

Assessment of the Reserve Bank Information and Transfer System

May 2018

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1. Executive Summary

Purpose	<p>This report is an Assessment of the Reserve Bank Information and Transfer System (RITS) against the <i>Principles for Financial Market Infrastructures</i> (the Principles), which is operated by the Bank's Payments Settlements Department. The Principles were developed by the Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO).¹ This Assessment has been carried out in accordance with the approach and rating system set out in the <i>Principles for Financial Market Infrastructures: Disclosure framework and assessment methodology</i> (the Disclosure Framework) produced by CPMI and IOSCO in December 2012² and CPMI and IOSCO's <i>Application of the Principles for Financial Market Infrastructures to Central Bank FMIs</i>, published in 2015.³ The assessment was independently prepared by the Bank's Payments Policy Department and endorsed by the Payments System Board.</p> <p>This report covers the period from April 2017 to March 2018.</p>
Conclusion	<p>This Assessment concludes that at end March 2018 RITS observed all the relevant Principles.</p>
Oversight Focus for the coming Assessment Period	<p>This Assessment identified no areas of concern in terms of RITS's observance with the Principles or specific recommendations to support continuous improvement. Nevertheless, among other things, as part of its ongoing oversight process Payments Policy Department will continue to monitor developments designed to ensure that RITS remains resilient in the face of evolving cyber-security threats. Specifically, Payments Policy Department will follow-up on progress in:</p> <ul style="list-style-type: none">• implementing the remaining recommendations arising out of the completed reviews of RITS's cyber security and cyber resilience• continued exploration of non-similar technology that could enable further enhancements to the ability to recover RITS from cyber attacks in a timely manner.

1 The Joint Statement by the RBA and ASIC, *Implementing the CPSS-IOSCO Principles for Financial Market Infrastructures in Australia*, is available at <https://www.rba.gov.au/payments-and-infrastructure/financial-market-infrastructure/principles/implementation-of-principles.html>.

2 See CPSS-IOSCO (2012), *Principles for Financial Market Infrastructures: Disclosure framework and assessment methodology*, December. Available at <http://www.bis.org/cpmi/publ/d106.htm>.

3 See CPMI-IOSCO (2015), *Application of the Principles for financial market infrastructures to central bank FMIs*, August. Available at <http://www.bis.org/cpmi/publ/d130.pdf>.

2. Summary and Review of Ratings and Recommendations

RITS is Australia's high-value payments system, which is used by banks and other approved institutions to settle their payment obligations on a real-time gross settlement (RTGS) basis.⁴ RITS is owned and operated by the Bank. The Bank seeks to ensure effective oversight of RITS by separating the Bank's operational and oversight functions, as well as by producing transparent assessments against international standards. This Assessment has been produced by the Bank's Payments Policy Department, which is the functional area responsible for oversight of the payments system, drawing on information provided by the Bank's Payments Settlements Department, which is the functional area responsible for operating RITS (see section A.3 for further background on the governance and oversight of RITS). This report has been endorsed by the Payments System Board.

This Assessment focuses on the critical services provided by the Bank as operator of RITS; in particular, RITS's role as a wholesale RTGS system, as it is this role that makes RITS a systemically important payment system.⁵ Currently, the Bank considers that RITS is the only domestic systemically important payment system for which an assessment against international principles is necessary.⁶ This view reflects the fact that RITS:

- is the principal domestic payment system in terms of the aggregate value of payments
- mainly handles time-critical, high-value payments
- is used to effect settlement of payment instructions arising in other systemically important financial market infrastructures.

During the assessment period, a new service of RITS – the Fast Settlement Service (FSS) – was established under the RITS Regulations. The FSS was publicly launched with the New Payments Platform (NPP) in February and settles transactions submitted via the NPP feeder system on an RTGS basis. Given that the FSS and NPP have only recently commenced operating, the focus on the FSS for this assessment will be limited to its interaction with the core (wholesale) RITS system.⁷ A similar approach is taken with the role RITS plays in the settlement of interbank payment obligations arising from net settlement systems, for example, those relating to cheque, direct entry and card transactions arising from the Low Value Settlement Service (LVSS).⁸

This section summarises steps taken since the publication of the 2017 Assessment in relation to the areas of supervisory focus identified in that assessment. It also summarises the ratings and recommendations arising from the current Assessment.

4 This means that individual payments are processed and settled continuously and irrevocably in real time.

5 'RITS' is used in this report to refer to the Bank as operator of RITS, as well as referring to the system itself.

6 See the Joint Statement by the RBA and ASIC, *Implementing the CPSS-IOSCO Principles for Financial Market Infrastructures in Australia*, available at <https://www.rba.gov.au/payments-and-infrastructure/financial-market-infrastructure/principles/implementation-of-principles.html>.

7 The NPP and FSS are not currently being used in ways that would trigger assessment against the Principles, based on the criteria for systemic importance listed above.

8 Further information on net settlement systems linked to RITS is provided in section A.5 of Appendix A.

2.1 Developments in 2017 Areas of Oversight Focus

In the 2017 Assessment, RITS was found to have observed all of the relevant Principles and no recommendations were made.⁹ However, the 2017 Assessment noted that Payments Policy Department would monitor progress in two areas of oversight focus, related to work to ensure that RITS remains resilient in the face of evolving cyber-security threats. Table 1 summarises these areas and progress by the Bank during the assessment period.

Table 1: Summary of Developments in Areas of Oversight Focus

Area of focus	Developments
Progress in the implementation of recommendations arising out of completed reviews of RITS's cyber security and cyber resilience.	The highest priority recommendations were implemented in early 2017, with a further 21 lower priority recommendations completed during the assessment period, and 35 expected to be addressed in the remainder of 2018. A small number of recommendations have been incorporated into related projects and, as such, their implementation may extend beyond 2018.
Progress in evaluating current and emerging technology that could enable further enhancements to the ability to recover RITS from cyber attacks in a timely manner.	The Bank has completed the first stage of its evaluation, electing to further explore a technology option that is 'non-similar' to RITS but which could provide an additional recovery option.

2.2 2018 Ratings and Recommendations

As of the end of March 2018, RITS was found to observe all of the relevant Principles (Table 2). Payments Policy Department has not identified any areas of concern in terms of RITS's observance with the Principles or specific recommendations to support continuous improvement. As part of its ongoing oversight process, however, Payments Policy Department will continue to follow up on developments in two aspects of the work to ensure that RITS remains resilient in the face of evolving cyber-security threats. As particular areas of oversight focus, Payments Policy Department will monitor progress in:

- the implementation of the remaining recommendations arising out of the completed reviews of RITS's cyber security and cyber resilience
- continued exploration of 'non-similar' technology that could enable further enhancements to the ability to recover RITS from cyber attacks in a timely manner.

Table 2: Ratings of Observance of the Principles^(a)

Principle	Rating
1. Legal basis; 2. Governance; 3. Comprehensive framework for the management of risks; 4. Credit risk; 5. Collateral; 7. Liquidity risk; 8. Settlement finality; 9. Money settlements; 13. Participant-default rules and procedures; 15. General business risk; 16. Custody and investment risks; 17. Operational risk; 18. Access and participation requirements; 19. Tiered participation requirements; 21. Efficiency and effectiveness; 22. Communication procedures and standards; 23. Disclosure of rules, key procedures, and market data	Observed
12. Exchange-of-value settlement systems	Not applicable

(a) Principles 6, 10, 11, 14, 20 and 24 are not relevant for payment systems.

⁹ In its assessment, Payments Policy Department has applied the approach and rating system set out in the Disclosure Framework. 'Observed' is the highest rating within this framework and is applied when Payments Policy Department assesses that '(An) FMI observes the principle. Any identified gaps and shortcomings are not issues of concern and are minor, manageable and of a nature that the FMI could consider taking them up in the normal course of its business.' The full rating scale is set out in Appendix B.

3. Material Developments

This section draws out material developments relevant to RITS that have occurred since the 2017 Assessment. This Assessment covers the period from April 2017 to March 2018. Over this period, there have been material developments that are relevant to the Principles concerning operational risk (Principle 17), legal basis (Principle 1) and tiered participation arrangements (Principle 19). To complement this section, background information on how RITS operates, activity and participation in RITS, and the operational performance of RITS over the assessment period is set out in Appendix A. A detailed assessment of how RITS meets the Principles (incorporating developments discussed in this section) is presented in Appendix B.

3.1 Operational Risk Management

3.1.1 Cyber resilience

The Bank has continued work to further strengthen its cyber resilience over the assessment period. This builds on work in the previous assessment period to address cyber resilience-related recommendations made in 2015, including reviews of RITS's cyber-security controls, operational resilience, and options to improve the ability to detect and recover from a disruption of service in RITS, or loss of software or data integrity. The previous Assessment noted that Payments Policy Department would continue to monitor progress in two areas related to this work: the implementation of remaining recommendations from reviews of RITS's cyber security and cyber resilience; and evaluating the potential for further enhancements to the ability to recover RITS from cyber attacks in a timely manner. In addition, the Bank has carried out work to meet security standards established by SWIFT, and is considering how most effectively to take into account the recently released CPMI report on endpoint security in wholesale payments (Box A).

Implementation of additional security measures

The 2016 reviews conducted by the Bank included a stocktake of existing security controls, a program of penetration testing, and a review of recovery capabilities. The highest priority recommendations from these reviews were implemented in early 2017, with a number of the lower priority recommendations also since completed. The remainder of the lower priority recommendations are scheduled to be addressed in 2018, with the exception of a small number of recommendations that are being addressed via related projects that may extend beyond 2018.

SWIFT-related security controls

As a user of the SWIFT network, the Bank is required to meet the security obligations set by SWIFT. The SWIFT Customer Security Controls (CSC) Framework was introduced in March 2017, as a key component of SWIFT's broader Customer Security Programme (Box A). At the end of 2017, the Bank lodged its first annual attestation relating to compliance with the CSC Framework.

Box A: Endpoint Security

CPMI strategy for endpoint security

On 8 May 2018, CPMI released its report *Reducing the Risk of Wholesale Payments Fraud Related to Endpoint Security*.¹⁰ The report was produced by a CPMI Task Force established in the light of cyber fraud incidents such as the theft of funds from Bangladesh Bank in February 2016. The scope of the report focuses on interactions between wholesale payment systems, messaging networks and their participants, where weaknesses in the security arrangements between any of these parties ('endpoint security') create the potential for fraud in the transmission of payment instructions. The report describes a strategy for reducing the risk of wholesale payments fraud related to endpoint security, intended to assist operators of wholesale payment systems and messaging networks, their participants and relevant regulatory authorities. The strategy consists of seven elements:

1. Identifying and understanding the risks related to endpoint security.
2. Establishing endpoint security requirements for participants.
3. Promoting adherence to endpoint security requirements.
4. Providing and using information and tools to improve the prevention and detection of attempted wholesale payments fraud.
5. Responding in a timely way to potential fraud.
6. Supporting ongoing education, awareness and information sharing.
7. Monitoring evolving endpoint security risks and updating endpoint security practices accordingly, and coordination of endpoint security enhancements across different wholesale payments and messaging systems.

CPMI identifies that the successful execution of this strategy depends on the active engagement of operators, participants and other relevant stakeholders. The report also notes steps to be taken by CPMI and its member central banks (including the Bank) to support operationalisation of the endpoint security strategy within and across jurisdictions and systems. This includes monitoring how system operators, participants and other stakeholders are implementing elements of the strategy through to the end of 2019.

The endpoint security strategy is not intended to replace or supersede requirements in the Principles or related cyber resilience guidance. However, the strategy is designed to be taken into account by operators, participants and other relevant stakeholders in reducing wholesale payments fraud. The Bank is considering how it can most effectively take the strategy into account alongside its existing efforts in relation to cyber security.

SWIFT Customer Security Programme

The CPMI endpoint security work complements existing work in this area by SWIFT, which launched its own Customer Security Programme in May 2016. The programme consists of five strategic initiatives:

1. Improving information sharing amongst the global community.
2. Enhancing SWIFT-related security tools for customers.
3. Enhancing guidelines and providing audit frameworks for customer security.

¹⁰ The report is available at <https://www.bis.org/cpmi/publ/d178.htm>.

4. Supporting increased use of pattern detection for fraudulent messages.
5. Enhancing support by third-party providers of security-related services.

A key component of this programme was the establishment of the SWIFT CSC Framework, a set of mandatory and advisory controls for users of the SWIFT messaging infrastructure. It aims to provide a baseline security standard for the SWIFT network and an associated assurance framework for the global SWIFT community. SWIFT customers must attest annually to their compliance with the CSC Framework. The first annual attestation was due at the end of 2017, with 89 per cent of SWIFT users responsible for 99 per cent of messaging volumes worldwide completing this attestation on time, including the Bank. Users are expected to be fully compliant with the mandatory controls within the CSC Framework by the time of the next annual attestation. SWIFT has also established a system that allows its customers to request access to attestations lodged by their counterparties, and reserves the right to report users that are not compliant with attestation or control requirements to the relevant supervisory authority.

Resumption of operations

Consistent with cyber resilience guidance developed by CPMI and IOSCO, the Bank has undertaken to evaluate current and emerging technology options that may further enhance the capability of RITS to meet the CPMI-IOSCO two-hour recovery time objective; that is, to be able to safely resume critical operations within two hours of a cyber disruption. The first stage of this evaluation was completed in late 2017, with the Bank deciding to further explore a technology option that is 'non-similar' to RITS but could provide an additional recovery option.

3.1.2 Business continuity arrangements

The introduction of the FSS in late 2017 (see Box B) required a significant change to the operational arrangements for RITS, in order to support a 24/7 operating model. Although core operating hours for the existing RITS system (see section A.6) have not changed with the introduction of FSS, arrangements to support FSS have implications for RITS due to shared operational and technical resources across the two systems. In particular, to support the continuous operation of the FSS, the Bank now maintains permanent 24/7 operational and technical support staff for RITS and FSS at two geographically remote operating sites. Components of both RITS and FSS are monitored 24/7 to ensure that any issues are detected on a timely basis.

Recognising that the resilience and reliability of RITS and members is critical to the smooth functioning of the Australian payments system, the Bank has business continuity arrangements in place that focus on the continuity of RITS operations and the Bank's settlement activities, including business and IT support activities, during significant contingency events. Consistent with existing arrangements for RITS, the FSS has been designed with a high degree of technical redundancy, including automatic failover of components. If the FSS processor fails at the primary site, settlement processing will automatically switch to the alternative FSS processor at the primary site within two minutes. Similarly, the Bank has developed business continuity procedures for the FSS, and has included the new system in the programme of testing and review of its contingency procedures alongside RITS.

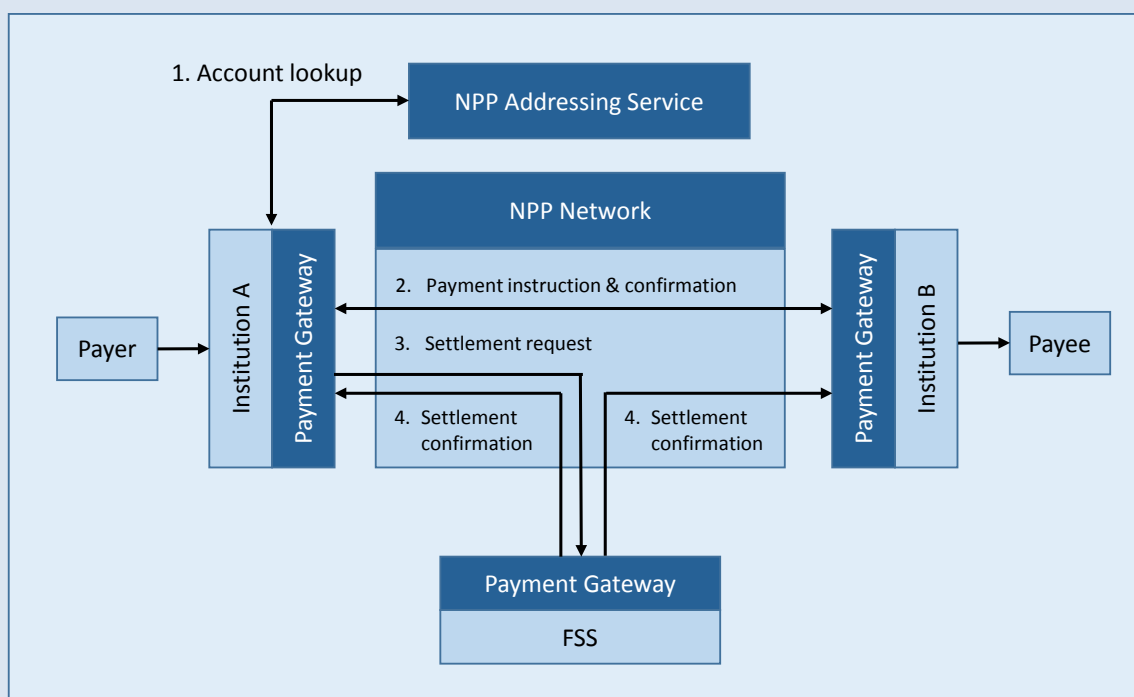
Box B: The New Payments Platform and the Fast Settlement Service

In 2012, the Payments System Board concluded a strategic review of innovation in the Australian payments system, which identified a number of gaps in Australia’s retail payments system and called on the industry to determine the best way of addressing these gaps.¹¹ The gaps identified included the ability to: make real-time retail payments; send more complete remittance information with payments; address payments in a relatively simple way; and make and receive payments on a 24/7 basis. In response, 13 Australian financial institutions, including the Reserve Bank, formed NPP Australia Limited to oversee the development and operation of the NPP. The NPP, and the Bank’s FSS, launched publicly on 13 February 2018, following a period of trial operation from 27 November 2017.

The NPP is a fast payments system that enables close-to-immediate funds availability to payment recipients on a 24/7 basis, even where the payer and payee use different financial institutions. The NPP also enables more information to be attached to a payment, and easier addressing of payments using the ‘PayID’ service, which can be used to link accounts to a phone number, email address or ABN. ‘Overlay services’ can also make use of the basic payments infrastructure to provide additional payment services on a commercial basis, with BPAY developing Osko as the first such service.

The NPP Basic Infrastructure, which includes the NPP network, switching capability (enabled by payment gateways) and addressing service, was designed and built by SWIFT, and utilises the SWIFT network to exchange payment and settlement instructions and confirmations (Figure B1). To facilitate the 24/7 settlement of individual payments made through the NPP, the Bank has developed the FSS. The FSS allows transactions to be settled individually on a 24/7 basis and in real time. It is used to settle obligations generated by NPP payments between customers of different banks.

