

Witness Name: Robert Booth

Statement No.: WITN 0406R9\_1

Exhibits: WITN 0406R9\_1/1 – WITN 0406R9\_1/106

Dated: 16 September 2022

## THE POST OFFICE HORIZON IT INQUIRY

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### First Witness Statement of Robert Booth in the Post Office Horizon IT Inquiry

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I, **Robert Booth**, of **Finsbury Dials, 20 Finsbury Street, London, EC2Y 9AQ, SAY**

#### AS FOLLOWS:

1. I am a Solutions Architect for Post Office Limited ("**POL**"). Whilst my given name is Robert Booth, I am generally known as Bob Booth and there will be references in documents to me under both names.
2. Except where I indicate to the contrary, the facts and matters contained in this witness statement are within my own knowledge. Where any information is not within my personal knowledge, I have identified the source of my information or the basis for my belief. The facts in this witness statement are true to the best of my knowledge and belief.
3. This witness statement has been prepared in response to the request made by the Horizon IT Inquiry (the "**Inquiry**") pursuant to Rule 9 of the Inquiry Rules 2006, dated 21 July 2022 (the "**21 July Rule 9 Request**"). In this witness statement, I address each of the questions set out in the Annex to the 21 July Rule 9 Request.

4. Where I refer to specific documents in this statement, these are the documents that the Inquiry provided to me for review. They are identified by the Inquiry's unique reference number for that document.

## **DEFINED TERMS**

5. In this statement, I have used a number of acronyms and defined terms. I have set out a definition of each, as I have introduced them. However, for convenience, I also set out the definitions of these acronyms and defined terms below:

<b>AEI</b>	Application Enrolment Identity
<b>APS</b>	Automated Payment System
<b>BA</b>	Benefits Agency
<b>BES</b>	Benefits Encashment Service
<b>CAPO</b>	Card Account at Post Office, aka POCA
<b>CIT</b>	Code and Integration Testing – internal Fujitsu development and testing
<b>EUC</b>	End User Compute
<b>EPOSS</b>	Electronic Point of Sale System
<b>Fujitsu</b>	Successor to ICL Pathway in approximately 2002
<b>HAPS</b>	Host Automated Payment System
<b>HNG-A</b>	Current Horizon implementation on supported Java version, run in conjunction with the Tower providers
<b>HNG-X</b>	Fujitsu rewrite of the original Escher/Riposte Horizon system when Fujitsu managed the total service
<b>Horizon</b>	The Horizon IT System Also used as generic term for all the iterations Also used to refer to the original Escher/Riposte based system
<b>Inquiry</b>	The Horizon IT Inquiry

<b>LST</b>	Live System Test – promotion of release candidate in test environment to confirm it was releasable
<b>paystation</b>	Standalone terminal for low value payments of bills and token top ups with low level of training required. Separate from Horizon
<b>ICL Pathway</b>	ICL Pathway which later became Fujitsu in approximately 2002
<b>PCI</b>	Payment Card Industry
<b>PDA</b>	Programme Design Authority
<b>PFI</b>	Private Finance Initiative
<b>POCA</b>	Post Office Card Account, aka CAPO
<b>POCL</b>	Post Office Counters Limited which later became Post Office Limited in 2001
<b>POL</b>	Post Office Limited which succeeded Post Office Counters Limited in 2001
<b>SV&amp;I</b>	System Validation and Integration – first formal integration stage, later stages visible to POL
<b>TUPE</b>	Transfer of Undertakings (Protection of Employment) Regulations 1981 or Transfer of Undertakings (Protection of Employment) Regulations 2006

6. In this statement, I have referred to both POCL and POL as well as ICL Pathway and Fujitsu. When I first became involved with Horizon, POCL and ICL Pathway were the relevant company names and they later became POL and Fujitsu; I have tried to use the appropriate name depending on the time frame. Similarly, Alliance & Leicester later became Santander and Link later became Vocalink. For consistency, throughout this statement I have referred to these companies as Alliance & Leicester and Link respectively.

## **BACKGROUND**

### **1. Please set out a brief professional background.**

#### **Educational background**

7. I have a degree in Mechanical Engineering from the University of Surrey.

#### **Sep 84 – Sep 90: CAP > SEMA > Schlumberger SEMA**

8. In September 1984, I joined Computer Analysts and Programmers Ltd ("**CAP**") as a graduate in the industrial division as a programmer. CAP merged with Sema-Metra SA in 1988 to form Sema Group plc, which in turn was acquired by Schlumberger in 2001. By the time I left Schlumberger Sema, I was a Team Leader in the financial division involved with real time dealing room trading systems.

#### **Oct 90 – May 03: Post Office**

9. In October 1990, I joined Post Office Counters Limited ("**POCL**") as a Team Leader for the in-house development of an electronic point of sale system, ECCO+, which was part of the counter automation of Post Office's directly managed offices (these are also known as Crown Offices). I led one of the front office development teams and later moved into a design and business liaison role.
10. I subsequently moved on to consolidating the disparate email systems in the Royal Mail Group before joining the already established POCL Private Finance Initiative ("**PFI**") team. The PFI team had been set up specifically to handle the procurement of what became the Horizon System. I did not join at the very beginning and I cannot recall the exact date I joined the PFI team, but it was

likely to be in 1994 or 1995, on the basis that the tender process for the system took place in early 1996. I explain my role at this time in detail in response to question 2 below but I worked on the Horizon project in various roles roughly through to June 2003 and then again in 2014.

11. In 2003, I was part of the Post Office team that worked on enabling chip and PIN cards for payment and banking where the Benefits Agency's Post Office Card Account product ("**POCA**") was treated as a bank. Horizon was the largest connected retail network in Europe, and leading edge with colour touch screens, scales, bar code readers and PIN pads. I subsequently worked on the replacement of the original banking switch (connecting Horizon to the Link network, Alliance & Leicester Bank and POCA) in use by Post Office at the time (IBM Connex) to a Fujitsu solution.

**Jun 03 – Oct 06: Xansa > Steria (TUPE from Post Office)**

12. In June 2003, I was transferred from Post Office to Xansa (became Steria) and continued to work primarily on Post Office projects. Whilst at Xansa, I continued working on the Post Office Horizon chip and PIN project until it was completed, although I cannot remember the date that project completed.
13. After the chip and PIN project was completed, I became technical lead for the development and deployment of the paystation programme. Paystation was a project with an estate of 12,500 standalone terminals separate from Horizon. It transacted bill payments, smart card (Quantum gas) and smart key recharging (Talexus electricity), as well as phone top-ups and debit/credit card payment.

**Nov 06 – Mar 14: Post Office**

14. In November 2006, I resigned from Xansa and re-joined Post Office as an employee and led the technical strand for a standalone biometric capture solution, Application Enrolment Identity ("**AEI**"). This solution was implemented and deployed servicing UK Border Agency (later to become UK Visas and Immigration), the Driver and Vehicle Licensing Agency and the Security Industry Authority, providing a light touch interface to Horizon to allow for sharing of the physical peripherals and allowing customers to pay for the transaction using standard Horizon services.

**Apr 14 – Mar 20: Atos (TUPE from Post Office)**

15. In April 2014, I was transferred under TUPE to Atos where I worked on the Post Office counter hardware refresh evaluation and implementation for both HQ and branches, including new hardware, new network and porting HNG-X to HNG-A. This was primarily moving to modern functionally equivalent hardware and operating system and worked with Computacenter who took over the management of the counter estate to achieve this. Fujitsu ported the HNG-X application to a current Java version, HNG-A, that would run on the new hardware and delivered this into user acceptance having internally tested the port first.
16. Following on from ad-hoc consultancy, in 2019 I moved onto my current project of making the Post Office payment and banking solution compliant with the current Payment Card Industry ("**PCI**") standards. A major part of this was changing the way the PIN pads communicated with the POS and how the transactions were routed to Link (and thence the banks) and to Global

Payments for credit/debit card and a minor piece of work for handling Travel Money Cards.

**Apr 20 – Present: Post Office TUPE from Atos**

17. In April 2020, I was transferred under TUPE from Atos back to Post Office where I have continued work on the PCI project which has just completed rollout.

**2. Please set out the background to your involvement in the Horizon project.**

18. Not having had continuous employment with Post Office, I do not have any day books relating to that period and with matters going back over twenty years I am unable to give precise dates and roles and have set out things as best as I can remember them. I cannot be sure that these are true memories and not affected by later knowledge or reinterpretation of matters after the event. As other material comes to light, this may change my recollection but my answers here are as I remember things.

**Background to Horizon**

19. For context, Horizon has moved through several evolutions in its life and has generally been referred to as "Horizon" throughout by branch staff. It has not materially changed in function (it still records sales, facilitates payment and delivery of transactions, performs accounting, has user management etc.) but the underlying technology has changed.
  - a. At the time of the award, Horizon was based on the Riposte product from Escher which was used for the national rollout and several iterations thereafter.

- b. Horizon then moved to Horizon Next Generation and was labelled HNG-X as there were discussions that I was not privy to around options and option “X” was agreed upon. At this time it was also known as Horizon Online as one of the changes was that every basket was committed online in real time, rather than updates to the centre occurring whenever a connection was established which could leave several baskets waiting to be uploaded to the data centre. HNG-X was a fresh counter code implementation but used the same hardware, allowing the migration to be performed with on-site assistance at a peak of circa 300 branches a week. As well as the counter change, the data centre that interacted with the counters changed in line though back end interfaces were protected as much as possible to minimise disruption to connected parties.
  - c. With the push to adopt Towers models – where there would be several suppliers potentially competing for work – POL split the Fujitsu single supplier service into several services. Computacenter delivered new hardware and a Windows 10 operating environment that they managed and Fujitsu ported the HNG-X counter to HNG-A which was a modern Java implementation and accommodated the new hardware and drivers.
20. Throughout my involvement with Horizon, POCL had contractual relationships with ICL Pathway, and POCL clients such as Alliance & Leicester and Link. However, there was no direct contractual relationship between ICL Pathway and these parties in regard to the work POCL required to interface into Horizon. ICL Pathway would document their solution at an interface level or high-level infrastructure level, which BA/POCL and later just POCL (including myself)



would then use to agree with the relevant third party, or the third party would provide their interface for ICL Pathway to conform to. Sometimes there were ICL Pathway/third party workshops but always facilitated by POCL.

21. Once interfaces were agreed and elements of data to be captured were identified, the revised workflows and other documents would be produced by Fujitsu and then I, along with colleagues, would review and agree these specifications. The lower level implementation detail and testing were not shared and POL would subsequently test at an end user level as part of User Acceptance Testing that would feed any defects and/or observations back to be amended or noted at Acceptance meetings as outstanding with mitigations, where the overall recommendation was passed up to the Release Authorisation Board for release authorisation.
22. As in any development lifecycle, there would have been issues found and rated as "High", "Medium" or "Low". High referred to fundamental problems with the product, Medium referred to problems with the product that were not fatal and had an acceptable workaround (but a limit to the number of workarounds that would be reasonably accommodated was in place) and Low referred to problems that did not materially affect the operation of the product such as text alignment (but again there was a limit to the number of Lows to ensure the end user experience was good). By the time Acceptance occurred, there would be fewer issues with the product and Acceptance would not be recommended with any Highs, and only some Mediums would be permitted whilst there would be a bigger limit on Lows. The Acceptance status was then passed on to the Release Authorisation Board for a release authorisation verdict.

### **Involvement with Horizon**

23. My first involvement with Horizon was when I joined the established POCL PFI team, as explained in response to question 1 above.
24. When I joined the POCL PFI team, I was initially involved as a junior member of the technical evaluation team, collating business requirements from analysts and working with POCL and BA to set out some of the baseline technical requirements for what was to become Horizon.
25. I was part of the team which scored the tenders on a predefined matrix, which was then combined with other strands and led to the award of the Horizon contract to ICL Pathway. I remember attending meetings with bidders, but not the specifics as it was a long time ago.
26. The evaluation and delivery team were, as I recall, in silos with the back office (e.g. settlement, billing, remuneration) separate from the front office (transaction capture / interaction with clerk and customer) where I was placed. There were other strands including security, service management, contracts and the commercial terms and conditions etc. but I cannot recall the precise strands or breakdown of responsibilities.
27. Following the award of the Horizon contract to ICL Pathway, I worked with the Benefits Agency ("**BA**") as part of the POCL team in refining the requirements and implementation to deploy the first generation of Horizon. This was based on the Escher Riposte product which was in use until circa 2009 when it was replaced by a Fujitsu written Java application and Oracle based data centre. The Escher Riposte product was, and still is, a messaging product where a message is generated at a counter and replicated to partners be they within the

branch or within the data centre. For single position branches there were two discs in the machine, with the second disc being the partner such that data was always stored on at least two media. Once data had been replicated to the data centre, it was available for harvesting and delivery to clients. In terms of process, requirements set by BA/POCL were set out in a requirement catalogue and ICL Pathway would then set out acceptance criteria of how they were going to meet each requirement. BA/POCL would then assess the approach and these would be agreed; ICL Pathway would then submit evidence in line with the criteria to allow POCL to assess if the criteria were met.

