

**CASE NUMBER 1HQ16X01238**

**ALAN BATES & OTHERS [CLAIMANT]**

**V**

**POST OFFICE LIMITED [DEFENDANT]**

**SECOND JOINT STATEMENT OF**

**JASON COYNE**

**AND**

**DR ROBERT WORDEN**

**25 FEBRUARY 2019**

## **Introduction**

This Joint Statement sets out further areas of agreement between the Experts. The structure of the document captures i) A table of bugs/errors/defects containing evidence of financial impact upon branch accounts that both experts agree (or indicate if they do not), ii) all expert agreements grouped by Horizon issue, and iii) additional comments and observations input by the respective expert.

Because of time pressures and the complexity of the issues, we have not been able to address all the Horizon issues in this joint statement. We will issue a subsequent joint statement addressing those issues we have not yet addressed. For those issues we have addressed in this statement (issues 1, 2, 9, 14 and 15), the layout and references are not as polished as we would have wished, and there may be further points we need to address in the next joint statement, which will address the other Horizon issues. We apologise to the court for these shortcomings.

Jason Coyne – In this Joint Statement I have sought to document my agreement or disagreement with Dr Worden in respect of the Horizon Issues. It is my understanding that this document is not a responsive report to Dr Worden's supplemental report, therefore I have not provided comments, criticisms or observations of his report in this Joint Statement. Where Dr Worden seeks to provide rebuttals and responsive comments to my supplemental report, I do not address them in this document, but seek to focus only on agreement on the Horizon Issues as they are stated in the pleadings. Where an additional statement under an agreed issue is attributed by me, It is made to clarify or qualify the agreements made in that issue section.

Jason Coyne – Dr Worden wishes to include a table of what he believes are the financial impacts of the Bugs Errors and Defects discovered to date. I have not considered such a calculation and therefore the data within this table is not agreed.

Robert Worden – I believe this joint statement (and those to come after it) can serve as a concise roadmap for the court, of the areas of agreement and disagreement between the experts, as they are at the date of issue. As such, this statement should express the disagreements as concisely as possible but describing the differences between the experts' opinions with sufficient precision to assist the court. I have attempted to do that.



**Table of Bugs/Errors/Defects with acknowledged or disagreed evidence of financial impact**

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
1	Receipts and Payments Mismatch Bug (acknowledged bug)	2010	Identified approx. 60 branch accounts impacted	<p>This is a bug acknowledged by PO, which had impact on branch accounts.</p> <p>Peak PC0204765 and others show that Fujitsu were able to establish the branches affected and the amounts, even if they had not been reported by the Subpostmaster.</p> <p>Therefore, the extent of this bug is well established, in the GJ analysis.</p>	<p><b>PEAKs</b> PC0204765, PC0204263, PC0203864</p> <p><b>KELs</b> wrightm33145J, ballantj1759Q, chitkelaS1953M, BrailsfordS130S</p> <p><b>Coyne Supplemental Report 3.27</b></p> <p><b>Gareth Jenkins analysis</b></p> <p><b>RW 650-659</b></p>
2	Callendar Square/Falkirk Bug (acknowledged bug)	2000-2006	Thirty branches affected when investigated in 2005.	<p>This is a bug acknowledged by PO, which had impact on branch accounts.</p> <p>Peak PC0103864 shows that PO/FJ were able to detect occurrences of the fault, (by reconciliation on the Host) even if they had not been reported by an Subpostmaster.</p> <p>The bug arose from a fault in the underlying Riposte software, so it is not surprising that it took Fujitsu some time to understand it, or that they had to rely on the suppliers to fix</p>	<p><b>PEAKs</b>, PC0126042, PC0126376, PC0103864, PC0116670, PC0075892, PC0083101, PC0086212, PC0193012</p> <p><b>KELs</b> JSimpkins338Q, JBallantyne5245K</p> <p><b>Coyne Supplemental Report 3.27</b></p>

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
				it. It does not show poor system design or support by Fujitsu.	<b>Godeseth WS</b>  <b>RW 660-669</b>
3	Suspense Account Bug (acknowledged bug)	2010-2013	<p>It was reported that 14 branches were affected when investigated in 2013.</p> <p>The PEAK notes that Horizon needs to change in the future; <i>“This change would alert support teams to the existence of a system problem affecting branch accounts, rather than having to wait for it to be reported. Such a problem, affecting 14 branches, was not reported until 15 months after it first could have been noticed.”</i></p>	<p>This is a bug acknowledged by PO, and the technical account of the bug is well established.</p> <p>It was a transient effect arising not from a fault in the software, but from a change in database archiving policy in 2010. The delay in correcting it arose from a failure of communication between PO and Fujitsu. Because the bug would only manifest itself annually for any affected branch, the effects of this delay were not widespread.</p> <p>Peak PC0223870 shows that Fujitsu were able to identify the branches affected, even when Subpostmasters did not report it. There is evidence that the branches were compensated, as I would expect from the normal error correction processes.</p>	<p><b>PEAKs</b> PC0223870 <b>KELs</b> acha2230K <b>Coyne Supplemental Report 3.43</b></p> <p><b>Gareth Jenkins Analysis</b></p> <p><b>RW 670- 686</b></p>
4	Dalmellington Bug/ Branch Outreach Issue (not acknowledged but dealt with in Responsive Witness Statements)	2000-2005 (actual fix to Horizon recorded in KEL as 12 <sup>th</sup> Jan 2016)	112 occurrences of the bug impacting 88 branches across a five year period, some branches impacted five separate times. The contemporaneous investigations suggest that the discrepancies were not detected in a timely manner.	<p>Dalmellington was analysed in my first report under KEL acha621P, although I did not there identify it with Dalmellington, which is a cash remming error.</p> <p>PO had a well-tested process of reconciliation and TCs to detect and correct errors in cash remming (used</p>	<p><b>PEAKs</b> PC0246949, PC0247207, <b>KELs</b> acha621P <b>Coyne Supplemental Report 3.46</b></p> <p><b>RW Supp 144 – 163</b></p>

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
			The 2015 Audit report into the bug reported that four occurrences with financial discrepancies' have "unknown outcomes"	20,000 times per year), whatever their source. It is straightforward for Horizon to detect any discrepancy between a 'rem out' and the corresponding 'rem in' (a mismatch arising either from a miscount, or a multiple count of a pouch), and then a TC can be issued.  This process catches and corrects remming errors, whatever their cause - including if they arise from, or are provoked by, software faults.	<b>RW 938 (Table 9.3)</b>
<b>The bugs/errors/defects below have been identified by review of PEAK and KEL records. The number of bugs/errors/defect and supporting evidence referenced may not be exhaustive nor depict the full extent of the issues.</b>					
5	'Remming In' Bug (not acknowledged)	March – August 2010 recorded as fixed approx. 2011	Para 3.63 Coyne Supplemental Report for 14 example branches impacted.	As for the Dalmellington bug, above – PO had a robust process for detecting and correcting remming errors, whatever their origin.  So, there were no lasting effects on branch accounts.	<b>PEAKs</b> see Coyne Supplemental Report paras below for PEAK references <b>KELs</b> acha4221Q <b>Coyne Supplemental Report</b> paras 3.56 – 3.66  <b>RW Supp 144-153</b>  <b>RW 938 (Table 9.3)</b>
6 (i)	'Remming Out' (i) Bug (not acknowledged)	February/April 2007 recorded as fixed approx. 2007.	Para 3.70 of Coyne Supplemental report for 57 branches impacted.	As for the Dalmellington bug, above – PO had a robust process for detecting and correcting remming errors, whatever their origin.	<b>PEAKs</b> see Coyne Supplemental Report <b>KELs</b> acha508S <b>Coyne Supplemental</b>

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
					<b>Report</b> paras 3.67 – 3.77  <b>RW Supp 144-153</b>  <b>RW 938 (Table 9.3)</b>
6 (ii)	‘Remming Out’ (ii) Bug (not acknowledged)	May 2005	Para 3.73 of Coyne Supplemental Report, One example branch impacted	<p>As for the Dalmellington bug, above – PO had a robust process for detecting and correcting remming errors, whatever their origin.</p> <p>So, there were no lasting effects on branch accounts.</p>	<b>KEL GMaxwell3853P PEAK PC0120937 Coyne Supplemental Report 3.73</b>  <b>RW Supp 144-153</b>
7	Local Suspense Issue (not acknowledged & not “Suspense Account Bug)	2010 reported as fixed in September 2010	<p>Utilising PC0197409 as the search term returns four associated KELs (see Supporting Evidence column).</p> <p>Mr Parker’s first Witness Statement identifies 33 branches impacted. .</p> <p>However, the associated PEAK records have not been provided and the four associated KELs to the above PEAK illustrate this problem may have been larger than 33 branches as KEL acha5838T records “Two different but similar problems”.</p> <p>Utilising the KEL as the search term returns the following PEAK numbers:</p> <p>acha5259Q – 6 PEAKs cardc2043L – 10 PEAKs</p>	<p>The KEL acha5259Q implies that PO and Fujitsu were able to identify all occurrences of the problem, without being notified by any Subpostmaster. I would therefore expect them to have corrected any impact on branch accounts as part of normal error correction processes.</p> <p>I would not expect evidence of all corrections to accounts to have survived to the present day. Peaks and KELs are not used to record corrections of financial impact.</p> <p>Fujitsu analysed the KEL (Parker WS) and said: ‘Temporary financial impact which would have been cancelled out in the following period by a corresponding discrepancy’</p>	<b>PEAKs</b> PC0198077, PC0197409, PC0197797 PC0204396, <i>PC0197409 + those displayed in table at 3.81 of Coyne Supplemental Report</i> <b>KELs</b> acha5259Q, PorterS199P <b>Coyne Supplemental Report</b> paras 3.78 – 3.83  <b>RW analysis of KEL – Appendix D.5</b>



Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
			PorterS199P – 3 PEAKs acha5259Q – 6 PEAKs		<b>Fujitsu analysis of KEL – attached to Parker WS</b>
8	Recovery Issues (not acknowledged)		The text within the PEAKs and KELs suggests that in each case a branch account discrepancy would be evident and would require correction by the Post Office.	The KELs and Peaks cited by Mr Coyne are not indicative of errors in Horizon. They provide guidance on how to correct discrepancies caused by human errors or other errors in transaction recovery ('recoverable transactions')	<b>PEAK</b> PC0197769, PC0198352, PC0256566, PC0256502, PC0264632, PC0223229.
	“Wrong Trading or Balancing Period”	2010	PC0198352 reports; “ <i>This problem caused a loss at the branch for which they should not be liable</i> ”	Because there were many such errors, there were many calls to the help desk and many Peaks and KELs	<b>KEL</b> acha5650L, acha959T, dsed4010N, cardc464Q, seng2048K, dsed2640M
	“Subpostmaster processed a transaction that did not appear on the transaction log”	2017	PC0256502 & PC0256566 report: “ <i>advised them to do the necessary reconciliation for this sum of cash (Cash withdrawal for £244). We have no way of knowing the internal POL process as to when they will do the reconciliation if not done already.</i> ”	Normally, correction of errors involved back office reconciliation and issuing TCs. This was accurate and effective; I have derived an upper limit of £2 per branch per month on the mean impact of erroneous TCs	<b>Coyne Supplemental Report</b> para 3.84 to 3.98
	‘AUTHORISED’ receipt was printed but transaction lost from log.		PC0264632 reports; “ <i>As the successful receipt was printed, PM should have collected 54 EUR from the customer but we are not sure the customer account was credited with this amount because the transaction was not recorded anywhere to check this.</i> ”	One important KEL acha959T was guidance to the back office MSU, not for Subpostmasters	<b>RW sect 9.6</b> <b>RW supp sect 7 and appendix</b>
	“investigation of transaction(s) in a state other than	2017 - No resolution reported			

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
	Final as showing in daily Reconciliation report”	although still chasing up to Aug 2018	acha959T is referred to by 2,473 other PEAKs from 2010 to 2018, each of these may (but may not) indicate a similar issue with the Horizon recovery process and potentially creating a discrepancy within branch accounts.		
9	Reversals	Identified impact in April 2003, KEL PSteed2847N created April 2003 last updated 20 June 2003	<p>In April 2003 due to a failure in regression testing, Horizon version S30 was released by Fujitsu and this introduced a bug where the value of transactions reversed by Subpostmasters was shown twice in the amount of the reversal in branch accounts.</p> <p>PSteed2847N (the KEL associated to the PEAK record (see Supporting Evidence column)) records: <i>“the PM should be contacted to say that the problem is due to a software error and that they should ask the NBSC for balancing procedures”</i>.</p>	<p>Transaction reversals are a complex area which, like recoverable transactions, are less familiar to Subpostmasters and are more prone to human error. They lead to many calls to the help line and to many KELs and Peaks - not necessarily related to any fault in Horizon.</p> <p>Coyne supp. 3.99 - 3.101 refer to a cash remming reversal issue. Whether or not this was caused by a fault in Horizon, all remming errors are detected by Horizon and corrected by TCs (or previously, error notices). Therefore, there was no lasting effect on branch accounts.</p> <p>Coyne Supp. 3.103 and 3.104 further address the same remming reversal issue. My opinions are as for other remming issues.</p>	<p><b>PEAK</b> PC0089918 (25<sup>th</sup> April 2003), PC0091284</p> <p><b>KEL</b> PSteed2847N</p> <p><b>Coyne Supplemental Report</b> 3.99 – 3.104</p>

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
				The KEL indicates that, as this remming issue was caused by a software bug, PO and FJ wanted discrepancies to be corrected early to reassure the Subpostmaster. In my opinion, a remming TC would have corrected the discrepancy in any case.	
10	Data Tree Build Failure Discrepancies	Identified impacts: PC0033128 dated 1999,  3 x PEAKs in 2000,  Associated KEL MSCardifield2219S created July 2005 last updated November 2007.	Text within the PEAK reads “Data trees have been failing to build fully, and the system has not been detecting this.”  Dugannon branch suffered a £43,000 discrepancy but the cause was not immediately known.  £52,814.29 at the Yate Sodbury Branch  £9,368.40 at the Appleby Westmoreland branch  PC0033128 sates “...There have been a number of calls relating to this kind of issue.”)	There was a bug which has potential impact on branch accounts, early in the lifetime of Horizon.  Soon after it arose, the error was trapped and detected by DEP and was then soon fixed.  The fault was easily noticeable at branches before the error trapping which was soon introduced and would be even more noticeable after that. Only three branches appear to have been affected, as described by Mr Coyne.  Because it was so noticeable at the branch, and the Peak is concerned with a software error rather than any other cause, I would expect any discrepancies in branch accounts to have been corrected.	<b>PEAKs</b> PC0033128 (10 November 1999), PC0132133, PC0046811, PC0055964, PC0058161  <b>KEL</b> MSCardifield2219S  <b>Coyne Supplemental Report</b> 3.106 to 3.118
11	Girobank Discrepancies	Identified period May – September 2000,	Eight instances of this defect are identified in the PEAKs as relative to KEL MWright531 which was associated to one manifestation of this issue. The	Peak PC004432, cited at Coyne Supp 3.119, shows that the first fault concerns reports. A fault in a report is not a discrepancy in branch accounts, and only causes one if it causes a	<b>PEAKs</b> PC0044232 (5 <sup>th</sup> May 2000), PC0044101, PC0050418 (17 <sup>th</sup> July 2000), PC0050861



Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
		PC0068633 dated 2001,  3 X PEAKs dated 2002 (associated with KEL AChambers4410R).	discrepancy values identified from those PEAKs referenced range from £40 - £500.  Investigations relative to PEAK PC0044232 identify that there were actually further problems in relation to this bug, in summary, as a result of process timing issues.  Further KELs are associated with the varying manifestations of this bug. Each KEL in turn applying to varying numbers of PEAKs (see Coyne Supplemental references).	person to make a mistake. I have not yet seen evidence that it did so, and Mr Coyne cites no such evidence. Discrepancies in reports are of concern to Subpostmasters and give rise to Peaks and KELs.  In the second Peak PC0068633 cited at 3.124, it is clear that the error notice cleared the error, which was an example of normal error correction. The extract cited by Mr Coyne at 3.125 indicates that this fault also affected reports.  For these reasons, I do not agree with Mr Coyne's conclusion at 3.128 that branch accounts were affected.,	(21 <sup>st</sup> July 2000), PC0052575 (13 <sup>th</sup> September 2000), PC0052704 (18 <sup>th</sup> August 2000), PC0052804 (21 <sup>st</sup> August 2000), PC0053975 (13 <sup>th</sup> September 2000)  <b>KELs</b> MWright531p, AChambers4410R  <b>Coyne Supplemental Report 3.119 – 3.128</b>
12	Counter Replacement Issues (Rebuild / One sided Transactions)	PC0058528 dated 2000, KEL JBallantyne5328R created December 2000 last updated July 2007 (returns 88 further PEAKs). KEL DRowe4629L raised in 2002 records other occurrences of this issue noted in 2003 and 2009.	When replacing a counter within a branch the process could result in the “ <i>total loss of a transaction</i> ”.  Identifying the branches impacted by such issues is not straightforward. PEAK PC0058528 is used as an example, however, this bug/error/defect could apply in varying ways. The KELs indicate these were intermittent but ongoing problems and could result in gains, losses or no effect due to both sides of a transaction being missing.	Mr Coyne's description at 3.129 is that this was a receipts/payment mismatch. It was therefore obvious to the Subpostmaster and unlikely to have been attributed to human error. He says that 'there is no further detail within the PEAK record as to how this was resolved financially for the Subpostmaster.'  The KEL makes this clearer. The KEL records both the cause: 'Riposte is coming online from Recovery mode too early and causing messages to be overwritten' and the nature of the correction: 'To find the	<b>Coyne Supplemental Report 3.129 – 3.131</b>  <b>Example Peaks</b> PC0058528, PC0071836, PC0133822, PC0153851, PC0058686  <b>KELs</b> JBallantyne5328R, DRowe4629L

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
			.	<p>overwritten transactions for reconciliation we need to look at the Ripostemirror messagestore', followed by detailed instructions.</p> <p>It therefore seems clear that, following any reported discrepancy, reconciliation and a routine Error Notice would correct it. So, I do not agree with Mr Coyne's implication at 3.129 that there were potential discrepancies in branch accounts; or with his conclusion at 3.131.</p> <p>The incident arose from a hardware replacement (probably from a hardware fault) not from a fault in Horizon. It is a different kind of recovery issue.</p> <p>This conclusion appears to apply equally to the 88 further Peaks which refer to this KEL, as noted by Mr Coyne in para 3.130.</p>	
13	Withdrawn Stock Discrepancies	Identified occurrences January to April 2011	The full extent of branch impact has not been identified, PC0209602 states "Can cause confusion and unexpected (though hopefully temporary) discrepancies at branches by allowing them to declare stock which has already been withdrawn. Additional problems	<p>I analysed this KEL in the appendix to my first report because Mr Coyne had cited it in his report at para 5.165. I said: 'Some impact on branch accounts cannot be ruled out, although it is small'.</p> <p>Fujitsu's analysis of the same KEL was: <i>'This may have had a financial impact but, if so, it would be due to</i></p>	<p><b>Peaks</b> PC0207834, PC0209602, PC0208918 <b>KEL</b> pothapragadac4359R</p> <p><b>Coyne Supplemental Report</b> 3.132 – 3.139</p>