Figure B1: Infrastructure and Payment Processing

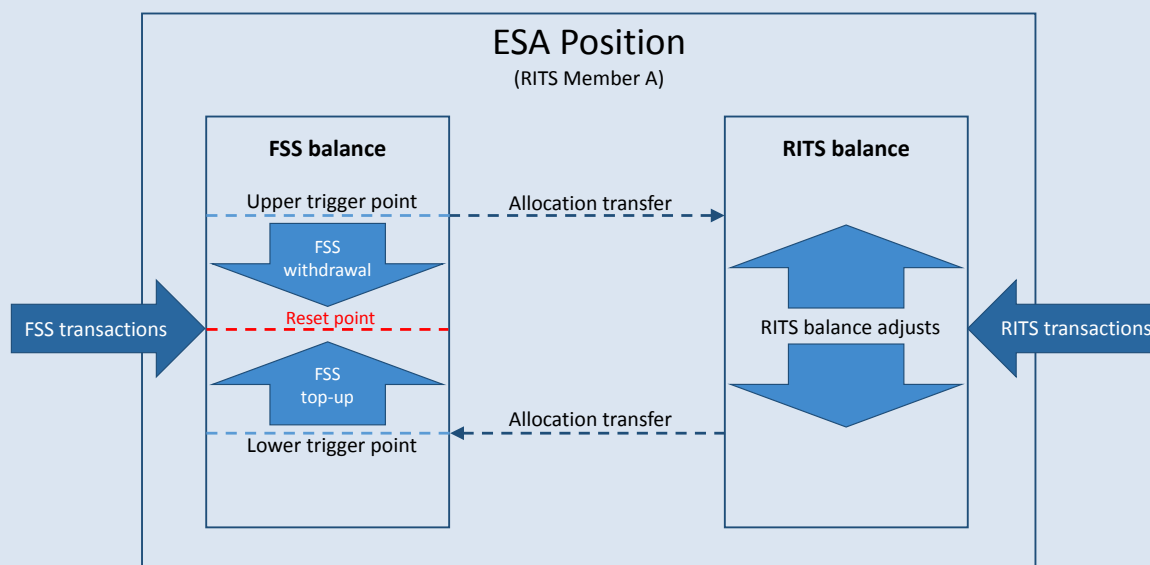


11 See ‘Conclusions of the Strategic Review of Innovation in the Payments Systems’, available at <http://www.rba.gov.au/payments-and-infrastructure/payments-system-regulation/past-regulatory-reviews/strategic-review-of-innovation-in-the-payments-system/conclusions/>.

Direct users of the FSS must be RITS members and the service is governed by the RITS Regulations. Although the FSS uses some of the pre-existing RITS infrastructure, the systems operate on separate platforms so that the RITS core settlement service and the FSS are able to process and settle payments independently of one another. While RITS members use a single Exchange Settlement Account (ESA) to settle payments in both RITS and the FSS, members divide their ESA balances between an 'FSS balance' and a 'RITS balance'. FSS payments are only tested for settlement against the FSS balance, and payments sent to RITS's core settlement service are only tested for settlement against the RITS balance. FSS payments are tested for settlement on a settle-or-reject basis; if a member does not have enough funds in its FSS balance the payment will be rejected, and the member would need to resubmit the payment later if it wants the payment to be settled.

Members are able to manage the distribution of their ESA balances between their FSS and RITS balances during operating hours of the core RITS settlement service, including via automated tools to reallocate balances. For example, there is functionality allowing members to set criteria (upper, lower and reset point values) that will be used by RITS to automatically generate allocation transfers between members' FSS and RITS balances. The transfers are generated to return the FSS balance to a nominated FSS balance reset point. That is, if funds in the FSS balance fall below the lower trigger point value, RITS will automatically trigger an FSS top-up transfer from the member's RITS balance to bring the FSS balance up to the reset point. Conversely, if funds in the FSS balance rise above the upper trigger point value, RITS will automatically trigger an FSS withdrawal to return the FSS balance to the reset point (Figure B2). Outside of core RITS operating hours (see Appendix A.6), the entirety of a member's ESA balance is allocated to its FSS balance and available for settlement of FSS payments.

Figure B2: ESA Funds Allocation



As a RITS service, the FSS has been designed to meet standards in relation to availability, capacity and security that are equivalent to, and in some cases even higher than, those of the core RITS service. The FSS is designed with the capacity to process at least 1 000 settlements per second, and adjusts its capacity target to meet projected volumes for at least five years in advance. The FSS is held to an availability target of 99.995 per cent (compared with 99.95 per cent for the core RITS service), equivalent to a tolerance for 26 minutes of downtime in a year. The system is monitored continuously, with a target of detecting any system problems within 30 seconds. The security standards for the FSS are equivalent to those of the core RITS service.

In order to support 24/7 operation of the FSS, the Bank has also extended operating hours of the RITS Help Desk to 24/7. The FSS is designed to allow maintenance and upgrades to be carried out while the system remains in operation, through the use of isolated components that can be upgraded independently. The FSS, like the core RITS system, can be operated from two geographically remote

sites, with a target recovery time of less than two minutes in the event of a system disruption. In the event of a more extreme disruption, the NPP has contingency arrangements in place that ensure that clearing of payments can continue for up to 12 hours in case of an FSS outage, storing settlement requests until the FSS is available again.

Although settlement risks are mitigated by the real-time settlement of NPP transactions, the new system has liquidity implications for financial institutions participating in NPP and the FSS. Systems like the FSS that settle payments on a gross basis can be less liquidity efficient than systems that settle on a net basis. However, it is not considered likely that participants in the payments system will need to hold significantly larger balances to facilitate their NPP payment obligations. The NPP is primarily a payment system for retail transactions, with individual transactions expected to be relatively low in value. Wholesale interbank transactions are already typically settled individually and in real time via the core RITS service, so there will be a limited net impact on liquidity if some are made as NPP payments. Financial institutions also have access to funds through standing facilities to help manage their liquidity needs, and are able to utilise automated tools to allocate funds between their RITS and FSS balances as required.

3.2 Legal Basis

The RITS Regulations form the legal basis for all key aspects of RITS. The Bank seeks external legal advice on material amendments to the RITS Regulations and associated contractual agreements, including, where relevant, on the interaction of such amendments with Australian and New South Wales laws and regulations. The RITS Membership Agreement binds RITS members and the Bank to the RITS Regulations.

3.2.1 Revised RITS Regulations

The Bank has further amended the new set of RITS Regulations that came into effect in the previous assessment period, in order to incorporate changes supporting the FSS. The amendments to the RITS Regulations came into effect on 10 November 2017, before the commencement of live trial operation of the FSS.

The changes made to the RITS Regulations to incorporate the FSS and NPP recognise the NPP as a feeder system to RITS, and draw a distinction between the existing 'core' RITS system and the new FSS system. These include: defining 'RITS Transactions' and 'FSS Transactions' as separate sub-sets of transactions, the former tested for settlement on the RITS System Queue and the latter by the FSS settlement engine; reflecting that funds may be allocated across ESA balances between RITS and the FSS for settlement testing; and other amendments to reflect agency arrangements and the 24/7 functioning of the FSS. Changes have also been made to the Global Master Repurchase Agreement to provide for an alternative form of trade confirmation in cases of intraday repos that are entered into with the Bank under certain FSS contingency scenarios.

In addition to these changes related to the FSS, other amendments were introduced to govern outright securities transactions and securities lending transactions between the Bank and members (including Australian Office of Financial Management securities lending transactions).

3.2.2 Foreign RITS members

The Bank has a requirement that all overseas-domiciled RITS members provide an independent legal opinion that the RITS Membership Agreement is enforceable in their home jurisdiction. This has been required for all new foreign RITS members since 2011, but it was not required of members who joined

before then. Following the signing of new RITS Membership Agreements in 2017, the Bank has been working with foreign members on the provision of legal opinions that meet the Bank's requirements, in cases where members had not provided a legal opinion previously or their previous opinion required updating. The Bank is currently reviewing legal opinions that it has received from foreign members.

3.3 Access and Participation

3.3.1 Tiered participation

As of 6 May 2018, the definition of bank in the *Banking Act 1959* was changed to allow all authorised deposit-taking institutions (ADIs) to call themselves banks. The Australian Prudential Regulation Authority (APRA) is also developing a phased approach to authorising new ADIs, which is expected to facilitate entry into the banking industry. Under this phased approach, new entrants will be authorised as 'restricted ADIs' within around three months of applying, after which they will have up to two years to obtain a full ADI licence.

As these proposed changes make it no longer meaningful to set different requirements for different types of ADIs, the Bank reviewed the requirement in the ESA policy for indirect-settling banks to have an ESA for contingency purposes. Rather than extend this requirement to all ADIs, the Bank decided to make holding a dormant ESA for contingency purposes optional rather than mandatory. The current tiering threshold of 0.25 per cent of RITS RTGS transaction values has been maintained; ADIs with RITS RTGS transactions that are at or above this threshold are required to settle wholesale RTGS transactions using their own ESA.

3.3.2 Non-ADI Exchange Settlement Accounts

The Bank allows non-ADIs to hold ESAs for the purpose of settling payments on behalf of third parties, subject to meeting operational and liquidity standards, in order to ensure that non-traditional payment service providers are not at a competitive disadvantage by being dependent on an institution that would otherwise be a competitor (for details of participation in RITS see Appendix A, section A.1). Over the year to the end of March, the Bank has received applications from several non-ADI providers of third-party payment services to open ESAs at the Bank, in order to directly settle payments on behalf of their customers.

Adyen, a card acquirer for merchants, opened an ESA in July 2017 as a third-party payment services provider. Previously, the only non-ADI to hold an ESA for the purposes of providing third-party payments services was First Data Network Australia (previously known as Cashcard Australia). The Bank is also in discussion with several other third-party payment service providers, including firms that provide card acquiring and ATM processing services, about becoming ESA holders.

3.3.3 LCH PPS arrangements

LCH Limited (LCH) is a UK-based central counterparty (CCP) that offers central clearing for a range of products, including over-the-counter interest rate derivatives and inflation swaps. LCH settles Australian dollar transactions, typically variation margin payments, across its ESA in RITS. LCH also operates an Australian 'Protected Payments System' (PPS) that facilitates the settlement of Australian

dollar obligations directly between ESAs held at the Bank.¹² During the assessment period, another three major Australian banks began to use the Australian PPS. As a result, all four major Australian banks now settle their Australian dollar obligations with LCH using the Australian PPS, rather than via correspondent banking arrangements. The volume of obligations settled using the Australian PPS could increase during the next assessment period, when LCH is expected to begin clearing deliverable foreign-exchange options.

3.3.4 eftpos Batch

On 30 August 2017 settlement of eftpos transactions moved into a separate multilateral net batch administered by eftpos Payments Australia Limited (ePAL). These transactions were previously settled as part of the LVSS batch. Under normal operations, ePAL submits one batch per RITS business day for settlement in the morning settlement session. ATM transactions processed by ePAL are currently not included in the eftpos Batch and are settled under the existing LVSS arrangements.

12 For more information on LCH's PPS, which is used to settle member margin and other obligations, see the *2017 Assessment of LCH Limited's SwapClear Service*, available at: <https://www.rba.gov.au/payments-and-infrastructure/financial-market-infrastructure/clearing-and-settlement-facilities/assessments/lch/2017/pdf/lch-assess-2017-12.pdf>.

Appendix A: Background Information

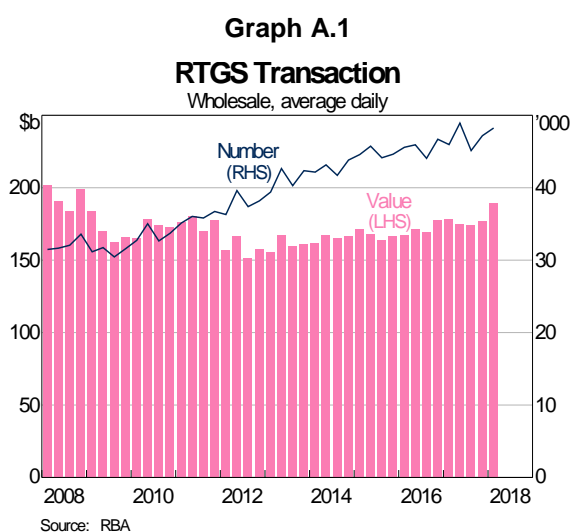
This Appendix presents an overview of activity and participation in RITS and the operational performance of RITS over the assessment period, and describes the operational arrangements and key design features of RITS. Material changes to RITS since the previous assessment are discussed in section 3 of this report.

In February 2018, the Bank launched the RITS FSS (see Box B). Although governed by the RITS Regulations, the FSS operates as a separate service from the core RITS service.¹³ Except where otherwise noted, this Appendix provides background information on the core RITS service.

A.1 Activity and Participation

Over 70 per cent of the value of non-cash payments in Australia is settled in the core RITS settlement system on an RTGS basis (Table A.1). RITS is used to settle time-critical wholesale payments for other financial market infrastructures (FMIs): Australian dollar pay-ins to or pay-outs from CLS Bank International (CLS); margin payments to CCPs; and debt and equity settlement obligations arising in securities settlement systems. RITS also settles the interbank obligations arising from non-cash retail payments.

In the 12 months to March 2018, RITS settled over \$178 billion in wholesale RTGS transactions on average each day, which is around 3 per cent higher than the average daily value settled in the previous twelve months (Graph A.1). The number of transactions also increased over the same period; in the 12 months to March, the average number of wholesale RTGS transactions settled each day increased by around 4 per cent to around 47 000. The peak number of transactions settled on a single day during the assessment period was around 85 000 transactions, while the peak daily value was around \$256 billion.



¹³ Given the currently limited activity in NPP and the FSS, the Bank does not presently assess these systems against the Principles. The Bank will continue to monitor developments in NPP and the FSS, and periodically review whether an assessment against the Principles should be conducted in future.

Table A.1: Payments in Australia^(a)
Daily average^(b), April 2017–March 2018

	Number ^(c) '000s	Value ^(c) \$ billion	Interbank settlement value in RITS \$ billion
RITS Wholesale RTGS	47.3	178.8	174.1
<i>SWIFT payments (HVCS)</i>	43.6	107.2	107.1
<i>Debt securities (Austraclear)^(d)</i>	3.5	58.1	53.5
<i>RITS cash transfers</i>	0.2	13.5	13.5
CLS	56.7	274.1	2.8
Retail payments	50 391	69.9	4.7
<i>Direct entry^(e)</i>	15 789.3	63.1	
<i>Cheques</i>	341.6	4.3	
<i>Credit/charge cards</i>	10 969.7	1.3	
<i>Debit cards</i>	23 290.4	1.2	
Equity settlements (CHES)	1 153.8	4.9 ^(f)	0.5
Property settlements (PEXA)	0.7	0.5	0.2 ^(g)

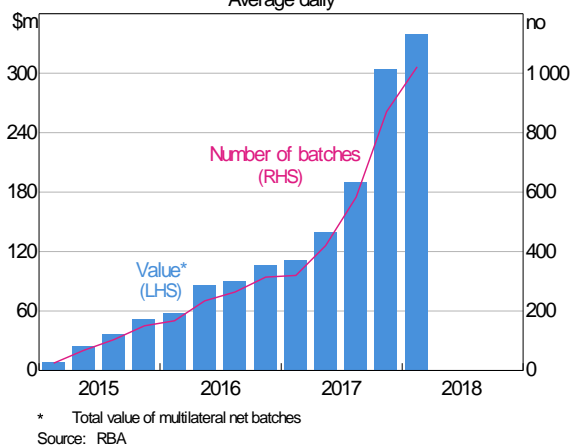
- (a) Excludes NPP payments as NPP was only launched in February 2018.
(b) Business days
(c) Includes payments between customers of the same financial institution
(d) Excludes intraday repurchase agreements
(e) Includes BPAY
(f) Gross value of equity trades
(g) Net value of property settlement batches; each property settlement batch may involve a number of payments
Sources: ASX; CLS; RBA

In addition to settling individual wholesale payments, RITS also facilitates the settlement of net interbank obligations arising from the equity market (through CHES, the equities settlement system operated by ASX Settlement), retail payment systems and the property settlement system (see section A.5 for more information on these systems). Equity and property settlement payments are settled as batch payments. The majority of the value of retail payments settled in RITS is from the direct entry (DE) system.

RITS commenced settling property transactions in late 2014 for the national electronic conveyancing system conducted by Property Exchange Australia Limited (PEXA). PEXA can submit linked property transactions for settlement as individual multilateral net batches within RITS.¹⁴ While they remain a small proportion of overall activity within RITS, the number and value of property batches settling in RITS has continued to grow rapidly (Graph A.2).

14 For more information on property settlement functionality in RITS see section 3.2.3 in RBA (2014), *2014 Assessment of the Reserve Bank Information and Transfer System*, p 13. Available at <https://www.rba.gov.au/payments-and-infrastructure/rits/self-assessments/2014/>.

Graph A.2
Property Settlement
Average daily



Agency arrangements for wholesale RTGS payments

Under the Bank’s ESA policy, ADIs that account for 0.25 per cent or more of the total value of wholesale RTGS transactions, and systemically important CCPs, are required to settle their Australian dollar obligations in RITS using their own ESAs (see section A.9 for further details on access and participation in RITS). An ADI with a share of transactions of less than 0.25 per cent of the total value of wholesale RTGS transactions is permitted to use an agent to settle its transactions. In light of changes to the definition of bank in the *Banking Act 1959*, the Bank reviewed its requirement that banks hold at least a dormant ESA for contingency purposes. Rather than extend this requirement to all ADIs, the Bank decided to make holding a dormant ESA for contingency purposes optional rather than mandatory.¹⁵

As at the end of March, 40 ADIs held dormant ESAs (Table A.2). The value of wholesale RTGS payments settled by these members has remained very low, at below 1 per cent of total RTGS payments over the assessment period. Activity in RITS remained highly concentrated among the major domestic banks and foreign banks, both in terms of number and value of RTGS payments. During the current assessment period one foreign bank resigned its membership.

15 See the Bank’s Media Release 2018-06: <https://www.rba.gov.au/media-releases/2018/mr-18-06.html>.

Table A.2: RITS Participation^(a)

	Number of ESAs As at end March 2018	Number of payments ^(b) Per cent, year to end March 2018	Value ^(b) Per cent, year to end March 2018
Major domestic banks	4	61.8	52.2
Foreign institutions	34	32.4	38.5
Other domestic institutions	15	3.0	2.6
Clearing and settlement facilities and the Bank	5	2.8	6.7
Dormant accounts ^(c)	40	-	-
Total	98	100.0	100.0

(a) Excludes RITS members that do not hold an ESA

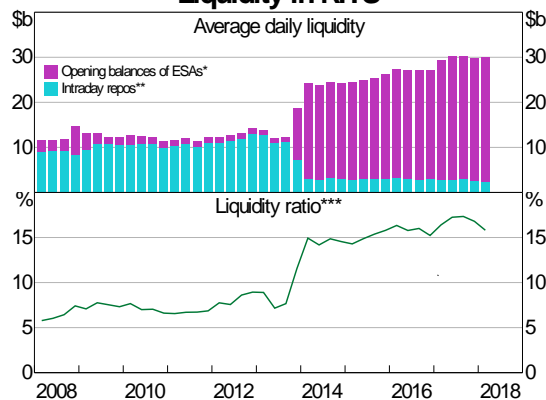
(b) Outgoing payments

(c) Indirect RITS participants that maintain an ESA for contingency purposes

Source: RBA

Since RITS is an RTGS system, members need access to additional liquidity (relative to a deferred net settlement system) in order to settle payments individually. Liquidity can be sourced from members' opening ESA balances and additional funds made available to members by the Bank via its intraday liquidity facility (see section A.7 for details). The aggregate of opening ESA balances is primarily determined by the Bank's open market operations (OMOs) and liquidity provided under open repos. Open repos were introduced in November 2013 to facilitate the settlement of same-day DE payments, as evening settlement obligations arising from the DE system are unknown before the close of the interbank cash market. Since February 2018, open repos have also provided liquidity for FSS settlements of NPP payments initiated after 4.45 pm Australian Eastern Standard Time (AEST)/Australian Eastern Daylight-saving Time (AEDT) on business days, as well as on weekends and public holidays. Average liquidity in RITS increased sharply following the introduction of open repos (Graph A.3, top panel).