28. In respect of Horizon, I was broadly involved in the design of the front-end magnetic card acceptance and client interface for the Post Office Card Account ("**POCA**") which was also known as Card Account at Post Office ("**CAPO**") or the Benefits Payments Card ("**BPC**"). This was the front-end transaction capture for bill payment and banking and payment. This referred to the clerk-customer interaction for basic bill payment where a customer would present a token (magnetic card or barcoded bill) along with monies to credit their account. I also worked on back-end interfaces to the clients to deliver transactions to them and get authorisation verdicts from them, and fed into the reconciliation of the counter view and the client view. The back office was responsible for invoicing (payment for work done by Post Office), settlement (the exchange of monies tendered by the customer) and remuneration (payment to the branch for chargeable work that was undertaken).
29. My main role was as a point of presence at the Fujitsu site in Feltham, being physically present on site to allow Fujitsu to discuss matters face-to-face which I could then take back to the relevant experts. Both POCL and BA staff were in

a single room in Feltham, separate to Fujitsu, with no unaccompanied access to Fujitsu areas. This allowed attendance at document review meetings and undertaking of reviews of Fujitsu provided documents with other BA and POCL colleagues. These documents consisted of mainly technical interface documents but I also provided ad-hoc advice on other types of documents. Being physically on site, I would have acted as a "document champion" for POCL; this role was to provide a point of contact for Fujitsu in relation to the review of documents, but I was not necessarily the subject matter expert. I would have acted as a single point of contact for Fujitsu and as a conduit to the relevant subject matter experts, facilitating discussion and collating comments before sending these comments back to Fujitsu. Whilst they were involved, BA had the senior presence at Feltham and greater access to ICL Pathway and I reported into several different managers within the Post Office infrastructure over the period and recall at least two management consultancies (French Thornton and PA Consulting) into whom I also reported at one stage or another.

30. When BA withdrew from Horizon, there was no substantive change in my role of being a point of contact for Fujitsu and reviewing the Fujitsu documents. The main difference was that I felt that my views were given more weight as any concerns I raised would be moderated by Post Office as opposed to BA where the single BA product outweighed the needs of all the POL products.
31. My recollection is that the original Horizon rolled out with the payment mechanism being a bar-coded book. However, in 2003, work began to move to chip and PIN as the payment mechanism since there was a change coming in 2005 which moved payment liability to retailers if they did not have a chip and PIN payment facility. The IBM Connex banking switch in use at the time

would have needed enhancement to support chip and PIN and I think there was a tender process, but the result was that Fujitsu developed equivalent banking and payment support to allow card acceptance, including chip and PIN. I continued my involvement in payment and banking, reviewing technical Fujitsu documents and liaising with POCL clients: Streamline (for payment, later retendered and awarded to Global Payments), POCA and Alliance & Leicester who were directly connected to Horizon, and Link who were directly connected to Horizon and acted as a switch to access the other POCL banking clients.

32. I then moved away from Horizon and worked on various other Post Office initiatives, the main ones being the technical strand lead of a separate paystation project, after which I was the technical strand lead for the separate biometric AEI project.
33. After this gap away from direct Horizon involvement, I would have been called upon ad-hoc on matters relating to Horizon due to my previous involvement, though I cannot recall any specific queries. I became involved in the POL Towers Procurement around 2014. One element of the POL Towers Procurement, as far as Horizon was concerned, was to replace the aged counter hardware, necessitating the porting of HNG-X to an updated Java and Windows 10 environment. There were initially five Towers involved, which impacted Horizon and broke up the Fujitsu monolith into a multi-vendor environment where there would be competitive tension between the vendors to try and achieve a more cost effective and faster solution. This resulted in a network Tower won by Verizon, an End User Compute hardware ("**EUC**") Tower for administration and counter hardware and engineers won by Computacenter (but now retendered and with DXC), a Front Office Application

Tower won by IBM to replace Horizon (counter, data centre, client connections, reconciliation i.e. everything that Fujitsu were delivering to POL) but later cancelled, a data centre Tower that was not awarded and the individual suppliers maintained their own data centres, and a System Integrator Tower won by Atos but now expired and reverted back to POL.

34. I was involved in the EUC Tower and focussed on the replacement of Post Office branch hardware. To facilitate the move from HNG-X on the old NT4 to the new Windows 10, the migration approach agreed was to upgrade the HNG-X Java implementation to a modern Java that would run on Windows 10 ("**HNG-A**"). This would allow the swap of network and hardware in one visit leaving the clerk with familiar HNG software and it was planned there would be a later (after approximately three months rolling deployment) upgrade over the wire to the IBM solution. With the cancellation of IBM counter solution, the HNG-A solution and infrastructure and processes used by HNG-A have continued to be used to provide POL's counter service.
35. Since 2018, I have been involved in the implementation of a solution removing card data from the HNG-A system to allow POL to gain PCI accreditation. This project is currently ongoing.

## DESIGN AND DEVELOPMENT

**3. Please consider: FUJ00085352 (WITN 0406R9\_1/1); FUJ00003487 (WITN 0406R9\_1/2); FUJ00058486 (WITN 0406R9\_1/3); FUJ00058484 (WITN 0406R9\_1/4); POL00028188 (WITN 0406R9\_1/5)**

**a. Please describe your role in the design and development of the Horizon IT system.**

36. I have reviewed documents WITN 0406R9\_1/1, WITN 0406R9\_1/2, WITN 0406R9\_1/3, WITN 0406R9\_1/4, WITN 0406R9\_1/5 identified in respect of Q3 but have not limited my responses to Q3 in relation to these documents. Please read this response in conjunction with my response to Q2.

37. Horizon continues to evolve and be developed. My role in the design and development of Horizon was as part of a team reviewing Fujitsu produced technical material (e.g. screen designs, process flows, etc.) and liaising with third parties as required, (as described in paragraph 21 above). It should be noted that Fujitsu only shared high level designs against the requirements; low level designs, and code were never shared or made available for review. It should also be noted that the documents to review could be quite large and reviews would be restricted to the changes detailed by Fujitsu e.g. the change history would state "section 3.2 amended" and that would then be reviewed and the remainder of the document may not have been reviewed.

38. In terms of the design and development, my role was 'up front', reviewing the high-level designs, input to screen flows, agreeing interface specifications etc. and being available for questions during the testing of the implementation,

which could occur at any point. The implementation was carried out by Fujitsu, and then by POL testers and followed the structure below.

### **Development Lifecycle**

39. The lifecycle followed a process where Fujitsu internally undertook Code and Integration Test (“**CIT**”) and development, before moving onto System Validation and Integration (“**SV&I**”) where the code was placed on test rigs alongside the rest of the system and potentially connected to client test systems. Fujitsu would typically spend two weeks locating and fixing issues – as would be expected in a life cycle – before resetting the rig with improved code and running their tests again, with a third cycle where the code would be a release candidate.
40. During SV&I, POL testers had first sight of the screens and reports and feeds to systems and would be able to highlight anything that was incorrect (e.g. an interpretation or requirement that needed amending as it did not work, or addressing text where a previously unidentified error message was required) and validate the User Acceptance Test (“**UAT**”) scripts that POL would later run. POL would run UAT which is very end user and business process orientated, confirming screens flowed as expected. This phase could not cover technical tests such as communication failures, for example, where cables became disconnected, it would not be known if it was before or after a message was sent so the expected behaviour would not be known and the test would not be repeatable; only by stopping the code and removing the cable and resuming code execution could this be tested – a technical intervention that POL were reliant on Fujitsu for. This phase also did not cover volume or concerted performance testing (though it would note if the end user experience was slow).



POL depended on Fujitsu's technical lower level testing to address these conditions. The final phase is Live System Test ("LST") where Fujitsu would promote the new code on the LST test rigs to confirm that the migration stages and internal run books saying what has to happen are correct.

41. With testing complete, a Release Board would have the evidence presented along with Fujitsu's recommendation and then would authorise proceeding to Live if the evidence supported the decision. Live would be firstly in a Model Office environment, a Live counter just like all the other counters but with no access to the public. This allowed live connections to be proven, new transitions to be exercised and to confirm the promotion occurred successfully, before typically moving to a pilot set of branches for a period. Though testing is thorough, Live branches will put through more transactions and operate the system in different ways – not always in accordance with instructions – and the pilot period allows anomalies to be identified, and if necessary, remedial action to be taken. The software is then deployed to the estate.

#### **Later involvement with Horizon**

42. After a period without direct involvement in Horizon, I resumed my involvement in the design and development of Horizon in 2014 as part of the POL Towers Procurement as described at paragraphs 33 to 34 above.
43. In relation to Landis & Gyr / Quantum and Talexus, (WITN 0406R9\_1/4), I had previous experience from the paystation implementation of these technologies and concepts. Though the Quantum product was released, I do not believe that the Talexus solution was deployed on Horizon.

44. In relation to Data Reconciliation (WITN 0406R9\_1/1), I would have been involved in review and looking at how exceptions would be spotted and if necessary rectified. This would have looked at matters such as the timing of arrival of transactions from various feeds and what happened if they arrived out of sequence and/or did not match etc. i.e. the logical cases that had to be accommodated and turned into lower level and database and code designs by Fujitsu which were not shared.
45. In relation to other matters, I am unable to recall the circumstances of the events and provide any more detail than what is already set out in the documents identified in relation to Q3. However, I would guess that my involvement with HAPS was to support John Bruce with the AP files from Horizon to HAPS to AP clients.
46. In all cases, my involvement with Horizon was at the review of the high-level designs provided by Fujitsu as implementation specifications and more detailed material was not shared with me. External interfaces would have been shared and agreed with the external parties, and would have been checked to ensure that the high-level design met the requirements. It did not, however, go into the lower level detail of how Fujitsu would achieve this.

***b. What understanding did you have of any technical issues with the ICL Pathway solution in February to May 1997?***

47. I have reviewed documents WITN 0406R9\_1/1, WITN 0406R9\_1/2, WITN 0406R9\_1/3, WITN 0406R9\_1/4, WITN 0406R9\_1/5 but they do not assist my recollection in relation to this question. Please read this response in conjunction with my response to Q2.

48. I do not recall any specific issues or general issues with the ICL Pathway solution and would not be able to narrow down to specific timeframe if I did.

***c. Were you involved in addressing any technical issues between February to May 1997?***

49. I have reviewed documents WITN 0406R9\_1/1, WITN 0406R9\_1/2, WITN 0406R9\_1/3, WITN 0406R9\_1/4, WITN 0406R9\_1/5 but they do not assist my recollection in relation to this question. Please read this response in conjunction with my response to Q2.

50. I do not recall any specific issues or general technical issues and would not be able to narrow down to specific timeframe if I did.

***d. What did your role as 'PDA Acceptance Test Manager' for 'APS/HAPS' entail?***

51. Please read this response in conjunction with my response to Q2.

52. Horizon had an interface to the Host Automated Payment System ("**HAPS**"), which was a mechanism to deliver payments to various end clients. The role of Programme Design Authority ("**PDA**") Acceptance Test Manager entailed the review of ICL Pathway supplied documents where they set out their responses to Acceptance criteria to demonstrate compliance. It should be noted that I did not undertake direct testing, nor did I have any test resource that I was responsible for; my role was limited to document reviews and evaluation of written responses from ICL Pathway. The responses included satisfying criteria by Test, where ICL Pathway would state the success of their testing, but could also include a document review or a simple statement.

***e. What concerns did POL have about the reliability and robustness of the Horizon system between February to May 1997?***

53. I have reviewed documents WITN 0406R9\_1/1, WITN 0406R9\_1/2, WITN 0406R9\_1/3, WITN 0406R9\_1/4, WITN 0406R9\_1/5 but they do not assist my recollection in relation to this question. Please read this response in conjunction with my response to Q2.
54. It should be noted that POL had requirements and Fujitsu developed the solution to meet those requirements, but POL did not see the low-level design, code or testing. By the time testing was shared there would have been relatively few bugs, but the point of testing is to uncover bugs so they can be fixed before the code goes live.
55. My general recollection is limited to the areas I was involved with and looking back, I cannot recall any specific concerns. As in any development lifecycle, I expect that there were issues, but if these issues were known prior to release and not resolved they would have been categorised at Acceptance as described at paragraph 22 above. If issues were identified in the live phase, I cannot remember the process that was followed at that time to deal with them. An issue in the development cycle could range from a disagreement about whether an acceptance criteria is a test or document review or it could be a problem identified during testing.

***f. How would you describe the relationship between BA/POCL and ICL Pathway in June 1997?***

56. I have reviewed documents WITN 0406R9\_1/1, WITN 0406R9\_1/2, WITN 0406R9\_1/3, WITN 0406R9\_1/4, WITN 0406R9\_1/5 but they do not assist my

recollection in relation to this question. Please read this response in conjunction with my response to Q2 at paragraph 29 above.

57. I do not recall anything specific about the relationship between BA/POCL and ICL Pathway and my recollection may be limited due to the nature of my involvement as a junior member of the technical evaluation team at the time and then being based in Feltham. In general terms, there was a feeling of POCL being the junior partner with BA having a closer and more senior relationship with the ICL Pathway.

