

PRINCIPLES FOR FINANCIAL MARKET INFRASTRUCTURES

DISCLOSURE

Responding institution: CLS Bank International, an Edge Act corporation under Section 25A of the United States Federal Reserve Act.

Jurisdiction(s) in which the FMI operates: CLS Bank International has Settlement Members with their head or home offices in, or settles the currency of, the following 24 jurisdictions: Australia, Belgium, Canada, Denmark, England & Wales, France, Germany, Hong Kong, Hungary, Israel, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Scotland, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, and the United States.

Authorit(ies) regulating, supervising or overseeing the FMI: the Board of Governors of the Federal Reserve System, the Federal Reserve Bank of New York and the CLS Oversight Committee.

The date of this disclosure is: as of December 31, 2016

This disclosure can also be found at: <https://www.cls-group.com/About/CG/Pages/CorePrinciples.aspx>

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I. EXECUTIVE SUMMARY

In April 2012, the Bank for International Settlements Committee on Payment and Settlement Systems (“**CPSS**”)¹ and the Technical Committee of the International Organization of Securities Commissions (“**IOSCO**”) published the *Principles for financial market infrastructures* (collectively, the “**PFMI**” and each principle a “**Principle**”). To facilitate implementation and promote ongoing observance of the PFMI, CPSS-IOSCO also issued the *Principles for financial market infrastructures: disclosure framework and assessment methodology* (the “**CPSS-IOSCO Disclosure framework**”).²

The PFMI are designed to ensure that the infrastructure supporting global financial markets is robust and able to withstand financial shocks. The PFMI apply to all systemically important financial market infrastructures (“**FMI**s”), including payment systems. The PFMI replace the 2001 *Core Principles for Systemically Important Payment Systems*, the standards previously applicable to CLS Bank International (“**CLS Bank**”).³

In 2012, CLS Bank was designated a systemically important financial market utility (“**FMU**”) by the United States Financial Stability Oversight Council under Title VIII of the Dodd-Frank Wall Street Reform and Consumer Protection Act (the “**Dodd-Frank Act**”). The Board of Governors of the Federal Reserve System’s Regulation HH requires designated FMUs for which the Board of Governors of the Federal Reserve is the “Supervisory Agency” (as defined by the Dodd-Frank Act) to publish a disclosure of rules, key procedures, and market data. CLS Bank publishes this Disclosure as required by Regulation HH and in line with the CPSS-IOSCO Disclosure framework.

This Disclosure describes CLS Bank’s operations and its approach to observing the applicable Principles.⁴ CLS Bank has consulted with the CLS Oversight Committee in the drafting of this Disclosure.

The discussion in this Disclosure is primarily with regard to CLS Bank’s settlement of its Members’ payment instructions relating to underlying foreign exchange (“**FX**”) transactions and over-the-counter (“**OTC**”) credit derivative transactions (the “**Settlement Service**”). It may be noted, however, that CLS Services Ltd. (“**CLS**

¹Effective September 1, 2014, the CPSS changed its name to the Committee on Payments and Market Infrastructures (“**CPMI**”).

²The CPSS-IOSCO Disclosure framework was issued in December 2012 and is available at: <http://www.bis.org/cpmi/publ/d106.pdf>.

³The Core Principles for Systemically Important Payment Systems were published in 2001 by CPSS, and served as a set of guidelines for the design and operation of safe and efficient systemically important payment systems by providing a detailed framework for the key characteristics of such systems. The Board of Governors issued its Policy on Payments System Risk in 2007, whereby it established an expectation that systemically important payment systems would publicly disclose self-assessments as to their compliance with the Core Principles for Systemically Important Payment Systems.

⁴The applicability of each Principle to each type of FMI is based on the functional definition of the type of FMI. Because the Settlement Service is a payment system, certain Principles, such as those directly applicable to central counterparties (“**CCPs**”), do not apply to CLS Bank.

Services”), an affiliate of CLS Bank located in London, also provides certain services to the Members pursuant to an *In/Out Swap Program*, and that CLS Aggregation Services LLC (“**CLSAS**”), a majority-owned affiliate of CLS Bank, provides an Aggregation Service to the Members that participate in the service. Additionally, CLS Services facilitates the triReduce CLS Forward FX Compression Service (“**Compression**”) by providing TriOptima AB (“**TriOptima**”) with matched FX forward-dated trade data for participating entities.

