dated 21 October 2009	POINQ0230739F	FUJ00176504
239.	Email chain from P. Boardman to S. Browell, P. Gauntlett, G. Barnes copying M. Mistry with subject “Historical Issue with Audit Data” dated 2 December 2021	POINQ0230741F	FUJ00176506
240.	Email from S. Browell to P. Gauntlett, G. Barnes and P. Boardman copying M. Mistry with subject “Historical Issue with Audit Data” dated 2 December 2021	POINQ0230742F	FUJ00176507
241.	Document titled “Inconsistent data in IRE11 and IRE19 Audit Archives” dated 2 December 2021	POINQ0230743F	FUJ00176508
242.	Email chain from G. Barnes to S. Browell, P. Gauntlett and P. Boardman copying M. Mistry with subject “Historical Issue with Audit Data” dated 2 December 2021	POINQ0230744F	FUJ00176509
243.	Email from G. Barnes to S. Browell, P. Gauntlett, P. Boardman and E. Ashford copying M. Mistry with subject “Historical Issue with Audit Data” dated 2 December 2021	POINQ0230746F	FUJ00176511
244.	Email from G. Barnes to E. Ashford, S. Browell, P. Gauntlett and P. Boardman copying M. Mistry, A. R. Gibson and S. Wilson with subject “Historical Issue with Audit Data” dated 3 December 2021	POINQ0230747F	FUJ00176512
245.	Email chain from E. Ashford to G. Barnes, S. Browell, P. Gauntlett and P. Boardman copying M. Mistry, A. R. Gibson and S. Wilson with subject “RE: Historical Issue with Audit Data” dated 3 December 2021	POINQ0230748F	FUJ00176513
246.	Email chain from G. Barnes to E. Ashford, S. Browell, P. Gauntlett and P. Boardman copying M. Mistry, A. R. Gibson and S. Wilson with subject “Historical Issue with Audit Data” dated 3 December 2021	POINQ0230749F	FUJ00176514
247.	Email chain from S. Browell to P. Gauntlett, P. Boardman and G. Barnes with subject “PCI meeting where audit archive gaps was raised” dated 3 December 2021	POINQ0230750F	FUJ00176515

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Exhibit no.	Document Description	Control No.	URN
248.	Email from S. Browell to A. Kemp, A. Holmes, G. Barnes and P. Gauntlett copying J. Muir and G. Baker with subject “CONFIDENTIAL - Notes from our catch up earlier - ARQ focused” dated 3 December 2021	POINQ0230751F	FUJ00176516
249.	Email chain from G. Barnes to S. Browell, A. Kemp, A. Holmes and P. Gauntlett copying J. Muir and G. Baker with subject “CONFIDENTIAL - Notes from our catch up earlier - ARQ focused” dated 4 December 2021	POINQ0230752F	FUJ00176517
250.	Email chain from E. Ashford to G. Barnes, S. Browell, P. Gauntlett, and P. Boardman copying M. Mistry, A. R. Gibson and S. Wilson with subject “Historical Issue with Audit Data” dated 3 December 2021	POINQ0230753F	FUJ00176518
251.	Email chain from E. Ashford to G. Barnes, S. Browell, P. Gauntlett and P. Boardman copying M. Mistry, A. R. Gibson and S. Wilson with subject “Historical Issue with Audit Data” dated 3 December 2021	POINQ0230754F	FUJ00176519
252.	Email chain from S. Browell to E. Ashford, G. Barnes, P. Gauntlett and P. Boardman copying M. Mistry, A. R. Gibson and S. Wilson with subject “Historical Issue with Audit Data” dated 6 December 2021	POINQ0230755F	FUJ00176520
253.	Email chain from E. Ashford to S. Browell, G. Barnes, P. Gauntlett and P. Boardman copying M. Mistry, A. R. Gibson and S. Wilson with subject “Historical Issue with Audit Data” dated 6 December 2021	POINQ0230756F	FUJ00176521
254.	Email chain from S. Browell to E. Ashford, G. Barnes, P. Gauntlett and P. Boardman copying M. Mistry, A. R. Gibson and S. Wilson with subject “Historical Issue with Audit Data” dated 6 December 2021	POINQ0230757F	FUJ00176522
255.	Email chain from G. Barnes to S. Browell, E. Ashford, P. Gauntlett and P. Boardman copying M. Mistry, A. R. Gibson and S. Wilson with subject “Historical Issue with Audit Data” dated 6 December 2021	POINQ0230758F	FUJ00176523
256.	Email chain from G. Barnes to E. Ashford copying P. Gauntlett and A. R. Gibson with subject “Historical Issue with Audit Data” dated 6 December 2021	POINQ0230759F	FUJ00176524