**4. Please consider: FUJ00058252 (WITN 0406R9\_1/6); FUJ00000561 (WITN 0406R9\_1/7).**

**a. What did you perceive as the risks to the Pathway Solution from the introduction of frame relay as preferred to the non-ISDN solution?**

58. I have reviewed documents WITN 0406R9\_1/6 and WITN 0406R9\_1/7 identified in respect of Q4 but have not limited my responses to Q4 in relation to these documents.

59. I believe the frame relay technology for connecting all the branches to the data centre was a proposal that was withdrawn. This seems to be supported by the documents (WITN 0406R9\_1/6; WITN 0406R9\_1/7); VSAT (a satellite dish with an Earth Station that the local router plugged into negating the need for any wired connection to the branch) was used in its place and is still in use, albeit in a later guise, today.

***b. What was your understanding of the issues with network communications and lack of access around the time of the Horizon rollout?***

60. I have reviewed documents WITN 0406R9\_1/6 and WITN 0406R9\_1/7 but they do not assist my recollection in relation to this question.

61. Whilst not directly involved with network communications, from memory of anecdotal information at the time, ISDN was new and not available across the country, but BA/POCL would provide a volume of lines and diverse enough coverage to give sufficient impetus to make it viable and cost effective for British Telecommunications to deploy ISDN at a reasonable, universal, cost.

62. As I was not directly involved in the day to day rollout of Horizon I cannot comment on any specific issues, and I do not recall any specific issues being brought to me to assist with, including network communications.

***5. Please consider: FUJ00078768 (WITN 0406R9\_1/8); FUJ00058397 (WITN 0406R9\_1/9); FUJ00078883 (WITN 0406R9\_1/10)***

***a. What did your role as 'TIP Authority Test Manager' in July 1998 entail?***

63. I have reviewed documents WITN 0406R9\_1/8, WITN 0406R9\_1/9, and WITN 0406R9\_1/10 identified in respect of Q5 but have not limited my responses to Q5 in relation to these documents. Please read this response in conjunction with my response to Q2.

64. Whilst I cannot remember what "TIP" stands for, the role of TIP Authority Test Manager would have entailed the review of ICL Pathway supplied technical documents and, along with colleagues, providing feedback on those documents. It should be noted that I did not undertake direct testing, nor have

any test resource that I was responsible for; my role was limited to document reviews.

***b. What technical defects / issues were you aware of as a result of the pilot in June 1999?***

65. I have reviewed documents WITN 0406R9\_1/8, WITN 0406R9\_1/9, and WITN 0406R9\_1/10 but they do not assist my recollection in relation to this question.

66. I am unable to recall being made aware of any technical defects or issues as a result of the pilot in June 1999. I would only be aware of any technical defects or issues brought to review meetings.

***c. What was the result of the identification of such technical defects / issues?***

67. I have reviewed documents WITN 0406R9\_1/8, WITN 0406R9\_1/9, and WITN 0406R9\_1/10 but they do not assist my recollection in relation to this question. Please read this response in conjunction with my response to Q2 at paragraph 22 above.

68. I am unable to recall the results of the identification of any such technical defects or issues. In general terms, the approach would be a review of presented material, categorisation of any issues identified as described in my response to Q2 and a recommendation on next steps would have been made for senior management to agree.

***d. Did this prompt further testing?***

69. I have reviewed documents WITN 0406R9\_1/8, WITN 0406R9\_1/9, and WITN 0406R9\_1/10 but they do not assist my recollection in relation to this question.

Please read this response in conjunction with my response to Q2 at paragraph 22 above.

70. I am unable to recall if this prompted further testing. In general terms, I would have expected any issues categorised as High or Medium to have an agreed set of steps that would lead to the resolution of the problem, normally with an agreed plan to accompany it.
71. The role of TIP Authority Test Manager would have entailed the review of ICL Pathway supplied technical documents and, along with colleagues, providing feedback on those documents. As explained above, it should be noted that I did not undertake direct testing, nor have any test resource that I was responsible for; my role was limited to document reviews and the documents would not have had low level detail in them.

***e. What was your role in this between June to November 1999?***

72. I have reviewed documents WITN 0406R9\_1/8, WITN 0406R9\_1/9, and WITN 0406R9\_1/10 but they do not assist my recollection in relation to this question.
73. I am unable to recall my role in relation to this between June to November 1999.

***6. Please consider: FUJ00001493 (WITN 0406R9\_1/11); FUJ00088005 (WITN 0406R9\_1/12); FUJ00001441 (WITN 0406R9\_1/13); FUJ00088068 (WITN 0406R9\_1/14)***

***a. What involvement did you have in ensuring the security and integrity of the data in the Horizon System from 1999 to 2004?***

74. I have reviewed documents WITN 0406R9\_1/11, WITN 0406R9\_1/12, WITN 0406R9\_1/13, WITN 0406R9\_1/14 but have not limited my responses to Q6 in



relation to these documents. Please read this response in conjunction with my response to Q2.

75. I am unable to recall my involvement in ensuring the security and integrity of the data in Horizon from 1999 to 2004. Looking at the documents, they are not familiar and I assume I was acting as a gateway into others within Post Office for more detailed review as I was co-located with ICL Pathway at Feltham. Though I am aware of general security principles, I am not a security specialist and would have deferred to specialists such as Sue Lowther (WITN 0406R9\_1/14).

***b. What processes did you understand were in place for access control and user administration in 1999?***

76. I have reviewed documents WITN 0406R9\_1/11, WITN 0406R9\_1/12, WITN 0406R9\_1/13, WITN 0406R9\_1/14 but they do not assist my recollection in relation to this question.
77. I am unable to recall what processes were in place for access control and user administration in 1999 as this was not my area. In respect of counter login, I believe there would have been a general approach of branch users having just enough access to do their jobs, but I cannot recall the detail. In addition, while I remember the use of a memory card to ensure there was a token as well as a PIN to start up and then username and password to log on to the counter system I cannot recall any details of these measures. I would have deferred to security specialists and collated their feedback.

**c. What processes did you understand were in place for access control and user administration in 2000? Did they change during that year? If so, please explain why.**

78. I have reviewed documents WITN 0406R9\_1/11, WITN 0406R9\_1/12, WITN 0406R9\_1/13, WITN 0406R9\_1/14 but they do not assist my recollection in relation to this question.

79. I am unable to recall the processes in place at the time and if they did change.

**d. What effect did this have on the rollout of the Horizon Programme?**

80. I have reviewed documents WITN 0406R9\_1/11, WITN 0406R9\_1/12, WITN 0406R9\_1/13, WITN 0406R9\_1/14 but they do not assist my recollection in relation to this question.

81. I do not know what effect this had on rollout of Horizon as rollout was not my area and I do not recall being made aware of any issues.

**e. What was your understanding of the issues that arose with security / data integrity within the Horizon system from 1999 to 2004?**

82. I have reviewed documents WITN 0406R9\_1/11, WITN 0406R9\_1/12, WITN 0406R9\_1/13, WITN 0406R9\_1/14 but they do not assist my recollection in relation to this question.

83. I am unable to recall being made aware of any issues that arose with the security or data integrity within Horizon from 1999 to 2004.

**7. Please consider: FUJ00078292 (WITN 0406R9\_1/15); FUJ00058366 (WITN 0406R9\_1/16); FUJ00001670 (WITN 0406R9\_1/17)**

**a. What involvement did you have in the design of the Interface Specifications for the Horizon system in June/July 1997?**

84. I have reviewed documents WITN 0406R9\_1/15, WITN 0406R9\_1/16, and WITN 0406R9\_1/17 but have not limited my responses to Q7 in relation to these documents. Please read this response in conjunction with my response to Q2.

85. Whilst I am unable to recall anything specific to June/July 1997, in general terms I would have been a reviewer for the ICL Pathway supplied documents as well as any documents originating from third parties if they had them (e.g. Horizon connecting to a standard offering). I would have input to any deficiencies or ambiguities that I and my colleagues found during our review. The implementation of our comments would have fallen to ICL Pathway and would not have been shared with us.

**b. Were you aware of any issues or defaults in the design specifications in June/July 1997?**

86. I have reviewed documents WITN 0406R9\_1/15, WITN 0406R9\_1/16, and WITN 0406R9\_1/17 but they do not assist my recollection in relation to this question. Please read this response in conjunction with my response to Q2.

87. I am unable to recall any issues or defaults in the design specifications in June/July 1997. All designs go through iterations up to and during testing and subsequently if issues arise in live. Without the change history detail, I cannot extrapolate further but would not be surprised by iterations. However, I would

not have had sight of lower level designs or issues resolved within ICL Pathway before the designs were shared with BA/POCL.

***c. What involvement did you have in the design of the Interface Specifications during the rollout in early 2000?***

88. I have reviewed documents WITN 0406R9\_1/15, WITN 0406R9\_1/16, and WITN 0406R9\_1/17 but they do not assist my recollection in relation to this question. Please read this response in conjunction with my response to Q2.

89. I am unable to recall what Interface Specifications were being worked on in early 2000, but would have reviewed the Interface Specifications along with colleagues and any third parties if present at that time.

***d. FUJ00001670 (WITN 0406R9\_1/17): what was your understanding for the updates to this version of the document which included removing the comment on "system shortfall" and adding a comment on "liability due to system shortfall" in section 3.3, at the same time as the document classification changed to "COMMERCIAL IN CONFIDENCE"?***

90. I have reviewed document WITN 0406R9\_1/17. I was listed as an "optional reviewer" on the document and may not have reviewed the document. Whilst the comments on "system shortfall" and "liability due to system shortfall" appear to have been removed as set out in the document history section, the section provides no context to this change and does not assist my recollection in relation to this question.

91. I am unable to recall the reason behind these changes and whether they had any bearing on the change in document classification to "COMMERCIAL IN CONFIDENCE".

**8. Please consider: FUJ00079076 (WITN 0406R9\_1/18); FUJ00001368 (WITN 0406R9\_1/19); FUJ00001379 (WITN 0406R9\_1/20); FUJ00001378 (WITN 0406R9\_1/21); FUJ00001377 (WITN 0406R9\_1/22); FUJ00058190 (WITN 0406R9\_1/23)**

**a. What was your understanding of the 'OPS / TMS boundary issue' in December 1998?**

92. I have reviewed documents WITN 0406R9\_1/18, WITN 0406R9\_1/19, WITN 0406R9\_1/20, WITN 0406R9\_1/21, WITN 0406R9\_1/22 and WITN 0406R9\_1/23 but they do not assist my recollection in relation to this question. Whilst the documents refer to correspondence dated 2 December 1998, this correspondence is not attached.

93. However, document WITN 0406R9\_1/24 (FUJ00079077) may clarify the 'OPS / TMS boundary issue'. At comment 7, the document states:

94. *"...of the OPS / TMS boundary issue concerning whether the Service boundary between OPS and TMS shall be defined as the physical separation between an outlet and a point in the ICL Pathway Data Centres, or as the programmatic interface between the APS/BES/OBCS/EPOSS/PCDF counter applications and the TMS message store."*

95. Based on this comment, I believe the issue was one of ambiguity of definition of what the boundary was – physical or programmatic - between the branch (OPS data centre) where the branch would interact with the data centre to lodge transactions and access clients online. I believe the purpose of the definition was to give the potential for “competitive tension” in that, if there was a defined interface between the branch and the centre, a third party could use the

interface and it would allow another supplier to bid for work in conjunction with or in competition with ICL Pathway. This was never taken forwards and the challenges to implement this would have been immense.

***b. What involvement did you have in the design of the OPS / TMS design specifications in February to May 2000?***

96. Please read this response in conjunction with my response to Q2.
97. My role in the design of the OPS / TMS design specifications would have been as a reviewer of the ICL Pathway documents as they were the author and supplier of the specifications.

***c. Were you aware of any issues or defaults in the design specifications in February to May 2000? Please explain your answer.***

98. I have reviewed documents WITN 0406R9\_1/18, WITN 0406R9\_1/19, WITN 0406R9\_1/20, WITN 0406R9\_1/21, WITN 0406R9\_1/22 and WITN 0406R9\_1/23. Whilst the documents specify the usage of the design specifications, these specifications were never passed on to a third party and exercised so I cannot comment on their accuracy and completeness.
99. I am unable to recall any issues or defaults in the design specifications in February to May 2000. These would only have come to light if the documents had been passed to a third party with a specific task to actively engage with Fujitsu to interface with OPS / TMS. These were very much a place holder should POL take that step and would have involved far more detailed engagement dependent on the third party and what was being integrated. This was never taken forwards and the challenges to implement this would have been immense.

***d. In your view, were the issues with the OPS / TMS overcome? Please explain your answer.***

100. Please read this response in conjunction with my response to Q8a.

101. I believe the issue referred to here was one of terminology and that it was resolved as programmatic rather than a physical boundary.