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
			<p>Spring 2011 highlighted that at least 60 or so branches managed to do this.”</p> <p>The word “additional” implies this defect may have been operational before spring 2011.</p>	<p><i>human error (i.e. declaring that it held an item of stock that it couldn't transact). This discrepancy would be removed if the branch accurately declared that it had no such stock.'</i></p> <p>Mr Coyne at para 135 cites the Peak: 'Can cause confusion and unexpected (though hopefully temporary) discrepancies at branches by allowing them to declare stock which has already been withdrawn'.</p> <p>Since the discrepancies in branch accounts appear to be both temporary, and caused by human error, these are not a case of a bug in Horizon causing lasting effects on branch accounts.</p>	
14	Bureau Discrepancies	Exemplified occurrences August and December 2017	The PEAK detail records the impact of a Horizon bug which left a branch £204.59 short after Horizon initially recorded the complete currency order but only actually processed one out of two currencies	<p>This appears to be a system error with impact on branch accounts. Although it is possible that a subsequent discrepancy between branch accounting and POLSAP would reveal the problem, leading to a correction (e.g. see Peak PC0265443, and Mr Coyne's para 3.146), I cannot be certain of this.</p> <p>The first Peak, cited in para 3.141, contains a comment which confirms that any issue with potential financial impact was treated as high priority: 'SSC; please raise the priority of this</p>	<p><b>Coyne Supplemental Report 3.140 – 3.146</b></p> <p><b>PEAKs</b> PC0261541 PC0261710 PC0265443</p>

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
				<i>PEAK. As a general rule of thumb, any financial-related errors resulting in losses should be at least C priority.'</i>	
15	Phantom Transactions	PC0052025 August 2000, PC0065021 April 2001	<p>Whilst no specific branch account discrepancies are noted, many events recorded in the PEAK PC0065021 suggesting multiple 'Phantom Transactions' at branch during the period of 14<sup>th</sup> April 2001 to 12<sup>th</sup> November 2001. It is therefore possible (with the unpredictable nature of Phantom Transactions) that branch accounts could have been impacted.</p> <p>Observations recorded on 19<sup>th</sup> June 2001 by Fujitsu's Patrick Carroll "<i>I now have pressing evidence to suggest that unwanted peripheral input is occurring, the likely source being the screen... I have observed system activity corresponding to screen presses happening with no corresponding [sic] evidence of either routine system activity or human interference</i></p>	<p>The master Peak PC0065021 has status 'closed- no fault in product'.</p> <p>Throughout the master Peak there is no suggestion of any bug in Horizon - only hardware and environmental problems were suspected, and finally user error was suspected. There is no pattern indicative of a software bug. The Peak concludes: <i>'Phantom Txns have not been proven in circumstances which preclude user error. In all cases where these have occurred a user error related cause can be attributed to the phenomenon. I am therefore closing this call as no fault in product.'</i></p> <p>Peak PC0052025 appears to have a straightforward explanation, as being caused by user error.</p> <p>There is no evidence for bugs in Horizon with impact on branch accounts.</p>	<p><b>PEAK:</b> PC0065021, PC0052025,</p> <p><b>KEL</b> RColeman2110J (not formally disclosed)</p> <p><b>Coyne Supplemental Report</b> 3.148 – 3.153</p>
16	Reconciliation Issues	Incidents identified March Exemplified Incidents: PC0039832 dated 2000 (reportedly	PC0039832 –The bug/error/defect reported in this PEAK caused discrepancies to be displayed to the Subpostmaster that did not actually appear in the accounts.	Peak PC0039832 does not relate to 'reconciliation' in the sense of the back-office process addressed elsewhere in the expert reports. It relates to a counter reconciliation	<b>Example PEAKs</b> PC0039832, PC0045847, PC0075240,



Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
	Relating to Horizon Issues 1, 4 & 5	fixed Aug 2000), 3 x PEAKs dated 2002, PC0204872 dated 2010, PC0236246 dated 2014	<p>PC0039832 details small discrepancies reported on Horizon reconciliation report. The problem with any discrepancy, however small is that it may reduce the Subpostmasters ability to resolve discrepancies of greater values because the net discrepancy does not match any of the transactions on the report.</p> <p>PC0049578 – Records that Horizon incorrectly counted the number of cash a/c outlet files and transaction outlet files. This would have impacted the integrity of the reconciliation checking within Horizon and therefore may have allowed branch accounts to have suffered impact from TC's being issued by Post Office in error.</p> <p>PC0045847 – reports message store corruption that resulted in a branch discrepancy of £4462.46. The PEAK recording that this is a duplicate of an earlier incident; <i>"supposed to be fixed in the near future"</i>.</p> <p>PC0236246 – reports of discrepancies within Client Transaction Summary files (CTS). Client Transaction Summaries are totals derived from</p>	<p>report in the branch, so it does not go to reconciliation as in Horizon issues 5 and 15.</p> <p>As it concerns an issue in reporting, the software fault (which was fixed after 5 months) had no direct impact on branch accounts. The only effect of an error in this report would be to mislead or confuse the Subpostmaster - probably leading him to check his figures more carefully and costing him some time.</p> <p>The Peaks referred to in paras 3.158 - 3.162 relate to a cash rounding error in the back-end TIP system, causing discrepancies of 1p in certain back-end reports. So, the bug being discussed here is: (a) a back-end reporting problem, with no direct impact on branch accounts, and (b) involves tiny financial discrepancies, which would usually be dismissed as human error.</p> <p>The effort spent in chasing this issue down illustrates how precisely Horizon was expected to balance the accounts.</p> <p>In Peak PC0049578 there is a software fault and the fix is to <i>'Update TPSC260 to correctly count</i></p>	<p>PC0075415, PC0049578, PC0236246, PC0204872</p> <p><b>KEL DRowe304L</b> (not formally disclosed)</p> <p><b>Coyne Supplemental Report 3.154 – 3.173</b></p>

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
			<p>the aggregation of all branch accounts. Any discrepancies within the CTS may indicate discrepancies at branch account level.</p> <p>PC0204872 provides a specific example of where CTS discrepancies may relate directly to branch accounts: <i>“7th May 2010 - CTS was greater than vendor figures by 84.86. POL have suggested that this may have been related to an event from 27th February for FAD 490519, although we can find no BIMS record of this from a Reconciliation perspective.”</i></p>	<p><i>the number of files read.</i> Mr Coyne concludes: <i>'The implications of this might have affected reconciliation'.</i> I agree that they might have done. However, in my opinion the effect is remote from branch accounts, and the chances of causing a reconciliation error (leading to an erroneous TC) are slight - as a mis-count of the number of files (the fault) is not a financial discrepancy.</p> <p>Coyne supp paras 3.170- 3.174 concern errors in the Client Transaction Summary (CTS) which, as Mr Coyne states at 3.171, are produced by the Automated Payments System (APS). The APS High Level Design document (DES/APP/HLD0026.docx) states:</p> <p><i>'Following the delivery of the Client Files, a Client Transmission Summary is generated that contains totals by product of all the transactions delivered today for each client. This program (APSC2083) uses the raw AP transactions as the prime source of information.'</i></p> <p>From this, it is clear that the CTS file has no role in reconciliation or TCs, because it only contains totals by product per day. From these totals, it</p>	

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
				is not possible to locate a discrepancy in an individual transaction, or to relate it to any branch. The use of the CTS file is explained in Peak PC0236246 and has no connection to branch accounts. Discrepancies in individual transactions can only be seen in the more detailed Client Files delivered by APS.	
17	Branch Customer Discrepancies  (Horizon Issue 4)	Exemplified Incident March 2008	PC0156246 details a situation where the Subpostmaster declined a transaction but the Customer was still debited by his bank leaving the customer with a shortfall. The PEAK suggests the position with regards to the Subpostmaster is unclear: <i>“So it is likely that the branch balanced but the customer's account now needs rectifying for the loss so I am passing this call back with the note to MSU: that before this customer's a/c is rectified for his loss of £165.26 that POL contact the PM at the branch to double check that NO money did change hands for certain, before finally ensuring that this financial discrepancy is dealt with.”</i>	Coyne Paragraph 3.175 cites Peak PC0156246, which describes a banking incident involving transaction recovery, as described in the general recovery KEL acha959T which has title 'HNGx banking reconciliation - state 4'.  There is no evidence in the Peak of any software fault in Horizon.  The Peak says 'This transaction was in State 4 yesterday and call PC0156174 was raised for the investigation. The branch was contacted, and the recovery messages were written'. This shows that the incident was detected at the back office, rather than the branch.	<b>PEAK</b> PC0156246  <b>Coyne Supplemental Report</b> 3.174 – 3.78
18	Concurrent Logins	Exemplified incident PC0027581 9 <sup>th</sup> July	Branch Account discrepancies resulted from a user in a branch	In 1999 -2000, users were able to log in at two terminals at once, and	<b>PEAKS</b> PC0027581



Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
		1999 – until at least 2001	<p>logging in on two different branch terminals.</p> <p>The discrepancies would appear as a receipts and payments mismatch.</p> <p>The Riposte bug that appears to be the cause of this issue appears to be within Horizon from July 1999 and was not fixed by July 2001. No fix date noted.</p>	<p>discrepancies could occur - manifesting themselves as a receipts/payments mismatch. This had the potential to affect branch accounts. The mismatch would bring it to the attention of the Subpostmaster, who would require it to be investigated, except possibly in the case of small mismatches, which he might pass off as an error in the branch (e.g. of counting stock).</p> <p>In the first Peak PC0027581, cited at 3.180, Fujitsu believed it was a problem with the underlying Riposte software, and passed it to Escher. In September 2000, the problem was 'Now formally fixed in Build 223 update 19 which was released overnight.' However, the new release from Escher did not, as it was expected to, fix the problem. Escher denied that it was a bug in Riposte, but Fujitsu believed in July 2001 that <i>'This is clearly a bug in the Supplier's code'</i>.</p> <p>Peak PC0051327 is another example of concurrent logon with a different cause.</p> <p>In my opinion these faults had the potential to produce discrepancies in</p>	<p>PC0051327 PC0051813 (classed as duplicate of above PEAK) PC0051485 (classed as duplicate of above PEAK PC0051327)</p> <p><b>Coyne Supplemental Report 3.179 – 3.183</b></p>