**Graph A.3
Liquidity in RITS**



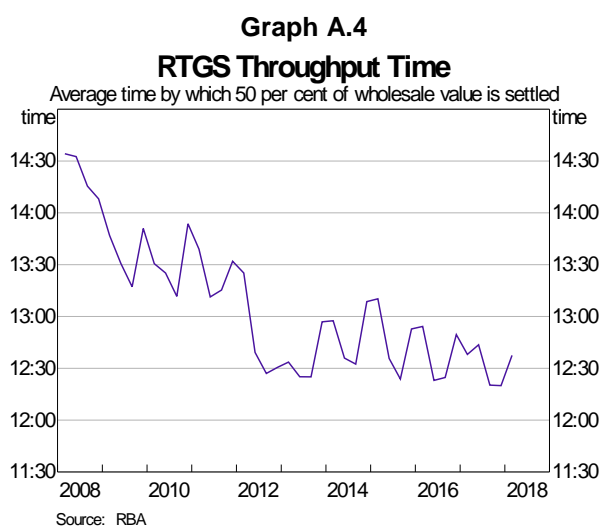
* Includes open repos

** Average value of intraday repos during the daily settlement session

*** Daily average liquidity as a proportion of wholesale RTGS value settled

Source: RBA

System liquidity plays a role in the timely settlement of RTGS transactions. In general, settling payments earlier in the day is desirable as it limits the potential adverse consequences if a participant or RITS were to experience an operational issue late in the day. The ratio of system liquidity to the value of payments settled had been slowly increasing from around 2007, and then doubled following the introduction of open repos (Graph A.3, bottom panel). The liquidity buffer created by open repos results in higher levels of system liquidity being available earlier in the day and therefore has contributed to the earlier settlement of payments in RITS. The average time of day when half of payments, by value, have settled has moved progressively earlier; from between 2.00 pm and 3.00 pm in the mid 2000s, to between around 12.00 pm and 1.00 pm in recent years (Graph A.4).



A.2 Operational Risk

RITS availability

The key operational target is for RITS to be available to its members in excess of 99.95 per cent of the time. Availability is measured relative to the total number of hours that the system is open for settlement and reporting. In 2017, the Bank met its availability target in respect of RITS, recording average availability of 99.98 per cent (Table A.3).¹⁶

RITS also has capacity targets. These include a:

- *processing throughput target*, which aims to ensure that RITS is able to process the peak-day transactions in less than two hours (assuming no liquidity constraints)
- *projected capacity target*, which specifies that RITS should be able to accommodate projected volumes 18 months in advance with 20 per cent headroom.

RITS is regularly tested against these targets and continues to meet them.

¹⁶ For this measure, Bank-operated systems means all Bank-operated, RITS-related systems including the RITS core system, the low-value feeder, RITS Austraclear interface and firewalls. In 2017, the RITS core system had 99.993 per cent availability.

Table A.3: RITS Availability

Per cent

	Bank-operated systems	External feeder systems
2017	99.977	99.993
2016	99.992	99.984
2015	99.831	99.922
2014	99.976	99.987
2013	99.989	99.914

Source: RBA

External system availability and other dependencies

The Bank maintains service level agreements with SWIFT, Austraclear, and other feeder systems that set out availability targets, as well as expected response times and level of support should an issue arise. In 2017, the combined availability of the Austraclear system and SWIFT services was 99.99 per cent (see Table A.3, above). RITS also has critical dependencies on utility providers. To manage these dependencies, both the main and backup sites have an uninterruptable power supply and a backup power generator system. All external communications links to data centres are via dual, geographically separated links.

The efficient operation of RITS is also dependent on the operational reliability and resilience of its members. An operational disruption at a member could prevent it from sending payment instructions to RITS. This could in turn cause liquidity to accumulate in that member's ESA, forming what is known as a 'liquidity sink', and preventing liquidity from being recycled through the system efficiently. Recognising this interdependency, the Bank published Business Continuity Standards for direct participants in RITS in May 2013. These standards aim to promote high availability in RITS payments processing operations, requiring both resilience of system components and rapid recovery if failover to alternative systems is required.¹⁷ These Business Continuity Standards were revised in 2017 to incorporate, among other items, specific reference to cyber security, with a target for members to fully comply with the revised standards by the February 2019 annual attestation.

The Bank monitors compliance with the Business Continuity Standards on an ongoing basis. Each member that directly participates in RITS is required to submit an annual self-certification statement against the standards. As at the end of 2017, 42 of 61 RITS direct participants self-certified that they were fully compliant with the standards. For some members, the reported non-compliance related to the revised standards discussed above, for which full compliance is targeted by the February 2019 self-certification. Where non-compliance relates to other standards previously in place, the Bank has asked members to provide an expected date for compliance and will follow up progress with members.

17 For more information on the participant Business Continuity Standards, see Box E: Participant Business Continuity Standards in RBA (2013), *2013 Self-assessment of the Reserve Bank Information and Transfer System*, p 27 <https://www.rba.gov.au/payments-and-infrastructure/rits/self-assessments/2013/>.

Since both the FSS and the core RITS service settle payments using funds in member ESAs, it is possible that an operational disruption in the FSS could affect the funds available to members to settle core RITS payments. This risk is mitigated by the use of separate balances within each member's ESA that can be used only to settle payments in the related settlement queue and by applying resilience standards in the FSS that are at least equivalent to those in the core RITS service (see Box B).

A.3 Governance and Oversight

RITS is owned and operated by the Bank. Since it is not operated as a separate legal entity, the management and operation of RITS fall under the governance structure of the Bank and are therefore subject to its normal oversight, decision-making and audit processes. The Bank articulates specific objectives in relation to its operation of RITS on its website.¹⁸ These are consistent with the high-level objectives of the Bank, which emphasise the stability of the broader financial system and the welfare of the Australian people. The Bank accordingly aims to provide infrastructure through which settlement obligations arising from the exchange of high-value payments and debt securities settlements can be completed in a safe and efficient manner.

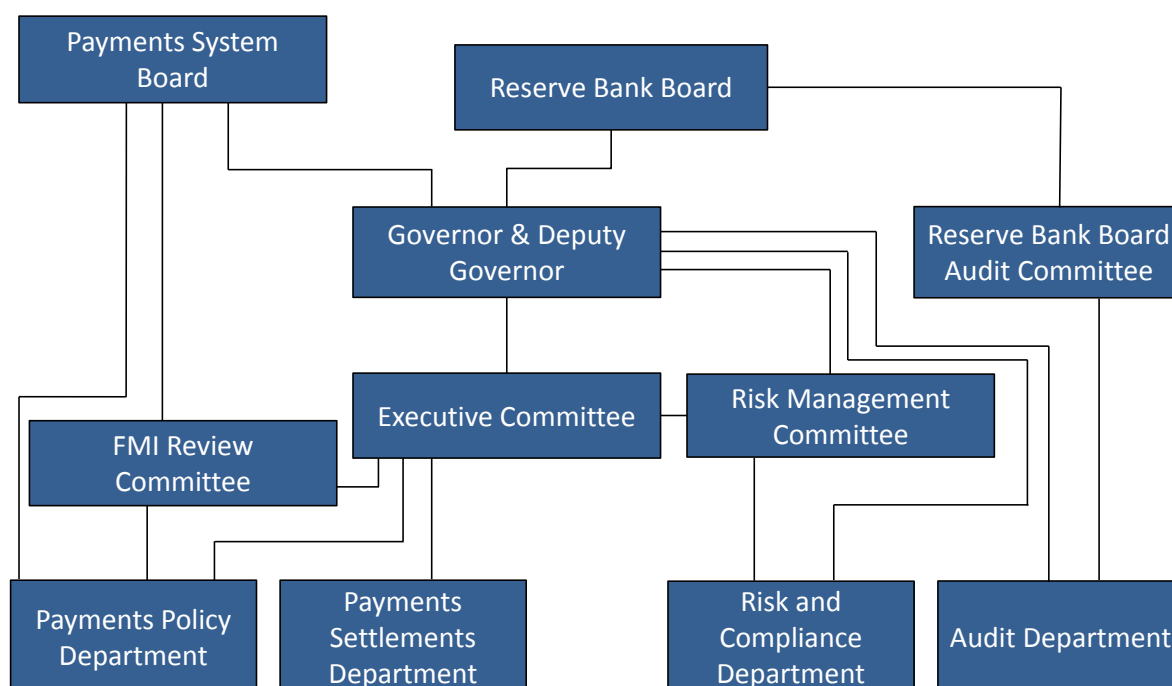
The governance structure as it applies to RITS is shown in Figure A.5. In accordance with the *Reserve Bank Act 1959*, the Governor is responsible for the management of the Bank, and is therefore ultimately responsible for the operation of RITS. The Governor is assisted and supported in this responsibility by the Executive Committee, which comprises the Bank's most senior executives. Day-to-day operations, liaison with members, and the ongoing development of RITS are delegated to the Bank's Payments Settlements Department.

RITS is also subject to oversight by the Bank's Payments Policy Department, within the policy framework for which the Payments System Board has ultimate responsibility.¹⁹ The Executive Committee has established an internal FMI Review Committee to govern oversight activities within this framework. This committee is chaired by the Assistant Governor (Financial System) and includes up to a further five senior members of Bank staff with relevant experience.

18 Available at <https://www.rba.gov.au/payments-and-infrastructure/rits/about.html>.

19 Payments Policy Department and Payments Settlements Department are separate departments in the Bank's organisational structure, with separate reporting lines up to and including the level of Assistant Governor.

Figure A.5: Reserve Bank Governance and Oversight Structure for Payments System Issues



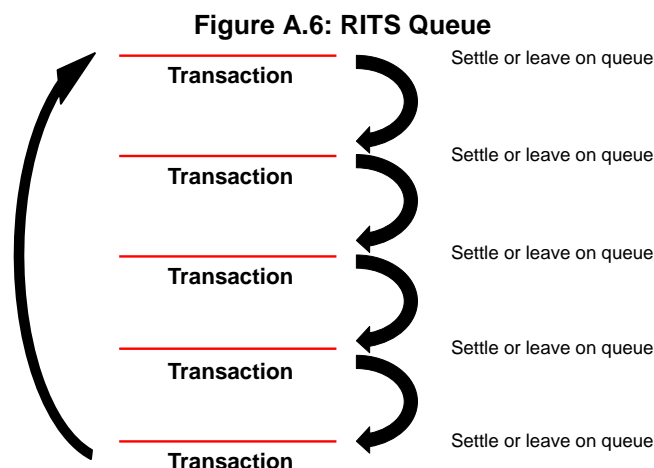
Source: RBA

A.4 Design Features

ESA funds are allocated between the core RITS service and the FSS. The RITS balance is used for funding high-value payments and multilaterally netted settlements. The FSS balance is used for funding the real-time settlement of consumer and business NPP payments. Members can control the use of liquidity within the system by setting parameters to automatically allocate ESA funds to or from the FSS (see Box B).

The core RITS system is designed to enhance efficiency in the use of liquidity within the system. Wholesale transactions in RITS are settled on a central queue. The RITS central queue uses a ‘next-down looping’ algorithm to continuously retest unsettled payments in order of submission (Figure A.6). If the transaction being tested for settlement cannot be settled individually using the RITS balance, the auto-offset algorithm searches for up to 10 offsetting transactions (based on the order of submission) between the pair of members and attempts to settle these simultaneously.²⁰ Members can also nominate specific offsetting payments to be settled simultaneously to assist in managing client credit constraints; this functionality is known as ‘targeted bilateral offset’.

²⁰ Payments will only trigger ‘auto-offset testing’ if they have been on the queue for at least one minute.



Source: RBA

Members have access to a range of real-time information in RITS to enable them to manage their liquidity efficiently and effectively. In particular, members have access to information on their current ESA balances, settled payments and receipts, queued inward and outward transactions, the value of first- and second-leg intraday repos, their projected end-of-day ESA balances, and their FSS balance and RITS/FSS allocation transfer facilities.

RITS also has features that allow members to efficiently manage and conserve liquidity. Members can use 'sub-limits', which they can change at any time during the settlement day, to reserve liquidity for priority payments. There are three payment statuses available to members, which determine how wholesale RITS individual transactions draw on liquidity:

- *Priority* payments are tested against the full RITS balance less funds reserved for property settlement.
- *Active* payment instructions are settled as long as the paying institution has sufficient funds in their RITS Balance above the sum of the member's specified sub-limit and any property settlement reservations.
- Payments with a *deferred* status are not tested for settlement until their status is amended.

This functionality can be accessed through either the RITS user interface or via SWIFT messages. Members can choose to change the payment status of each payment individually, or they can choose to automatically set the status of all payments of a particular type, above and below a member set threshold.²¹

A.5 Systems Linked to RITS

Wholesale RTGS payment instructions can be submitted to RITS directly as RITS cash transfers, or through two feeder systems: SWIFT Payment Delivery System (PDS) and Austraclear. The SWIFT PDS is a closed user group administered by the Australian Payments Network, which sets rules and procedures for clearing payments in Australia through its High Value Clearing System (HVCS).²² The

²¹ For example, a member may wish all small SWIFT transactions to be given an ESA Status of *priority* to allow them to settle quickly out of the priority tranche of ESA funds; transactions above the member-set threshold could be given a status of *active* to allow manual liquidity management for these transactions.

²² The Australian Payments Clearing Association became Australian Payments Network Ltd on 13 April 2017.

SWIFT PDS is used primarily to make customer and interbank payments, with interbank settlement occurring across ESAs in RITS. Austraclear transactions submitted to RITS for settlement generally represent the cash legs of debt security transactions, which are settled on a delivery-versus-payment model 1 basis.²³ Payment instructions that are not associated with the settlement of securities transactions may also be sent for settlement via the Austraclear system. Other FMI with ESAs (i.e. CLS, the ASX CCPs and LCH) use these feeder systems to settle Australian dollar obligations arising from the systems they operate.

RITS also facilitates the multilateral net settlement of interbank obligations arising from other systems (Table A.4). The settlement of obligations arising in the retail payment systems administered by the Australian Payments Network is facilitated by the Bank's LVSS in RITS.²⁴ All other multilateral net batches are administered by 'batch administrators' and entered into RITS through its batch feeder functionality.²⁵

Table A.4: List of Multilateral Net Batches in RITS

Linked system	Underlying transaction types	Governance and ownership
CHESS Batch	Primarily equity security transactions	The CHESS Batch is administered by ASX Settlement, which is owned by ASX Group. ASX Settlement is licensed as a clearing and settlement facility and is subject to the Bank's Financial Stability Standards for Securities Settlement Facilities.
Low Value Settlement Service	Cheque, DE (including the BPAY system) and card transactions	Each retail payment system has its own rules and procedures. These rules and procedures are determined by the system administrator (e.g. the Australian Payments Network), in consultation with its members.
MasterCard Batch	MasterCard brand credit and debit card payments	MasterCard is a privately owned company incorporated in the US and listed on the New York Stock Exchange.
PEXA Batches	Property transactions	PEXA is owned by the Victorian, New South Wales, Queensland and Western Australian governments, as well as a number of Australia's largest financial institutions.
eftpos Batch	eftpos brand debit card payments	The eftpos Batch is administered by the member-owned eftpos Payments Australia Limited.

A.6 Operating Hours

Standard settlement hours in the core RITS service, as established by the RITS Regulations, are 7.30 am to 10.00 pm.²⁶ Settlement of SWIFT and Austraclear transactions cease at 6.30 pm AEST and 8.30 pm during AEDT (the first Sunday in October to the first Sunday in April). RITS Sessions do not apply to the processing of transactions via the FSS, which takes place on a continuous 24/7 basis, with no allowable downtime for system changes.

²³ That is, the cash leg of the transaction is settled on a gross basis simultaneously with the transfer of the security.

²⁴ For more information on the LVSS, see [Box A: Developments in Retail Payments Settlement Arrangements](#), in the *2013 Self-Assessment of the Reserve Bank Information and Transfer System*.

²⁵ To ensure that a batch administrator can administer the batch in a safe and efficient manner, the Bank requires that it meets certain risk-based requirements. For more information, see <https://www.rba.gov.au/payments-and-infrastructure/rits/information-papers/eligibility-criteria-for-batch-administrator/>.

²⁶ During AEST, the 7.15 pm and 9.15 pm DE settlements occur after the close of the interbank cash market. However, during AEDT, Austraclear and SWIFT transactions continue to be settled until 8.30 pm, so only the last DE settlement occurs outside normal banking hours.

Prior to 9.15 am, settlement in RITS is limited to the deferred net obligations settled in the 9.00 am settlement process (during the 9.00 am processing session) (Figure A.7), and, before the 9.00 am settlement process, settlement of RITS cash transfers, interbank Austraclear transactions, obligations for the MasterCard batch and DE government clearings. Other payment instructions can be submitted to RITS during this time, but they are not tested for settlement until the daily settlement session commences at 9.15 am.

Figure A.7: The Core RITS Day



Source: RBA

There are also restrictions on the types of payments that can settle in the RITS evening settlement session. Only ‘evening agreed’ settlement participants, as defined in the RITS Regulations, can participate fully in the evening settlement session from 5.15 pm onwards.²⁷ Consequently, to allow the settlement of remaining queued transactions at the end of the day session there is a 45-minute settlement close session. At the end of the settlement close session at 5.15 pm, any remaining queued payments that are not flagged as being ‘evening eligible’ are removed from the queue.

A.7 Liquidity Provision

To facilitate the settlement of payments in RITS, the Bank provides liquidity to members at low cost via its Standing Facilities. Under these facilities, a member can enter into a repo with the Bank; a repo transfers outright title of eligible securities to the Bank (upon purchase of securities) in return for a credit to the member’s ESA, with an agreement to reverse the transaction at some point in the future. Standing facilities are available to any RITS member which is ‘approved’ by the Bank’s Domestic Markets department and settles its payments across its own ESA (for more information on eligibility criteria for OMOs and Standing Facilities see section A.9).

There are three types of repos that can be performed under the Bank’s Standing Facilities:

- *Intraday repos.* For these repos, both the sale and repurchase occur on the same day. They are provided free of charge (except for a small settlement transaction fee), but must be reversed before the settlement of Austraclear transactions ceases in RITS.
- *Overnight repos.* In the exceptional case that a member is unable to reverse an intraday repo by the end of the day, the transaction may, with the approval of the Bank, be converted to an overnight repo. Interest would then be charged at 25 basis points above the cash rate target.
- *Open repos.* This type of repo does not specify the date on which the transaction will be reversed. The member retains the liquidity for use on future days. Open repos help members meet their settlement obligations without having to actively manage their liquidity, particularly outside of normal banking hours. Open repos were introduced to facilitate the settlement of

²⁷ RITS members do not have to be evening agreed if they only participate in DE and property settlements after 5.15 pm.

evening DE payment obligations, the size of which are unknown prior to the close of the interbank cash market and Austraclear. They also support the settlement of NPP obligations arising in the FSS. For members that settle DE or NPP obligations across their own ESA, the Bank determines a minimum position in open repos that the member should maintain.²⁸ To the extent that these members retain matching funds against their open repo position (subject to an allowance for variations in ESA balances arising from settlement of DE and NPP obligations that occur outside of normal banking hours), those ESA balances are compensated at the cash rate target. However, to preserve the incentive for RITS members to remain active in the interbank cash market while it is open, ESA funds surplus to the ESA holder's open repo position (subject to the DE allowance) earn a rate 25 basis points below the cash rate target, while any shortfall in funds incurs a 25 basis point charge.