***9. Please consider: FUJ00001444 (WITN 0406R9\_1/25); FUJ00001677 (WITN 0406R9\_1/26); FUJ00001818 (WITN 0406R9\_1/27); FUJ00001756 (WITN 0406R9\_1/28)***

***a. What involvement did you have in the development of counter hardware and software design specifications in 2000?***

102. I have reviewed documents WITN 0406R9\_1/25, WITN 0406R9\_1/26, WITN 0406R9\_1/27, and WITN 0406R9\_1/28 but have not limited my responses to Q9 in relation to these documents. Please read this response in conjunction with my response to Q2.

103. Whilst I cannot be certain of the time period, based on the above documents I would have reviewed the hardware configurations and highlighted any gaps that I spotted and ensured an element of future proofing. For instance, I would have ensured that the PIN Entry Device also had a smart card reader and that additional communication ports for peripherals were included.

104. I was not involved in usability of the hardware in relation to repetitive stress injury etc. as POL engaged specialist ergonomists such as Robin Ellis of RED Design Ergonomics to assess usability and liaised with them.

105. In terms of overall process, a workflow would have been agreed via the business analysts with the product owners and married to any technical constraints to arrive at a signed off solution from ICL Pathway. In this context, a workflow refers to a series of steps a customer and clerk would need to take with the system to successfully complete a transaction.

***b. What was your understanding of how faults were reported to the Horizon System Helpdesk in 2000?***

106. I have reviewed documents WITN 0406R9\_1/25, WITN 0406R9\_1/26, WITN 0406R9\_1/27, and WITN 0406R9\_1/28 but they do not assist my recollection in relation to this question as the Horizon System Helpdesk was not within my strand.

107. However, in general terms, I believe that then, as now, the branch calls the helpdesk to raise a ticket with any hardware or software faults or concerns but these processes were not my area.

***c. What involvement did you have in the development of counter hardware and software design specifications in 2002 and 2003?***

108. Whilst I am unable to recall details specific to 2002 and 2003, I would have had a similar involvement in the development of counter hardware and software design specifications as I have set out in Q9a.

***d. What was your understanding of the training and/or advice that Subpostmasters / mistresses received on the various designs and updates to the counter screens between 2000 and 2003?***

109. I believe Training was a separate strand from the POCL Infrastructure strand I was involved with. Normal practice is for the design documents and test output



(screen shots, sample reports) to be used to construct user guides and training material, but I cannot recall if this was the case between 2000 and 2003. Training is also another consideration for release authorisation but I cannot recall whether this would have been a relevant consideration during this time period.

**10. Please consider: FUJ00000603 (WITN 0406R9\_1/29); FUJ00001681 (WITN 0406R9\_1/30); FUJ00001684 (WITN 0406R9\_1/31); FUJ00001702 (WITN 0406R9\_1/32); FUJ00001742 (WITN 0406R9\_1/33).**

**a. Please describe your involvement in the design of the Horizon IT system once it was rolled out.**

110. I have reviewed documents WITN 0406R9\_1/29, WITN 0406R9\_1/30, WITN 0406R9\_1/31, WITN 0406R9\_1/32, and WITN 0406R9\_1/33 but have not limited my responses to Q10 in relation to these documents. Please read this response in conjunction with my response to Q2.

111. Once Horizon was rolled out, I would have moved on to the next initiative and been involved in changes to introduce new functions or amend existing functions as part of a business sponsored or Fujitsu change control and reviewing any deferred items (if there were any), collating requirements, reviewing Fujitsu responses and liaising with third parties as required.

**b. What understanding did you have of any technical issues during the autumn / winter of 2002?**

112. I have reviewed documents WITN 0406R9\_1/29, WITN 0406R9\_1/30, WITN 0406R9\_1/31, WITN 0406R9\_1/32, and WITN 0406R9\_1/33. The documents show the inclusion of a beep, a change to retention period and general

documentation of the system but they do not assist my recollection in relation to this question.

113. I do not recall any specific technical issues during the autumn / winter of 2002.

**11. Please consider: FUJ00001753 (WITN 0406R9\_1/34)**

**a. What was your involvement in the rollout of EPOSS at Post Office Counters in 2003?**

114. I have reviewed document WITN 0406R9\_1/34. WITN 0406R9\_1/34 is a processes and procedures document that does not appear to contain any information relating to the rollout of EPOSS and does not assist my recollection in relation to this question.

115. I cannot recall being actively involved in the rollout of EPOSS in 2003. As I have set out in Q2, during 2003 work was starting with the capability to introduce chip and PIN and that would have been my focus.

**b. Were you aware of any testing of EPOSS before it was rolled out?**

116. I have reviewed document WITN 0406R9\_1/34 but it does not assist my recollection in relation to this question.

117. I do not have any reference documents as to what changed or what was tested and released in this period. However, I assume that the normal development lifecycle of test reports into acceptance and gating were performed as I have described in Q2.

**c. What technical issues / defects arose during the testing phase?**

118. I have reviewed document WITN 0406R9\_1/34 but it does not assist my recollection in relation to this question.

119. I am unable to recall any technical issues or defects that arose during the testing phase.

***d. What technical issues / defects arose during the rollout?***

120. I have reviewed document WITN 0406R9\_1/34 but it does not assist my recollection in relation to this question.

121. I am unable to recall any technical issues or defects that arose during the rollout.

***e. How prepared were the Subpostmasters / mistresses for the rollout? Please explain your answer.***

122. I have reviewed document WITN 0406R9\_1/34 but it does not assist my recollection in relation to this question.

123. I am unable to recall what changes occurred at this time nor the degree of communication that would have occurred as the actual rollout was outside the scope of my area.

***12. Please consider: FUJ00001819 (WITN 0406R9\_1/35); FUJ00001719 (WITN 0406R9\_1/36); FUJ00001631 (WITN 0406R9\_1/37)***

***a. What role did you play in the contract extension for Horizon in autumn 2003?***

124. I have reviewed documents WITN 0406R9\_1/35, WITN 0406R9\_1/36, and WITN 0406R9\_1/37 but have not limited my responses to Q12 in relation to these documents.

125. I do not remember any explicit work at this time in relation to the Horizon contract extension but may well have been involved. Looking at the documents, I would have supplied input to the lead POL architect (probably Torstein

Godeseth at that time) as and when requested, reviewing Fujitsu statements of actual volumes to "right-size" the Horizon system going forwards. Right-sizing a system refers to looking at actual business workload volumes and adjusting the technical capacity of a system to meet this demand. Where technical capacity exceeded demand, right-sizing could also involve considering the potential for any cost savings. The documents together with the question suggests a contract extension took place, but I cannot recall the term of the contract and whether autumn 2003 would have been when work on an extension was undertaken.

***b. What role did you play in the process of managing capacity and business workload volumes that the Horizon system would support under a contract extension?***

126. Whilst I am unable to recall playing a specific role in the context of a Horizon contract extension, in general terms I would have critiqued workload figures and projections produced by Fujitsu to ensure things such as Christmas peaks were included.

## ACCEPTANCE

**13. Please consider: FUJ00079089 (WITN 0406R9\_1/38); FUJ00079077 (WITN 0406R9\_1/24); FUJ00079087 (WITN 0406R9\_1/39); FUJ00079081 (WITN 0406R9\_1/40); FUJ00079083 (WITN 0406R9\_1/41); FUJ00079141 (WITN 0406R9\_1/42); FUJ00079143 (WITN 0406R9\_1/43); FUJ00001463 (WITN 0406R9\_1/44); FUJ00079176 (WITN 0406R9\_1/45); POL00028357 (WITN 0406R9\_1/46); FUJ00078793 (WITN 0406R9\_1/47); FUJ00079173 (WITN 0406R9\_1/48); POL00028359 (WITN 0406R9\_1/49); POL00028355 (WITN 0406R9\_1/50); POL00028332 (WITN 0406R9\_1/51)**

**a. What role did you play in the changes made to the Acceptance criteria and/or terms in order for the Horizon system to be accepted between December 1998 to June 1999?**

127. I have reviewed documents WITN 0406R9\_1/38, WITN 0406R9\_1/24, WITN 0406R9\_1/39, WITN 0406R9\_1/40, WITN 0406R9\_1/41, WITN 0406R9\_1/42, WITN 0406R9\_1/43, WITN 0406R9\_1/44, WITN 0406R9\_1/45, WITN 0406R9\_1/46, WITN 0406R9\_1/47, WITN 0406R9\_1/48, WITN 0406R9\_1/49, WITN 0406R9\_1/50, and WITN 0406R9\_1/51 but have not limited my responses to Q13 in relation to these documents.

128. As part of the POL technical evaluation team (reporting to Jeremy Folkes (POL Senior Technical Lead) and then Torstein Godeseth (POL Technical Lead)), I would have reviewed ICL Pathway's proposed acceptance criteria and suggested amendments or additional coverage where any gaps or ambiguity was identified, or where a criterion could be better met (more fully, or with less effort) elsewhere to optimise the process without diminishing the quality of the

outcome. Once these acceptance criteria were established and agreed by all parties, I would have been part of the review panel to ascertain if criteria had been met and then to help produce and collate a recommendation.

129. As the documents show, WITN 0406R9\_1/47, WITN 0406R9\_1/24, WITN 0406R9\_1/40, WITN 0406R9\_1/41 WITN 0406R9\_1/39, WITN 0406R9\_1/38, WITN 0406R9\_1/42, WITN 0406R9\_1/43, WITN 0406R9\_1/48, WITN 0406R9\_1/45, WITN 0406R9\_1/51, WITN 0406R9\_1/50, WITN 0406R9\_1/46, WITN 0406R9\_1/49 some acceptance incidents were raised (i.e. reflecting that certain failures had occurred) and rectified and amended which is what testing and acceptance are about and to be expected with seniors agreeing the position (WITN 0406R9\_1/45, WITN 0406R9\_1/51).

***b. What understanding and/or knowledge did you have of the results of any software testing prior to Acceptance?***

130. I have reviewed documents WITN 0406R9\_1/38, WITN 0406R9\_1/24, WITN 0406R9\_1/39, WITN 0406R9\_1/40, WITN 0406R9\_1/41, WITN 0406R9\_1/42, WITN 0406R9\_1/43, WITN 0406R9\_1/44, WITN 0406R9\_1/45, WITN 0406R9\_1/46, WITN 0406R9\_1/47, WITN 0406R9\_1/48, WITN 0406R9\_1/49, WITN 0406R9\_1/50, and WITN 0406R9\_1/51 but these documents do not assist my recollection in relation to this question.

131. I am unable to recall the results of any software testing prior to Acceptance. In general terms, I would have deferred to the Test team specialists to give input on the suitability of releases. However, based on my experience, I do not believe that ICL Pathway would have presented an Acceptance pack that they did not believe would get a significant number of items signed off. Prior to

Acceptance, the development lifecycle (as described more fully at paragraph 39 above) would have seen the code move through CIT, SV&I and possibly UAT and LST, and Acceptance would have addressed criteria in batches as and when evidence was available. A test pack may have been incomplete (i.e. missing criteria would not be tabled for acceptance) but would have been incremental to allow progress to be made in manageable batches.

132. It should also be noted that ICL Pathway development was behind closed doors, and only outstanding defects that were present would be declared to POCL when it began its User Testing.

***c. Were there external pressures to accept the Horizon System? If so, from whom?***

133. There is always a desire to complete a project and to avoid working on it past the point of diminishing returns. For instance, whilst Acceptance would not be recommended with any issues graded "High", a certain number of "Lows" would be permitted as part of the development lifecycle described at Q2 above. However, I do not recall any shortcuts being requested, and the acceptance criteria would have required entries against them showing how they had been satisfied and if not, why they had not been met.
134. It is worth noting that ICL Pathway did draw boundaries that were not to be crossed in terms of access to lower level designs and correlation of unit/system tests to design to confirm all paths had been considered and tested.

***d. What understanding did you have of any technical difficulties / issues between June to September 1999?***

135. I have reviewed documents WITN 0406R9\_1/38, WITN 0406R9\_1/24, WITN 0406R9\_1/39, WITN 0406R9\_1/40, WITN 0406R9\_1/41, WITN 0406R9\_1/42, WITN 0406R9\_1/43, WITN 0406R9\_1/44, WITN 0406R9\_1/45, WITN 0406R9\_1/46, WITN 0406R9\_1/47, WITN 0406R9\_1/48, WITN 0406R9\_1/49, WITN 0406R9\_1/50, and WITN 0406R9\_1/51. Even with the documents I cannot recall any understanding that I had at the time and I can only comment on how I would now interpret the issues raised in these documents.
136. WITN 0406R9\_1/51 is a management note that I was not copied on and would not have seen at the time, but provides a high level summary of the outstanding issues with the system. The issues included data not being harvested correctly and machines being rebooted due to lock-ups. I do not know how many branches would have been live at this time. Though mentioned in the note, I am unsure of what meetings and discussions I was involved in as the distribution list was of managers one, two or three levels up from myself.
137. WITN 0406R9\_1/48 suggests these issues occurred in Live Trial with 299 outlets. This means the issues occurred pre rollout and in a 'controlled' but real-life environment to tease out issues in the new IT system. Reviewing the documents in that light, the presence of bugs is not welcome, but it justifies the Live Trial approach where testing prior to a Live Trial would only reveal so much. When a release is tested the testers would follow the scripts to exercise the code and attempt to break the system by abandoning half way through and so on. However, a Live Trial exposes the system to real end users who may not have read the training material and interpret and follow paths that had not been



considered. There would also be higher concurrent volumes and a wider set of customer bar codes, magnetic cards and behaviours, which would potentially expose defects not found in test.