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
				branch accounts, of small amounts, for a short period of time.	
19	Post & Go / TA discrepancies in POLSAP  (Horizon Issue 4)	Exemplified Incidents 2012	This problem impacted at least one branch account for 43 days and the evidence of the discrepancy appeared repeatedly in a daily report to Post Office from Fujitsu, but the Peak explains that the matter was not dealt with in a timely manner and therefore evidence that might have led to understanding the discrepancy had already been purged from the Wincor Nixdorf data which is only stored for a relatively short period of time.	<p>The problem, as analysed by Ann Chambers (and cited by Mr Coyne at para 3.187) involves 2 tills at a branch being deliberately not associated with stock units, as a result of some previously understood problem. The problem was visible in the POLSAP discrepancies, so posed no risk of any undetected effect on branch accounts. It involved the RDS/DEA countermeasure detecting a potential problem.</p> <p>The duration of the problem appears from the Peak to have been from 29 August 2012 to 17 September 2012 - about 19 days, with the final comment from Ann Chambers 'We strongly recommend that POL monitor the SubfilesOnHold report which is sent to them daily' This does not imply to me that PO should have been monitoring that report for that purpose beforehand.</p> <p>I therefore do not understand Mr Coyne's observations in para 190, which seem to imply that PO should have been monitoring the report for 43 days - or that it impacted branch accounts at all.</p>	<p><b>PEAK:</b> PC0220393, PC0218702 PC0219432</p> <p><b>Coyne Supplemental</b> Report 3.185 – 3.190</p>

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
20	Recovery Failures (Horizon Issue 4)	<p>Example Incidents PC0220532 dated 5<sup>th</sup> September 2012,</p> <p>PC0197643 dated 2010,</p> <p>P0241242 February 2015,</p>	<p>PC0220532 – is a confusing PEAK and may not indicate a Horizon bug/error or defect</p> <p>Peak PC0241242 records: <i>“The problem is in transaction Recovery software which we are currently looking at”</i></p> <p>The peak refers to a KEL surs1034R which records <i>“It is not clear if the failure was due to ADCScript failure or a bug in the counter code software”</i> either of which confirms a Horizon bug/error/defect. The result of the investigation appears to be that a transaction needs to be deleted by Fujitsu and that this is awaiting authorisation by Post Office. This suggests impact of Branch Account certainly for a period of time until deletion of the offending transaction.</p> <p>PEAK PC0197643 refers to KEL acha959T which is one of the most referred to Horizon KEL’s when looking in theat PEAKS.</p> <p>This KEL documents the challenges faced by a Subpostmaster when initially Horizon fails and then the recovery process is unsuccessful leaving transactions in a state of</p>	<p>Peak PC0220532 concerns an Subpostmaster who believed that a memory dump on one of her counters had caused her a loss of £300. Since all transaction data was held remotely on the BRDB by that date (2012) this seems to be a misunderstanding by the Subpostmaster; the Peak records the sequence of activities to try to establish the actual cause of her discrepancies.</p> <p>There was some implication of hardware faults, with a replacement of a base unit, but the Peak has no evidence of software faults in Horizon.</p> <p>The Peak also says <i>‘The PM also stated that she was getting error messages on the system before the loss but did not write these error messages down’</i> so Fujitsu may have been trying to unravel a confusing situation.</p> <p>Peak PC0241242 is a long Peak that involves both transaction recovery and hardware replacements, and issues of authorisation. It is hard to draw any simple conclusion from it.</p> <p>Peak PC0197643 refers to the widely used recovery KEL acha959T. Mr</p>	<p><b>PEAKs:</b> PC0220532, PC0241242, PC0197643</p> <p><b>KEL:</b> surs1034R, acha959T</p> <p><b>Coyne Supplemental Report 3.191 – 3.196</b></p>

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
			confusion (at least to the Subpostmaster) as to whether Horizon has completed the transaction and if cash should be given to or taken from the customer at the counter in the Branch following the failure.	Coyne notes an uncertainty as to whether money was handed to the customer. This is a frequent uncertainty in recovery situations and is unremarkable. His comment in his next para 'it is unclear...' simply follows from the limitations of evidence available at this remove. There is no evidence of any fault in Horizon.	
21	Transaction Correction Issues  (Horizon Issue 4 & 15)	2005-2010	Transaction Correction bugs/errors and defects do not <i>cause</i> discrepancies with Branch Accounts but do: a) Reduce the Subpostmaster's ability to resolve any discrepancies which may have already occurred. b) Prevent Branches from "rolling over" to the next trading period (if not processed in some form on the Counter). c) Provide the opportunity for the Subpostmaster to incorrectly accept an erroneous Transaction Correction due to previously accepted Transaction Corrections being missing from reports.	Peak PC0129587 involves a counter freezing during acceptance of a TC. In my opinion this bug would result in an inconvenience to the Subpostmaster (inability to roll over to the next TP) but would not result in inaccurate processing of any TC, or any impact on branch accounts.  Peak PC0120459, and others cited from paras 3.201 - 3.203, show the same problem - freezing of the counter while accepting TCs. Like hardware failures, these do not impact branch accounts.  Paras 3.203- 3.210 relate to a Peak in which a Subpostmaster was trying to understand TCs over an extended time period. In my opinion it is not surprising that the Subpostmaster would find this difficult, after even a few days. There is no implication of any fault in Horizon.	<b>PEAKs</b> PC0129587, PC0130056, PC0120459, PC0118562, PC0114154, PC0121331, PC0130057, PC0129774, PC0204350, PC025567.  <b>Coyne Supplemental Report 3.197 – 3.210</b>



Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
22	Bugs/Errors Defects introduced by previously applied PEAK Fixes  Horizon Issue 4 and to an extent 10)	Exemplified Incidents 4 x PEAKs dated 2000, PC0098230 dated 2004,	PC0098230 – Branch accounts would be affected by this bug which would cause a discrepancy when handling cheques where the value of the cheque would be doubled. Whilst the Subpostmaster was in fact processing the cheque in a different manner than was recommended, the Subpostmaster had operated in the same way for the previous two years.  PC0052776 & PC0049702 Report small discrepancies in branch accounts.	The fault described in Peak PC0053160, cited at para 3.212, appears not to have affected branch accounts.  Paras 3.213 - 3.216 refer to Peak PC0098230. Here a fault would affect branch accounts when the user was handling cheques 'outside of process' as noted by Mr Coyne at para 3.214. In the Peak, Ann Chambers noted " <i>I think the PM should not be declaring his 'rest home' cheques in this way</i> ". There is no impact on branch accounts if the Subpostmaster follows correct procedures.  Para 3.218 cites Peak PC0049702. This describes a payments discrepancy in a back-office report TPSC252, which was an error of two pence resulting from a sign error in a figure of 1p. Thus, its effect was trivial, and in any case, it had no direct effect on branch accounts.  There is no evidence of impact on branch accounts.	<b>PEAKs:</b> PC0053160, PC0098230, PC0052776, PC0049702  <b>Coyne Supplemental Report 3.211 – 3.219</b>
23	Bureau de Change	2005, 2006, 2010  (differs from previous 2017 Bureau entry)	PC0129767 – Horizon allowed the reversal of the same transaction twice Impacting branch accounts. PC0137437 – User Error	When analysing the first KEL (2005) I noted that it concerned a user error, which would be corrected at monthly balancing; but that a very small error in the margin might not be corrected.	<b>PEAKs</b> PC0129767 PC0151787 PC0137437 PC0200042 PC0200090

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
		KEL agnihovtriv245L (8 further associated PEAKs date range 2010 – 2018)	PC0151787 – Discrepancy of £907.97 whilst reversing a currency	Analysing the second KEL (2010) I noted: ‘Impact small until bug fixed - rounding errors 10 <sup>-5</sup> in exchange rates.’	PC0200435 PC0201340 PC0209240 PC0226573 PC0254447 PC0260834  <b>KEL</b> AChambers2252R Agnihotriv245L  <b>RW 742</b> <b>RW App D.4</b>
24	Wrong branch customer change displayed	November – December 2005  (reported as fixed 8 <sup>th</sup> December 2005)	The KEL explains that “ <i>the cash amount entered is multiplied by the Qty and hence the new stack total is wrong</i> ”, this Horizon bug was due to incorrect reference data and led to an incorrect amount of change being displayed on the branch screen leading to the operator to provide the branch customer with the wrong amount of money thereby leaving a discrepancy in Branch Accounts. It is possible that the amount of change shown on screen is more than the actual money tendered by the customer.  The PEAKS report that the following Subpostmasters spotted the bug and reported the errors in their branches	When analysing this KEL I noted ‘Sounds like a genuine problem which may have led to giving the customer the wrong amount - i.e. not recoverable.’  And ‘Peak: fixed by a ref data change. No record that any other branch was affected.’	<b>PEAKs:</b> PC0129835, PC0129811, PC0128728, PC0128264  <b>RW 742</b> <b>RW App D.4</b>  <b>KEL</b> AChambers4134R