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Exhibit no.	Document Description	Control No.	URN
257.	Email chain from E. Ashford to G. Barnes copying P. Gauntlett and A. R. Gibson with subject “Historical Issue with Audit Data” dated 6 December 2021	POINQ0230761F	FUJ00176526
258.	Email chain from G. Barnes to S. Browell, E. Ashford, P. Gauntlett and P. Boardman copying M. Mistry, A. R. Gibson and S. Wilson with subject “Historical Issue with Audit Data” dated 6 December 2021	POINQ0230762F	FUJ00176527
259.	Email from S. Browell to G. Barnes, J. Muir, E. Ashford, P. Gauntlett, G. Baker, S. Wilson, M. Hatch and S. Bansal with subject “CONFIDENTIAL - Audit Archive - The action plan” dated 6 December 2021	POINQ0230763F	FUJ00176528
260.	Email chain from G. Barnes to S. Browell, A. Kemp, A. Holmes and P. Gauntlett copying J. Muir and G. Baker with subject “CONFIDENTIAL - Notes from our catch up earlier - ARQ focused” dated 5 December 2021	POINQ0230764F	FUJ00176529
261.	Email chain from E. Ashford to P. Gauntlett with subject “Mirroring the audit archives in IRE11 and IRE19” dated 14 January 2022	POINQ0230765F	FUJ00176530
262.	Email chain from H. Kuypers to P. Gauntlett and M. Mistry with subject “Problem statement IRE19 DCs” dated 28 January 2022	POINQ0230766F	FUJ00176531
263.	Email chain from H. Kuypers to P. Gauntlett, M. Mistry and R. Oye-Akinola with subject “Problem statement IRE19 DCs” dated 31 January 2022	POINQ0230767F	FUJ00176532
264.	Email chain from P. Gauntlett to G. Barnes with subject “Summary of Riposte and HNGx” dated 30 November 2021	POINQ0230768F	FUJ00176533
265.	Email from P. Gauntlett to G. Barnes with subject “Summary of Riposte and HNGx” dated 1 December 2021”	POINQ0230769F	FUJ00176534
266.	Email chain from P. Gauntlett to S. Browell copying G. Barnes, M. Mistry and P. Boardman with subject “Historical Issue with Audit Data” dated 1 December 2021	POINQ0230770F	FUJ00176535
267.	Email from P. Gauntlett to P. Boardman, S. Browell and G. Barnes copying M. Mistry with subject “Historical Issues with Audit Data” dated 2 December 2021	POINQ0230771F	FUJ00176536

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Exhibit no.	Document Description	Control No.	URN
268.	Email chain from P. Gauntlett to S. Browell, P. Boardman and G. Barnes with subject “PCI meeting where audit archive gaps was raised” dated 3 December 2021	POINQ0230772F	FUJ00176537
269.	Email chain from P. Gauntlett to S. Browell, P. Boardman and G. Barnes with subject “PCI meeting where audit archive gaps was raised” dated 3 December 2021	POINQ0230773F	FUJ00176538
270.	PC0187306	POINQ0230570F	FUJ00176335
OTHER POTENTIAL ISSUES RELATING TO ARQ DATA			
271.	PC0088573	POINQ0178277F	FUJ00172096
272.	PC0272681	POINQ0179364F	FUJ00173183
273.	PC0205806	POINQ0178402F	FUJ00172221
274.	PC0206923	POINQ0178396F	FUJ00172215
275.	PC0280793	POINQ0179365F	FUJ00173184
276.	PC0241862	POINQ0179244F	FUJ00173063
277.	PC0225656	POINQ0178467F	FUJ00172286
278.	PC0211833	POINQ0178422F	FUJ00172241
APPENDIX 1 - AUDIT TRAIL FUNCTIONAL SPECIFICATIONS			
279.	Audit Trail Functional Specification v 3.1 dated 10 November 1999	POINQ0125542F	FUJ00119343
280.	Audit Trail Functional Specification v 4.0 dated 10 November 1999	POINQ0124379F	FUJ00118196
281.	Audit Trail Functional Specification v 4.1 dated 10 April 2000	POINQ0161717F	FUJ00155523
282.	Audit Trail Functional Specification v 5.0 dated 15 January 2001	POINQ0007621F	FUJ00001450
283.	Audit Trail Functional Specification v 6.0 dated 25 February 2002	POINQ0007791F	FUJ00001620
284.	Audit Trail Functional Specification v 7.0 dated 17 September 2002	POINQ0007850F	FUJ00001679
285.	Audit Trail Functional Specification v 8.0 dated 18 October 2004	POINQ0008065F	FUJ00001894
286.	Audit Trail Functional Specification v 9.0 dated 22 November 2004	POINQ0125546F	FUJ00119347
287.	Audit Trail Functional Specification v 10.0 dated 29 June 2005	POINQ0008116F	FUJ00001945
288.	Audit Trail Functional Specification v 12.0 dated 8 October 2010	POINQ0008425F	FUJ00002254
APPENDIX 2 - ARQ DATA EXTRACTION PROCESSES			
289.	Conducting Audit Data Extractions at CSR Process v 1.0 dated 4 May 2000	POINQ0158353F	FUJ00152159
290.	Conducting Audit Data Extractions at CSR+ Process v 1.0 dated 15 December 2000	POINQ0158361F	FUJ00152167
291.	Conducting Audit Data Extractions at Live v 2.0 dated 27 November 2001	POINQ0158370F	FUJ00152176