***e. What understanding did you have of software defects such as incomplete transactions receipts, payment mismatches and duplicate transactions between June to September 1999?***

138. I have reviewed documents WITN 0406R9\_1/38, WITN 0406R9\_1/24, WITN 0406R9\_1/39, WITN 0406R9\_1/40, WITN 0406R9\_1/41, WITN 0406R9\_1/42, WITN 0406R9\_1/43, WITN 0406R9\_1/44, WITN 0406R9\_1/45, WITN 0406R9\_1/46, WITN 0406R9\_1/47, WITN 0406R9\_1/48, WITN 0406R9\_1/49, WITN 0406R9\_1/50, and WITN 0406R9\_1/51. Even with the documents I cannot recall any understanding that I had at the time and I can only comment on how I would now interpret the issues raised in these documents.

139. I am unable to recall details of any software defects and only in reading the referenced documents do I see that there were these issues. Even with the documents I cannot recall any understanding that I had at the time and comment would be based on my current interpretation of the documents rather than recollection at the time.

***f. What concerns did POL have about the reliability and robustness of the Horizon system between June to September 1999?***

141. I have reviewed documents WITN 0406R9\_1/38, WITN 0406R9\_1/24, WITN 0406R9\_1/39, WITN 0406R9\_1/40, WITN 0406R9\_1/41, WITN 0406R9\_1/42, WITN 0406R9\_1/43, WITN 0406R9\_1/44, WITN 0406R9\_1/45, WITN

0406R9\_1/46, WITN 0406R9\_1/47, WITN 0406R9\_1/48, WITN 0406R9\_1/49, WITN 0406R9\_1/50, and WITN 0406R9\_1/51.

142. I do not know what POL's view about the reliability and robustness of Horizon between June to September 1999 was. As a large organisation, I would not expect POL to have a singular view on any given issue. From the supplied documents, I can only interpret that the Live Trial surfaced items that needed resolution prior to rollout.

***g. Please consider: FUJ00079154 (WITN 0406R9\_1/52); FUJ00079158 (WITN 0406R9\_1/53); POL00028364 (WITN 0406R9\_1/54); POL00028360 (WITN 0406R9\_1/55). What role did you play in the Acceptance Incident Resolution Workshops in summer 1999?***

143. I have reviewed documents WITN 0406R9\_1/52, WITN 0406R9\_1/53, WITN 0406R9\_1/54 and WITN 0406R9\_1/55 but they do not assist my recollection in relation to this question.

144. I am unable to recall any Acceptance Incident Resolution Workshops, and if I did would not be able to confine the workshop to a summer 1999 time period. In general terms, my involvement would have been to critique ICL Pathway's responses to incidents and ensure the incidents were resolved to Post Office's (myself included) satisfaction. I would have had support from senior Post Office architects (Jeremy Folkes or Torstein Godeseth) in the technical evaluation team and other Post Office colleagues in the acceptance space (e.g. Tony Houghton (POL Acceptance)).

145. Whilst I do not remember this, reading the documents 'cold' shows that I was assigned incident AI372 to manage which refers to an upgrade activity that failed to upgrade all of the offices targeted.

146. The memo that is shown as being written by me, WITN 0406R9\_1/53, has light italic comments which I assume are ICL Pathway internal comments that were not shared with me at the time, and I do not know who made them.

***h. FUJ00079154 (WITN 0406R9\_1/52): what did you understand by POL's "ongoing concerns" with the transaction data following the test condition being met in July 1999?***

147. I have reviewed document WITN 0406R9\_1/52. I am unable to recall what POL's "ongoing concerns" related to and whether I was made privy to these concerns.

***i. What did you understand were the issues with system management in summer 1999?***

148. I have reviewed documents WITN 0406R9\_1/38, WITN 0406R9\_1/24, WITN 0406R9\_1/39, WITN 0406R9\_1/40, WITN 0406R9\_1/41, WITN 0406R9\_1/42, WITN 0406R9\_1/43, WITN 0406R9\_1/44, WITN 0406R9\_1/45, WITN 0406R9\_1/46, WITN 0406R9\_1/47, WITN 0406R9\_1/48, WITN 0406R9\_1/49, WITN 0406R9\_1/50, WITN 0406R9\_1/51, WITN 0406R9\_1/52 (FUJ00079154), WITN 0406R9\_1/53 (FUJ00079158), and WITN 0406R9\_1/54 (POL00028364) but they do not assist my recollection in relation to this question.

149. I am unable to recall any issues with system management in summer 1999 and can only infer what these issues might be from the supplied documents. It would

appear that not all outlets were updated and judgement calls were made by ICL Pathway during the upgrade process, though there may have been involvement from other POCL staff (Rod Stocker is mentioned in the documents). I do not appear to have been involved with these decisions.

***j. In summer 1999, did POL have confidence in the robustness/reliability of Fujitsu's ability to provide the Horizon system?***

150. I have reviewed documents WITN 0406R9\_1/38, WITN 0406R9\_1/24, WITN 0406R9\_1/39, WITN 0406R9\_1/40, WITN 0406R9\_1/41, WITN 0406R9\_1/42, WITN 0406R9\_1/43, WITN 0406R9\_1/44, WITN 0406R9\_1/45, WITN 0406R9\_1/46, WITN 0406R9\_1/47, WITN 0406R9\_1/48, WITN 0406R9\_1/49, WITN 0406R9\_1/50, WITN 0406R9\_1/51, WITN 0406R9\_1/52 (FUJ00079154), WITN 0406R9\_1/53 (FUJ00079158), and WITN 0406R9\_1/54 (POL00028364) but they do not assist my recollection in relation to this question.

151. I am unable to recall anything about POL's confidence in the robustness/reliability of Fujitsu's ability to provide Horizon in summer 1999. I can only interpret the supplied documents and cannot speak for the wider POL business. From the documents supplied, POCL were aware of several items that did not work as expected and were managing the risks they were aware of, seeking answers from ICL Pathway on why things did not go as expected and assurances that lessons had been learnt and problems identified.

***k. What was your understanding of other technical defects / issues at this stage following the pilot programme?***

152. I have reviewed documents WITN 0406R9\_1/38, WITN 0406R9\_1/24, WITN 0406R9\_1/39, WITN 0406R9\_1/40, WITN 0406R9\_1/41, WITN 0406R9\_1/42, WITN 0406R9\_1/43, WITN 0406R9\_1/44, WITN 0406R9\_1/45, WITN 0406R9\_1/46, WITN 0406R9\_1/47, WITN 0406R9\_1/48, WITN 0406R9\_1/49, WITN 0406R9\_1/50, WITN 0406R9\_1/51, WITN 0406R9\_1/52 (FUJ00079154), WITN 0406R9\_1/53 (FUJ00079158), and WITN 0406R9\_1/54 (POL00028364) but they do not assist my recollection in relation to this question.

153. I am unable to recall any other technical defects or issues at this stage following the pilot programme. I can only comment on the documents that I have now been referred to, with the risk of hindsight rather than being able to answer about my understanding at that stage.

***l. Were you aware of any of the following issues in summer 1999: with counter systems being subject to lockups; screen freezes requiring re-boots; receipts not matching payments and reference data issues?***

154. I have reviewed documents WITN 0406R9\_1/38, WITN 0406R9\_1/24, WITN 0406R9\_1/39, WITN 0406R9\_1/40, WITN 0406R9\_1/41, WITN 0406R9\_1/42, WITN 0406R9\_1/43, WITN 0406R9\_1/44, WITN 0406R9\_1/45, WITN 0406R9\_1/46, WITN 0406R9\_1/47, WITN 0406R9\_1/48, WITN 0406R9\_1/49, WITN 0406R9\_1/50, WITN 0406R9\_1/51, WITN 0406R9\_1/52 (FUJ00079154), WITN 0406R9\_1/53 (FUJ00079158), and WITN 0406R9\_1/54

(POL00028364) but they do not assist my recollection in relation to this question.

155. Whilst I am unclear on timeframe, I do recall that a policy of rebooting the counter each night was instigated due to an issue that, if the counter was left up for an extended period (I cannot recall how long) it could freeze or result in a blue-screen. I am unable to remember whether the cause of this problem was a memory leak (a program reserving memory but then not releasing it once finished) or something else. The nightly reboot seemed to clear the problem and reduced or eliminated its incidence.

156. It is important to note that 23 years ago NT4 was not as stable as modern Windows machines and therefore a degree of "blue screen of death" (also known as "BSOD") errors were expected in systems of that era.

157. I am unable to recall any issues with receipts or reference data.

***m. To what extent did time pressures prevent further testing before the end of 1999?***

158. I have reviewed documents WITN 0406R9\_1/38, WITN 0406R9\_1/24, WITN 0406R9\_1/39, WITN 0406R9\_1/40, WITN 0406R9\_1/41, WITN 0406R9\_1/42, WITN 0406R9\_1/43, WITN 0406R9\_1/44, WITN 0406R9\_1/45, WITN 0406R9\_1/46, WITN 0406R9\_1/47, WITN 0406R9\_1/48, WITN 0406R9\_1/49, WITN 0406R9\_1/50, WITN 0406R9\_1/51, WITN 0406R9\_1/52 (FUJ00079154), WITN 0406R9\_1/53 (FUJ00079158), and WITN 0406R9\_1/54 (POL00028364) but they do not assist my recollection in relation to this question.

159. I am unable to recall whether or to what extent time pressures prevented further testing before the end of 1999. However, I doubt if there was a known issue that had significant risk of occurring things would have proceeded as the effort to correct the issue and reputational damage would have hampered user acceptance of the system and made deployment more difficult in the future.

**14. Please consider: FUJ00078754 (WITN 0406R9\_1/56); FUJ00079086 (WITN 0406R9\_1/57); FUJ00058189 (WITN 0406R9\_1/58); FUJ00058194 (WITN 0406R9\_1/59); FUJ00001889 (WITN 0406R9\_1/60); POL00028508 (WITN 0406R9\_1/61)**

**a. What role did you play in the Acceptance Incidents process in early 2000?**

160. I have reviewed documents WITN 0406R9\_1/56, WITN 0406R9\_1/57, WITN 0406R9\_1/58, WITN 0406R9\_1/59, WITN 0406R9\_1/60 and WITN 0406R9\_1/61 but they do not assist my recollection in relation to this question.

161. I am unable to recall the role I played in the Acceptance Incidents process definitively or confine my answer to early 2000. In general terms, my involvement would have been to critique ICL Pathway's responses to incidents and ensure the incidents were resolved to Post Office's (myself included) satisfaction. I would have had support from senior Post Office architects (Jeremy Folkes or Torstein Godeseth) in the technical evaluation team and other Post Office colleagues in the acceptance space (e.g. Tony Houghton).

**b. To what extent did POL satisfy itself that the Acceptance Criterion had been met before proceeding with Acceptance?**

162. BA/POCL would have required responses to all the acceptance criteria and accepted the answers as sufficient or, flagged as risks those that were not

Passed with rectification actions to move them to a Pass state, which may have included deferral (i.e. criterion was not required at that stage) where agreed by all parties.

***c. What did your role covering the POCL programme management in August 2000 entail?***

163. I have reviewed documents WITN 0406R9\_1/56, WITN 0406R9\_1/57, WITN 0406R9\_1/58, WITN 0406R9\_1/59, WITN 0406R9\_1/60 and WITN 0406R9\_1/61 but they do not assist my recollection in relation to this question.

164. I am unable to recall my role covering the POCL programme manager Mike Woolley in August 2000 in any detail. In general terms, my role would likely have involved attending meetings, writing up outcomes and holding decisions where possible, giving steers and escalating any decisions that I would not normally have made that had to be made.

***d. What understanding did you have of any defects / issues in 2000?***

165. I have reviewed documents WITN 0406R9\_1/56, WITN 0406R9\_1/57, WITN 0406R9\_1/58, WITN 0406R9\_1/59, WITN 0406R9\_1/60 and WITN 0406R9\_1/61.

166. As in any development lifecycle, I expect that there were issues and some of these are documented in the referenced material. However, I am unable to recall any specific defects or issues and would not be able to confine them to the specified time period even if I did.



***e. What role did you have in the Horizon Generic Release Acceptance Process in September 2004?***

167. I have reviewed documents WITN 0406R9\_1/56, WITN 0406R9\_1/57, WITN 0406R9\_1/58, WITN 0406R9\_1/59, WITN 0406R9\_1/60 and WITN 0406R9\_1/61 but they do not assist my recollection in relation to this question.