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
			FAD 275207 FAD 173641 FAD 175504		
25	Lyca top up	2010	<p>PC0202925 reports that this defect is caused by incorrect reference data within Horizon.</p> <p>PC0202894 explains that when selling Lyca mobile phone top-up cards, the transaction is recorded within Horizon at the appropriate value but the receipt which is required by the customer to top up their mobile phone displays a zero value. The Fujitsu operator records; <i>“Can we find out if the customer has had any more of this issue? The offices are tending not to do the transactions after the problem as they know any issues with e-vouchers can result in a loss to them, they tend to try it twice and then leave it. I have however sent details of 3 separate office s that have had this issue.”</i></p> <p>PC0203108 regarding FAD400422</p> <p>The Fujitsu operators' words suggest that the defect was impacting more than a single branch.</p>	When analysing this KEL I noted: ‘Possible impact on branch accounts, as may cause a reconciliation error - could result in TC, erroneously accepted. Reference data issue, soon fixed.’	<p><b>PEAKs:</b> PC0202925, PC0202894, PC0203108 <b>PC0203215</b> <b>PC0203137</b> <b>PC0203284</b></p> <p><b>RW 742</b> <b>RW App D.4</b></p> <p><b>KEL</b> ballantj020J</p>



Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
26	TPSC250 report	KEL AChambers253L raised February 2005 last updated April 2008 has 24 associated PEAK records date range 2005 – 2009 (majority of incidents 2005).	The KEL AChambers253L explains the branch account impact when postage labels are printed in error with a minus value.  PC0115804 - FAD218227 PC0117659 - FAD17005 PC0118350 - FAD003210 PC0118677 - FAD86104 PC0119978 - FAD417207 PC0120063 - FAD 017005 PC0122147 - FAD010012 PC0122304 - FAD156946 PC0122354 - FAD166013 +15 others which reference AChambers253L  Typically, the values are less than £2 which may mean that Subpostmasters are unlikely to spot the reasons for such a discrepancy and may write it off as human error, which would be incorrect.	When analysing this KEL I noted ‘Some possible financial impact, as it is a reconciliation failure – but sounds very small’.  I now believe that as it was a back-end reporting problem, the chances of impact on branch accounts are small.	<b>Example PEAKs</b> PC0115804 PC0117659 PC0118350 PC0118677 PC0119978 PC0120063 PC0122147 PC0122304 PC0122354 PC0122357 PC0122630 PC0122631 PC0122664 PC0122766 PC0123056 PC0123058 PC0189625 PC0156718  <b>RW 742</b> <b>RW App D.5</b>  <b>KEL</b> AChambers253L
27	TPS	40 associated PEAKs date range from 2006 – 2010 approx 25. Are diagnosed with root cause as ‘Development – Code’.	This Horizon bug does impact branch accounts.  It appears at first pass to create a reconciliation error, but on more detailed review has doubled <i>both</i> the credit and debit side of the transaction	My analysis of this KEL was: ‘Sounds like a back-end discrepancy in TPS. Possible financial impact?’  Fujitsu’s analysis of the KEL was ‘no impact’.	<b>Example PEAKs</b> <b>PC0157357</b> <b>PC0159273</b> <b>PC0196893</b> <b>PC0174587</b> <b>OCR 19774</b> <b>OCR 18815</b>

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
			and therefore whilst there is an impact the net impact is zero.  PC0196893 & PC0174587 state: “**This may also have caused a receipts and payments error, can EDSC please confirm whether this is a gain or loss at the counter and the amount.**” Indicating that support believed this error may have caused a discrepancy in some instances.	I include this for completeness, in case Fujitsu’s evidence on this KEL is not accepted.  I now believe that as it was a back-end reporting problem, the chances of impact on branch accounts are small.	<b>RW App D.5</b>  <b>KEL</b> ballantj2547K  <b>Parker WS</b>
28	Drop and Go	July 2017	PC0260269 reports a branch account discrepancy caused by a Duplicate £100 ‘drop & go’ transaction leaving a shortfall of £100. The transaction reported a failure on several attempts but then finally displayed a success. The customer was credited with £100 but the branch was debited with £200.	I include this for completeness, in case Fujitsu’s evidence on this KEL is not accepted.  My analysis of this KEL was ‘Possible financial impact. Seems very visible on the counter. Script = reference data - therefore fixed easily’  Fujitsu’s analysis of the KEL was ‘This would have caused a loss in the branch accounts, although the issue was identified by the Subpostmaster and it would have been resolved by a transaction correction’	<b>PEAK:</b> PC0260269  <b>KEL</b> cardc235Q  <b>RW App D.5</b>  <b>Parker WS</b>
29	Network Banking Bug	Exemplified Incidents identified:  KEL CHawkes1745L raised 2004 last updated May 2005	Horizon appears to mis-handle communications, leading to errors within network banking and in turn causing the potential for branch account discrepancies.	I have been trying to establish whether the Peak has any indication of a bug in Horizon. It is mainly about a communication problem from BT, outside Horizon. However, it also refers to a ‘CNIM own goal’ which I need to investigate further.	<b>PEAK:</b> PC0109020 PC0142872  <b>KEL:</b> CHawkes1745L

Index	Bug/Error/Defect	Identified Year / Year(s) in Effect	Coyne Opinion as to branch account impact	Worden Opinion	Supporting Evidence
		has 12 associated PEAK records date range 2004 – 2010.  PC0109020 dated October 2004 PC0142872 dated 2007 (no financial impact recorded)	Horizon displays that Pensions transaction are declined but payments are taken from accounts.  <i>“Spoken to the PM and she told me that, her customer complained about money taken out of the bank, and she had to pay £50 back to her customer. She told me that she is £50 out of pocket.”</i>		

### Expert Agreements/Disagreements by Horizon Issue

For additional clarity, Horizon Issue 0 records areas of agreement in relation to generic points that both Experts agree that are global across several Horizon issues. For example, support processes, Horizon architecture and documentation observations.

### Horizon Issue 0 – Global Agreements

Index	Topic	Agreed / JC / RW	Statement	Coyne Refs	Worden Refs
0.1	Horizon Architecture	Agreed	The experts’ descriptions of the Horizon architecture are consistent with one another and can be taken together as an agreed description.	Section 4	Sections 3, 4, 5
0.2	Horizon Support	Agreed	The experts’ descriptions of Horizon support processes are consistent with one another and can be taken together as an agreed high-level description.	4.66 – 4.95	6.7 (332-352); App C.7
0.3	KELs and PEAKs	Agreed	KELs and Peaks together form a useful source of information about bugs in Horizon but are a limited window on what happened. It is sometimes necessary to use evidence from both to try to understand, but even so they are not a comprehensive picture. It is to be expected that both KELs and Peaks are incomplete in various respects.	S4.88(b); S5.164	
0.4	KELs and PEAKs	Agreed	KELs are aimed to help provide useful guidance to helpdesks in supporting the Subpostmaster, and to the back-end support function. As such they often give information about the impact of a bug or user error and may also give information about causes.	S3.2, S3.15-18	348 – 350; 402; 430- 434

Index	Topic	Agreed / JC / RW	Statement	Coyne Refs	Worden Refs
0.4a	KELs and PEAKS	RW	KELs are written in shorthand, by people who know Horizon very well.		430.1
0.5	KELs and PEAKS	Agreed	Peaks record a timeline of activities to fix a bug or a problem. They sometimes contain information not found in KELs about specific impact on branches or root causes – what needs to be fixed. They are written, by people who know Horizon very well. They do not contain design detail for any change. They are generally about development activities and timeline rather than about potential impact. Peaks typically stop when development has done its job, so they are not likely to contain information about follow-on activities, such as compensating branches for any losses.	S3.3	
0.6	Peaks	Agreed	Some Peaks record observations of financial impact		

**Horizon Issue 1 – To what extent was it possible or likely for bugs, errors or defects of the nature alleged at §§23 and 24 of the GPOC and referred to in §§ 49 to 56 of the Generic Defence to have the potential to (a) cause apparent or alleged discrepancies or shortfalls relating to Subpostmasters’ branch accounts or transactions, or (b) undermine the reliability of Horizon accurately to process and to record transactions as alleged at §24.1 GPOC?**

Index	Topic	Agreed / JC / RW	Statement	Coyne Refs	Worden Refs
1.1	The extent bugs were possible or likely	Agreed	We agree that bugs were possible, and the table above displays a number which in the opinion of either or both experts appeared to have impacted branch accounts.	See above table	Summarise table
1.2	The extent bugs were possible or likely	Agreed	Referring to the table of bugs above, the experts agree that the bugs in rows 1, 2, 3, 10, 13, 14, 18, 23, 24, 25, 27 and 28 may have had financial impact on branch accounts. Other rows, the impact is not agreed between the experts.		
1.3	Extent	Agreed	Horizon has produced more than 3 million sets of monthly branch accounts.	Dr Worden’s estimation is agreed	8.5
1.4	Extent	Agreed	<i>‘There is no technical reason to assume that there is any correlation between the likelihood of a bug’s occurrence and the value of its effect’</i>	S5.330(b); S5.438; S5.439(b)	8.10



Index	Topic	Agreed / JC / RW	Statement	Coyne Refs	Worden Refs
1.4a	Extent	Dr Worden	Dr Worden has never made the assumption described in 1.4 above, nor has he built it into any of his estimates		8.5, 8.7, 8.10
1.6	Bugs affecting branch accounts	Agreed	When Dr Worden makes a statement regarding what Post Office could have done following the notification of a bug, error or defect causing a discrepancy to “correct accounts” or “issue a TC”, the experts agree that this is what the process should be. Evidence has not been seen that this actually happened in respect of the bugs/errors and defects identified.		
1.6a	Bugs affecting branch accounts	Dr Worden	With respect to what the correction processes should be, in agreement 1.6: Since these were normal correction processes, Dr Worden would not expect the evidence that the process was carried out to have persisted to this day.		
1.7	Bugs affecting branch accounts	Agreed	<p>The term ‘Receipts/Payments Mismatch’ is commonly used within Horizon to describe a symptom, which is evident to the Subpostmaster during his monthly balancing and should not arise, but which may arise from many different causes.</p> <p>A number of the distinct bugs that we have discovered caused a ‘Receipts/Payments Match’.</p> <p>In this dispute the same term has been used to describe a specific bug which caused a receipts/payments mismatch.</p>		
1.7a	Bugs affecting branch accounts	RW	<p>In any case of a Receipts/payments mismatch. It is very obvious to the Subpostmaster (almost like a hardware failure) and would be unlikely to be attributed to human error.</p> <p>Therefore, it is very likely that in these cases, any discrepancy in branch accounts would be corrected at no cost to the Subpostmaster.</p>		
1.8	Extent	RW	In order to address Horizon issue 1, it is necessary to define measures of the extent of bugs with possible impact on branch accounts.	S5.24 - 5.25; S5.208; S5.490; S3.33; S3.37	8.4; 8.5; 8.7
1.9	Branch Account Impact	Agreed	The experts have differing views on “branch impact”. Mr Coyne refers to any discrepancy that caused a loss (or gain) within branch accounts that needed corrective action as an “impact to branch accounts”. Dr Worden only considers an effect or impact on branch accounts where a discrepancy loss (or gain) was not rectified by a correction such as a Transaction Correction.		