Members can also source liquidity through term repos and some outright transactions conducted in the Bank's OMOs. The overall amount of ESA funds available via these operations is set by the Bank to support the implementation of monetary policy. These transactions usually involve counterparties selling debt securities to the Bank either under repo or outright.

A.8 Credit Risk and Collateral

The Bank is not exposed to any credit risk from the settlement of wholesale payments in RITS, or from the settlement of NPP payments in the FSS. Wholesale payments in RITS are settled using funds in members' RITS Allocation and payments settled in the FSS use the member's FSS Allocation. Neither of these allocations can be overdrawn, and the Bank does not guarantee any transaction submitted for settlement in RITS or the FSS.

The Bank does, however, incur credit risk through the provision of liquidity to members through OMOs and Standing Facilities to support payments and settlement activity (for more information on OMOs and Standing Facilities see section A.7). It manages this credit risk by lending funds via purchase of securities under repo. Consequently, the Bank would only face a loss if a RITS member failed to repurchase securities sold under repo and the market value of the securities fell to less than the agreed repurchase amount. To manage this risk, the Bank purchases under repo only highly rated debt securities denominated in Australian dollars and lodged in Austraclear. All securities purchased under repo are conservatively valued, and subject to haircuts and daily margin maintenance.

To enter into a repo with the Bank, an entity must meet eligibility criteria. Counterparties must be: a RITS member and an Austraclear member (and the legal entity holding the Austraclear account must be identical to the legal entity that is a participant in RITS); subject to 'appropriate regulation' (for example, an entity regulated by APRA, or a clearing and settlement facility overseen by the Bank); and able to ensure efficient and timely settlement of transactions within Austraclear. To access the Bank's Standing Facilities, an approved counterparty must also settle its payments across its own ESA.²⁹

28 To limit the need for ESA holders to contract intraday repos on a regular basis, the Bank may agree to contract an amount of open repos (at the cash rate target) over and above the stipulated minimum position. This includes ESA holders that do not participate directly in the settlement of DE obligations in RITS. These maximum permitted positions in open repos are reviewed at least annually.

29 For more information on the Bank's counterparty eligibility criteria, see <https://www.rba.gov.au/mkt-operations/resources/tech-notes/eligible-counterparties.html>.

A.9 Access and Participation

Since settlement in RITS occurs using central bank money, only institutions that hold an ESA with the Bank can be settlement participants in RITS. Furthermore, since RITS is the only means of access to ESAs, all ESA holders must be RITS members and meet its operating conditions. The eligibility criteria to hold an ESA with the Bank therefore effectively represent the eligibility criteria for settlement participants in RITS. Policy on ESA eligibility is set by the Bank's Executive Committee, and is available on the Bank's website.³⁰ The policy has been designed to be fair and open, and to promote competition in the provision of payment services by allowing access to all providers of third-party payment services, irrespective of their institutional status. ADIs are eligible by default, because these institutions are assumed to provide third-party payment services as part of their business. Australian-licensed CCPs and securities settlement facilities (SSFs) with payment arrangements that require Australian dollar settlement are also eligible to hold an ESA.³¹ Only ESA holders which are also full participants or settlement participants as defined in the NPP Regulations are eligible to settle NPP payments in the FSS.

The ESA eligibility policy sets a number of risk-based participation requirements, including around operational capacity and access to liquidity. These are designed to reduce the likelihood that an individual member experiences an operational or financial shock that could disrupt the system more broadly. The application of participation requirements aims to be proportional to a prospective member's expected payments business in RITS. To reduce the operational burden on smaller RITS members, ADIs with aggregate outgoing RTGS transactions of less than 0.25 per cent of the total value of wholesale RTGS transactions may use an agent to settle their RITS transactions, rather than settling directly across their own ESAs. Payments settled on an RTGS basis through the FSS are not included in the calculation of the 0.25 per cent threshold.

The Bank's ESA policy limits the scope for material risks to arise from tiered participation arrangements. Since only ADIs individually accounting for less than 0.25 per cent of the total value of wholesale RTGS transactions may settle through an agent, no individual indirect member would be expected to pose material risk to either its agent or the system more broadly. Further, to reduce dependence on its agent, a member that participates indirectly has the option of maintaining an ESA for contingency purposes (see Section 3.3.1). To ensure that RITS has sufficient information about indirect participation, agents acting for ADIs that participate indirectly will be required to report the value and volume of their ADI client's outgoing RTGS payments to the Bank on a quarterly basis. This information will be used to monitor compliance with the 0.25 per cent threshold.

30 The *ESA Policy* is available at <https://www.rba.gov.au/payments-and-infrastructure/esa/>.

31 Under the Bank's *Financial Stability Standards for Central Counterparties* a CCP that the Bank determines to be systemically important in Australia and has Australian dollar obligations is required to settle its Australian dollar obligations across its own ESA or that of a related body corporate acceptable to the Bank.

Appendix B: Detailed Assessment of the Reserve Bank Information and Transfer System

This appendix sets out the detailed assessment of how well RITS observed the Principles developed by CPMI and IOSCO as at the end of March 2018. The Assessment focuses on RITS's role as a wholesale RTGS system; in respect of the FSS, only the interaction with the core (wholesale) RITS system is assessed (see section 2 for more information on the assessment scope). This Assessment was produced by the Bank's Payments Policy Department, which is the functional area responsible for oversight of the payments system, drawing on information provided by the Bank's Payments Settlements Department, which is the functional area responsible for operating RITS. The conclusions have been endorsed by the Payments System Board. In its assessment, Payments Policy Department has applied the rating system used in the CPMI-IOSCO Disclosure Framework. Under this framework, observance of each of the applicable Principles is rated according to the following scale:

- *Observed* – Any identified gaps and shortcomings are not issues of concern and are minor, manageable and of a nature that the FMI could consider taking them up in the normal course of its business.
- *Broadly observed* – The assessment has identified one or more issues of concern that the FMI should address and follow up on in a defined time line.
- *Partly observed* – The assessment has identified one or more issues of concern that could become serious if not addressed promptly. The FMI should accord a high priority to addressing these issues.
- *Not observed* – The assessment has identified one or more serious issues of concern that warrant immediate action. Therefore, the FMI should accord the highest priority to addressing these issues.
- *Not applicable* – The standard does not apply to the type of FMI being assessed because of the particular legal, institutional, structural or other characteristics of the FMI.

The ratings of RITS against the relevant Principles are supplemented by detailed information under each key consideration that is relevant to the assessment. In assessing RITS, Payments Policy Department has relied on guidance on the *Application of the Principles for Financial Market Infrastructures to Central Bank FMIs* published by CPMI and IOSCO in August 2015.³²

Note: Principles 6 (margin), 10 (physical deliveries), 11 (central securities depositories), 14 (segregation and portability), 20 (FMI links) and 24 (disclosure of market data by trade repositories) are not applicable to systemically important payment systems and have therefore been omitted.

³² See CPMI-IOSCO (2015), *Application of the Principles for financial market infrastructures to central bank FMIs*, August. Available at <http://www.bis.org/cpmi/publ/d130.pdf>.

1. Legal basis

A payment system should have a well-founded, clear, transparent and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.

Rating: Observed

1.1 The legal basis should provide a high degree of certainty for each material aspect of a payment system's activities in all relevant jurisdictions.

RITS is owned and operated by the Bank. The legal basis of all key aspects of RITS is set out in the RITS Regulations, which cover the operation of RITS, and the rights and obligations of members and the Bank. Standard agreements are executed to bind each member to the RITS Regulations. In addition to the RITS Regulations, the following key aspects of RITS activities are supported by Australian legislation and additional contractual arrangements.

RTGS feeder systems

RITS accepts settlement instructions from approved feeder systems. Admission as a feeder system is by specific reference in the RITS Regulations. The RTGS feeder systems are the SWIFT PDS, Austraclear, CHES RTGS and NPP.³³ The SWIFT PDS is administered by Australian Payments Network (AusPayNet) under its HVCS. The Bank and AusPayNet each have contractual arrangements with SWIFT covering the SWIFT PDS. The Austraclear and CHES RTGS feeder systems are operated by Austraclear and ASX Settlement, respectively. Both entities are wholly owned subsidiaries of ASX Limited. The Bank has separate contractual arrangements with Austraclear and ASX Settlement covering these feeder systems. The NPP feeder system is operated by New Payments Platform Australia Limited (NPPA) and is covered under a contractual arrangement between the Bank and NPPA.

Settlement finality

The RITS Regulations state that settlement is final when the ESAs of the paying and receiving members in RITS are simultaneously debited and credited, respectively. The irrevocability of payments settled in RITS is protected by RITS's approval as an RTGS system under Part 2 of the *Payment Systems and Netting Act 1998* (PSNA). With this approval, a payment executed in RITS at any time on the day on which a RITS member enters external administration has the same standing as if the member had gone into external administration on the next day (in the case of a winding up) or as if the member had not gone into external administration (in the case of other forms of external administration). Accordingly, in the event of insolvency all transactions settled on the day of the insolvency are irrevocable and cannot be unwound simply because of the event of external administration (i.e. they are protected from the 'zero-hour' rule). The PSNA also, amongst other things, clarifies that resolution of a financial institution is a form of non-terminal administration, and that a payment executed in RITS when a member has gone into non-terminal administration has the same effect it would have had if the member had not gone into non-terminal administration.

³³ The CHES RTGS feeder system provides for the delivery-versus-payment model 1 settlement of equities transactions executed on ASX. This system is currently not used.

The irrevocability of settled transactions originating from the Austraclear and CHESST RTGS feeder systems is supported by their respective approvals as RTGS systems under Part 2 of the PSNA.

Netting arrangements

In the unlikely event that RITS is unavailable for a significant period of time, payments arising from Austraclear and the SWIFT PDS can be settled using 'fallback arrangements'. These arrangements involve the multilateral netting and settlement of transactions arising from those systems. The irrevocability of settlement under these fallback arrangements is supported by the approval of Austraclear and HVCS as netting arrangements under Part 3 of the PSNA. The approval of HVCS establishes the legal basis for the netting of SWIFT PDS payments.

While RITS is primarily an RTGS system, it also provides for the final settlement of net obligations arising in other payment and settlement systems. This is either through the LVSS or the batch feeder functionality.³⁴ RITS's approval under Part 2 of the PSNA does not ensure the legal certainty of the netting of the underlying obligations. Nevertheless, the majority of the value of obligations settled in these multilaterally netted batches originates from the Australian Payments Network clearing streams and transactions settled in the eftpos and CHESST batches, which are approved netting arrangements under Part 3 of the PSNA.

Enforceability of repurchase agreements

The enforceability of repos in the event of a default also requires a high degree of legal certainty. Repos with the Bank are governed by an international standard agreement – Securities Industry and Financial Markets Association (SIFMA)/International Capital Market Association (ICMA) Global Master Repurchase Agreement (GMRA) (2011 version) – as amended by an annexure to the RITS Regulations. This agreement sets out, among other things, what constitutes default and the consequential rights and obligations of the parties. In the event of a default, the agreement allows the non-defaulting party to terminate the agreement, calculating the net obligation based on the prevailing market value at the time the contract is closed out. Close-out netting provisions included in repo contracts with RITS members provide for the immediate liquidation of collateral in the event of default. This right is supported by Part 4 of the PSNA.

1.2 A payment system should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.

To facilitate a clear understanding of RITS rules and procedures, the RITS Regulations are supplemented by user guides and other documentation that explain RITS requirements and functions. This material facilitates existing and prospective members' understanding of the RITS Regulations and the risks they face by participating in RITS. The Bank completed a major restructure and rewrite of the RITS Regulations, to implement a 'plain-English' drafting style and remove redundant concepts and terminology, which came into effect on 27 March 2017. In conjunction with this, RITS members were required to execute a new, simplified, RITS Membership Agreement. The RITS Regulations were further updated to incorporate provisions relating to the FSS from November 2017.

34 A small number of obligations sent through LVSS are settled on a gross basis.

The Bank seeks external legal advice on material amendments to the RITS Regulations and associated contractual agreements, including, where relevant, on the interaction of such amendments with Australian and New South Wales laws and regulations.

1.3 A payment system should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant, participants' customers, in a clear and understandable way.

At a high level, the legal basis for RITS is articulated in a clear and understandable manner on the Bank's website and the RITS Information Facility.³⁵

1.4 A payment system should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the payment system under such rules and procedures will not be voided, reversed, or subject to stays.

To ensure that the RITS Regulations and associated contractual agreements are enforceable, the Bank seeks external legal advice on material amendments to these documents.

There have been no court cases that have tested the RITS legal framework.

1.5 A payment system conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.

The RITS Regulations are governed by New South Wales law and require that all members submit to the non-exclusive jurisdiction of the courts of New South Wales. Since 2011, the Bank has required foreign RITS applicants to provide a legal opinion affirming that the RITS membership legal documents constitute valid, legally binding and enforceable obligations.³⁶ This opinion must cover whether the courts in the home jurisdiction of the applicant will give effect to the choice of New South Wales law as the governing law and whether the judgement of an Australian court would be enforceable in the home jurisdiction without retrial or re-examination. The Bank sought legal opinions from foreign members subsequent to executing the new RITS Membership Agreement in early 2017, and is reviewing the legal opinions that have been provided.

2. Governance

A payment system should have governance arrangements that are clear and transparent, promote the safety and efficiency of the payment system, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.

Rating: Observed

Note: In line with the CPMI-IOSCO guidance on the Application of the Principles to Central Bank FMIs, as RITS is operated as an internal function of the Bank, Key Consideration 2.3 and 2.4 are not intended to constrain the composition of the Bank's governing body or that body's roles and responsibilities.

35 See <https://www.rba.gov.au/payments-and-infrastructure/rits/legal-framework.html>.

36 For further details on the scope of the legal opinion, see https://www.rba.gov.au/rits/info/pdf/Signing_Instructions.pdf.

2.1 A payment system should have objectives that place a high priority on the safety and efficiency of the payment system and explicitly support financial stability and other relevant public interest considerations.

RITS is owned and operated by the Bank. The high-level objectives of the Bank are set out in the *Reserve Bank Act 1959*. The Bank's duty is to contribute to the stability of the currency, maintenance of full employment, and the economic prosperity and welfare of the Australian people. Stability of the financial system is also a longstanding responsibility of the Bank – a mandate confirmed by the Australian Government when it introduced significant changes to Australia's financial regulatory structure in July 1998.³⁷

The Bank's website states its specific objectives in relation to its operation of RITS.³⁸ In particular, the Bank's objective in developing and operating RITS is to provide the infrastructure through which settlement obligations arising from the exchange of high-value payments and debt securities settlements can be extinguished in a safe and efficient manner. The design of RITS ensures that there is no build-up of settlement exposures associated with high-value transactions, which in turn promotes the stability of Australia's financial system. Reflecting the critical importance of RITS to the Australian financial system, the Bank aims to operate RITS at an extremely high standard of availability and resilience, and to ensure that its settlement services continue to evolve to meet the changing needs of the broader payments system.

Decisions concerning the operation of RITS and ESAs are required to be consistent with the policy environment determined by Payments Policy Department, which under the governance of the Payments System Board carries out oversight of RITS and supervision of clearing and settlement facilities licensed in Australia. The broad mandate of the Payments System Board, which is set out in the Reserve Bank Act, places a high priority on the safety and the efficiency of the wider Australian payments system.³⁹

2.2 A payment system should have documented governance arrangements that provide clear and direct lines of responsibility and accountability. These arrangements should be disclosed to owners, relevant authorities, participants, and, at a more general level, the public.

Since it is not operated as a separate entity, the management and operation of RITS fall under the governance structure of the Bank, and are subject to the Bank's normal oversight, decision-making and audit processes. The Bank has clear and transparent governance arrangements. Information on the Bank's governance arrangements for RITS is documented on the Bank's website and described in section A.3.⁴⁰

The Bank's governance arrangements reflect relevant provisions of the Reserve Bank Act and the *Public Governance, Performance and Accountability Act 2013*. In accordance with the Reserve Bank Act, the Governor is responsible for the management of the Bank and is

37 Information on the role of the Bank in maintaining financial stability is available at <https://www.rba.gov.au/fin-stability/reg-framework/role-of-the-reserve-bank-in-maintaining-financial-stability.html>.

38 Information on the Bank's objectives in relation to its operation of RITS is available at <https://www.rba.gov.au/payments-and-infrastructure/riits/about.html>.

39 Information on the Payments System Board is available at <https://www.rba.gov.au/about-rba/boards/psb-board.html>.

40 A summary of the governance arrangements of the Bank is available at <https://www.rba.gov.au/about-rba/governance.html>.

therefore ultimately responsible for the operation of RITS. In fulfilling his responsibilities to manage the Bank under the Reserve Bank Act and as the accountable authority under the Public Governance, Performance and Accountability Act, the Governor is assisted and supported by the Executive Committee, which is comprised of the Bank's most senior executives. The Executive Committee is the key decision-making committee of the Bank for matters of an administrative and management nature that have strategic, Bank-wide or external significance. Accordingly, major decisions related to RITS are considered by the Executive Committee.

Decisions affecting the day-to-day operations, customer relations and development of RITS have been delegated to the Bank's Payments Settlements Department. Payments Settlements Department is part of the Bank's Business Services Group, which is headed by an Assistant Governor who reports to the Governor and Deputy Governor. Clear internal procedures are in place to elevate day-to-day operational matters within Payments Settlements Department and other areas of the Bank, as appropriate.

Oversight of RITS is carried out by the Bank's Payments Policy Department, within the policy framework for which the Payments System Board has ultimate responsibility. Payments Policy Department is separate from Payments Settlements Department in the Bank's organisational structure, with separate reporting lines up to and including the level of Assistant Governor. The two departments nevertheless meet regularly to discuss policy issues and operational developments, and the Payments System Board is periodically updated on relevant developments.

As an independent central bank and statutory body, the Bank is ultimately accountable to the Parliament of Australia. Since 1996, the Governor and senior officers of the Bank have appeared twice yearly before the House of Representatives Standing Committee on Economics to report on matters under the responsibility of the Bank. The Reserve Bank Act also requires that the Bank inform the Australian Government of its policies 'from time to time'. In addition, to fulfil its obligations under the Public Governance, Performance and Accountability Act, the Bank prepares an annual report for presentation to the Treasurer and tabling in the Parliament.⁴¹

2.3 The roles and responsibilities of a payment system's board of directors (or equivalent) should be clearly specified, and there should be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest. The board should review both its overall performance and the performance of its individual board members regularly.

As described in Key Consideration 2.2, the Governor, with assistance from the Executive Committee, is ultimately responsible for the management of the Bank, including the operation of RITS. The roles and responsibilities of the Governor are set out in the Reserve Bank Act and the Public Governance, Performance and Accountability Act. The role of the Executive Committee is set out in its terms of reference.

In recognition of the Governor's responsibility for maintaining a reputation for integrity and propriety on the part of the Bank, the Governor and other members of the Executive

41 The 2017 *Reserve Bank of Australia Annual Report* is available at <https://www.rba.gov.au/publications/annual-reports/rba/index.html>.

Committee are subject to the Code of Conduct for Reserve Bank Staff, which places a high priority on integrity and has provisions that address potential conflicts of interest. Specific Bank policies deal with potential conflicts of interest arising from the Bank's roles as the principal regulator of the payments system and as provider of banking services to the Australian Government.⁴²

2.4 The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s).

Under the terms of the Reserve Bank Act, the Governor is appointed by the Treasurer. Since RITS is owned by the Bank, and is not operated as a separate legal entity, the skills and qualifications of the Governor are determined in accordance with the Bank's broader responsibilities. The Bank has human resources policies in place to help ensure that senior staff, including members of the Executive Committee, have the appropriate skills and incentives. These policies are described in Key Consideration 2.5.