168. I am unable to recall what role I had in the Horizon Generic Release Acceptance Process in September 2004. In broad terms, I would have been involved in general acceptance activity but the above forum and date does not bring anything to mind.

***15. Please consider: FUJ00001680 (WITN 0406R9\_1/62); FUJ00001895 (WITN 0406R9\_1/63)***

***a. To what extent did you contribute to the Business Continuity Framework?***

169. I have reviewed documents WITN 0406R9\_1/62 and WITN 0406R9\_1/63.

170. From the documents supplied, I was a reviewer and would have provided input to the service managers to clarify points they may have had about the system without the need to go to ICL Pathway.

***b. Do you believe this Framework was effective in dealing with failures in the core Fujitsu services when they arose? Please explain your answer.***

171. I have reviewed documents WITN 0406R9\_1/62 and WITN 0406R9\_1/63.

172. The Framework set out an approach and was used by the Business Continuity team who were the leads and end customer for this. My input was more on technical accuracy as it related to POCL's business. As I did not use the Framework, I cannot comment on its efficacy.

**c. What role did the Framework play in the Acceptance Review process?**

173. I have reviewed documents WITN 0406R9\_1/62 and WITN 0406R9\_1/63 but these documents do not assist my recollection in relation to this question.

174. I am unable to recall what role the Framework played in the Acceptance Review process. The Framework may have been another strand in the acceptance process which I was not involved in.

**NETWORK BANKING SERVICES**

**16. Please consider: FUJ00001740 (WITN 0406R9\_1/64); FUJ00001624 (WITN 0406R9\_1/65); FUJ00001623 (WITN 0406R9\_1/66); FUJ00001632 (WITN 0406R9\_1/67); FUJ00088053 (WITN 0406R9\_1/68); FUJ00001756 (WITN 0406R9\_1/27); FUJ00001812 (WITN 0406R9\_1/69); FUJ00001838 (WITN 0406R9\_1/70); FUJ00001902 (WITN 0406R9\_1/71); FUJ00001883 (WITN 0406R9\_1/72); FUJ00001890 (WITN 0406R9\_1/73); FUJ00001906 (WITN 0406R9\_1/74); FUJ00003485 (WITN 0406R9\_1/75); FUJ00003486 (WITN 0406R9\_1/76); FUJ00001891 (WITN 0406R9\_1/77); FUJ00001958 (WITN 0406R9\_1/78); FUJ00001903 (WITN 0406R9\_1/79); FUJ00001904 (WITN 0406R9\_1/80); FUJ00001905 (WITN 0406R9\_1/81); FUJ00001907 (WITN 0406R9\_1/82); FUJ00001842 (WITN 0406R9\_1/83); FUJ00001884 (WITN 0406R9\_1/84); FUJ00001885 (WITN 0406R9\_1/85); FUJ00003483 (WITN 0406R9\_1/86); FUJ00003484 (WITN 0406R9\_1/87); FUJ00001932 (WITN 0406R9\_1/88); FUJ00001933 (WITN 0406R9\_1/89)**

**a. What role did you play in the design and development of the software required for the rollout of the Network Banking Services throughout Post Office branches from 2002 to 2005?**

175. I have reviewed documents WITN 0406R9\_1/64, WITN 0406R9\_1/65, WITN 0406R9\_1/66, WITN 0406R9\_1/67, WITN 0406R9\_1/68, WITN 0406R9\_1/27, WITN 0406R9\_1/69, WITN 0406R9\_1/70, WITN 0406R9\_1/71, WITN 0406R9\_1/72, WITN 0406R9\_1/73, WITN 0406R9\_1/74, WITN 0406R9\_1/75, WITN 0406R9\_1/76, WITN 0406R9\_1/77, WITN 0406R9\_1/78, WITN 0406R9\_1/79, WITN 0406R9\_1/80, WITN 0406R9\_1/81, WITN 0406R9\_1/82, WITN 0406R9\_1/83, WITN 0406R9\_1/84, WITN 0406R9\_1/85, WITN 0406R9\_1/86, WITN 0406R9\_1/87, WITN 0406R9\_1/88 and WITN 0406R9\_1/89. Please read this response in conjunction with my response to Q2.
176. I am unable to recall the role I played in the design and development of the software required for the rollout of the Network Banking Services in detail nor am I able to break down my involvement into specific time periods. I believe I worked with a colleague, Jason Crellin, who led on the IBM migration, whilst I focussed on the chip introduction. However, broadly speaking, my involvement would have been during the transition from the IBM Connex banking switch to a Fujitsu solution which supported chip and PIN payments around 2003. Around this time, I would also have been involved in the selection of the PIN Entry Device to be used.
177. As POL had the contractual relationship with IBM and POL clients such as POCA, Alliance & Leicester, Link and Streamline, when Fujitsu took over the banking switch, POL, myself included, would have facilitated any meetings between these parties. However, I would have handed off to the POL testing function any liaison with Link and Streamline regarding their testing, as Horizon was, 'just another connection' to them and Streamline and Link used their

standard take on and acceptance approach with POL. I would have liaised more with Alliance & Leicester and EDS Citibank (later JP Morgan) in respect of POCA/CAPO and the technical interface between the parties as these were one-off connections between the bank and Horizon.

178. Fujitsu would have had requirements and responded with solutions. I would have been involved in formulating the requirements with business analysts and the business itself and reviewing Fujitsu's responses for completeness and reuse.
179. The banking design approach agreed upon for the rollout of the Network Banking Services was to use the Link model. Link are a switch allowing Horizon to connect to tens of different banks and each bank has a standard interface to Link. This interface was mimicked by Horizon so that Alliance & Leicester and POCA saw Horizon as another Link type interface – simplifying their integration and, as Horizon connected out to Link, it also simplified the design and implementation for Horizon.
180. The payment sector change of retailer liability on 1<sup>st</sup> January 2005 drove adoption of chip and PIN by POL and it was decided to do banking at the same time to harmonise the counter experience and counter changes. The IBM Connex changes were significant and a decision to move to a Fujitsu solution was made.
181. Bespoke extensions for POCA were made from the adoption of banking card use instead of bar codes, the most notable being a new transaction type to allow a customer to withdraw up to a daily limit whatever was in their account to mimic the emptying of a Green Giro. Customers on benefit who needed their

entire benefit – a large percentage – would otherwise have had to do a balance enquiry and then ask for the balance as two transactions, increasing time, cost, errors and also disclosing to those around them how much they were taking.

182. As the development was for real time authorisations, I believe ePay (initially for mobile phone top ups) was developed at the same time and Fujitsu decided to share some platforms when they came to implement and reconcile.

183. Each banking connection had its own Interface Specification (Alliance & Leicester were not privy to the POCA solution and vice versa etc.) even though, from a Fujitsu perspective there was a large amount of repetition.

184. The goal was to reuse to minimise development and support costs and reduce time to market.

***b. What did your role as 'Solutions Architect' for POL entail during the design and rollout phase?***

185. As a Solutions Architect for POL, I reviewed the design and connection approaches proposed by IBM for the banking switch (and later Fujitsu's replacement of the IBM switch when chip & PIN was introduced) and the relevant POL client and fed into the acceptance criteria and acceptance from a technical perspective, agreeing specific acceptance criteria and the acceptance method and evaluating the evidence submitted by Fujitsu. This would not have been at the low level or code review but would have had the medium level of say interconnections between Fujitsu and POCA, agreeing the number of processor interfaces and how they were cycled through for availability and resilience. I would also have been involved in the migration plan, to assure that the risks being put forward by Fujitsu were understood by senior release board

members. Whilst I would have been involved in any live issues that arose, I cannot recall any specific issues and the outcome of any resultant meetings.

186. Part of my remit would have been to ensure that a reusable solution and an industry standard approach was being used to ease the introduction and replacement of clients at a future date. For example, this could be where there was a retender for a Merchant Acquirer for payment or to introduce another directly connected bank.

187. I was also involved in the PIN pad selection and customisation, in consultation with ergonomists and the business to get a device that could support PIN entry, and also have future capability.

***c. What knowledge and/or understanding did you have of any testing that was conducted prior to the rollout of Network Banking Services?***

188. As I recall, Link and Streamline accreditation testing was undertaken by the POCL test team to gain sign off from those parties in the same way as other major new connections would be signed off by them. The purpose of this testing was to ensure compatibility between Horizon and Link or Streamline respectively. I believe there was also sign off from Alliance & Leicester for their connection and POCA for theirs but I do not have any reference documents to confirm this.

189. Prior to the accreditation testing, I believe Fujitsu conducted their own tests with a simulator product and before rollout there would have been POL User Acceptance Testing.

190. I would expect that all these tests would have fed into a gating process but I have no reference documents to confirm or evidence this.

***d. What were the results of such testing? What, if anything, was changed following the testing?***

191. I have reviewed documents WITN 0406R9\_1/64, WITN 0406R9\_1/65, WITN 0406R9\_1/66, WITN 0406R9\_1/67, WITN 0406R9\_1/68, WITN 0406R9\_1/27, WITN 0406R9\_1/69, WITN 0406R9\_1/70, WITN 0406R9\_1/71, WITN 0406R9\_1/72, WITN 0406R9\_1/73, WITN 0406R9\_1/74, WITN 0406R9\_1/75, WITN 0406R9\_1/76, WITN 0406R9\_1/77, WITN 0406R9\_1/78, WITN 0406R9\_1/79, WITN 0406R9\_1/80, WITN 0406R9\_1/81, WITN 0406R9\_1/82, WITN 0406R9\_1/83, WITN 0406R9\_1/84, WITN 0406R9\_1/85, WITN 0406R9\_1/86, WITN 0406R9\_1/87, WITN 0406R9\_1/88 and WITN 0406R9\_1/89 but these documents do not assist my recollection in relation to this question.

192. I am unable to recall the results of the testing conducted prior to the rollout of Network Banking Services. As noted in my response to Q2, I would expect there to be iterations in any development lifecycle and but I am unable to recall anything specific.

***e. What knowledge and/or understanding did you have of any technical issues / defects in the Network Banking Services prior to rollout?***

193. I have reviewed documents WITN 0406R9\_1/64, WITN 0406R9\_1/65, WITN 0406R9\_1/66, WITN 0406R9\_1/67, WITN 0406R9\_1/68, WITN 0406R9\_1/27, WITN 0406R9\_1/69, WITN 0406R9\_1/70, WITN 0406R9\_1/71, WITN 0406R9\_1/72, WITN 0406R9\_1/73, WITN 0406R9\_1/74, WITN 0406R9\_1/75, WITN 0406R9\_1/76, WITN 0406R9\_1/77, WITN 0406R9\_1/78, WITN 0406R9\_1/79, WITN 0406R9\_1/80, WITN 0406R9\_1/81, WITN 0406R9\_1/82,

WITN 0406R9\_1/83, WITN 0406R9\_1/84, WITN 0406R9\_1/85, WITN 0406R9\_1/86, WITN 0406R9\_1/87, WITN 0406R9\_1/88 and WITN 0406R9\_1/89 but these documents do not assist my recollection in relation to this question.

194. I am unable to recall any technical issues or defects in the Network Banking Services prior to rollout. As noted in my response to Q2, I would expect there to be iterations in any development lifecycle and but I am unable to recall anything specific.

***f. What knowledge and/or understanding did you have of any technical issues / defects in the Network Banking Services during rollout?***

195. I have reviewed documents WITN 0406R9\_1/64, WITN 0406R9\_1/65, WITN 0406R9\_1/66, WITN 0406R9\_1/67, WITN 0406R9\_1/68, WITN 0406R9\_1/27, WITN 0406R9\_1/69, WITN 0406R9\_1/70, WITN 0406R9\_1/71, WITN 0406R9\_1/72, WITN 0406R9\_1/73, WITN 0406R9\_1/74, WITN 0406R9\_1/75, WITN 0406R9\_1/76, WITN 0406R9\_1/77, WITN 0406R9\_1/78, WITN 0406R9\_1/79, WITN 0406R9\_1/80, WITN 0406R9\_1/81, WITN 0406R9\_1/82, WITN 0406R9\_1/83, WITN 0406R9\_1/84, WITN 0406R9\_1/85, WITN 0406R9\_1/86, WITN 0406R9\_1/87, WITN 0406R9\_1/88 and WITN 0406R9\_1/89 but these documents do not assist my recollection in relation to this question.

196. I am unable to recall any technical issues or defects in the Network Banking Services during rollout. As noted in my response to Q2, I would expect there to be iterations in any development lifecycle and but I am unable to recall anything specific.



***g. What concerns did POL have about the reliability and robustness of the Horizon system from 2002 to 2005?***

197. I have reviewed documents WITN 0406R9\_1/64, WITN 0406R9\_1/65, WITN 0406R9\_1/66, WITN 0406R9\_1/67, WITN 0406R9\_1/68, WITN 0406R9\_1/27, WITN 0406R9\_1/69, WITN 0406R9\_1/70, WITN 0406R9\_1/71, WITN 0406R9\_1/72, WITN 0406R9\_1/73, WITN 0406R9\_1/74, WITN 0406R9\_1/75, WITN 0406R9\_1/76, WITN 0406R9\_1/77, WITN 0406R9\_1/78, WITN 0406R9\_1/79, WITN 0406R9\_1/80, WITN 0406R9\_1/81, WITN 0406R9\_1/82, WITN 0406R9\_1/83, WITN 0406R9\_1/84, WITN 0406R9\_1/85, WITN 0406R9\_1/86, WITN 0406R9\_1/87, WITN 0406R9\_1/88 and WITN 0406R9\_1/89 but these documents do not assist my recollection in relation to this question.