Index	Topic	Agreed / JC / RW	Statement	Coyne Refs	Worden Refs
1.10	Corrections of financial impact of bugs	RW	Dr Worden believes that transient inaccuracies in branch accounts, which needed some form of correction, have arisen so frequently and from so many causes that to list them is not useful; and that evidence of each correction being carried out is unlikely to persist to this day.		
1.11	Corrections of financial impact of bugs	RW	I would not expect to see such evidence after 15 years. I have measured the error rate in TCs and found that the mean magnitude of the impact of erroneous TCs on branch accounts is less than £2 per branch per month.		
1.12	KELs and Peaks	JC	PEAKS and KELs are Fujitsu recording tools and a discrepancy would only appear in a PEAK or KELs if a Horizon system problem is <i>suspected</i> .		
1.13	KELs and Peaks	JC	Discrepancies caused by human errors should not appear in PEAKs and KELs as these should be dealt with by the Subpostmaster or Post Office and its helpdesk subcontractors in the earlier stages of the support process.		
1.14	KELs and Peaks	RW	Peaks and KELs are frequently about complex situations involving the correction of human errors (or other adverse events such as hardware failures and communication failures) and in these cases there is usually no implication of any error in the Horizon software.		
1.15	Bugs affecting branch accounts	Agreed	The number of distinct bugs, for which the experts have seen strong evidence of the bug causing a lasting discrepancy in branch accounts, is between 12 and 29.	S3.22	Bugs table above
1.16	Bugs affecting branch accounts	JC	Of the bugs acknowledged by Post Office ('acknowledged bugs') it is observed that the Callendar Square/Falkirk and Suspense Account bug were in operation for many years before Subpostmasters reported the issues that led to their respective identification.	Paras 3.21 – 3.146 Coyne Supplemental	Consider KEL dates and PO does for years in effect
1.17	Bugs affecting branch accounts	JC	Similarly, for those bugs not acknowledged by Post Office (e.g., Dalmellington) there is evidence that these also operated within Horizon for several years before Subpostmaster reported error led to their identification.		Please review Godeseth WS
1.18	Bugs affecting branch accounts	RW	Any bug which, like the Dalmellington bug, would cause an error in remming in or remming out, is easily detected by Horizon as a discrepancy between a rem in and a rem out. This leads to a TC which corrects any discrepancy in branch accounts (as remming TCs do approximately 20,000 times per year).	S3.46 – S3.77; S4.49- S4.53	S6.2 (S144 – 153)
1.19	Bugs affecting branch accounts	RW	I have <i>'engaged with the impact of the other bugs which can be identified from the documents'</i> .	S5.9, S5.307	

Index	Topic	Agreed / JC / RW	Statement	Coyne Refs	Worden Refs
			I have surveyed large numbers of KELS and Peaks and have identified some bugs in them with potential impact on branch accounts. I have analysed the evidence which Mr Coyne considers indicate bugs with financial impact. The latest results of that analysis are described in this joint statement.		
1.20	Bugs affecting branch accounts	RW	In his para 5.43 Mr Coyne has misunderstood my para 166. As the context makes clear, I was referring to a hypothetical bug.	S5.43	166, 167
1.21	Bugs affecting branch accounts	RW	<i>'if Dr Worden is suggesting ...'</i> . I am not.	S5.284	Section 8.11
1.22	Bugs affecting branch accounts	RW	<i>'I have analysed the evidence relating to bugs which reveals information about the system and the potential for other similar bugs to arise.'</i>  Similar bugs which may arise is not a relevant question. Mr Coyne has hardly at all analysed the potential of identified bugs to have lasting impact on branch accounts, in the presence of countermeasures.	S5.285; S5.291	
1.23	Bugs affecting branch accounts	RW	<i>'evidence to show that they were the cause'</i> [of discrepancies]  Mr Coyne has not presented the evidence or analysis	S5.288	
1.24	Bugs affecting branch accounts	RW	This bug concerns an inaccuracy in the CTS report. From DES/APP/HLD0026.docx:  'Following the delivery of the Client Files, a Client Transmission Summary is generated that contains totals by product of all the transactions delivered today for each client. This program (APSC2083) uses the raw AP transactions as the prime source of information.'  The CTS report has no connection with individual transactions or branches. Errors in the CTS report do not impact branch accounts.		DES/APP/HLD0026
1.25	Bugs affecting branch accounts	RW	Many Peaks or KELs cited by Mr Coyne in section 3 of his supplemental report are about complex recovery situations, with no indication of any fault in Horizon. Examples are:	Supplemental report, sections 3 and 5	



Index	Topic	Agreed / JC / RW	Statement	Coyne Refs	Worden Refs
			PC0197643, PC0156246, PC0156246, acha959T, PC0220532, PC0198352, PC0256566, PC0256502, 2,473 different associated PEAKs (cited in Coyne Supp 3.94), PC0071836, PC0133822, PC0241242, PC0197643, PC0058435, PC0197987.		
1.26	Bugs affecting branch accounts	RW	<p>Many Peaks or KELs cited by Mr Coyne are about bugs which only affect reports and have no direct effect on branch accounts. In these cases, it is far from obvious that there will be any effect on branch accounts. Examples are:</p> <p>PC0039832, PC004432, MSCardifield2219S, PC0265443, PC0075415, PC0049578, PC0236246, PC0204872, PC0129587, PC0049702, PC0143503, PC0143504, PC0143511, PC0144386, MWright531P, PC0052575, PC0052804, PC0039832, PC0075240, PC0077508, PC0075415, PC0049578, PC0220393, PC0204350, PC0049702, PC0159445, PC0159702, PC0159759, PC0057909.</p>	Supplemental report, sections 3 and 5	
1.27	Bugs affecting branch accounts	RW	<p>Some Peaks or KELs cited by Mr Coyne are about situations which stop the Subpostmaster working, and there is no evidence of any effect on branch accounts. In these situations, it seems highly likely that any effect on branch accounts will be corrected by the countermeasures (e.g. those needed for hardware failures). Examples are:</p> <p>PC0053160, PC0129587, PC0120459, PC0120459, PC0130056, PC0121331, PC0197592.</p>	Supplemental report, sections 3 and 5	
1.28	Bugs affecting branch accounts	RW	<p>Many Peaks or KELs cited by Mr Coyne are about remming errors, where the normal process of remming TCs (or previously, error notices) would prevent any lasting effect on branch accounts. Examples are:</p> <p>PC0098230, PC0203085, acha4221Q, PC0195380, PC0196154, PC0195511, PC0197032, PC0197753, PC0197838, PC0197873, PC0251952, PC0143435, acha508S, PC0143440, PC0143499, PC0143502, PC0143515, PC0143839, PC0144937, PC0120937, GMaxwell3853P, PC0089918,</p>	Supplemental report, sections 3 and 5	
1.29	Bugs affecting branch accounts	Agreed	Review of the PEAK records has highlighted that between Horizon inception to present day, there are varying bugs/errors and defects that have been operating for varying periods of time and sometimes, only appear to have been discovered upon a the Subpostmaster report of error.		

Index	Topic	Agreed / JC / RW	Statement	Coyne Refs	Worden Refs
1.30	Bugs affecting branch accounts	Agreed	Review of Peaks and KELs shows that many adverse events, which may arise from defects in Horizon or may not, can be detected by back end monitoring or reports, without any reporting from the branch. For certain adverse events it is also often possible by back end monitoring to establish the branches affected and any financial impact.		
1.31	Extent	RW	<p>In section 8.7.8 of my report, at paragraph 742, I estimated the mean impact of a bug with financial impact on all branches. The table at paragraph 742 contained the 7 bugs which I then thought might impact branch accounts and estimated the mean impact across those 7 bugs. My conservative estimate, from the table, was £6000 (para 744), and my central estimate was £2000 (Para 745; changed to £1000 in my supplemental report). I explained at at para 743 that these estimates were very approximate.</p> <p>From the discussions with Mr Coyne leading to this joint memorandum, as summarised in the table of bugs above, there are now 12 bugs which in my opinion might have had impact on branch accounts. I have therefore re-estimated the mean financial impact of a bug, using the larger sample of these 12 bugs, with the same method of estimation.</p> <p>The result of this re-estimate is that the central estimate is again about £2000, but the conservative estimate has increased from £6000 to £13,300. The conservative estimate has increased mainly because of the inclusion of the Data Tree Build bug, described in Mr Coyne's supplemental report, which had a large financial impact of about £105,000 (as in the table above). This large figure now dominates the mean.</p> <p>The central estimate, as I described at paragraph 745, includes my estimate of the probability that branches were compensated for any discrepancy, so that the Subpostmaster would suffer no loss. In my opinion, the data tree build bug was very prominent (a small number of large losses), and there is a very high likelihood that branches were compensated for it.</p> <p>However, the issue of whether or not branches were compensated for a particular bug is a factual issue, and I do not know what the court will find</p>		8.7, 742