2.5 The roles and responsibilities of management should be clearly specified. A payment system's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the payment system.

The roles and responsibilities of the management responsible for the day-to-day operation of RITS are clearly documented in position descriptions.

The Bank has human resources policies in place to help ensure that management positions are filled with employees with the appropriate skills, incentives, experience and integrity to perform their duties. The Bank has formal performance management arrangements, which help to clarify the expectations of supervisors and employees and ensure that timely feedback is provided. Recruitment and selection at the Bank is based on the principles of being merit-based, fair, objective and open, and consistent with diversity and inclusion. It is based on the suitability of an applicant to carry out the specific requirements of the position to be filled, having regard to the applicant's ability to perform the duties of the position, relevant experience, relevant training and qualifications, and willingness to meet any particular requirement specified in the position description. Bank staff are subject to the Code of Conduct for Reserve Bank Staff (see Key Consideration 2.3).

The Bank also aims to offer remuneration packages that attract employees able to perform their duties to a high standard. To this end, remuneration for each role is benchmarked against equivalent roles in the market to ensure that remuneration policies are consistent with market practice. The Remuneration Committee of the Reserve Bank Board is kept informed of the remuneration arrangements for Bank staff.

2.6 The board should establish a clear, documented, risk-management framework that includes the payment system's risk tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance

42 These are set out in the document *Managing Potential Conflicts of Interest arising from the Bank's Commercial Activities*, available at <https://www.rba.gov.au/payments-and-infrastructure/payments-system-regulation/conflict-of-interest.html>.

arrangements should ensure that the risk-management and internal control functions have sufficient authority, independence, resources, and access to the board.

The Bank has a well-established risk management framework that facilitates the identification, assessment and treatment of all risks – including those arising from its operation of RITS – at both an enterprise ('top-down') and business ('bottom-up') level. Risk management is seen as an integral part of the management function in the Bank. Line managers have the responsibility to evaluate their risk environment, put in place appropriate controls and monitor the effectiveness of these controls. Management is supported in this role through the development and maintenance of a culture that acknowledges the need for careful analysis and management of risk in all business processes.

The Bank's risk management framework is set out at a high level in the Bank's Risk Management Policy.⁴³ Risks associated with monetary and payments policies are the direct responsibility of the Reserve Bank Board and the Payments System Board, respectively. These Boards review management of risks annually as part of their decision-making processes. The Risk Management Policy is complemented by a Risk Appetite Statement, which provides an outline of the Bank's appetite for and approach to managing its most significant risks, including strategic, financial, people and operational risks. The Risk Appetite Statement is published on the Bank's website.⁴⁴

The risk management framework, including the Risk Management Policy and Risk Appetite Statement, is governed by the Risk Management Committee, in accordance with the Risk Management Committee Charter. This Committee consists of members of the executive team who are responsible for the Bank's operational areas or key support functions. It is chaired by the Deputy Governor and comprises: the Assistant Governors for Business Services, Corporate Services and Financial Markets; the Chief Financial Officer; the Chief Information Officer; the Heads of Audit Department, Human Resources Department, Information Department and Risk and Compliance Department; and the General Counsel. The Risk Management Committee meets six times a year, or more frequently if required, and reports on its activities to both the Executive Committee and the Reserve Bank Board Audit Committee.

The Risk Management Committee is assisted in its responsibilities by Risk and Compliance Department, whose main role is to assist individual business areas to manage their risk environment within a broadly consistent framework. Risk and Compliance Department also monitors and reports on portfolio risks and compliance with respect to the Bank's operations in financial markets, and provides support to business areas in the implementation of fraud control, business continuity and compliance management. The Head of Risk and Compliance Department reports directly to the Deputy Governor.

Audit Department also supports the framework for managing risk, complementing but remaining separate from the work of Risk and Compliance Department. In addition to providing assurance that the Bank's risk management policies are effective, Audit Department has a separate, independent mandate to test the adequacy of procedures and controls at all levels of the Bank. The Head of Audit Department reports to the Deputy Governor and the Reserve Bank Board Audit Committee.

43 This policy is available at <https://www.rba.gov.au/about-rba/our-policies/risk-management-policy.html>.

44 This policy is available at <https://www.rba.gov.au/about-rba/our-policies/risk-appetite-statement.html>.

Crisis and emergencies

In circumstances including a significant disruption to the Bank's operations that affects several business areas, the Governor may delegate responsibility for coordination of the Bank's response, either to the Bank's Crisis Management Group or an individual. The Crisis Management Group's membership is composed of the Governor (leader); the Deputy Governor (alternate leader); other members of the Executive Committee, the Heads of Risk and Compliance, Facilities Management, the Chief Information Officer and Senior Manager (Communications Division, Secretary's Department). The Chief Warden may also attend. The Crisis Management Group responds to crises and emergencies in accordance with the Bank's Incident Management Framework.

Payments Settlements Department also maintains plans that address decision making in crises and emergencies. These plans cover operational disruptions (see Principle 17) and the default of a RITS member (see Principle 13). The plans are required to set out how Payments Settlements Department would communicate with the Crisis Management Group during a disruption.

- 2.7 The board should ensure that the payment system design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public.**

The Bank's governance arrangements ensure accountability and transparency to RITS members and other relevant parties. To ensure the interests of relevant stakeholders are taken into account, the Bank engages in routine liaison with members and consults on all material changes to operational arrangements (see Principle 21). All decisions affecting the operation of RITS are advised to members. Policy decisions that affect RITS are also communicated to the public through media releases. Major decisions and the reasons for them are also explained in the Reserve Bank Annual Report and, if relevant, the Payments System Board Annual Report.

3. Framework for the comprehensive management of risks

A payment system should have a sound risk management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.

Rating: Observed

Note: In line with the CPMI-IOSCO guidance on the Application of the Principles for Financial Market Infrastructures to Central Bank FMIs, since RITS is owned and operated by the Bank as one of the services which the Bank has undertaken to provide, the Bank's ability to ensure continuity of operations of the FMI as necessary in extreme financial circumstances means that the requirements to prepare recovery and orderly wind-down plans do not apply. In addition, since intervention by a resolution authority is not relevant, requirements to support resolution planning or intervention by a resolution authority in the operation or ownership of the FMI do not apply. Accordingly, the Bank has not assessed RITS against Key Consideration 3.4.

- 3.1 A payment system should have risk-management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are**

borne by the payment system. Risk management frameworks should be subject to periodic review.

The Bank's risk management framework is set out under Key Consideration 2.6. Under this framework, Payments Settlements Department is required to identify all of the risks that might impact its ability to operate RITS in a safe and efficient manner in a single Risk Register. Risks are categorised at a high level into strategic, credit, liquidity and operational risks, and further sub categorised into more detailed risk groups (e.g. legal and information technology risks are sub categories of operational risk). For each risk that has been identified, Payments Settlements Department sets out the potential impact and probability of the risk occurring, and also identifies existing controls and mitigation strategies (including contingency plans) to reduce the likelihood and/or impact of the risk crystallising. Where a risk is co-managed by another business area – for example, some RITS operational controls are implemented by the Bank's Information Technology Department – this must be acknowledged by the other business area.

The Bank's Risk Management Policy requires that Payments Settlements Department reviews and updates its risk register annually and, after any major change to the Department's risk environment, to reflect any changes in risks and controls that have occurred. As part of this process, any residual risks identified in the Risk Register that are outside of the Department's risk appetite or agreed tolerance levels must be appropriately escalated. The Department's risk appetite must be consistent with the Bank's Risk Appetite Statement.

3.2 A payment system should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the payment system.

Given the design of RITS, members do not pose liquidity or credit risks to the Bank as operator of RITS (see Principles 4 and 7). RITS membership requirements aim to reduce the likelihood that an individual member would disrupt the operation of RITS. If a member does not meet these membership requirements, the Bank may apply sanctions to, or impose additional requirements on, that member (see Principle 18).

3.3 A payment system should regularly review the material risks it bears from and poses to other entities (such as other FMIs, settlement banks, liquidity providers, and service providers) as a result of interdependencies and develop appropriate risk-management tools to address these risks.

The Bank, in operating RITS, reviews the material risks that it bears from and poses to other entities. This is done in the context of its ongoing review of risks (such as the annual update of its Risk Register), and its processes for identifying risks associated with major changes to its risk environment, such as new activities or system changes. This is also part of the Bank's change management framework (see Key Consideration 17.1). The tools used to manage risks from other entities include service level agreements, customer support packages and documented operational and contingency procedures (see Key Consideration 17.7).

4. Credit

A payment system should effectively measure, monitor, and manage its credit exposures to participants and those arising from its payment, clearing, and settlement processes. A payment system should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence.

Rating: Observed

Note: Key Considerations 4.4, 4.5 and 4.6 do not apply to RITS as it is not a CCP. Consistent with the CPMI-IOSCO guidance on the Application of the Principles to Central Bank FMI, this Principle should not constrain the Bank's policies on the provision of credit, or the terms of or limits on such provision.

4.1 A payment system should establish a robust framework to manage its credit exposures to its participants and the credit risks arising from its payment, clearing, and settlement processes. Credit exposure may arise from current exposures, potential future exposures, or both.

The Bank is not exposed to credit risk in its role as operator of RITS. Payments in RITS are settled using funds in members' ESAs, which cannot be overdrawn, and the Bank does not guarantee any transaction submitted for settlement in RITS. Accordingly, in the event of a member default the Bank would not be exposed to a loss in its role as operator of RITS.

The Bank does, however, incur credit risk in the provision of liquidity to approved RITS members under its Standing Facilities to support payments activity (see Appendix A, section A.7 for more information on these facilities). This risk is primarily managed by purchasing securities under repo, in accordance with the Bank's risk management framework. The Bank also manages the credit risk arising from its Standing Facilities by restricting the counterparties that it enters into a repo with. In particular, to access the Bank's Standing Facilities, a RITS member must be an ESA holder, a member of Austraclear, subject to an appropriate level of regulation, and able to ensure efficient and timely settlement of transactions within the Austraclear system.

Under the Bank's risk management framework, responsibility for approving and reviewing collateral eligibility lies with the Domestic Markets Department, with oversight from the Risk Management Committee. The policies, procedures and controls implemented to mitigate credit risk are subject to audit by Audit Department. The Bank's risk management framework is reviewed annually (see Key Consideration 2.6 for further detail on the Bank's risk management framework).

The RTGS mode of settling wholesale payments in RITS is also designed to ensure that unintended credit risks do not accumulate between members during the settlement process. For payments using the SWIFT PDS, transactions are settled across ESAs in RITS prior to the payment messages being sent to the receiving member. Austraclear transactions submitted to RITS for settlement generally represent the cash legs of debt security transactions, which are settled on a delivery-versus-payment model 1 basis to mitigate the credit risk associated with the settlement process. Since RITS cash transfers are payments between two ESA holders unintended credit risk would not arise.

4.2 A payment system should identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk-management tools to control these risks.

Under the Bank's risk management framework, Domestic Markets Department has responsibility for identifying and managing the credit risks that arise from its activities. For each credit risk identified, Domestic Markets Department sets out the potential impact and probability of the credit risk crystallising, and, where possible, the existing controls and mitigation strategies. These controls are reviewed and signed off by management annually, or when there are material changes to the Bank's risk environment.

The Bank incurs credit risk in the provision of liquidity to approved RITS members under repo. This credit risk is mitigated by purchasing only high-quality securities, applying appropriate haircuts to the securities, and maintaining mark-to-market margin on a daily basis (see Principle 5). Membership requirements in RITS also help to reduce the probability of a member default (see Principle 18). The Bank monitors the liquidity it provides to approved RITS members and the composition of securities that it holds on a daily basis. This information is readily available via summary reports produced by the Bank's trade entry and collateral management system (see Key Consideration 5.6).

- 4.3 A payment system should cover its current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (see Principle 5 on collateral). In the case of a deferred net settlement payment system in which there is no settlement guarantee but where its participants face credit exposures arising from its payment, clearing, and settlement processes, such a payment system should maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.**

The credit risk assumed by the Bank in providing liquidity to RITS members is mitigated by purchasing high-quality securities under repo, which could be closed out immediately upon default of the repo counterparty. The Bank also faces a potential future loss, which would crystallise in the event that a member defaulted and the market value of collateral securities fell below the amount of credit provided under repo. This risk is mitigated by applying a haircut to the securities, calibrated to cover the maximum expected decline in the market price of the securities, over a conservative liquidation horizon, at a high level of confidence. The Bank also maintains mark-to-market margin on a daily basis to ensure that the price changes on the previous day do not erode the value of the securities it holds (see Principle 5 for further detail on eligible securities, haircuts and mark-to-market margin maintenance).

RITS is not a deferred net settlement payment system and accordingly the requirement to maintain sufficient resources to cover the exposures of the two members and their affiliates that would create the largest aggregate credit exposure in the system does not apply.

- 4.7 A payment system should establish explicit rules and procedures that address fully any credit losses it may face as a result of any individual or combined default among its participants with respect to any of their obligations to the payment system. These rules and procedures should address how potentially uncovered credit losses would be allocated, including the repayment of any funds a payment system may borrow from liquidity providers. These rules and procedures should also indicate the payment system's process to replenish any financial resources that the payment system may employ during a stress event, so that the payment system can continue to operate in a safe and sound manner.**

As explained under Key Consideration 4.1, in the event of a member default the Bank would not be exposed to a loss in its role as operator of RITS. Nevertheless, the Bank maintains internal procedures that set out the course of action it would take after a member default (see Principle 13).

5. Collateral

A payment system that requires collateral to manage its or its participants' credit exposure should accept collateral with low credit, liquidity, and market risks. A payment system should also set and enforce appropriately conservative haircuts and concentration limits.

Rating: Observed

Note: Consistent with the CPMI-IOSCO guidance on the Application of the Principles to Central Bank FMIs, this Principle should not constrain the Bank's policies on what it accepts as eligible collateral in its lending operations.

5.1 A payment system should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks.

The Bank provides liquidity to approved RITS members via OMOs and via its Standing Facilities. Under the Standing Facilities, a bank can enter into a repo with the Bank, exchanging outright title to eligible securities in return for the credit of funds in its ESA with an agreement to reverse the transaction before the end of the day (intraday repo) or on an 'open' basis if permitted by the Bank (see Appendix A, section A.7 for more information on the Standing Facilities available). Eligible members can also source liquidity by participating in the Bank's daily OMOs, which are aimed at providing sufficient liquidity in the overnight interbank market so as to maintain the cash rate at its target. These transactions usually involve counterparties selling debt securities to the Bank either under term repo or outright.⁴⁵

The Bank only purchases highly rated debt securities denominated in Australian dollars under repo. This policy applies to all of the Bank's domestic operations, irrespective of whether the repos are contracted under the Bank's Standing Facilities or in OMOs. The policy is made publicly available on the Bank's website and is reviewed from time-to-time.⁴⁶ Eligible securities are generally restricted to highly liquid securities issued by entities with high credit quality, including those issued by: the Australian Government; the central borrowing authorities of the state and territory governments (semi-government securities); certain supranational organisations, foreign governments and government agencies with an explicit government guarantee; investment grade ADIs; and the senior AAA-rated tranches of approved asset-backed securities (ABS).

In addition, all securities must meet the following criteria:

- The security must be denominated in Australian dollars.
- The security must be lodged and active in Austraclear (the Australian central securities depository) at the time of settlement of an agreed transaction with the Bank.

45 Outright sales to the Bank are limited to Australian government securities with a residual maturity of less than 18 months.

46 The policy is available at <https://www.rba.gov.au/mkt-operations/resources/tech-notes/eligible-securities.html>.

- Securities accepted as collateral must generally meet a minimum credit rating.⁴⁷
- ABS must be tradeable in the secondary market and must be based on a true sale of assets into a bankruptcy-remote special purpose vehicle.
- Securities sold to the Bank under a repo must not enter the ‘closed period to maturity’ during the term of the repo.

The Bank does not accept what it deems to be highly structured securities, such as collateralised debt obligations backed by other ABS.

Australian Government and semi-government securities are automatically eligible collateral. All other securities are subject to an initial approval process. The Bank will not purchase securities under repo until the approval process for eligibility is complete and the securities are added to the Bank’s list of eligible securities.⁴⁸

In order to assess the eligibility of the security, the minimum credit rating assigned to a security or its issuer by any of the major rating agencies will be used (except certain credit-enhanced securities such as covered bonds). For ADI-issued securities with a residual maturity greater than one year, at least two major credit rating agencies must rate the security or the issuer. For covered bonds issued by ADIs, where two or more security ratings are available, only the ratings on the security will be considered. If two security ratings are not available for ADI-issued covered bonds, the minimum issuer rating will also be considered.

The Bank routinely monitors events such as credit downgrades to ensure that its list of eligible collateral remains current. If a particular collateral security is no longer eligible, counterparties to the Bank with outstanding repos collateralised with that security are required, on a same-day basis, to substitute eligible collateral.

To enhance its risk management of ABS, the Bank requires the issuers of these securities (or their appointed information providers) to provide more detailed information in order for these securities to be eligible for repo with the Bank.⁴⁹ The criteria mitigate risks arising from the Bank’s potential exposure to ABS under its Standing Facilities. This contingent exposure increased significantly following the implementation of open repos and the Committed Liquidity Facility. The additional information, which must be kept up to date, covers both transaction-related data as well as information on the underlying assets (i.e. loan-level data).

Wrong-way risk

To mitigate wrong-way risk in its operations, the Bank will not purchase securities from an approved RITS member it considers to be materially related to the credit quality of the security. Where applicable, the Bank’s list of eligible securities identifies those counterparties considered to be related to specific securities. The Bank considers a material relationship to exist when the entities are members of the same corporate group, or where one entity has an ownership stake in another entity that exceeds 15 per cent.

47 This requirement does not apply to Commonwealth government securities, semi government securities, securities with an Australian government guarantee or securities issued and/or guaranteed by the New Zealand government.

48 The current list of eligible securities is available at <https://www.rba.gov.au/mkt-operations/xls/eligible-securities.xls>.

49 More information on this initiative is available at <https://www.rba.gov.au/securitisations/>.

Upon request by a member for a related-party exemption, the Bank may purchase certain related-party ABS under repo through its Standing Facilities. However, these securities are subject to an additional haircut and additional reporting requirements. Relatedness thresholds also apply beyond which the Bank will not permit the use of the security, irrespective of the size of the haircut. The Bank considers each of the following parties to be related to an ABS: the sponsor of the issuing trust; the loan originators; servicers; swap counterparties; liquidity providers; and guaranteed investment contract providers to the issuing trust. The magnitude of any additional haircut will depend on the nature of the relationship between the member and the ABS.

In the event of insolvency, the close-out netting provisions included in the repo agreements allow the Bank to close out or terminate the second leg of the repo immediately. This right is protected by Part 4 of the PSNA. Where an approved member sells securities issued by a third-party issuer as collateral, both the member and the issuer of the security would have to fail for the Bank to potentially incur a financial loss. In the event that an approved member that had provided ABS and the issuing trust failed, the Bank would have recourse to the underlying assets (e.g. the residential mortgage loan pool).

5.2 A payment system should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.

Valuation

The Bank values securities purchased under repo using available market prices. When a timely market price is not available or reliable, the Bank uses conservative valuation formulae that are reviewed regularly.