198. I am unable to recall any specific concerns about the general reliability and robustness of Horizon and cannot speak for the wider POL business. The move of the banking engine from IBM to Fujitsu (as described in my response to Q2 at paragraph 31) would seem to indicate high level confidence at giving new additional and significant work to Fujitsu. Following standard practice, any incident or risk that was identified would have been managed; it would be accepted (unlikely to occur or small impact), had a plan to resolve, had an agreed workaround, or been a show stopper and had to be fixed before release would be permitted.

***h. Did POL have any concerns about Fujitsu's ability to deliver the Network Banking Services?***

199. I have reviewed documents WITN 0406R9\_1/64, WITN 0406R9\_1/65, WITN 0406R9\_1/66, WITN 0406R9\_1/67, WITN 0406R9\_1/68, WITN 0406R9\_1/27, WITN 0406R9\_1/69, WITN 0406R9\_1/70, WITN 0406R9\_1/71, WITN 0406R9\_1/72, WITN 0406R9\_1/73, WITN 0406R9\_1/74, WITN 0406R9\_1/75, WITN 0406R9\_1/76, WITN 0406R9\_1/77, WITN 0406R9\_1/78, WITN 0406R9\_1/79, WITN 0406R9\_1/80, WITN 0406R9\_1/81, WITN 0406R9\_1/82, WITN 0406R9\_1/83, WITN 0406R9\_1/84, WITN 0406R9\_1/85, WITN 0406R9\_1/86, WITN 0406R9\_1/87, WITN 0406R9\_1/88 and WITN 0406R9\_1/89 but these documents do not assist my recollection in relation to this question.

200. I am unable to recall any specific concerns and cannot speak for the wider POL business. The move of the banking engine from IBM to Fujitsu (as described in my response to Q2 at paragraphs 31) would seem to indicate high level confidence at giving new additional and significant work to Fujitsu.

***i. What understanding and/or knowledge do you have of how prepared Subpostmasters / mistresses were for the rollout? Did they receive any training on the new counter screens or processes for network banking?***

201. I have reviewed documents WITN 0406R9\_1/64, WITN 0406R9\_1/65, WITN 0406R9\_1/66, WITN 0406R9\_1/67, WITN 0406R9\_1/68, WITN 0406R9\_1/27, WITN 0406R9\_1/69, WITN 0406R9\_1/70, WITN 0406R9\_1/71, WITN 0406R9\_1/72, WITN 0406R9\_1/73, WITN 0406R9\_1/74, WITN 0406R9\_1/75, WITN 0406R9\_1/76, WITN 0406R9\_1/77, WITN 0406R9\_1/78, WITN

0406R9\_1/79, WITN 0406R9\_1/80, WITN 0406R9\_1/81, WITN 0406R9\_1/82, WITN 0406R9\_1/83, WITN 0406R9\_1/84, WITN 0406R9\_1/85, WITN 0406R9\_1/86, WITN 0406R9\_1/87, WITN 0406R9\_1/88 and WITN 0406R9\_1/89 but these documents do not assist my recollection in relation to this question.

202. I am unable to recall how prepared counter staff were for the rollout or the training they received. This was not my area and would have been covered by the POL Training team.

**17. Please consider: FUJ00001916 (WITN 0406R9\_1/90); FUJ00002066 (WITN 0406R9\_1/91); FUJ00002068 (WITN 0406R9\_1/92); FUJ00001953 (WITN 0406R9\_1/93); FUJ00002045 (WITN 0406R9\_1/94); FUJ00002169 (WITN 0406R9\_1/95); FUJ00001954 (WITN 0406R9\_1/96); FUJ00001959 (WITN 0406R9\_1/97); FUJ00002069 (WITN 0406R9\_1/98); FUJ00002171 (WITN 0406R9\_1/99); FUJ00002108 (WITN 0406R9\_1/100); FUJ00002044 (WITN 0406R9\_1/101); FUJ00002170 (WITN 0406R9\_1/102); FUJ00002067 (WITN 0406R9\_1/103); FUJ00002005 (WITN 0406R9\_1/104); FUJ00002238 (WITN 0406R9\_1/105)**

**a. What role did you play once the Network Banking Services had been rolled out across the Post Office Estate from 2005 to 2010?**

203. I have reviewed documents WITN 0406R9\_1/90, WITN 0406R9\_1/91, WITN 0406R9\_1/92, WITN 0406R9\_1/93, WITN 0406R9\_1/94, WITN 0406R9\_1/95, WITN 0406R9\_1/96, WITN 0406R9\_1/97, WITN 0406R9\_1/98, WITN 0406R9\_1/99, WITN 0406R9\_1/100, WITN 0406R9\_1/101, WITN 0406R9\_1/102, WITN 0406R9\_1/103, WITN 0406R9\_1/104 and WITN

0406R9\_1/105. Please read this response in conjunction with my response to Q2.

204. I reported to David Gray (possibly Clive Reed at one stage) as part of the Post Office Design Authority, with my area of interest being the banking and payment area. During this period, I moved away from Horizon to other Post Office projects but would have been contacted ad-hoc for input on 'random' areas.
205. Reviewing the referenced documents, it would appear that "PIN change" and "CAPO Withdrawal Correction" were introduced, the latter being introduced to correct a misunderstanding at the counter where the customer withdraws the wrong amount and wants to correct it – it was not a bug that needed correction.
206. There was also an update to the Link interface versions in this period which I do not remember nor any of the other small changes cited in the version history of these documents.

***b. What did your role as 'Solutions Architect' for POL entail once Network Banking Services were installed at Post Office Counters?***

207. When the banking service was deployed, I moved onto a different work strand of paystation which was separate from Horizon.

***c. What knowledge and/or understanding did you have of any technical issues / defects or bugs in the Network Banking Services from 2005 to 2010?***

208. I have reviewed documents WITN 0406R9\_1/90, WITN 0406R9\_1/91, WITN 0406R9\_1/92, WITN 0406R9\_1/93, WITN 0406R9\_1/94, WITN 0406R9\_1/95, WITN 0406R9\_1/96, WITN 0406R9\_1/97, WITN 0406R9\_1/98, WITN 0406R9\_1/99, WITN 0406R9\_1/100, WITN 0406R9\_1/101, WITN

0406R9\_1/102, WITN 0406R9\_1/103, WITN 0406R9\_1/104 and WITN 0406R9\_1/105.

209. I am unable to recall being made aware of any technical issues, defects or bugs in the Network Banking Services from 2005 to 2010. However, the documents I have been referred to show there were some issues during this period, and I may have been involved in an ad-hoc manner whilst working in other areas due to my background involvement.

***d. What concerns did POL have about the reliability and robustness of the Horizon system from 2005 to 2010?***

210. I have reviewed documents WITN 0406R9\_1/90, WITN 0406R9\_1/91, WITN 0406R9\_1/92, WITN 0406R9\_1/93, WITN 0406R9\_1/94, WITN 0406R9\_1/95, WITN 0406R9\_1/96, WITN 0406R9\_1/97, WITN 0406R9\_1/98, WITN 0406R9\_1/99, WITN 0406R9\_1/100, WITN 0406R9\_1/101, WITN 0406R9\_1/102, WITN 0406R9\_1/103, WITN 0406R9\_1/104 and WITN 0406R9\_1/105 but these documents do not assist my recollection in relation to this question.

211. I am unable to recall any specific concerns and cannot speak for the wider POL business. However, in this period there was a major change of the system from the Escher Riposte product to HNG-X which included a Java counter and Oracle centre which I believe was based on commercial considerations.

**18. Please consider: POL00031810 (WITN 0406R9\_1/106).**

**a. What understanding / knowledge did you have of Pathway bugs in spring 2002?**

212. I have reviewed WITN 0406R9\_1/106. Whilst the document was copied to me, I do not recall any positive action from myself and the document does not assist my recollection in relation to this question.

213. I do not recall any specific or general Pathway bugs and would not be able to place any bugs I recalled to a specific time period.

**b. To what extent did you believe that Fujitsu were taking these bugs seriously enough?**

214. I have reviewed WITN 0406R9\_1/106 but the document does not assist my recollection in relation to this question.

215. I am unable to recall bugs that were around at the time and the action taken in regard to them so I am unable to comment. From reading the cited document, it would appear there was an issue and the discussion centred more on whether it was a bug for Fujitsu to fix (their cost) or a change for POL to sponsor and pay for.

**19. Are there any other matters that you consider will assist the Chair?**

216. I note that whilst some of the documents contain my name, the context in which my name arose were actions items for people to ask me to do something, or where I was being cited as a source. I was not present for or privy to some of these documents before receiving them from the Inquiry as part of this Witness Statement submission.

217. It should be noted that Fujitsu were the authors and providers of material and owned (and still own) the ultimate decision in design and implementation. POL was and is only able to review material submitted to it in good faith.

218. Finally, as mentioned earlier, these matters have occurred over 20 years ago in some cases. With no day books or additional reference material, some of my responses may be inaccurate and contain a degree of blurring as to what happened when and whether things did happen or not. My responses do reflect what I can recall to the best of my ability but my recollection may be influenced due to the passage of time and on reading the referenced documents 20 years on.

**Statement of truth**

I believe the content of this statement to be true.

Signed:

A rectangular box with a dashed border containing the letters "GRO" in a large, bold, black sans-serif font.

Dated: 16<sup>th</sup> September 2022

Witness Name: Robert Booth

Statement No.: WITN 0406R9\_1  
Exhibits: WITN 0406R9\_1/1 – WITN 0406R9\_1/106  
Dated: 16 September 2022

**THE POST OFFICE  
HORIZON IT INQUIRY**

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**WITNESS STATEMENT OF ROBERT  
BOOTH**

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Herbert Smith Freehills LLP  
Exchange House  
Primrose Street  
London  
EC2A 2EG  
Ref: 2066/9100/31048180



Witness Name: Robert Booth

Statement No.: WITN 0406R9\_1

Dated: 16 September 2022

**THE POST OFFICE HORIZON IT INQUIRY**

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**Index to the exhibits to the First Witness Statement of Robert Booth in the  
Post Office Horizon IT Inquiry**

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<b>No.</b>	<b>Exhibit Number</b>	<b>Document Description</b>	<b>Control Number</b>	<b>URN</b>
1.	WITN 0406R9_1/1	Network Banking End to End Reconciliation Reporting (Withdrawn)	POINQ0091523F	FUJ00085352
2.	WITN 0406R9_1/2	Landis & Gyr Quantum Specification H1 1290 6974	POINQ0009658F	FUJ00003487
3.	WITN 0406R9_1/3	Letter from BA- POCL to ICL Pathway dated 9 June 1997.	POINQ0064657F	FUJ00058486

4.	WITN 0406R9_1/4	Action points and notes from the BA/POCL Programme Pathway Release 2 and 3 Progress Review Meeting No. 4 held on 17 April 1997	POINQ0064655F	FUJ00058484
5.	WITN 0406R9_1/5	Acceptance of Operational Trial v1.0	POL-0024670	POL00028188
6.	WITN 0406R9_1/6	Frame Relay Risk Analysis v2.0	POINQ0064423F	FUJ00058252
7.	WITN 0406R9_1/7	ICL Pathway Change Control Note No. 633b	POINQ0006732F	FUJ00000561
8.	WITN 0406R9_1/8	Performance Summary Report for New Release 2 v2.0	POINQ0068356F	FUJ00078768
9.	WITN 0406R9_1/9	New Release 2 - Acceptance Test Specification Update Status v17.0	POINQ0064568F	FUJ00058397
10.	WITN 0406R9_1/10	Revisions to the Testing & Integration Approach for Pathway Release CSR+ v2.0	POINQ0068471F	FUJ00078883

11.	WITN 0406R9_1/11	NR2 Access Control And User Administration Processes and Procedures Description v2.0	POINQ0007664F	FUJ00001493
12.	WITN 0406R9_1/12	CSR+ Access Control And User Administration Processes and Procedures Description v1.0	POINQ0094176F	FUJ00088005
13.	WITN 0406R9_1/13	CSR+ Access Control And User Administration Processes and Procedures Description v4.0	POINQ0007612F	FUJ00001441
14.	WITN 0406R9_1/14	Security Functional Specification v7.0	POINQ0094239F	FUJ00088068
15.	WITN 0406R9_1/15	Direct Interface Testing Specification - Pathway to HAPS v1.1	POINQ0067880F	FUJ00078292
16.	WITN 0406R9_1/16	Direct Interface Testing Specification - Pathway to HAPS v2.0	POINQ0064537F	FUJ00058366
17.	WITN 0406R9_1/17	Horizon - Streamline	POINQ0007841F	FUJ00001670