A glossary of the defined terms used herein is provided in **ANNEX A**.

II. SUMMARY OF MAJOR CHANGES SINCE THE LAST UPDATE OF THE DISCLOSURE

As described in greater detail in this Disclosure, there have been various noteworthy changes relating to CLS Bank and the Settlement Service since CLS Bank last issued this Disclosure in December 2014 (the “**December 2014 Disclosure**”):

- Effective November 2015, CLS Bank began settlement of payment instructions in the Hungarian forint;
- Effective October 2015, CLS Services began facilitating Compression by providing TriOptima with matched FX forward-dated trade data for participating entities;
- Effective November 2015, CLS Bank expanded its Settlement Service to include payment instructions relating to the initial and final notional exchanges of cross currency swap (“**CCS**”) transactions (“**CCS payment instructions**”);
- As of December 2015, CLS Bank finalized a comprehensive plan to facilitate the recovery and orderly wind-down of the Settlement Service (the “**CLS Recovery and Orderly Wind-Down Plan**”); and
- Effective January 2017, CLS Bank introduced two new categories of direct participation: non-shareholder membership and affiliated membership.⁵

These changes are also discussed in detail in relevant sections throughout this Disclosure. Additionally, revisions and refinements have been made to the December 2014 Disclosure in the interest of streamlining the content and therefore facilitating the readability of this Disclosure.

III. GENERAL BACKGROUND ON THE FMI

General Description of the FMI and the Markets it Serves

CLS Bank was established by the private sector, in cooperation with a number of central banks, as a payment-versus-payment (“**PvP**”) system, to reduce the principal risk arising from settling FX transactions.

The Settlement Service operated by CLS Bank provides a mechanism for payments relating to underlying FX transactions to be made on a simultaneous basis. This ensures that the final settlement of a payment instruction in one currency occurs if, and only if, settlement of the payment instruction for the currency being exchanged is also final. In this way, the Settlement Service mitigates the risk that one side of an FX transaction is settled with finality without the corresponding counter-currency payment also being settled with finality: so-called “settlement risk.” By settling payment instructions on a PvP basis, CLS Bank ensures that the principal amounts involved are protected.

CLS Bank operates the world’s largest multicurrency cash settlement system, mitigating settlement risk in respect of FX transactions of CLS Bank’s Members and their customers. The FX market is the world’s largest market, with an average daily turnover of US\$5.1 trillion equivalent as of April 2016.⁶ The FX market facilitates a broad range of cross-border transactions involving the transfer of goods, services, capital, and investment flows. Large international

⁵ Detailed below under *Participating Institutions; Access to the Settlement Service*.

⁶BIS *Triennial Central Bank Survey, Foreign exchange turnover in April 2016*, p. 3.

institutions finance their operations through the FX markets, and a significant portion of the daily turnover value in domestic payment systems is related to FX settlement. It is therefore essential that the primary risk from FX transactions, settlement risk, be properly managed.

CLS Bank began settling FX payment instructions in 2002 in seven currencies, and currently settles payment instructions in 18 currencies (“**Eligible Currencies**”).⁷ In 2007, CLS Bank expanded its Settlement Service to include single-currency payment instructions relating to NDF transactions⁸ and certain OTC credit derivative transactions. Payment instructions related to underlying two-way FX transactions, however, make up the vast majority of the payment instructions which are settled by CLS Bank.

Use of the CLS System

In the 12 months ending December 31, 2016, CLS Bank settled an average daily volume of 805,416 payment instructions in the Main Session; with a peak day of 2,577,046 payment instructions on November 14, 2016. Average daily value during the same period was US\$4.821 trillion equivalent with a peak day of US\$10.67 trillion equivalent on December 17, 2014.⁹ The multilateral netting aspects of funding in CLS Bank (discussed in more detail below) yield a payment netting benefit of approximately 95.8%. As a result of this netting and the application of the In/Out Swap liquidity management tool described under *In/Out Swap Program* below, on average only approximately 0.9% of the total value of the payment instructions is currently required in funding from Settlement Members for CLS Bank to complete settlement on any given day in the Main Session.

With regard to the SDS Session, in the 12 months ending December 31, 2016, CLS Bank has settled an average daily volume of 170 payment instructions, with a peak day of 536 payment instructions on November 26, 2014. Average daily value during the same period was US\$19.1 billion equivalent with a peak day of US\$37.3 billion equivalent on January 30, 2015. The multilateral netting aspects of funding in CLS Bank yield a payment netting benefit of approximately 57%. As a result of this netting, on average approximately 43% of the total value of the payment instructions is currently required in funding from Settlement Members for CLS Bank to complete settlement on any given day in the SDS Session.

