



BANK OF ENGLAND

Independent review of RTGS outage on 20 October 2014: Bank of England's response

SUMMARY

1. The Bank of England is responsible for the operation of the United Kingdom's Real-Time Gross Settlement (RTGS) system, through which it acts as the settlement agent to the main interbank payment systems. These include Clearing House Automated Payment System (CHAPS), which is used for high value wholesale payments and other time-critical, lower value payments including house purchases. In this role, the Bank provides ultimate, risk-free means of discharging payment obligations between parties.
2. Given its significance to the effective functioning of the UK economy and financial system, participants in the RTGS system – and most importantly, their customers – rightly expect it to meet extremely high standards of service, availability and resilience. The Bank is committed to meeting those high expectations, aiming for 99.95% availability of RTGS system settlement services to CHAPS. Notably, RTGS functioned smoothly during the financial crisis (from 2008 to 2013, for example, availability was 100%).
3. On 20 October 2014, RTGS experienced an outage of approximately nine hours. Following restoration of the service later the same day, the Governor of the Bank of England, Mark Carney, apologised for any problems caused by the outage and announced an independent review into the causes of the incident, the effectiveness of the Bank's response and the lessons to be learned¹.
4. On 29 October 2014, the Bank's Court of Directors appointed Deloitte to conduct the independent review and set out its terms of reference (included in the Annex). Deloitte's final report, in appropriately redacted form, is published alongside this response².
5. With the full cooperation of the Bank, Deloitte conducted interviews with 35 Bank employees, alongside 17 interviews with representatives of affected organisations and individuals.
6. The Bank accepts all of the recommendations in the report, and is committed to implementing them in a full and timely manner.

The key findings of the report are:

- i. The root cause of the incident was the introduction of defects as part of functionality changes made to the RTGS system in April 2013 and May 2014.
- ii. All submitted payments (total value of £289.3 billion) were settled within the day's operating hours (which were extended until 20:00), and substantive risks to financial stability, financial loss or long-term damage to the economy were avoided through the execution of a comprehensive plan to fully resolve the issue and enable all submitted transactions to be cleared by the end of the day.

¹ <http://www.bankofengland.co.uk/publications/Pages/news/2014/135.aspx>

² On grounds of information security, some redactions have been made to the report itself.

- iii. The outage caused inconvenience to RTGS participants, and by consequence, to their customers – most notably a delay to some housing transactions.
 - iv. Among the lessons learned, the incident has highlighted the need for the Bank to further consider the contingency solutions for RTGS, as well as the future development of the system. In addition it highlights the need to strengthen the Bank’s crisis management framework.
7. The Bank would again like to apologise sincerely to those affected. On 24 October, the Bank implemented a compensation scheme to cover claims for costs incurred as a result of the outage. Affected parties were advised to contact their bank or building society and the Bank undertook to reimburse all claims paid. To date the Bank has settled nine claims totalling £4,056.89. The Bank does not expect substantial further claims.
8. Deloitte has identified lessons learned as part of the report. Measures already taken include:
- a. the Bank has reconstituted its RTGS Board (the ‘strategy board’), now chaired by Deputy Governor, Markets and Banking, and which met in its new form for the first time on 12 March. In addition the Bank has reconstituted an operational Board (the ‘delivery board’) to strengthen further the effective delivery of the RTGS service;
 - b. the Bank has deferred any functional or non-routine changes to RTGS, whilst business assurance activities are undertaken;
 - c. the Bank is implementing an enhanced crisis management framework, which reflects the three-tiered approach recommended in the report.
9. The Bank would like to thank Deloitte for conducting an independent and thorough review³, and in particular welcomes the input from external partners who have helped the Bank to identify the lessons learned from the incident.