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Exhibit no.	Document Description	Control No.	URN
292.	Audit Data Extractions Process v 0.1 dated 31 January 2002	POINQ0230501F	FUJ00176267
293.	Audit Data Extraction Process v 2.0 dated 27 January 2003	POINQ0230504F	FUJ00176270
294.	Audit Extraction Support Guide v 2.0 dated 21 May 2003	POINQ0230505F	FUJ00176271
295.	Audit Data Extraction Process v 1.0 dated 1 March 2011	POINQ0158412F	FUJ00152218
296.	Audit Data Extraction Process v 2.0 dated 23 April 2012.	POINQ0158417F	FUJ00152223
297.	Audit Data Extraction Process v 3.0 dated 4 September 2014	POINQ0158422F	FUJ00152228
298.	Audit Data Extraction Process v 4.0 dated 2 December 2016	POINQ0158426F	FUJ00152232
APPENDIX 2 - PROSECUTION SUPPORT PROCESSES			
299.	Network Banking Management of Prosecution Support Procedure v 1.0 dated 26 November 2002	POINQ0158399F	FUJ00152205
300.	Service Description for the Security Management Service v 1.0 dated 6 January 2003	POINQ0007914F	FUJ00001743
301.	Service Description for the Security Management Service v 2.0 dated 2 December 2004	POINQ0230507F	FUJ00176273
302.	Service Description for the Security Management Service v 3.0 dated 6 March 2006	POINQ0008171F	FUJ00002000
303.	Security Management Service: Service Description v 1.0 dated 24 August 2006	POINQ0094351F	FUJ00088180
304.	Security Management Service: Service Description v 2.0 dated 31 December 2008	POINQ0094508F	FUJ00088337
305.	Management of the Litigation Support Service v 1.0 dated 27 October 2009	POINQ0158406F	FUJ00152212
306.	Security Management Service: Service Description v 3.0 dated 15 October 2010	POINQ0094854F	FUJ00088683
307.	Management of the Litigation Support Service v 2 dated 23 April 2012	POINQ0158419F	FUJ00152225
308.	Security Management Service: Service Description v 3.5 dated 25 November 2013	POINQ0095039F	FUJ00088868
309.	Security Management Service: Service Description v 4.0 dated 4 December 2013	POINQ0095040F	FUJ00088869
310.	Security Management Service: Service Description v 5.0 dated 4 April 2014	POINQ0095068F	FUJ00088897

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APPENDIX 1

Audit Trail Functional Specifications

	Version	Date	Control Number	URN
1.	3.0	1 July 1999	POINQ0007489F	FUJ00001318
2.	3.1	10 November 1999	POINQ0125542F	FUJ00119343
3.	4.0	10 November 1999	POINQ0124379F	FUJ00118196
4.	4.1	10 April 2000	POINQ0161717F	FUJ00155523
5.	5.0	15 January 2001	POINQ0007621F	FUJ00001450
6.	6.0	25 February 2002	POINQ0007791F	FUJ00001620
7.	7.0	17 September 2002	POINQ0007850F	FUJ00001679
8.	8.0	18 October 2004	POINQ0008065F	FUJ00001894
9.	9.0	22 November 2004	POINQ0125546F	FUJ00119347
10.	10.0	29 June 2005	POINQ0008116F	FUJ00001945
11.	11.0	4 August 2006	POINQ0008190F	FUJ00002019
12.	12.0	8 October 2010	POINQ0008425F	FUJ00002254