Haircuts and mark-to-market margin maintenance

The Bank applies haircuts to all securities purchased under repo.⁵⁰ For operational simplicity, uniform haircut rates are set for broad groups of securities rather than for individual securities, with an additional adjustment for approved related-party ABS depending on the degree of credit support provided to the transaction by the sponsor. Haircuts are set to cover the maximum expected decline in the market price of the security, at a confidence level of at least 95 per cent based on a look back period that includes stressed market conditions. The key inputs to this calculation are market prices, the maturity of the securities in the relevant asset classes and the credit ratings of the securities. The Bank reserves the right to review haircuts at any time. The haircut schedule is made publicly available on the Bank's website.⁵¹

The Bank also maintains mark-to-market (variation) margin on a daily basis to cover changes in the value of its portfolio of securities.⁵² To do this, the Bank calculates an exposure amount against each counterparty each day in respect of all securities held under repo based on the closing prices of the preceding business day. Where the Bank's net exposure to a counterparty is greater than \$1 million and represents more than 1 per cent of the net repurchase amounts agreed with that party, the Bank will call for mark-to-market margin

50 The Bank uses the terminology 'margins' instead of 'haircuts' in its publicly available documents.

51 A list of the haircuts used by the Bank is available at <https://www.rba.gov.au/mkt-operations/resources/tech-notes/margin-ratios.html>.

52 Intraday repos do not require mark-to-market margin collection, as they are reversed by the end of the business day.

equal to its net exposure.⁵³ Similarly, the Bank will meet requests for mark-to-market margin from a counterparty when it has a net exposure to the Bank greater than \$1 million and where that net exposure represents more than 1 per cent of the net repurchase amounts agreed with that party.

5.3 In order to reduce the need for procyclical adjustments, a payment system should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent.

The Bank generally applies haircuts that are calibrated to include periods of stressed market conditions. Haircuts are calibrated to capture the stressed market conditions following the default of Lehman Brothers in late 2008. This reduces the need for procyclical haircut adjustments during periods of stress.

5.4 A payment system should avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects.

The Bank routinely monitors transaction and collateral summary reports to ensure that the Bank is not exposed to large collateral concentration and liquidation risks. The key factor considered by the Bank is the depth of the market for each security when compared with the Bank's holdings of that security. This mitigates the risk of a price impact from liquidation of a large collateral holding.

5.5 A payment system that accepts cross-border collateral should mitigate the risks associated with its use and ensure that the collateral can be used in a timely manner.

The Bank mitigates the risks associated with cross-border collateral by imposing additional restrictions. The only cross-border collateral that the Bank currently accepts is very highly rated Australian dollar-denominated securities issued or guaranteed by a foreign government or issued by a supranational. The terms and conditions of these securities must be governed by Australian law. In addition, because certain cross-border securities may be less liquid than domestic securities, the Bank applies higher haircuts to these securities. There is no operational risk associated with differences in time zones since all collateral must be lodged in Austraclear. The operating hours of the Austraclear system and RITS are aligned.

5.6 A payment system should use a collateral management system that is well designed and operationally flexible.

The Bank relies on a well-designed and operationally flexible trade entry and collateral management system to manage the securities it purchases under repo. This system is an integrated trading, middle-office and back-office system, and has been extensively customised for the Bank. The system supports the buying, selling, margining, substitution and liquidation of securities in a timely manner. Transactions involving the exchange of securities with approved members are recorded and tracked in this system.⁵⁴ In addition, the system facilitates pricing of securities, application of haircuts by default, collateral substitutions,

53 The repurchase amount for a repo is the value of the repo purchase price adjusted for accrued interest.

54 Intraday repos involving Commonwealth Government Securities or semi-government securities are recorded outside of this system unless they are extended to become overnight repos.

margin maintenance and coupon passes.⁵⁵ The Bank has developed within this system a large number of analytical reports to monitor counterparty and collateral exposures, repo and outright portfolio holdings, daily activity summaries and other analytics associated with the Bank's domestic operations (both for OMOs and Standing Facilities). The Bank ensures that there are sufficient resources to maintain its trade entry and collateral management system to a high standard.

RITS members have the option to use ASX Collateral services to deliver a subset of eligible securities under certain types of repos.⁵⁶ ASX Collateral is a collateral management service that acts as an agent to automate the allocation and optimisation of collateral in respect of securities held in Austraclear.⁵⁷ As agent, ASX Collateral is responsible for ensuring that securities delivered to the Bank's Austraclear account using its service are appropriately valued and meet the Bank's eligibility requirements. ASX Collateral also offers extensive reporting functionality, including reports on collateral transactions and securities held.

The Bank does not re-use securities it receives under repo.

7. Liquidity risk

A payment system should effectively measure, monitor, and manage its liquidity risk. A payment system should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate liquidity obligation for the payment system in extreme but plausible market conditions.

Rating: Observed

Note: Key Consideration 7.4 does not apply to RITS as it does not operate a CCP.

7.1 A payment system should have a robust framework to manage its liquidity risks from its participants, settlement banks, nostro agents, custodian banks, liquidity providers, and other entities.

RITS conducts its settlements on an RTGS basis and does not guarantee settlement. The Bank, as operator of RITS, does not therefore assume liquidity risk in its operations. Since members face liquidity risks, however, RITS assists members in their liquidity management through: its liquidity-efficient design; the provision of liquidity through Standing Facilities; the provision of real-time information on transactions and ESA balances; and the provision of tools to manage their payments and liquidity (see section A.4). Furthermore, RITS's membership requirements aim to reduce the probability that a member experiences an operational or financial problem that could disrupt the flow of liquidity in the system (see Principle 18).

55 'Coupon passes' refer to the Bank passing the coupon payments on securities that it has purchased under a repo agreement back to the seller of the securities.

56 For more information on the types of repos and securities eligible to be settled via ASX Collateral see <https://www.rba.gov.au/mkt-operations/resources/tech-notes/settlement-procedures.html>.

57 For more information see RBA (2013), 'Box B: ASX Collateral', Self-assessment of the Reserve Bank Information and Transfer System, p12, available at <https://www.rba.gov.au/payments-and-infrastructure/rits/self-assessments/2013/>.

7.2 A payment system should have effective operational and analytical tools to identify, measure, and monitor its funding flows on an ongoing and timely basis, including its use of intraday liquidity.

Since RITS does not assume liquidity risk, there are no relevant funding flows for RITS to measure and monitor. In managing operational risk, the Bank's operational staff continuously monitor the flow of liquidity and payments at both a system and member level for evidence of any disruption to the flow of liquidity, which could occur if a member experienced an operational or financial problem (see Principle 17). If such a disruption were observed, the Bank would liaise with members to mitigate the impact. To further mitigate possible disruption under such a scenario, members are required to inform the Bank in the event of any operational problem, and the RITS Regulations also set out actions that the Bank may take in response to a member default (see Principle 13).

7.3 A payment system, including one employing a DNS mechanism, should maintain sufficient liquid resources in all relevant currencies to effect same-day settlement and, where appropriate, intraday or multiday settlement, of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions.

Since the Bank does not assume liquidity risk as operator of RITS, the requirement to maintain liquid resources to cover payment obligations in stressed scenarios does not apply.

7.5 For the purpose of meeting its minimum liquid resource requirement, a payment system's qualifying liquid resources in each currency include cash at the central bank of issue and at creditworthy commercial banks, committed lines of credit, committed foreign exchange swaps, and committed repos, as well as highly marketable collateral held in custody and investments that are readily available and convertible into cash with prearranged and highly reliable funding arrangements, even in extreme but plausible market conditions. If a payment system has access to routine credit at the central bank of issue, the payment system may count such access as part of the minimum requirement to the extent it has collateral that is eligible for pledging to (or for conducting other appropriate forms of transactions with) the relevant central bank. All such resources should be available when needed.

Since the Bank does not assume liquidity risk as operator of RITS, the minimum liquid resource requirement does not apply.

7.6 A payment system may supplement its qualifying liquid resources with other forms of liquid resources. If the payment system does so, then these liquid resources should be in the form of assets that are likely to be saleable or acceptable as collateral for lines of credit, swaps, or repos on an ad hoc basis following a default, even if this cannot be reliably prearranged or guaranteed in extreme market conditions. Even if a payment system does not have access to routine central bank credit, it should still take account of what collateral is typically accepted by the relevant central bank, as such assets may be more likely to be liquid in stressed circumstances. A payment system should not assume the availability of emergency central bank credit as a part of its liquidity plan.

Since the Bank does not assume liquidity risk as operator of RITS, the need to supplement its qualifying liquid resources does not apply.

- 7.7 A payment system should obtain a high degree of confidence, through rigorous due diligence, that each provider of its minimum required qualifying liquid resources, whether a participant of the payment system or an external party, has sufficient information to understand and to manage its associated liquidity risks, and that it has the capacity to perform as required under its commitment. Where relevant to assessing a liquidity provider's performance reliability with respect to a particular currency, a liquidity provider's potential access to credit from the central bank of issue may be taken into account. A payment system should regularly test its procedures for accessing its liquid resources at a liquidity provider.**

Since the Bank does not assume liquidity risk as operator of RITS, the requirement to maintain liquid resources to cover payment obligations in stressed scenarios does not apply.

- 7.8 A payment system with access to central bank accounts, payment services, or securities services should use these services, where practical, to enhance its management of liquidity risk.**

Since the Bank does not assume liquidity risk as the operator of RITS, the requirement to use central bank accounts, payment services or securities services does not apply.

- 7.9 A payment system should determine the amount and regularly test the sufficiency of its liquid resources through rigorous stress testing. A payment system should have clear procedures to report the results of its stress tests to appropriate decision makers at the payment system and to use these results to evaluate the adequacy of and adjust its liquidity risk management framework. In conducting stress testing, a payment system should consider a wide range of relevant scenarios. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions. Scenarios should also take into account the design and operation of the payment system, include all entities that might pose material liquidity risks to the payment system (such as settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs), and where appropriate, cover a multiday period. In all cases, a payment system should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount and form of total liquid resources it maintains.**

Since the Bank does not assume liquidity risk as operator of RITS, the requirement to test the sufficiency of its liquid resources does not apply.

- 7.10 A payment system should establish explicit rules and procedures that enable the payment system to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations on time following any individual or combined default among its participants. These rules and procedures should address unforeseen and potentially uncovered liquidity shortfalls and should aim to avoid unwinding, revoking, or delaying the same-day settlement of payment obligations. These rules and procedures should also**

indicate the payment system’s process to replenish any liquidity resources it may employ during a stress event, so that it can continue to operate in a safe and sound manner.

The RITS Regulations include rules and procedures that govern the management of a member default (see Principle 13). Since the Bank does not assume liquidity risk as operator of RITS, the requirement to establish rules and procedures to address unforeseen and potentially uncovered liquidity shortfalls and replenish any liquid resources does not apply.

8. Settlement finality

A payment system should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, a payment system should provide final settlement intraday or in real time.

Rating: Observed

8.1 A payment system’s rules and procedures should clearly define the point at which settlement is final.

The settlement of a payment in RITS is final and irrevocable when the ESAs of the paying and receiving RITS members are simultaneously debited and credited.⁵⁸ The point of settlement is clearly defined in Clause 16 of the RITS Regulations. As explained under Key Consideration 1.1, this is further protected by the approval of RITS as an RTGS system under Part 2 of the PSNA.

8.2 A payment system should complete final settlement no later than the end of the value date, and preferably intraday or in real time, to reduce settlement risk. A large-value payment system should consider adopting RTGS or multiple-batch processing during the settlement day.

Wholesale RTGS payments in RITS are settled individually in real time. Although settlements occur in real time, a wholesale RTGS payment submitted to the System Queue may remain there if the payer chooses not to settle the transaction (e.g. if the payer has set the status of the transaction to ‘deferred’) or has insufficient funds. Any wholesale RTGS payments that are not settled at the end of the last session during which the transaction was eligible for settlement are automatically removed from RITS but may be resubmitted for settlement when the system reopens (for more information on RITS session times refer to Appendix A, section A.6).

8.3 An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.

Under Clause 13.2 of the RITS Regulations, a member can unilaterally revoke its outgoing wholesale RTGS payments sent to the System Queue at any time prior to settlement. RITS cash transfers can be revoked via the RITS User Interface, while payments sent via a feeder system must be revoked via that feeder system.

⁵⁸ Wholesale RTGS payments settled using the ‘auto offset’ functionality are settled in full across relevant ESAs simultaneously. These payments are posted in full to the ESAs and are not subject to bilateral netting.

9. Money settlements

A payment system should conduct its money settlements in central bank money where practical and available. If central bank money is not used, a payment system should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.

Rating: Observed

- 9.1 A payment system should conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks.**

Money settlements in RITS are conducted in central bank money. Payment obligations in RITS are settled on an RTGS basis across ESAs at the Bank.

- 9.2 If central bank money is not used, a payment system should conduct its money settlements using a settlement asset with little or no credit or liquidity risk.**

Money settlements in RITS are conducted using central bank money.

- 9.3 If a payment system settles in commercial bank money, it should monitor, manage, and limit its credit and liquidity risks arising from the commercial settlement banks. In particular, a payment system should establish and monitor adherence to strict criteria for its settlement banks that take account of, among other things, their regulation and supervision, creditworthiness, capitalisation, access to liquidity, and operational reliability. A payment system should also monitor and manage the concentration of credit and liquidity exposures to its commercial settlement banks.**

Money settlements in RITS are conducted using central bank money.

- 9.4 If a payment system conducts money settlements on its own books, it should minimise and strictly control its credit and liquidity risks.**

Money settlements in RITS are conducted using central bank money across the books of the Bank. The Bank's credit and liquidity risks from the operation and provision of liquidity in RITS are strictly controlled, as described in Principles 4 and 7.

- 9.5 A payment system's legal agreements with any settlement banks should state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received should be transferable as soon as possible, at a minimum by the end of the day and ideally intraday, in order to enable the payment system and its participants to manage credit and liquidity risks.**

The Bank does not use commercial bank money settlement agents in the operation of RITS.

12. Exchange-of-value settlements

If a payment system settles transactions that involve the settlement of two linked obligations (for example, securities or foreign exchange transactions), it should eliminate principal risk by conditioning the final settlement of one obligation upon the final settlement of the other.

Rating: Not applicable

RITS is not an exchange-of-value settlement system. It does not perform the settlement of foreign exchange transactions or securities transactions. RITS does, however, facilitate the settlement of

linked securities, foreign exchange and property transactions in other systems, assisting market participants in eliminating principal risk. In particular, RITS settles the interbank obligations arising from the cash leg of delivery-versus-payment debt and equity security transactions in Austraclear and ASX Settlement, respectively.⁵⁹ RITS is also used to fund the Australian dollar leg of foreign exchange transactions settled on a payment-versus-payment basis in CLS's settlement system. RITS also facilitates the financial settlement of property transactions originating from a system operated by PEXA such that the lodgement of the title transfer only occurs once settlement has been assured by the reservation of funds in ESAs.

13. Participant-default rules and procedures

A payment system should have effective and clearly defined rules and procedures to manage a participant default. These rules and procedures should be designed to ensure that the payment system can take timely action to contain losses and liquidity pressures and continue to meet its obligations.

Rating: Observed

Note: Consistent with the CPMI-IOSCO guidance on the Application of the Principles to Central Bank FMIs, this Principle should not constrain the Bank's policies on maintaining financial stability including when managing participant defaults.

13.1 A payment system should have default rules and procedures that enable the payment system to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.

The RITS Regulations and Membership Agreement include rules and procedures to govern the management of a member default. A member that becomes aware of an insolvency event – either its own insolvency, or the insolvency of another member for which it acts as a settlement agent – must notify the Bank immediately. The Bank may then suspend the relevant member, at which point the Bank will remove any queued payments to and from the member, and prevent the input of any new payments involving the suspended member. The Bank may also suspend a member that is unable to meet its settlement obligations. By permitting swift and decisive action in this way, the RITS Regulations allow the Bank to minimise the potential for a member default to disrupt settlement in the system more widely.

As explained under Principle 4, in the event of a member default the Bank would not be exposed to a loss in its role as operator of RITS. Accordingly, the RITS Regulations do not cover replenishment of financial resources following a member default.

13.2 A payment system should be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in its rules.

The Bank has internal default management procedures that document the steps it would take in response to an insolvency event. These procedures outline the roles and responsibilities of management for each decision that must be taken after such an event, which persons should be consulted when taking each decision, and which persons should be advised of a decision.

⁵⁹ For more information, see Standard 10 in Appendix C2 of the 2016/17 Assessment of ASX Clearing and Settlement Facilities, available at <https://www.rba.gov.au/payments-and-infrastructure/financial-market-infrastructure/clearing-and-settlement-facilities/assessments/2016-2017/>.

The procedures also set out which other Australian industry bodies and other FMIs should be contacted if a member is suspended from RITS, and the methods available for communication with these parties. The procedures are tested and updated on a periodic basis.

13.3 A payment system should publicly disclose key aspects of its default rules and procedures.

The key aspects of the default management rules and procedures are set out in the RITS Regulations, which are publicly available on the Bank's website.

13.4 A payment system should involve its participants and other stakeholders in the testing and review of the payment system's default procedures, including any close-out procedures. Such testing and review should be conducted at least annually or following material changes to the rules and procedures to ensure that they are practical and effective.

Since RITS default management procedures do not require members to perform any actions, members are not involved in the testing or review of these procedures.

15. General business risk

A payment system should identify, monitor, and manage its general business risk and hold sufficient liquid net assets funded by equity to cover potential general business losses so that it can continue operations and services as a going concern if those losses materialise. Further, liquid net assets should at all times be sufficient to ensure a recovery or orderly wind-down of critical operations and services.

Rating: Observed

Note: Consistent with the CPMI-IOSCO guidance on the Application of the Principles to Central Bank FMIs, the requirement to hold ring-fenced liquid net assets funded by equity to cover business risk and support a recovery or wind-down plan (Key Considerations 15.2 – 15.4) does not apply to the Bank, given its inherent financial soundness. Similarly, the requirement to maintain a plan to raise additional equity (Key Consideration 15.5) does not apply.

15.1 A payment system should have robust management and control systems to identify, monitor, and manage general business risks, including losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses.

As set out under Key Consideration 2.6, the Bank takes a coordinated approach to identifying, assessing and managing risk at both an enterprise and business level. A key component of the Bank's framework for managing general business risk is its budgeting and accounting processes, which allow it to monitor, manage and control its operating expenses, including those arising from the operation of RITS. The Bank's financial accounts are also subject to audit by the Australian National Audit Office. Audit reports are reviewed by the Audit Committee.

The Bank's financial target with respect to RITS is to recover its operating costs over the medium term. This gives the Bank some flexibility over the timing of fee changes and allows it to provide greater price stability to members. The fee structure is reviewed annually, although not every review results in changes to the fees. Fees for wholesale RTGS transactions are based on a combination of the value and volume of settled transactions. The

use of value fees recognises that the benefit derived from wholesale RTGS settlement is a function of the value settled. In 2017, existing RITS fees for wholesale RTGS transactions were unchanged.

However, with the introduction of the FSS, a volume-based fee for FSS transactions was added to the RITS pricing structure. This fee is capped for the first five years of operation of the FSS but thereafter the Bank retains the option of changing the volume-based fee and/or introducing a value-based fee depending on the usage of the FSS.