³ The total cost of the independent review, as paid to Deloitte, was £164,600 excluding VAT

Table of Recommendations and the Bank's Response

Area	Recommendation	Response
<p>Robustness of the system</p>	<p>Improve the governance, change and testing arrangements over the Real Time Gross Settlement system (RTGS)</p> <p>Governance</p> <p>a. The RTGS Board should be reconstituted, with a Deputy Governor as Chair and the CIO and Director of Banking Services attending</p> <p>Change</p> <p>b. Unless there is a compelling policy or market reason, further functional or non-routine configuration changes to RTGS should be deferred while business assurance activities are undertaken</p> <p>c. Where a functional or non-routine configuration change is deemed essential, appropriate leadership approval should be given and a risk mitigation plan put in place, including ensuring the availability of an appropriate senior person and operational / ISTD staff on site on the day of the change going live</p> <p>Testing</p> <p>d. The Bank should improve the testing regime for RTGS. The Bank should consider: increased independence of testing responsibilities between ISTD and Banking, more thorough regression testing for future changes and more comprehensive test scenarios and scripts</p> <p>e. Strong consideration should be given to separate test and pre-production environments</p> <p>Technical strategy</p> <p>f. The Bank should define the future technical strategy for the delivery of RTGS (taking account of the outcomes of the internal review of the underlying risks of RTGS). The strategy should be reviewed and approved by the reconstituted RTGS Board</p>	<p>a. An RTGS Strategy Board has been reconstituted as recommended by Deloitte, and met for the first time on 12 March. The Board is chaired by Deputy Governor (DG), Markets & Banking and is attended by the Chief Operating Officer (COO), Chief Information Officer (CIO) and other senior representatives from the Bank. The Strategy Board will be responsible for the future strategy of the RTGS system. The Strategy Board will also oversee the implementation of all actions identified as part of this report</p> <p>b. As a result of Deloitte's preliminary findings, the Bank has deferred any functional or non-routine changes to RTGS</p> <p>c. Additional governance has been put in place to support any proposed future changes to the RTGS system: an RTGS Delivery Board will review and oversee all proposed changes, and any significant changes will require approval of the Strategy Board</p> <p>d. The Bank is reviewing the approach it takes to assuring quality of the RTGS system, which will include testing. A proposal for a revised approach will be presented to the Strategy Board for discussion by September 2015</p> <p>e. The Bank will include multiple environments in the proposal for a revised approach to testing, to be discussed at the Strategy Board by September 2015</p> <p>f. Planning for the delivery of the future technical strategy of the RTGS system will begin this year, with a view to implementation over the coming years. The strategy will be agreed and overseen by the Strategy Board, with regular updates to the Bank's Court</p>

<p>Effectiveness of the Bank's response</p>	<p>Accelerate the improvements being made to the Bank's crisis management capabilities</p> <p>a. The on-going work to improve and then test the Bank's internal crisis management and communications capabilities should be accelerated to ensure the Bank is better prepared to deal with an operational event, or a situation affecting the Bank's reputation, in a controlled, transparent and co-ordinated manner. This should include:</p> <p style="padding-left: 40px;">i. Incorporating defined escalation protocols and accepted best practice structures, roles and responsibilities for managing a crisis</p> <p style="padding-left: 40px;">ii. Acknowledging within the Authorities Response Framework (ARF) that in certain circumstances the Bank itself may be the cause of a wider financial services sector 'crisis' and that an RTGS outage is one such scenario and that in such situations the Bank should co-ordinate proactively with the PRA, FCA and HMT and that the ARF provides the mechanism for this</p>	<p>a. A review of the Bank's crisis management arrangements has been undertaken, resulting in the development of a new Critical Incident Management Framework. This will include the development of a rehearsal strategy, providing the opportunity to test the new framework. A plan for implementation of the revised approach will be agreed by March 2015</p> <p style="padding-left: 40px;">i. The Critical Incident Management Framework will be based on UK government best practice and will establish robust escalation protocols</p> <p style="padding-left: 40px;">ii. The framework will include a standing member from the Bank's Resolution Directorate, responsible for assessing, invoking and coordinating actions between the Authorities Response Framework (ARF)</p>
	<p>Establish a co-ordinated operational response capability with CHAPS Co. to an RTGS failure, which considers the impacts and needs of all stakeholders</p> <p>a. The Bank should recognise more clearly in its contingency planning that RTGS provides high value payments services to the public, corporations and Government and co-ordination and communications in the event of an outage should fully reflect this</p> <p>b. The roles and responsibilities in the Memorandum of Understanding (MOU) with CHAPS Co. relating to handling an RTGS outage should be re-examined and once completed, both parties should develop a joint response plan enabling them to fulfil the agreed roles and responsibilities, co-ordinate their involvement and support each other</p> <p>c. The Bank or CHAPS Co. should consider setting-up an access point (on-line) where affected parties can go to for information and updates on an RTGS outage. One possibility is the CHAPS Co. website given this is a location that end-users (e.g. CHAPS members and solicitors) would naturally turn to. The role of the website already established for major operational disruptions under the ARF should also be considered in this context</p> <p>d. The Bank should conduct a scenario based rehearsal of a prolonged RTGS outage as soon as the work above is completed, involving all necessary parties (including external stakeholders). The rehearsal should test escalation protocols, information flows, lines of communication (internally and externally) and key decisions over contingency options and recovery procedures</p>	<p>a. The Bank will reflect the broad range of stakeholders relevant to the RTGS system as part of the new Critical Incident Management Framework. The framework will also include plans for communication and coordination in the event of a future outage</p> <p>b. The Bank and CHAPS Co have begun a review of the MOU and will develop a joint response plan to be agreed by the Strategy Board by June 2015</p> <p>c. The Bank and CHAPS Co are discussing the best means to provide stakeholders with up-to-date information on service availability. An approach is expected to be defined with CHAPS Co. by April 2015</p> <p>d. The plan to implement the new Critical Incident Management Framework will include the development of a rehearsal strategy, which will provide the opportunity to test the new framework. One of the scenarios covered in the rehearsal plan will be the Bank's response to an RTGS failure</p>