Index	Topic	Agreed / JC / RW	Statement	Coyne Refs	Worden Refs
			<p>for any specific bug. For my conservative estimate, therefore, I assume that the branches were not compensated for any of these bugs – leading to a larger total which favours the claimants. With that assumption, the data tree build bug dominates the average of 12 bugs.</p> <p>I have included a spreadsheet of this revised calculation, with an explanation of it, as an annex to this joint statement. The calculation is not agreed between the experts.</p> <p>The conservative estimate of the mean impact of a bug has increased from £6000 to £13800 – just over a factor 2. As a result, my estimate of the maximum possible proportion of claimants’ claimed shortfalls which might arise from bugs in Horizon has increased, from 0.181% to about 0.4%. The maximum is still not sufficient to account for even a small part of the claimed shortfalls.</p>		
1.32	Extent	RW	Claimants’ branches are, on average, smaller than the average branch across the PO network (in terms of customer transactions per month)		8.5, S5.1
1.33	Extent	RW	In my opinion, there is no evidence or reason to suppose that a claimant’s branch, in any given month, would be much more susceptible to bugs affecting branch accounts, than other branches in the PO network.	S5.25	App F
1.34	Extent	RW	<p>Mr Coyne has given no reason why my analysis of the financial impact of bugs is ‘ultimately flawed’. I corrected the estimates of impact for many effects, such as shortcomings in the process of creating KELs, archiving KELs, sampling of KELs, or claimant branch sizes. Mr Coyne has given no reason why claimant branches should be more prone to bugs, compared with other branches.</p> <p>My final estimate of 0.181% (the maximum proportion of claimants’ shortfalls caused by bugs, now altered to 0.4%) includes many conservative assumptions, designed to favour the claimants. The effect of the conservative assumptions is to increase the estimate by about a factor of 30, over an estimate from my best assumptions.</p>	S4.90, S5.23	8.7, S133
1.35	Extent	RW	<i>‘further assumptions’</i>	S5.292, 294(a)	8.5

Index	Topic	Agreed / JC / RW	Statement	Coyne Refs	Worden Refs
			The only further assumption used in section 8.5 of my report is that claimants' branches are not especially prone to bugs, more so than other branches. Mr Coyne has given no evidence or analysis to question this assumption (see above)		
1.36	Extent	RW	<i>'Claimants are more likely than non-claimants to make errors'</i>  This was a conservative assumption, introduced to favour the claimants. Bugs induced by human error are a second-order effect, and so have very small impact.	S5.294(b) i	App 435
1.37	Extent	RW	<i>'many other factors'</i> can induce a bug.  Mr Coyne has not identified any factors which particularly impact claimants' branches, more than other branches.	S5.295	8.7
1.38	Extent	RW	<i>'many assumptions I do not agree with'</i>  Mr Coyne has not given any detailed analysis to support his disagreements or described what they are.	S5.311-315	8.7
1.39	Extent	RW	Mr Coyne's first point in this paragraph is already agreed between the parties and does not address the issue of extent.  Mr Coyne's analysis of my section 8.7, where I derived the upper limit of 0.181% of claimants' claimed shortfalls caused by bugs in Horizon, concludes here at his para S5.315, without having defined any of the assumptions he says he disagrees with. The conservative estimate of 0.181% is now increased to 0.4%, for reasons described above.	S5.315	8.7
1.40	Extent	RW	Mr Coyne does not define the assumptions he does not agree with.	S5.316-317	8.8 – 8.9
1.41	Extent	RW	[raindrops analogy]  Dr Worden's raindrops analogy at para 804 was possibly ill-chosen. Raindrops occur with uniform probability and high frequency. A better analogy would have been lightning strikes – which occur with uniform probability but low frequency. The observed distribution of lightning strikes is not uniform. They are isolated and sporadic, but with uniform probability per acre of field.	S5.320- 321; S5.330(a)	804



Index	Topic	Agreed / JC / RW	Statement	Coyne Refs	Worden Refs
			I agree with Mr Coyne's para 5.321 – because bugs are more like lightning strikes - but it does not affect Dr Worden's analysis.		
1.42	Extent	RW	<p><i>'Dr Worden's graph at 813 would actually be consistent with the idea that bugs were the primary cause of issues'</i></p> <p>This is not correct, because the average tenure of a claimant was about 90 months. Therefore, to account for their losses, each claimant would have to have suffered losses in several months. Their average loss per month (as in the graph) would then cluster around the mean value of £360 per month. Mr Coyne has confused individual loss events with the mean loss per month.</p> <p>This was accounted for in my detailed statistical analysis - which showed that the evidence is not consistent with bugs as the cause of the shortfalls.</p>	S5.330(c)	813
1.42a	Extent	RW	I agree that Mr Coyne's alternative explanation of the increased rate of loss per month for claimants with short tenures at his 5.336 is a possible explanation.	S5.336	820
1.43	Extent	RW	<p><i>'more claimants were reporting losses over a period of 10 years.'</i></p> <p>Mr Coyne has mis-interpreted the graph at his figure 7. It has nothing to do with reported losses, or bugs, or human errors. It shows only the numbers of claimants who were in post for each year – as derived from their claims.</p> <p>Therefore Mr. Coyne's assertions at 336-338 are incorrect.</p>	S5.335 – S5.338	821
1.43a	Extent	RW	I agree with Mr Coyne that any interpretation of the fluctuating graph at 821 which he refers to at 5.343 is not straightforward. It is not immediately obvious what should be regarded as random fluctuations, and what has some other cause.	S5.343	821
1.44	Extent	RW	<p><i>'there is no technical reason to assume that bugs would have the same effect in all cases.'</i></p> <p>Mr Coyne is again confusing averages (which para 383 refers to) with individual events.</p>	S5.349(d)	App 383

Index	Topic	Agreed / JC / RW	Statement	Coyne Refs	Worden Refs
1.45	Extent	RW	<i>'A bug, error or defect could theoretically account for 100% of a claimant's claimed monthly loss.'</i>  This is possible. if I had made this assumption, the resulting upper limit would have been lower than the 8% I derived.	S5.349(e)	App 384, 389
1.46	Extent	RW	<i>'there is no reason to assume that bugs (or even any given bug) will affect all claimants equally'</i>  Mr Coyne is again confusing averages (which 389 refers to) with individual events. Clearly individual events may have large random fluctuations around the average. This was accounted for in my calculations.	S5.349(f)	App 389
1.47	Extent	RW	<i>'Dr Worden assumed that losses from horizon bugs were never, or very rarely, cancelled out by gains from human error'</i>  If I were to relax this assumption, the resulting upper limit would have been lower than the 8% I derived.	S5.349(g)	App 385
1.48	Extent	RW	<i>'Horizon was continuously updated over the course of many years'</i>  This calculation was an average over all years, so fluctuations over years do not affect it. I separately calculated rates of loss from bugs in 3-year periods.	S5.349(h)	App 387.5
1.49	Extent	RW	<i>Dr Worden assumes that "good months" compensate for "bad months", so the amount of fluctuation between claimants is small. There is no technical foundation for this assumption as bugs could vary wildly in their effect.</i>  This is not a technical assumption about Horizon. It follows from elementary statistics, that an average of many values (monthly losses) has a small random fluctuation, even though the values themselves may have larger fluctuations. This is known as the 'law of averages'.	S5.349(i)	App 393
1.50	Extent	RW	<i>Dr Worden assumes that the uncertainty caused by factors such as variation in the size of branches is small. Dr Worden gives no basis for this assumption.</i>  At 401, I said I would investigate the effects of this assumption in my supplemental report. I have now made this analysis, and the resulting upper	S5.349(l)	App 401

Index	Topic	Agreed / JC / RW	Statement	Coyne Refs	Worden Refs
			limit of 8% is unchanged. The description can be made available to the court if required.		
1.51	Extent	RW	<i>'it is very unlikely that an analysis which uses these assumptions as a basis will result in an accurate conclusion'</i>  Mr Coyne has given no valid reasons to question the conclusion. In any case, the upper limit of 8% (derived from the claimants' claims, in section 8.10) is much weaker than the upper limit of 0.181% (now 0.4%) derived in section 8.7 and in section 5.3 of my supplemental report.	5.350	8.10, 8.7, S5.3

**Horizon Issue 2 – Did the Horizon IT system itself alert Subpostmasters of such bugs, errors or defects described in (1) above and if so how?**

<b>Index</b>	<b>Sub Topic</b>	<b>Agreed or JC / RW</b>	<b>Statement</b>	<b>Coyne Refs</b>	<b>Worden Refs</b>
2.1	Alert of bugs to Subpostmasters	Agreed	Horizon did not, in general, alert Subpostmasters to any significant bugs or other defects in the system itself. That said, the extent to which any IT system can automatically alert its users to bugs within the system itself is necessarily limited. Whilst Horizon has automated checks, there are types of bugs that would circumvent such checks.		