For significant improvements to RITS functionality, such as the FSS, the Bank absorbs the initial capital and development costs as a policy-related expense. Such projects must be approved by the Bank's Investment Committee and relevant financial analysis is included as part of the business case approval process. Ongoing operational costs and system lifecycle replacement costs are recovered.

In addition, the Bank has an ongoing program to evaluate fraud risks and review its fraud control framework (see Key Consideration 17.1).

16. Custody and investment risks

A payment system should safeguard its own and its participants' assets and minimise the risk of loss on and delay in access to these assets. A systemically important payment system's investments should be in instruments with minimal credit, market, and liquidity risks.

Rating: Observed

Note: Consistent with the CPMI-IOSCO guidance on the Application of the Principles to Central Bank FMIs, this Principle should not constrain the Bank's policies on investment strategy (including that for reserve management) or impose requirements regarding the disclosure of that strategy.

16.1 A payment system should hold its own and its participants' assets at supervised and regulated entities that have robust accounting practices, safekeeping procedures, and internal controls that fully protect these assets.

The Bank does not hold RITS member's assets as part of its role as operator of RITS. However, the Bank does do so as part of its provision of liquidity to approved RITS members. Eligible securities purchased by the Bank as collateral under repo (both for payment system purposes and open market operations) must be denominated in Australian dollars and lodged in Austraclear (see Principle 5). Austraclear is a licensed clearing and settlement facility and is therefore overseen by the Australian Securities and Investments Commission (ASIC) and the Bank. In accordance with the licensing regime, Austraclear must meet the Bank's SSF Standards, which are aligned with the Principles. The SSF Standards require that Austraclear maintain robust accounting practices, safekeeping procedures and internal controls that fully protect the assets for which it acts as a central securities depository.

The Bank does not use custodian banks to hold the collateral it purchases in providing liquidity to eligible RITS members, or hold Australian dollar-denominated collateral with entities in other time zones or foreign legal jurisdictions.

16.2 A payment system should have prompt access to its assets and the assets provided by participants, when required.

Approved RITS members are bound by the RITS Regulations, which include an amended and supplemented version of the SIFMA/ICMA GMRA (2011 version) legal contract governing the terms and conditions of repos with the Bank. The close-out netting provisions included in the Bank's repo agreements with counterparties provide for the Bank to close out or terminate the second leg of a repo immediately. This right is protected by Part 4 of the PSNA (see Principle 1).

The Austraclear system is subject to high operational resilience standards and operates in the same time zone as RITS, whose operating hours are aligned with those of RITS. The Bank would therefore expect to have prompt access to the securities it holds as collateral. In particular, the Bank has a service agreement with ASX – the owner of Austraclear – that imposes strict operational requirements on the Austraclear system, including a requirement to provide a minimum 99.9 per cent availability during business hours. The Austraclear system must also adhere to similar high standards of security and operational reliability set out in the SSF Standards.⁶⁰

RITS members have the option to use ASX Collateral services to deliver a subset of eligible securities under certain types of repo (see Principle 5). Securities provided to the Bank under repo through ASX Collateral are held in special-purpose 'collateral accounts' in Austraclear. Securities in these accounts can only be transferred based on instructions from ASX Collateral. For this reason, the Bank relies on the availability of ASX Collateral to be able to promptly access the securities held in the Bank's collateral accounts and, in the case of a default of the repo counterparty, liquidate those securities in a timely manner. The operational resilience of ASX Collateral is addressed in Key Consideration 17.7.

16.3 A payment system should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.

The Bank does not use custodian banks to hold the collateral it receives in providing liquidity to eligible RITS members.

16.4 A payment system's investment strategy should be consistent with its overall risk management strategy and fully disclosed to its participants, and investments should be secured by, or be claims on, high-quality obligors. These investments should allow for quick liquidation with little, if any, adverse price effect.

The Bank publishes criteria for securities eligible for domestic operations on its website. Eligibility criteria take into account the creditworthiness of the issuers and the Bank applies conservative margin ratios on all collateral securities purchased under repo. The legal contract governing the repo transactions give the Bank full title to the purchased securities and the close out netting provisions enable the Bank to terminate the repo contract, value and liquidate the securities upon notice of default.

The Bank does not re-use collateral purchased under repo and therefore does not face investment risks associated with returning re-used securities on the unwind date of repos.

60 For further information on the operational resilience of Austraclear see: <https://www.rba.gov.au/payments-and-infrastructure/financial-market-infrastructure/clearing-and-settlement-facilities/assessments/asx/>.

17. Operational risk

A payment system should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfilment of the payment system's obligations, including in the event of a wide-scale or major disruption.

Rating: Observed

17.1 A payment system should establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.

The Bank has established a robust operational risk management framework, with systems, policies and procedures to identify, monitor and manage operational risk. Under the risk management framework, Payments Settlements Department is required to identify the range of risks that might impact its ability to operate RITS in a safe and efficient manner. To identify operational risks, the Bank applies both a historical approach, drawing lessons from issues that have occurred in the past, and a theoretical approach whereby experienced staff members seek to identify possible additional sources of risk. For each operational risk identified, Payments Settlements Department assesses the probability of the operational risk crystallising and its potential impact. Controls and mitigation strategies are also considered. Operational controls are documented in procedures manuals, administration guides and daily checklists. These controls and contingency plans are reviewed and signed off by management annually, or when system changes or upgrades are planned.

The operational risk management framework supporting RITS is benchmarked against relevant domestic and international standards, including:

- Business Continuity – Managing Disruption-related Risk (AS/NZS 5050-2010)
- Fraud and Corruption Control (AS 8001-2008)
- Whistleblower Protection Programs for Entities (AS 8004-2003).

Change and project management

The Bank has a change management policy, supported by detailed processes and procedures, to safeguard the integrity and reliability of RITS. The policy is aligned to standards that are considered best practice in the information and technology and finance industries, including:

- Information Technology Infrastructure Library, Version 3
- ISO Standard 20000: IT Service Management.

Under the policy, any material change typically would require the responsible business area to prepare a change implementation plan, which would identify possible risks arising from the change and controls in place to mitigate those risks. These controls would include plans to 'back out' any change that had been implemented, should this be necessary. Changes assessed as posing a high or medium risk are presented for approval to the Change Advisory

Board, which comprises senior management from operational and information technology areas in the Bank.

To ensure that changes do not disrupt the operation of RITS, major or high-risk changes are implemented outside of core operating hours. Changes to the FSS, which operates continuously, are managed using component isolation or upgrades to one site at a time. Backups of data and system configurations are made prior to the implementation of any major changes. Any system changes are subject to extensive testing in separate test environments before approval for live implementation. This includes connectivity, functional, performance and failover testing. RITS members are given the opportunity to become familiar with new functionality in an industry test environment prior to live implementation.

The Bank has an enterprise-wide project management framework. This framework includes guidance to ensure internal consistency in the way project risks are managed, as well as the arrangements for governing a project. The framework is aligned to widely used industry best practice, including the PRINCE2 framework. The framework is supported by the Enterprise Project Management Office (EPMO). The EPMO provides analysis, including on risk, and status reports to the Bank's executives on major initiatives. It also provides advice and support to Bank staff working on projects.

Access to resources

The resourcing of the areas in Payments Settlements Department involved in the operation of RITS is the responsibility of the senior management in those areas. Recruitment and selection at the Bank is based on the principles of being merit-based, fair, objective and open, and consistent with diversity and inclusion. New staff are required to undergo training in a range of areas, including anti-money laundering, information security, workplace health and safety, acceptable use of technology, fraud awareness and the Bank's Code of Conduct. Staff rotations and cross-training in critical areas ensure that critical functions are not dependent on particular individuals. The Bank also has succession planning processes in place for key staff. Additional staff resources have been put in place to ensure 24/7 support of RITS and FSS since the launch of the latter.

Payments Settlements Department relies on the Bank's Information Technology Department to provide technical support for RITS. To ensure there is a common understanding, the level of service expected from Information Technology Department with regard to the support of RITS is set out in internal documents. The resourcing policies set out above also apply to Information Technology Department.

Fraud control

The Bank has an ongoing program to evaluate fraud risks and review its fraud control framework. This is documented in the Fraud Control Policy. The primary preventative fraud controls include audit logs, dual input checks, separation of duties, management sign-off and processing checklists. These controls are supported by reconciliations and review by management. Regular staff training in fraud awareness is also conducted and monitored to ensure that all staff are actively engaged in fraud prevention. The Bank operates a hotline for staff, through which suspicious behaviour can also be reported anonymously. Audit Department investigates the potential for fraud and fraud controls as part of its regular audits.

17.2 A payment system’s board of directors should clearly define the roles and responsibilities for addressing operational risk and should endorse the payment system’s operational risk management framework. Systems, operational policies, procedures, and controls should be reviewed, audited, and tested periodically and after significant changes.

The Bank manages the operational risks arising from RITS within its risk management framework, the governance of which is set out under Key Consideration 2.6. Under this framework, operational risk policies are developed and approved by the senior management of Payments Settlements Department, with oversight from the Risk Management Committee. In some circumstances, policies would need to be approved by the Assistant Governor, Business Services Group. Operational policies, procedures and controls in respect of RITS are subject to audit by the Audit Department, with assistance from external consultants. Audit reports are reviewed by the Audit Committee, with copies provided to the Risk Management Committee.

The systems, policies, procedures and controls that are part of the operational risk framework are tested periodically (see Key Considerations 17.4–17.7 for further details).

17.3 A payment system should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.

RITS availability targets are clearly defined and documented. The target availability for RITS is at least 99.95 per cent over the calendar year, for Bank-controlled components. Availability is measured relative to the total number of hours that the system is open for settlement and reporting. These targets are set out in internal documents. Performance against the annual availability target for RITS is assessed on a quarterly basis. Assessments are available to senior management in Payments Settlements Department.

The Bank has established arrangements to ensure that RITS meets target availability, including a detailed business continuity policy (see Key Consideration 17.6) and change management framework (see Key Consideration 17.1). In addition, Payments Settlements Department applies a number of controls to prevent or manage disruptions, including operating procedure manuals, dual input checks and the use of checklists.

The Bank also monitors RITS components to ensure that issues are detected in a timely manner. The monitoring of RITS aims to detect system problems within 15 minutes of their inception. Automated tools are used, which verify the operation of system components in intervals as short as one minute, and provide automatically generated email alerts to relevant Bank staff if any issues are detected. RITS and FSS liquidity is monitored on a near real-time basis, based on the value and volume of queued and settled payments relative to historical averages. Since the introduction of the FSS in November 2017, both RITS and the FSS are monitored on a continuous basis.

17.4 A payment system should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.

The Bank has processes and controls in place to ensure that RITS has sufficient capacity. RITS capacity targets for wholesale RTGS transactions include a:

- processing throughput target – that is, that RITS should be able to process peak-day transactions in less than two hours (assuming no liquidity constraints)

- projected capacity target – that is, RITS should be able to accommodate projected volumes 18 months in advance with 20 per cent headroom.

Targets are also set for response times to member enquiries via the RITS user interface (which includes both RITS and FSS functionality).

RITS is tested regularly to ensure that it meets these targets. Processing throughput testing is performed quarterly and complemented by daily monitoring of actual processing throughput. Capacity testing is performed prior to each new RITS software release and at regular intervals. Test outcomes are reviewed by management in Payments Settlements Department. In the event of a problem, the Bank would investigate options to either improve processing throughput or increase capacity.

Testing is complemented by an alert system, which is designed to automatically advise operational staff if operational capacity for various RITS components is approached.

17.5 A payment system should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.

Information security

At the Bank, cyber resilience – in relation to both RITS and the Bank’s operations more broadly – is overseen by the Risk Management Committee as part of the Bank’s enterprise-wide risk management framework. As noted in the Bank’s Risk Appetite Statement, the Bank has a very low appetite for threats to Bank assets arising from external malicious cyber attacks. To address this risk, the Bank aims for strong internal control processes and the development of robust technology solutions.

Information Technology Department, in conjunction with Payments Settlements Department, is responsible for the review and implementation of the information security policies applicable to RITS. To support the Bank’s information security, within the Information Technology Department there is a dedicated team headed by the Bank’s Chief Information Security Officer. Information security policies are aligned to the Australian Government’s Protective Security Policy Framework.⁶¹ Cyber security practices are also informed and supported by domestic and international best practice, including strategies for mitigating cyber intrusions developed by the Australian Signals Directorate. The security policies are reviewed annually and in the event of changes to either the nature of the risk or the assets being protected. Security reviews by external consultants are also routinely commissioned for new RITS components and in response to significant changes to the RITS system or security environment.

While the Bank’s current information security policies presently address all known potential vulnerabilities and threats, the Bank recognises that both the nature of cyber-related issues and industry best practice are rapidly evolving. Accordingly, the Bank undertook a project to review and test the mechanisms in place to prevent and respond to a cyber-related incident. The project involved a review of risks and a stocktake of existing security controls, a program of penetration testing, and a review of recovery capabilities. This project was completed in 2016. Based on the findings, the Bank determined a set of additional measures to be put in place. All high priority recommendations as well as a number of lower priority

61 This framework is available at <https://www.protectivesecurity.gov.au/Pages/default.aspx>.

recommendations have already been implemented. Other lower priority recommendations will be addressed in the remainder of 2018 or have been incorporated into related projects.

As a user of the SWIFT messaging network, the Bank is required to meet security standards established by SWIFT, including the SWIFT CSC Framework that was launched in 2017. The CSC Framework provides a baseline security standard for the SWIFT network. SWIFT customers are required to annually attest to their compliance with these controls, with the first such attestation due at the end of 2017. The Bank lodged its inaugural security compliance attestation with SWIFT in December 2017, after assessing its SWIFT security arrangements against (and where necessary aligning these with) the CSC Framework.

Physical security

Facilities Management Department administers the Bank's physical security policy, which complies with the Protective Security Policy Framework set by the Australian Government. Under the policy, security risks are identified and controls implemented to mitigate these risks. The Bank maintains a number of controls to limit physical access to sensitive areas.

- 17.6 A payment system should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption. The plan should incorporate the use of a secondary site and should be designed to ensure that critical information technology systems can resume operations within two hours following disruptive events. The plan should be designed to enable the payment system to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The payment system should regularly test these arrangements.**

The Bank maintains detailed business continuity plans. These set out the operational response to events that could disrupt the operation of RITS. These plans cover lines of authority, means of communications and failover procedures, and are updated annually or more frequently if required e.g. when there is a major change to RITS.

A primary control to reduce the impact of a contingency event is a high degree of redundancy in RITS systems. RITS data are synchronously mirrored at two geographically remote sites, which are permanently staffed. Full redundancy of equipment exists at both these sites, ensuring there is no single point of failure at either site. RITS can be operated from either site indefinitely. Live operations alternate between both sites on a regular basis. Critical staff are also able to work from home through remote logon using a virtual private network. For RITS, the recovery time target is up to 40 minutes, depending on the nature of the operational disruption.

The Bank has continued to implement enhanced monitoring capacities to identify cyber attacks and enhanced systems and processes to enable recovery of accurate data following a breach. The Bank had already developed plans to improve the capability of RITS to meet the two-hour recovery time objective in the context of a cyber attack. These plans met expectations established by CPMI and IOSCO in their 2016 Cyber Resilience Guidance. The Bank is also continuing to evaluate current and emerging technology that could further enhance its ability to recover from cyber attacks in a timely manner. A high degree of redundancy is complemented by internal plans to deal with a wide variety of potential disruptions. These potential disruptions include the failure of individual RITS components and

wide-scale external disruptions, such as floods and pandemics. Target recovery times are documented for each scenario. Contingency procedures are reviewed at regular intervals, and after major system changes and testing (if required).

Contingency plans include arrangements for the provision of timely information to stakeholders, including RITS members and operators of interdependent systems. The plans include predefined notification lists of both internal and external parties, and assign responsibility for regular updates. A web-based crisis communication facility for RITS enables the Bank to disseminate information via email and SMS to a large number of stakeholders within minutes. This facility can also be operated from remote locations and does not rely on the availability of either operational site. Conference call facilities are also available to enable timely discussion between key stakeholders. To ensure that staff are familiar with the crisis communications facility, it is used regularly.

Plans for all key contingencies are tested at least annually to ensure that the contingency procedures are robust and remain effective. To ensure that staff are fully aware of the contingency plans, procedures are also tested in regular 'at desk' contingency drills. In addition, Payments Settlements Department staff that are based at the Bank's head office are required to work at the Bank's geographically remote second site during a designated week each year to ensure that they are familiar with the facility. In addition, staff who are responsible for the day-to-day operation of RITS are also required to work at both sites on a regular basis.

Even if there is an extreme event in which RITS was unavailable and recovery was not possible, transactions from the SWIFT PDS and Austraclear feeder systems, which account for the majority of value and volume of wholesale RTGS transactions settled in RITS, can be settled using 'contingency settlement arrangements'. These arrangements involve the deferred net settlement of interbank obligations arising from the two feeder systems in a multilateral batch in RITS on the following day.

The Bank is conducting an evaluation of the existing contingency arrangements to determine whether any refinements are needed to ensure that payment clearing and settlement could continue in the event that RITS or its external feeder systems were unavailable.

17.7 A payment system should identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In addition, a payment system should identify, monitor, and manage the risks its operations might pose to other FMIs.

Members

Recognising that the efficient operation of RITS is also dependent on the operational reliability and resilience of its members, any technical problem affecting a member's transaction activity must be notified to the Bank immediately. The Bank also monitors members' payment flows in real time. If a potential problem is detected, the Bank will contact that member for further information. After a disruption, a member is required to provide the Bank with a detailed incident report on the causes and remedial actions of the disruption. In addition, the Bank has developed its Business Continuity Standards for RITS members, which aim to promote high availability in RITS payments processing operations, requiring both resilience of system components and rapid recovery if failover to alternative systems is

required.⁶² These business continuity standards were revised in 2017 to incorporate specific reference to cyber security, with a target for compliance to be achieved by 2019.

The Bank continues to monitor RITS members' compliance with the standards. The Bank has received members' latest annual self-certification statements against the new standards as at the end of 2017, at which time 42 of 61 RITS members self-certified that they were fully compliant with the standards. Members that reported being partly compliant are expected to provide a date for compliance and the Bank will follow up progress.

Service and utility providers

SWIFT has been identified as a critical service provider to RITS, as the failure of SWIFT would severely impair the ability of members to effect third-party payments, as well as the management of Austraclear settlements via the RITS Automated Information Facility (which uses SWIFT messages). The Bank has a premium support package from SWIFT. The terms of this package set out the response times and level of support expected from SWIFT should an issue arise. The Bank also liaises regularly with SWIFT and participates in a coordinated global outage test, which simulates an operational disruption at SWIFT. The resilience and reliability of SWIFT is supported by regulation and oversight by the SWIFT Oversight Group, comprising the G10 central banks and chaired by the National Bank of Belgium.⁶³ To support its oversight activities, the Oversight Group has set proprietary minimum standards – the High Level Expectations – against which SWIFT is assessed.

To address the risks to RITS from critical dependencies on utility providers, the Bank has put in place a number of controls:

- each operational site has an uninterruptable power supply and a backup power generator system
- all external communications links to the two operational sites are via dual geographically separated links, and where possible with different telecommunications providers
- the Bank performs regular testing of backup arrangements.

Other FMIs

Austraclear has been identified as an FMI that is of critical importance to the operation of RITS. The service level agreement with ASX – the owner of Austraclear – imposes strict service operational requirements on the Austraclear system, including requiring the Austraclear system to provide a minimum 99.9 per cent availability during business hours. The agreement also requires the Austraclear system to conduct connectivity testing with RITS annually.