<p>Contingency Plans and back-ups</p>	<p>Prepare for a loss of integrity scenario for RTGS and reduce the barriers to switching to MIRS other than as a decision of last resort.</p>	<p>a. The Bank is currently doing an assessment of reversion from MIRS to RTGS intra-week, and expects to report to the Strategy Board by June 2015</p>
	<p>MIRS Contingency Solution</p>	
	<p>a. Work should be undertaken to remove or reduce the barriers to invocation of MIRS so that the Bank can “switch and fix” in parallel and in confidence. This should focus on testing the process to fail-back to RTGS intraweek (which is the primary barrier to invocation). If it is not possible to reduce this barrier, consideration should be given to enhancing the resilience and functionality within MIRS. In addition the Bank may wish to consider other back-up options for RTGS</p>	<p>b. An education programme on the MIRS solution and its limitations will be provided by key internal and external stakeholders by 30 June 2015</p>
	<p>b. The understanding and awareness of key internal and external stakeholders of the MIRS contingency option (what it provides, when it would be used and the implications of using it) should be enhanced (this in part can be achieved through the recommended scenario based rehearsal)</p>	
	<p>RTGS Managers’ Contingency Manual:</p>	
	<p>c. The manual should address a ‘loss of integrity’ scenario. This should include development of the necessary scripts and templates to facilitate faster reconciliation</p>	<p>c. A loss of integrity scenario has been added to the Contingency Manual. Scripts have also been developed for key RTGS scenarios to improve resolution time in a contingency solution.</p>
	<p>d. The manual should set out the decision criteria for invocation of MIRS, including the impacts and implications for various market segments against a range of decision times for invocation of MIRS</p>	<p>d. The Bank will set out its decision-making criteria for invocation of MIRS, which will then be agreed at the Strategy Board. The intention is to schedule this discussion for the Strategy Board in June 2015.</p>
	<p>e. The Bank should consider reviewing media communication strategies and the approach to redress and compensation in the event of an RTGS outage, and include these in the manual</p>	<p>e. The Bank has established an approach to redress and compensation in relation to the RTGS system and this has been included in the Contingency Manual</p>
	<p>CLS contingency</p>	
	<p>f. The Bank should also reconsider adoption of the CLS Central Bank Automated Contingency solution which would reduce the manual effort required and make reconciliation of the CLS sterling payments-in faster (it has been adopted by Switzerland, New Zealand and Canada; the Bank does not have a date scheduled for adoption)</p>	<p>f. The Bank is reviewing the case for adoption of the CLS Central Bank Automated Contingency solution</p>



Annex A: Terms of reference of the review

The terms of reference as set out for the review were as follows:

- a. Causes of the incident
 - i. Conduct a root cause analysis
 - ii. Evaluate the robustness of the system
 - iii. Review the governance of the system
- b. Effectiveness of the Bank's response
 - i. Assess the Bank's response on the day
 - ii. Evaluate the effectiveness of incident management and back-up plans
- c. Lessons learned