**Horizon Issue 9 - At all material times, what transaction data and reporting functions (if any) were available through Horizon to Subpostmasters for: a. identifying apparent or alleged discrepancies and shortfalls and/or the causes of the same; and b. accessing and identifying transactions recorded on Horizon?**

Index	Sub Topic	Agreed or JC / RW	Statement	Coyne Refs	Worden Refs
9.1	Facilities for Subpostmasters	Agreed	In the experts' experience, any competent IT support operation is grateful to its users, when they draw its attention to any problem which can be fixed, to reduce the future costs of support.	S5.389	
9.2	Facilities for Subpostmasters	Agreed	The experts would not expect Subpostmasters to have detailed knowledge of the system.	S5.391	
9.3	Facilities for Subpostmasters	Agreed	The causes of some types of apparent or alleged discrepancies and shortfalls may be identified from reports or transaction data available to Subpostmasters. Other causes of apparent or alleged discrepancies and shortfalls may be more difficult or impossible to identify from reports or transaction data available to Subpostmasters, because of their limited knowledge of the complex back-end systems. Identification requires cooperation of Post Office staff and Subpostmasters.	S5.393	
9.4	Human errors	RW	<i>'most discrepancies are caused by human error'</i>  Some classes of TC (e.g. remming TCs) arise almost entirely for the correction of human errors. The number of such TCs (20,000 per year) gives an indication (a lower limit) of the level of human errors.  In contrast, the experts have identified in total a far smaller number of discrepancies caused by software errors – even when (as I have done) they have tried to correct for the limitations of their sampling.	S5.396-397	958
9.5	Human errors	RW	<i>'Dr Worden's analysis does not appear to account for issues caused by 3rd parties'</i>  This is not correct. For instance, my analysis of the level of erroneous TCs includes TCs which were in error because of errors by third parties such as Santander.	S5.398	9.6, S7

Index	Sub Topic	Agreed or JC / RW	Statement	Coyne Refs	Worden Refs
9.6	Human errors	RW	Mr Coyne is referring here to remming errors, which are detected automatically by Horizon and corrected by TCs. So, there is no need for the Subpostmaster to <i>'identify the cause of that discrepancy'</i> .	S5.399	S6.2
9.7	Support knowledge	RW	I do not agree that support teams <i>'still have access to the same information as a Subpostmaster'</i> . They do not know at first hand what happened in the branch.	S5.402	
9.8	Evidence	RW	There are gaps in the evidence of how those bugs acknowledged by Post Office were handled.  The main sources of evidence including KELs and Peaks and witness statements, are necessarily incomplete – especially at this remove in time.	S5.408B	

**Horizon Issue 14 – How (if at all) does the Horizon system and its functionality:**

**a. enable Subpostmasters to compare the stock and cash in a branch against the stock and cash indicated on Horizon? b. enable or require Subpostmasters to decide how to deal with, dispute, accept or make good an alleged discrepancy by (i) providing his or her own personal funds or (ii) settling centrally? c. record and reflect the consequence of raising a dispute on an alleged discrepancy, on Horizon Branch account data and, in particular: d. does raising a dispute with the Helpline cause a block to be placed on the value of an alleged shortfall; and e. is that recorded on the Horizon system as a debt due to Post Office? f. enable Subpostmasters to produce (i) Cash Account before 2005 and (ii) Branch Trading Statement after 2005? g. enable or require Subpostmasters to continue to trade if they did not complete a Branch Trading Statement; and, if so, on what basis and with what consequences on the Horizon system?**

Index	Sub Topic	Agreed or JC / RW	Statement	Coyne Refs	Worden Refs
14.1	Facilities for Subpostmasters	Agreed	The descriptions by the experts of facilities available to the Subpostmasters are consistent with one another and can be taken together as an agreed description.	7.19 – 7.38	Section 10.4 (987 – 1009)
14.2	Stock on Hand	Agreed	Subpostmaster comparison of Cash and Stock in branch and figures recorded within Horizon can be determined by the Subpostmaster/Auditor physically counting the cash and stock in branch and inputting those values derived into Horizon		

Index	Sub Topic	Agreed or JC / RW	Statement	Coyne Refs	Worden Refs
			for a comparison to be made against the electronically derived figures held by Horizon.		
14.3	Subpostmasters handling discrepancies	Agreed	<p>It is agreed that functionality enabling the Subpostmasters to deal with, dispute, accept or make good alleged discrepancies is as follows:</p> <p>At the end of the Trading Period, Horizon reports to the user the amount of any discrepancy. The system invites the user to transfer this amount into the local suspense account and continue to roll over – or to discontinue this operation. If, at the end of a Trading Period, there is a discrepancy (i.e. either a surplus or a shortfall) of less than £150, the Subpostmaster must 'make good' the discrepancy – either by removing money from the till (in the event of a surplus) or by adding money to the till (in the event of a shortfall). The ability to make good through Horizon was also available before 2005 under Cash Accounting. 'Making good' causes the derived cash position to remain the same and the actual cash position to change accordingly. The next Trading Period can then begin with a balanced account (both physical cash and electronically recorded). If, at the end of a Trading Period, a branch has a discrepancy of more than £150, they have the option to either make good or settle the discrepancy centrally. The ability to 'settle centrally' was not available under Cash Accounting. If the Subpostmaster chooses to settle centrally, they do not have to physically place cash in the till (in the case of a shortfall) at the time. Instead, a message is sent to Post Office's Finance Services Centre and the</p>		

Index	Sub Topic	Agreed or JC / RW	Statement	Coyne Refs	Worden Refs
			<p>discrepancy is moved to a central account. A Subpostmaster may wish to dispute a discrepancy. This only appears to have been available post 2005.</p> <p>The Subpostmaster cannot dispute a discrepancy on Horizon or record that they have raised a dispute. This is done through contacting the helpline.</p>		
14.4	Trading	Agreed	The experts agree that no technical controls have been identified within the disclosure that would indicate Subpostmasters were prevented from trading if they did not complete a Branch Trading Statement.		
14.5	Correction / Dispute Process	Agreed	The experts agree that the Transaction Correction Flow Chart 1 [A_19] and Flow Chart 2 Branch Trading Statement [A_20] documents produced for the Common Issues trial are reflective of their understanding of the processes.		
14.6	Discrepancies	Agreed	Horizon does not record disputes. It is Post Office's back office accounting facilities that record disputes and make decisions upon discrepancy investigations and the issuing of error notices/TCs [see 15.5 below for further]		
14.7	Discrepancies / Investigations	JC	With the above in mind (14.4), Post Office's operational back office accounting processes and their adequacy were crucial to ensuring branch accounts were not adversely affected by discrepancy or error arising from Horizon generated events (i.e., bugs/errors/defects) or manual error / lack of policy adherence in respect of decision-making processes regarding discrepancy disputes.		



**Issue 15 – How did Horizon process and/or record Transaction Corrections?**

Index	Sub Topic	Agreed or JC / RW	Statement	Coyne Refs	Worden Refs
15.1	TCs Issued	Agreed	Transaction Corrections arise (in the majority of occasions) as a result of a either POL or a Subpostmaster identifying an imbalance/discrepancy.  Between the years of 2006 to 2017 TCs were applied more than 100,000 times each year.		928
15.1a	TCs Issued	JC	For the years 2005 and 2018 the figure was less than 100,000		928
15.1b	TCs Issued	RW	The smaller figures for 2005 and 2018 in the table at para 928 arose because they were part years. TCs started in 2005, and the table only reflected part of 2018		928
15.2	Erroneous TCs	Agreed	The Transaction Correction process could lead to Transaction Corrections being issued in error and when disputed, some TCs are corrected by issuing another TC (when disputes are upheld).	Smith 1 <sup>st</sup> WS	
15.3	TCs	Agreed	Post Office does not inspect Audit Data before issuing a TC. As there are typically more than 100,000 TCs per annum, it would incur additional cost and delay for Post Office to inspect audit data before issuing any TC.		
15.4	TCs	Agreed	When a TC is disputed, we would expect Post Office to investigate/validate with more data sources than utilised in the initial determination.		
15.5	Errors in TCs	RW	Those TCs disputed and still wrongly issued (not upheld), are probably fewer in number than those disputed and upheld - because of the careful process of investigation.		
15.6	Errors in TCs	RW	I have derived an upper limit on the financial impact of errors in the TC process. The magnitude of the mean financial impact per branch per month of erroneous TCs is less than £2.	S5.150	9.6, S7
15.7	Errors in TCs	RW	The reference to my para 993 should be to para 933.  ‘77% of 2,890 Transaction Correction disputes were upheld in 2016/2017 in relation to Santander Manual Deposits’	S5.357- 359	933

Index	Sub Topic	Agreed or JC / RW	Statement	Coyne Refs	Worden Refs
			<p>The figure of 77%, taken from Mr Smith's witness statement, does not support Mr Coyne's conclusions up to his para S5.359. It only shows that for the small proportion of Santander TCs that were disputed, the resulting investigation found in favour of the Subpostmaster rather than the PO client.</p> <p>This does nothing to alter my conclusion in S7 that the losses to claimants from erroneous TCs were very small, compared to their claimed shortfalls.</p>		
15.8	Errors in TCs	RW	The figure of 77% shows that correction by PO of possible errors by Santander was effective - the opposite of what Mr. Coyne implies	S5.370	
15.9	Errors in TCs	RW	Mr. Coyne has misunderstood. The examples at 924 and 925 were hypothetical.	S5.371	924, 925
15.10	Errors in TCs	RW	The assumption that Mr. Coyne disagrees with is addressed in my supplemental report	S5.373	931, S App 11-12
15.11	Errors in TCs	RW	The experts have still not achieved clarity on the '10,000 transactions per week' referred to by Mr. Coyne. This amounts to 500,000 transactions per year, considerably larger than the number of TCs per year.	S5.377	
15.12	Errors in TCs	RW	Mr Coyne's comments at 377 and 378 do not alter my opinion that the losses to claimants from erroneous TCs were very small, compared to their claimed shortfalls.	S5.377 - 378	9.6, S7
15.13	Errors in TCs	RW	<p>PC0129587 dated 1 December 2005 relates to Transaction Corrections (TC) and issues with counter freezes during acceptance of the Transaction Correction.</p> <p>There is nothing in the Peak to indicate a fault in Horizon, or that there would have been any inaccuracy in a resulting TC.</p>	S3.198	

Approved for service 25<sup>th</sup> February 2019

Mr Jason Coyne

**GRO**

Dr Robert Worden