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APPENDIX 2

Schedules of Approved ARQ Extraction Process Documents and Prosecution Support Process Documents

A. ARQ Data Extraction Processes

	Document Date	Title	Internal Reference	Version	Author/ Originator	URN
1.	4 May 2000	Conducting Audit Data Extractions at CSR	IA/PRO/002	1.0	Jan Holmes	FUJ00152159
2.	21 August 2000	Audit Extractor Support Guide	TD/MAN/018	1.0	Bryan Muir	FUJ00176539
3.	22 December 2000	Conducting Audit Data Extractions at CSR+	IA/PRO/003	1.0	Jan Holmes Brian Mooney Anthony Brown	FUJ00152167
4.	27 November 2001	Conducting Audit Data Extractions at Live	IA/PRO/003	2.0	Jan Holmes Jane Bailey	FUJ00152176
5.	31 January 2002	Audit Data Extractions Process	IA/PRO/004	0.1	Jan Holmes Jane Bailey	FUJ00176267
6.	29 May 2002	Audit Data Extractions Process	IA/PRO/004	1.0	Jane Bailey	FUJ00176540
7.	27 January 2003	Audit Data Extractions Process	IA/PRO/004	2.0	Jane Bailey	FUJ00176270
8.	21 May 2003	Audit Extractor Support Guide	TD/MAN/018	2.0	Keith Hibberd	FUJ00176271
9.	1 February 2005	Audit Data Extractions Process	IA/PRO/004	3.0	Neneh Lowther	FUJ00176265
10.	1 March 2011	Audit Data Extraction Process	SVM/SEC/PRO/0018	1.0	Penny Thomas	FUJ00152218
11.	14 February 2012	Audit Data Extraction Process	SVM/SEC/PRO/0018	2.0	Penny Thomas	FUJ00152223
12.	4 September 2014	Audit Data Extraction Process	SVM/SEC/PRO/0018	3.0	Kumudu Amaratunga	FUJ00152228
13.	2 December 2016	Audit Data Extraction Process	SVM/SEC/PRO/0018	4.0	Farzin Denbali	FUJ00152232

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B. Prosecution Support Processes

	Document Date	Title	Internal Reference	Version	Author/ Originator	URN
1.	26 November 2002	Network Banking Management of Prosecution Support	NB/PRO/003	1.0	Jane Bailey	FUJ00152205
2.	6 January 2003	Service Description for the Security Management Service	CS/SER/016	1.0	Graham Hooper Peter Sewell	FUJ00001743
3.	2 December 2004	Service Description for the Security Management Service	CS/SER/016	2.0	Bill Mitchell Peter Sewell	FUJ00176273
4.	29 February 2005	Network Banking Management of Prosecution Support	NB/PRO/003	2.0	Neneh Lowther	FUJ00152209
5.	6 March 2006	Service Description for the Security Management Service	CS/SER/016	3.0	Peter Sewell Brian Pinder	FUJ00002000
6.	24 August 2006	Security Management Service: Service Description	SVM/SDM/SD/0017	1.0	Richard Brunskill	FUJ00088180
7.	31 December 2008	Security Management Service: Service Description	SVM/SDM/SD/0017	2.0	Peter Sewell	FUJ00088337
8.	27 October 2009	Management of the Litigation Support Service	SVM/SEC/PRO/0017	1.0	Penny Thomas	FUJ00152212
9.	15 October 2010	Security Management Service: Service Description	SVM/SDM/SD/0017	3.0	Donna Munro	FUJ00088683
10.	23 April 2012	Management of the Litigation Support Service	SVM/SEC/PRO/0017	2.0	Penny Thomas	FUJ00152225
11.	25 November 2013	Security Management Service: Service Description	SVM/SDM/SD/0017	3.5	Kumudu Amaratunga	FUJ00088868
12.	4 December 2013	Security Management Service: Service Description	SVM/SDM/SD/0017	4.0	Kumudu Amaratunga	FUJ00088869
13.	4 April 2014	Security Management Service: Service Description	SVM/SDM/SD/0017	5.0	Kumudu Amaratunga	FUJ00088897