The Bank also monitors the interdependencies between Austraclear and ASX Collateral. While ASX Collateral is not itself subject to direct regulation as an FMI, the Bank's SSF Standards set requirements for Austraclear to maintain equivalent resilience standards for critical

62 For more information on the member Business Continuity Standards, see RBA (2013), 'Box E: Participant Business Continuity Standards', *2013 Self-assessment of the Reserve Bank Information and Transfer System*, p 27.

63 In 2012, the Oversight Group set up the SWIFT Oversight Forum to include 12 additional central banks, including the Bank, in the oversight process. Through its membership of the Oversight Forum, the Bank is able to access information relevant to SWIFT oversight.

interdependent systems.⁶⁴ Accordingly, in its assessment of Austraclear against the SSF Standards, the Bank has sought to establish that the standards for operational resilience at ASX Collateral (including the link with Clearstream) are consistent with those that apply to Austraclear.⁶⁵ The availability of ASX Collateral is also relevant to the Bank's ability to promptly access securities held through ASX Collateral (see Key Consideration 16.2).

Austraclear and CLS rely on RITS to settle Australian dollar-denominated wholesale RTGS transactions, and their operations would be disrupted if RITS was not available. This risk is mitigated by ensuring the operational reliability and resilience of RITS. The Bank also conducts joint contingency testing with ASX (the operator of Austraclear) and CLS. In addition, ASX has contingency plans that contemplate Austraclear continuing to operate independently of RITS. These plans allow for the interbank settlement of funds to be effected using the contingency settlement arrangements mentioned above.

18. Access and participation requirements

A payment system should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.

Rating: Observed

Note: Consistent with the CPMI-IOSCO guidance on the Application of the Principles to Central Bank FMIs, this Principle should not constrain the Bank's policy on whom it is prepared to offer accounts and on what terms.

18.1 A payment system should allow for fair and open access to its services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements.

Since settlement in RITS occurs using central bank money, only an institution with an ESA at the Bank can be a settlement participant in RITS. Furthermore, since RITS is the only means of access to ESAs, all ESA holders must be members of RITS and meet all of its operating conditions. The eligibility criteria for ESA holders therefore effectively represent the eligibility criteria for settlement participants in RITS. Policy around ESA eligibility is set by the Bank's Executive Committee and is available on the Bank's website. The ESA eligibility policy has been designed to be fair and open and enhance competition in the provision of payment services by allowing providers of third-party payment services access, irrespective of their institutional status. ADIs are eligible by default, because these institutions are assumed to provide third-party payment services as part of their business.

Australian-licensed CCPs and SSFs (or a related body corporate acceptable to the Bank) with payment arrangements that require Australian dollar settlement are also eligible to hold an ESA.

64 See Standard 14.9 of the SSF Standards, available at <https://www.rba.gov.au/payments-and-infrastructure/financial-market-infrastructure/clearing-and-settlement-facilities/standards/securities-settlement-facilities/2012/standard-14.html>.

65 These standards are established under Austraclear Regulation 28.15 and elaborated under paragraph 28.15 of the Austraclear Procedures, Determinations and Practice Notes. For more information on ASX Collateral and its implications for Austraclear, refer to the 2014/15 Assessment of ASX Clearing and Settlement Facilities, available at <https://www.rba.gov.au/payments-and-infrastructure/financial-market-infrastructure/clearing-and-settlement-facilities/assessments/2014-2015/>.

An ESA applicant must also demonstrate that it meets certain risk-related participation requirements at the time of application, including that:

- it has the operational capacity to operate and manage its ESA
- it has access to sufficient ESA liquidity to meet its anticipated routine and 'peak' period settlement obligations
- access to adequate intraday ESA liquidity to allow it to conduct its customers' business in a way that does not unreasonably impinge on other members or reduce the efficiency of the system
- any collateral or guarantees it relies upon, especially in times of unpredictable stress, are adequate to meet its obligations.

These requirements are generally proportional to member's expected payments in RITS.

To ensure that the institution is always able to authorise, execute and settle RTGS transactions in an efficient and timely manner, the Bank requires that, for institutions settling transactions using their own ESA, responsibility for the ESA must rest with management located in Australia. ESA holders must also meet the Business Continuity Standards set by the Bank (see Key Consideration 17.7).

The Bank reserves the right to impose additional operational or other requirements on ESA holders at its discretion. In particular, an institution that is not supervised by APRA (i.e. not an ADI) or that has limited access to liquid assets, and that has deferred net settlement or time-critical payment obligations, may need to meet additional liquidity requirements on an ongoing basis.

18.2 A payment system's participation requirements should be justified in terms of the safety and efficiency of the payment system and the markets it serves, be tailored to and commensurate with the payment system's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, a payment system should endeavour to set requirements that have the least-restrictive impact on access that circumstances permit.

RITS participation requirements are designed to reduce the likelihood that an individual member experiences an operational or financial problem that disrupts the system more broadly, for instance by defaulting, becoming a liquidity sink or excessively delaying payments. The requirements are generally proportional to members' expected wholesale payments in RITS. For example, the Business Continuity Standards are proportional to the nature and size of a prospective member's payments business.

To reduce the operational burden on smaller RITS members, any ESA holder that is not a CCP, with aggregate outgoing wholesale RTGS transactions of less than 0.25 per cent of the total value of wholesale RTGS transactions, may use an agent to settle its wholesale RTGS transactions, rather than settling directly across its own ESA (see Principle 19).

Indirect participation in RITS is not available more broadly because of the concern that it might lead to a high degree of concentration of wholesale RTGS transactions through a few direct participants, and give rise to an unacceptable concentration of liquidity and operational risks in these members (see Principle 19). Indirect participation also introduces credit risk for members because settlement between an indirect participant and its settlement agent occurs

in commercial bank money. Although some small institutions are therefore required to participate in RITS directly, the cost of technical access to the RITS User Interface is low for these members, since they may use an internet connection.

18.3 A payment system should monitor compliance with its participation requirements on an ongoing basis and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements.

The Bank closely monitors member activity in RITS, to ensure that members are demonstrating that they have the operational capacity and sufficient liquidity to manage their payments activity on an ongoing basis (see Key Consideration 17.7). RITS direct participants are also required to self-certify their compliance with the Business Continuity Standards annually. In addition, the majority of RITS members – ADIs, CCPs and SSFs – are subject to ongoing regulation, supervision and oversight by either APRA, or ASIC and the Bank, including with respect to operational and liquidity requirements. Where RITS members, as ESA holders, are subject to additional operational or other requirements, evidence of their compliance with these requirements must be provided periodically to the Bank.

The RITS Regulations clearly set out the conditions under which the Bank can suspend a member. Accompanying procedures are designed to facilitate an orderly exit. The Bank may at any time terminate or vary the terms of the membership of any institution, or impose particular conditions on an institution's membership of RITS. In addition to these rights, the Bank may suspend, for such a period as it considers appropriate, any member who: fails to comply with any provision of the RITS Regulations; is guilty of any conduct regarded by the Bank to be contrary to the interests of the members of the system; or has become insolvent. To facilitate an orderly exit, unsettled payments to or from a suspended member would be removed from the RITS queue, and the input of any new payments involving the suspended member would be prevented (see Principle 13).

19. Tiered participation arrangements

A payment system should identify, monitor and manage the material risks to the payment system arising from tiered participation arrangements.

Rating: Observed

19.1 A payment system should ensure that its rules, procedures, and agreements allow it to gather basic information about indirect participation in order to identify, monitor, and manage any material risks to the payment system arising from such tiered participation arrangements.

The Bank's ESA policy limits the scope for material risks to arise from tiered participation arrangements (see Principle 18). In particular, the Bank's ESA policy limits indirect participation by ADIs, which are the primary providers of payment services in Australia, to those with aggregate outgoing wholesale RTGS transactions of less than 0.25 per cent of the total value of wholesale RITS RTGS transactions.

To ensure RITS has sufficient information about indirect participation, ESA holders that participate indirectly have been required to report the value and volume of their outgoing

wholesale RTGS payments to the Bank on a quarterly basis, and also notify the Bank if they change the agent bank through which they settle. Following changes to the Bank's ESA policy in March 2018, which remove the requirement for indirect-settling banks to hold an ESA, the Bank will in future be collecting this information from agent banks. The information is used to monitor compliance with the 0.25 per cent threshold. If the value of an ADI's outgoing wholesale RTGS payments consistently exceeded the 0.25 per cent threshold, the Bank would consider revoking approval for the agency arrangement. If revoked, the ADI would be required to settle payments using its own ESA.

As noted under Principle 18, the ESA policy also minimises the scope for risks arising from indirect participation by CCPs and SSFs:

- The Bank requires any Australian-licensed CCP that the Bank has determined to be systemically important in Australia to settle Australian dollar margin-related receipts or payments, and the CCP's Australian dollar securities- or derivatives-related obligations, across an ESA held in its own name, or that of a related body corporate acceptable to the Bank.
- Australian-licensed SSFs with payment arrangements that require Australian dollar settlement are eligible to hold ESAs. The Bank's SSF Standards also require that an SSF conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks. Together, these requirements mean that Australian-licensed SSFs with payment arrangements that require Australian dollar settlement settle such obligations in RITS.

19.2 A payment system should identify material dependencies between direct and indirect participants that might affect the payment system.

Taken in combination, the requirements described in Key Consideration 19.1 mitigate the risk of material dependencies developing between direct and indirect participants that could affect RITS.

The Bank considers it unlikely that there are material dependencies that could affect RITS between RITS members that are indirect participants that are not required to hold ESAs, and RITS members that are direct RITS participants. For this reason it only collects information about indirect wholesale RTGS payment flows originating from ADIs.

19.3 A payment system should identify indirect participants responsible for a significant proportion of transactions processed by the payment system and indirect participants whose transaction volumes or values are large relative to the capacity of the direct participants through which they access the payment system in order to manage the risks arising from these transactions.

Given that the value of an indirect participant's wholesale RTGS payments must be less than 0.25 per cent of total wholesale RTGS payments, it is unlikely that such a participant would be large relative to the direct participant it uses as an agent. The design of RITS also encourages direct participation by reducing the liquidity required for direct participation through liquidity-saving features, which are described in Appendix A, section A.4.

19.4 A payment system should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.

The Bank monitors compliance with its ESA policy, which mitigates the potential for risks to arise from tiered participation arrangements, on an ongoing basis. The Bank also reserves the right to review the ESA policy as necessary. In 2017, the Bank made a minor edit to the ESA policy to clarify that payments settled on an RTGS basis through the FSS will not be included in the calculation of the 0.25 per cent threshold. Further amendments in March 2018 removed the requirement for banks settling indirectly to hold an ESA (see Key Consideration 19.1).

21. Efficiency and effectiveness

A payment system should be efficient and effective in meeting the requirements of its participants and the markets it serves.

Rating: Observed

21.1 A payment system should be designed to meet the needs of its participants and the markets it serves, in particular, with regard to choice of a clearing and settlement arrangement; operating structure; scope of products cleared, settled, or recorded; and use of technology and procedures.

To ensure that the needs of its members and the markets its serves are met, the Bank consults widely on any proposed changes to RITS. The Bank also holds RITS User Group forums in Sydney every six months (with dial-in facilities available). These forums provide an opportunity both for members to suggest improvements and for the Bank to consult on planned upgrades. The Bank also liaises closely with the industry through the Australian Payments Network and the Australian Financial Markets Association (AFMA), and directly with RITS members on proposed changes to RITS.

A number of recent changes in RITS have been guided by the 2012 conclusions from the *Strategic Review of Innovation in the Payments System* that the Bank conducted.⁶⁶ The review drew extensively on two rounds of public consultation to develop a number of strategic objectives. Changes have been made to RITS to support the industry in achieving these objectives. For example, one of the strategic objectives was the ability of make real-time retail payments; FSS provides the settlement capability for this objective to be met by the NPP.

21.2 A payment system should have clearly defined goals and objectives that are measurable and achievable, such as in the areas of minimum service levels, risk management expectations, and business priorities.

The Bank's objectives in developing and operating RITS are clearly defined (see Key Consideration 2.1). The Bank sets goals relating to minimum service levels and risk management (see Key Consideration 17.3). A key business priority for RITS is to meet the changing needs of members in the payments system. RITS communicates its business priorities through public consultation, the RITS User Group forum, other direct consultations with RITS members, and liaison with industry through the Australian Payments Network and AFMA.

⁶⁶ The Conclusions from the review are available at <https://www.rba.gov.au/payments-and-infrastructure/payments-system-regulation/past-regulatory-reviews/strategic-review-of-innovation-in-the-payments-system/conclusions/>.

21.3 A payment system should have established mechanisms for the regular review of its efficiency and effectiveness.

The Bank has processes in place to ensure that RITS is operated in an efficient manner. These include regular internal audits of the functional areas involved in the operation of RITS, which are presented to the Bank's Audit Committee, and performance evaluations of Payments Settlements Department management against their position descriptions. A key metric for the review of the effectiveness of Payments Settlements Department is its operational performance. This is reviewed on a six-monthly basis. Feedback from periodic liaison with stakeholders at RITS User Group forums and industry liaison through the Australian Payments Network and AFMA are also key inputs into reviews of the effectiveness of RITS.

22. Communication procedures and standards

A payment system should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording.

Rating: Observed

22.1 A payment system should use, or at a minimum accommodate, internationally accepted communication procedures and standards.

The majority of payment messages sent to RITS – by both volume and value – are sent using the internationally accepted SWIFT message standards and network. Wholesale RTGS payment instructions can be submitted to RITS for settlement on the System Queue via two linked external feeder systems – SWIFT PDS and Austraclear – or entered into RITS directly.

Messages sent to RITS via the SWIFT PDS use SWIFT message standards and are transmitted over the SWIFT network. The Automated Information Facility, which members can use to access information on their payments, receipts and liquidity in real time, receive end-of-day ESA statements and submit commands to manage queued payments, also uses SWIFT message standards and is accessed via the SWIFT network.

The procedures and standards used to submit payments messages to Austraclear are determined by ASX.⁶⁷ Notwithstanding this, members can use the RITS User Interface or the Automated Information Facility to control the status of payments sent via the Austraclear feeder system.

Wholesale RTGS payments to be submitted to the System Queue can be manually entered directly into RITS using the RITS User Interface, which can also be used to perform enquiries, download reports and manage transactions. The RITS User Interface is a browser-based interface that can be accessed over the internet.

Messages sent to RITS via the NPP feeder system use ISO20022 message standards and are transmitted over the domestic SWIFT network.

⁶⁷ ASX also controls the procedures and standards for payment messages through a third RTGS feeder system, CHES-RTGS, which is currently not used.

23. Disclosure of rules, key procedures and market data

A payment system should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the payment system. All relevant rules and key procedures should be publicly disclosed.

Rating: Observed

23.1 A payment system should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.

The RITS Regulations and associated contractual arrangements are clear and comprehensive, and are available to the public on the Bank's website. The RITS Regulations were updated to incorporate provisions relating to the FSS from November 2017. The RITS Regulations are supplemented by information papers and user guides that explain RITS requirements and functions.

23.2 A payment system should disclose clear descriptions of the system's design and operations, as well as the payment system's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the payment system.

The Bank provides members with information papers and user guides that contain detailed descriptions of RITS's features and instruction on how to use them.

23.3 A payment system should provide all necessary and appropriate documentation and training to facilitate participants' understanding of the payment system's rules and procedures and the risks they face from participating in the payment system.

The Bank provides member training and monitors members' operations to ensure that the RITS rules, procedures and features are well understood. Training is provided to all new members, and is offered to all members when new functionality is introduced. Refresher training is available upon request. Training consists of presentations by the Bank on the key features of RITS, as well as the opportunity to be guided through transaction input and management in a test environment. Members also have access to a RITS test environment on an ongoing basis to help them gain familiarity with RITS. The Bank has established the RITS Help Desk to provide ongoing operational assistance to RITS members. The Help Desk provides support on a 24/7 basis.

23.4 A payment system should publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The payment system should provide clear descriptions of priced services for comparability purposes.

The RITS fees schedule is publicly available on the Bank's website.⁶⁸ This schedule provides fees at the level of individual services and provides clear descriptions of priced services. There are no discounts on RITS fees.

68 The RITS fee schedule is available at <https://www.rba.gov.au/payments-and-infrastructure/rits/membership/schedule-fees.html>. For further details see 'Box C: RITS Pricing' in RBA (2013), *Self-assessment of the Reserve Bank Information and Transfer System*, p 23, <https://www.rba.gov.au/payments-and-infrastructure/rits/self-assessments/2013/>.

23.5 A payment system should complete regularly and disclose publicly responses to the CPMI-IOSCO Disclosure Framework for financial market infrastructures. A payment system also should, at a minimum, disclose basic data on transaction volumes and values.

The assessment of RITS against the Principles is published on the Bank's website.⁶⁹ This report addresses all of the matters identified in the Disclosure Framework. The Bank also publishes on its website monthly data on the number and value of RITS payments, as well as a list of RITS members.⁷⁰ RITS payments data are also published by the Bank for International Settlements in the *Statistics on Payment, Clearing and Settlement Systems in the CPMI Countries* on an annual basis.⁷¹

69 Current and previous Assessments of RITS are available at <https://www.rba.gov.au/payments-and-infrastructure/rits/self-assessments/2015/index.html>.

70 Monthly RITS transaction data is available in *C7 Real-time Gross Settlement Statistics* of the RBA Statistical Tables at <https://www.rba.gov.au/statistics/tables/>. A list of RITS members is available at <https://www.rba.gov.au/payments-and-infrastructure/rits/membership/membership-list.html>.

71 These data are available at http://www.bis.org/list/cpmi/tid_57/index.htm.

Abbreviations

ABS	Asset-backed Securities	FSS	Fast Settlement Service
ADI	Authorised deposit-taking institution	GMRA	Global Master Repurchase Agreement
AEDT	Australian Eastern Daylight-saving Time	HVCS	High Value Clearing System
AEST	Australian Eastern Standard Time	ICMA	International Capital Market Association
AFMA	Australian Financial Markets Association	IOSCO	International Organization of Securities Commissions
APRA	Australian Prudential Regulation Authority	LCH	LCH.Clearnet Limited
ASIC	Australian Securities and Investments Commission	LVSS	Low Value Settlement Service
ASX	Australian Securities Exchange	NPP	New Payments Platform
ATM	Automatic Teller Machine	NPPA	New Payments Platform Australia Limited
AusPayNet	Australian Payments Network (formerly APCA)	OMO	Open Market Operation
CCP	Central counterparty	PDS	Payment Delivery System
CHESS	Clearing House Electronic Sub-register System	PEXA	Property Exchange Australia Ltd
CLS	CLS Bank International	PPS	Protected Payments System
CPMI	Committee on Payments and Market Infrastructures (formerly CPSS)	PSNA	Payment Systems and Netting Act 1998
CSC	Customer Security Controls	RITS	Reserve Bank Information and Transfer System
DE	Direct entry	RTGS	Real-time gross settlement
ePAL	eftpos Payments Australia Limited	SIFMA	Securities Industry and Financial Markets Association
EPMO	Enterprise Project Management Office	SSF	Securities settlement facility
ESA	Exchange Settlement Account	SSF Standards	Financial Stability Standards for Securities Settlement Facilities
FMI	Financial market infrastructure	SWIFT	Society for Worldwide Interbank Financial Telecommunication