		Application Interface Specification v1.1		
18.	WITN 0406R9_1/18	ICL Pathway Comments on POCL Infrastructure Acceptance Specification dated 17 December 1998	POINQ0068664F	FUJ00079076
19.	WITN 0406R9_1/19	Generalised API for OPS/TMS v1.0	POINQ0007539F	FUJ00001368
20.	WITN 0406R9_1/20	Generalised API for OPS/TMS v1.0 –Appendix B – Cryptography and Key Management	POINQ0007550F	FUJ00001379
21.	WITN 0406R9_1/21	Generalised API for OPS/TMS v1.0 – Appendix A – SmartMan Interfaces	POINQ0007549F	FUJ00001378
22.	WITN 0406R9_1/22	Generalised API for OPS/TMS v1.0 – Appendix C – System Management	POINQ0007548F	FUJ00001377
23.	WITN 0406R9_1/23	ICL Pathway Monthly Progress Report – February 2000	POINQ0064361F	FUJ00058190

24.	WITN 0406R9_1/24	ICL Pathway Memorandum re: POCL Infrastructure Acceptance Specification dated 22 December 1998	POINQ0068665F	FUJ00079077
25.	WITN 0406R9_1/25	CSR+ Operating Environment: Processes and Procedures Description v3.0	POINQ0007615F	FUJ00001444
26.	WITN 0406R9_1/26	Counter Hardware Design Specification v8.0	POINQ0007848F	FUJ00001677
27.	WITN 0406R9_1/27	Counter Hardware Design Specification v9.0	POINQ0007989F	FUJ00001818
28.	WITN 0406R9_1/28	Network Banking Service Processes and Procedures Description v1.0	POINQ0007989F	FUJ00001756
29.	WITN 0406R9_1/29	ICL Pathway Change Control Note No. 683	POINQ0006774F	FUJ00000603
30.	WITN 0406R9_1/30	TMS Architecture Specification v1.0	POINQ0007852F	FUJ00001681
31.	WITN 0406R9_1/31	TMS Hardware Design Specification v0.5	POINQ0007852F	FUJ00001684

32.	WITN 0406R9_1/32	Technical Design Standard v2.0	POINQ0007873F	FUJ00001702
33.	WITN 0406R9_1/33	TMS Architecture Specification v2.0	POINQ0007913F	FUJ00001742
34.	WITN 0406R9_1/34	CSR+ Electronic Point of Sale Service: Processes and Procedures Description v7.0	POINQ0007924F	FUJ00001753
35.	WITN 0406R9_1/35	Horizon Capacity Management and Business Volumes v2.0	POINQ0007990F	FUJ00001819
36.	WITN 0406R9_1/36	Horizon Capacity Management and Business Volumes v1.0	POINQ0007890F	FUJ00001719
37.	WITN 0406R9_1/37	Horizon New Service Business Volumes v2.0	POINQ0007802F	FUJ00001631
38.	WITN 0406R9_1/38	ICL Pathway Memorandum re: POCL Infrastructure Acceptance Specification dated 2 December 1998	POINQ0068677F	FUJ00079089
39.	WITN 0406R9_1/39	ICL Pathway Memorandum re: POCL Infrastructure	POINQ0068675F	FUJ00079087

		Acceptance Specification dated 26 February 1999		
40.	WITN 0406R9_1/40	ICL Pathway Memorandum re: POCL Infrastructure Acceptance Specification dated 10 March 1999	POINQ0068669F	FUJ00079081
41.	WITN 0406R9_1/41	ICL Pathway Memorandum re: POCL Infrastructure Acceptance Pack – Segment 3 dated 23 April 1999	POINQ0068671F	FUJ00079083
42.	WITN 0406R9_1/42	ICL Pathway Memorandum re: POCL Infrastructure Acceptance Pack – Segment 5 dated 28 May 1999	POINQ0068729F	FUJ00079141
43.	WITN 0406R9_1/43	ICL Pathway Memorandum re: POCL Infrastructure Acceptance Pack	POINQ0068731F	FUJ00079143

		– Segment 4 actions and late segment 5 dated 15 June 1999		
44.	WITN 0406R9_1/44	POCL Infrastructure Acceptance Test v2.0	POINQ0007634F	FUJ00001463
45.	WITN 0406R9_1/45	Acceptance Workshop (7) Action Points dated 17 September 1999	POINQ0068764F	FUJ00079176
46.	WITN 0406R9_1/46	Acceptance Incident Form dated 5 April 1999	POL-0024839	POL00028357
47.	WITN 0406R9_1/47	ICL Pathway NR2 Progress Summary for Input to Horizon / Pathway Delivery Meeting 18th August 1999	POINQ0068381F	FUJ00078793
48.	WITN 0406R9_1/48	Acceptance Proposal for Acceptance Incident 372	POINQ0068761F	FUJ00079173
49.	WITN 0406R9_1/49	AI 314 – Third Party Procurements v1.0	POL-0024841	POL00028359
50.	WITN 0406R9_1/50	Acceptance Incident Hotlist	POL-0024837	POL00028355



		dated 13 August 1999		
51.	WITN 0406R9_1/51	Minutes of Horizon Programme Management Resolution Meeting dated 12 August 1999	POL-0024814	POL00028332
52.	WITN 0406R9_1/52	ICL Pathway Actions Following Acceptance Incidents Resolution Workshop on 27-28 July 1999	POINQ0068742F	FUJ00079154
53.	WITN 0406R9_1/53	Email from Bob Booth to Dave Hollingsworth re: AI 372 – System management of LT1 to L2 dated 6 August 1999	POINQ0068746F	FUJ00079158
54.	WITN 0406R9_1/54	Output from Tranche 3 Acceptance Incident Workshop on 10 August 1999	POL-0024846	POL00028364
55.	WITN 0406R9_1/55	Meeting Output – Acceptance Incidents Discussed at	POL-0024842	POL00028360

		Meeting on 11 August 1999		
56.	WITN 0406R9_1/56	Pathway-to-TIP Interface Acceptance Review Pack v0.3	POINQ0068342F	FUJ00078754
57.	WITN 0406R9_1/57	Notes from POCL Infrastructure Acceptance Meeting – Segment 4 dated 2 June 1999	POINQ0068674F	FUJ00079086
58.	WITN 0406R9_1/58	ICL Pathway Monthly Progress Report – January 2000	POINQ0064360F	FUJ00058189
59.	WITN 0406R9_1/59	ICL Pathway Monthly Progress Report – August 2000	POINQ0064365F	FUJ00058194
60.	WITN 0406R9_1/60	Horizon Generic Release Acceptance Process v1.0	POINQ0008060F	FUJ00001889
61.	WITN 0406R9_1/61	Concluding Pathway Acceptance v0.1	POL-0024990	POL00028508
62.	WITN 0406R9_1/62	Business Continuity Framework v6.0	POINQ0007851F	FUJ00001680
63.	WITN 0406R9_1/63	Business Continuity Framework v9.0	POINQ0008066F	FUJ00001895

64.	WITN 0406R9_1/64	Network Banking End to End Reconciliation Reporting v5.0	POINQ0007911F	FUJ00001740
65.	WITN 0406R9_1/65	Network Banking Engine – Horizon Application Interface Specification v2.0c	POINQ0007795F	FUJ00001624
66.	WITN 0406R9_1/66	Reference Data System: Application Interface Specification Reference Data to Pathway v5.2	POINQ0007794F	FUJ00001623
67.	WITN 0406R9_1/67	PIN Pad Product Specification v4.0	POINQ0007803F	FUJ00001632
68.	WITN 0406R9_1/68	Security Functional Specification v6.0	POINQ0094224F	FUJ00088053
69.	WITN 0406R9_1/69	ETU Technical Interface Specification: Horizon to e-pay v1.0	POINQ0007983F	FUJ00001812
70.	WITN 0406R9_1/70	NBX – POCA Technical Interface Specification (TIS) v1.0	POINQ0008009F	FUJ00001838

71.	WITN 0406R9_1/71	NBX – POCA Technical Interface Specification (TIS) v2.0	POINQ0008073F	FUJ00001902
72.	WITN 0406R9_1/72	NBX – A&L Technical Interface Specification (TIS) v1.0	POINQ0008054F	FUJ00001883
73.	WITN 0406R9_1/73	NBX – LINK Technical Interface Specification (TIS) v1.0	POINQ0008061F	FUJ00001890
74.	WITN 0406R9_1/74	NBX – FI Reconciliation and Settlement File Format AIS v2.0	POINQ0008077F	FUJ00001906
75.	WITN 0406R9_1/75	NBX – A&L Application Interface Specification (AIS) v3.0	POINQ0009656F	FUJ00003485
76.	WITN 0406R9_1/76	NBX – A&L Application Interface Specification (AIS) v4.0	POINQ0009657F	FUJ00003486
77.	WITN 0406R9_1/77	NBX – CAPO Application Interface	POINQ0008062F	FUJ00001891

		Specification (AIS) v2.0		
78.	WITN 0406R9_1/78	NBX – CAPO Application Interface Specification (AIS) v3.0	POINQ0008129F	FUJ00001958
79.	WITN 0406R9_1/79	Horizon – Card Account Mapping v1.0	POINQ0008074F	FUJ00001903
80.	WITN 0406R9_1/80	Horizon – LINK Mapping v1.0	POINQ0008075F	FUJ00001904
81.	WITN 0406R9_1/81	Horizon – A&L Mapping v1.0	POINQ0008076F	FUJ00001905
82.	WITN 0406R9_1/82	NBX – Business Parameters v1.0	POINQ0008078F	FUJ00001907
83.	WITN 0406R9_1/83	Network Banking End to End Reconciliation Reporting v6.0	POINQ0008013F	FUJ00001842
84.	WITN 0406R9_1/84	Post Office Ltd to Fujitsu Services EMV Retail PIN Pad Reference Data Interface Specification v1.0	POINQ0008055F	FUJ00001884
85.	WITN 0406R9_1/85	Post Office Ltd to Fujitsu Services EMV Banking PIN Pad Reference Data Interface Specification v1.0	POINQ0008056F	FUJ00001885

86.	WITN 0406R9_1/86	NBX – LINK Application Interface Specification (AIS) v2.0	POINQ0009654F	FUJ00003483
87.	WITN 0406R9_1/87	NBX – LINK Application Interface Specification (AIS) v3.0	POINQ0009655F	FUJ00003484
88.	WITN 0406R9_1/88	EMV Banking: User Interface Design Proposal v2.0	POINQ0008103F	FUJ00001932
89.	WITN 0406R9_1/89	EMV Retail: User Interface Design Proposal v2.0	POINQ0008104F	FUJ00001933
90.	WITN 0406R9_1/90	PIN Pad Product Specification v5.0	POINQ0008087F	FUJ00001916
91.	WITN 0406R9_1/91	NBX – CAPO Application Interface Specification (AIS) v4.0	POINQ0008237F	FUJ00002066
92.	WITN 0406R9_1/92	Horizon – Card Account Mapping v2.0	POINQ0008239F	FUJ00002068
93.	WITN 0406R9_1/93	Horizon – LINK Mapping v2.0	POINQ0008124F	FUJ00001953
94.	WITN 0406R9_1/94	Horizon – LINK Mapping v3.0	POINQ0008216F	FUJ00002045
95.	WITN 0406R9_1/95	Horizon – LINK Mapping v4.0	POINQ0008340F	FUJ00002169

96.	WITN 0406R9_1/96	Horizon – A&L Mapping v2.0	POINQ0008125F	FUJ00001954
97.	WITN 0406R9_1/97	NBX – Business Parameters v2.0	POINQ0008130F	FUJ00001959
98.	WITN 0406R9_1/98	NBX – Business Parameters v4.0	POINQ0008240F	FUJ00002069
99.	WITN 0406R9_1/99	NBX – Business Parameters v5.0	POINQ0008342F	FUJ00002171
100.	WITN 0406R9_1/100	Post Office Ltd to Fujitsu Services EMV Retail PIN Pad Reference Data Interface Specification v2.0	POINQ0008279F	FUJ00002108
101.	WITN 0406R9_1/101	NBX – LINK Application Interface Specification (AIS) v4.0	POINQ0008215F	FUJ00002044
102.	WITN 0406R9_1/102	NBX – LINK Application Interface Specification (AIS) v5.0	POINQ0008341F	FUJ00002170
103.	WITN 0406R9_1/103	NBX – FI Reconciliation and Settlement File Format AIS v3.0	POINQ0008238F	FUJ00002067
104.	WITN 0406R9_1/104	Application Interface Specification:	POINQ0008176F	FUJ00002005

		Horizon to e-pay v5.0		
105.	WITN 0406R9_1/105	Application Interface Specification: Horizon to e-pay v6.0	POINQ0008409F	FUJ00002238
106.	WITN 0406R9_1/106	Email from Andrew J Perkins to Nicholas Samuel re: Cost Challenge: CCN965 Change to stock unit cash on hand total time dated 24 May 2002	POL-0028712	POL00031810