General Organization of the FMI

A Brief History of CLS Bank

Beginning in the mid-1990s, central banks became increasingly concerned that the high level of settlement risk in existing FX settlement practices, if coupled with an unexpected event or failure, could trigger a serious disruption of the global FX markets, potentially lead to significant credit losses, and impact liquidity in the financial system. Having settlement risk exposure for even a short time can be pronounced given the comparatively large transaction values coupled with gross value settlement could combine to represent a large portion of a party’s capital.

The CPSS report issued in 1996, *Settlement Risk in Foreign Exchange Transactions*, recommended that industry groups develop a risk-reducing, multicurrency FX settlement service to protect against the loss of principal in the settlement of FX transactions. A group of major financial institutions (the “**Group of Twenty**”), had joined forces (beginning in 1994) to consider how the private sector might develop such a solution. The Group of Twenty conducted a one-year study of alternative approaches, which resulted in a “continuous linked settlement” concept. Continuous linked settlement, an arrangement designed to eliminate settlement risk, involves a simultaneous, PvP exchange of each of the two legs of a payment relating to an underlying FX transaction.

In June 1997, the Group of Twenty formed CLS Services Ltd. (later renamed CLS UK Holdings Ltd. and then subsequently named CLS UK Intermediate Holdings, Ltd. (“**CLS UK Intermediate Holdings**”)) to develop and build a new, multicurrency, Pvp settlement service. CLS UK Intermediate Holdings acquired both the Exchange Clearing House (“**ECHO**”) and Multinet International Bank (“**Multinet**”) in 1997, to consolidate the providers of FX processing

⁷The Eligible Currencies are: AUD, CAD, EUR, JPY, CHF, GBP, USD, DKK, NOK, SGD, SEK, HKD, HUF, KRW, NZD, ZAR, ILS, and MXN.

⁸CLS Bank discontinued its NDF settlement service in November 2013.

⁹These values represent both sides of the underlying FX transactions in respect of which CLS Bank settles the corresponding payment instructions.

services.¹⁰ In the spring of 1998, certain non-Group of Twenty financial institutions were asked to join CLS UK Intermediate Holdings, which resulted in CLS UK Intermediate Holdings having 61 shareholders by the end of 1998.

The CLS group entities (collectively, the “**CLS group**”) reorganized in April 2002. CLS Group Holdings AG (“**CLS Group Holdings**”) was established as a for-profit, shareholder-owned company under Swiss law, with CLS UK Intermediate Holdings becoming its wholly-owned subsidiary. CLS UK Intermediate Holdings, in turn, has two wholly-owned subsidiaries, CLS Bank and CLS Services. CLS Bank, located in New York, was established as an Edge Act corporation under Section 25A of the United States Federal Reserve Act in November 1999, following approval by the Board of Governors of the Federal Reserve System.¹¹ CLS Services is located in London and, in addition to services related to the In/Out Swap Program, provides support and technology related services to CLS Bank (including services in connection with the Services Agreement between IBM and CLS Bank (the “**IBM Agreement**,” as further discussed under Principle 17).

The development of the CLS group was given further support in September 2000, when CPSS’s chairman emphasized the importance of such private sector initiatives. CLS Bank went “live” with its Settlement Service in September 2002 with 39 Settlement Members and seven currencies, and has added eleven currencies in subsequent years:

Go-Live Currencies (2002) Abbreviation

Australian dollar	AUD
Canadian dollar	CAD
Euro	EUR
Japanese yen	JPY
Swiss franc	CHF
UK pound sterling	GBP
US dollar	USD

2003 Currencies

Danish krone	DKK
Norwegian krone	NOK
Singapore dollar	SGD
Swedish krona	SEK

2004 Currencies

Hong Kong dollar	HKD
South Korean won	KRW
New Zealand dollar	NZD
South African rand	ZAR

2008 Currencies

Israeli shekel	ILS
Mexican peso	MXN

2015 Currencies

Hungarian forint	HUF
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Principle 2 provides additional detail as to the organizational and governance structure of CLS Bank and the other CLS group entities.

Legal and Regulatory Framework

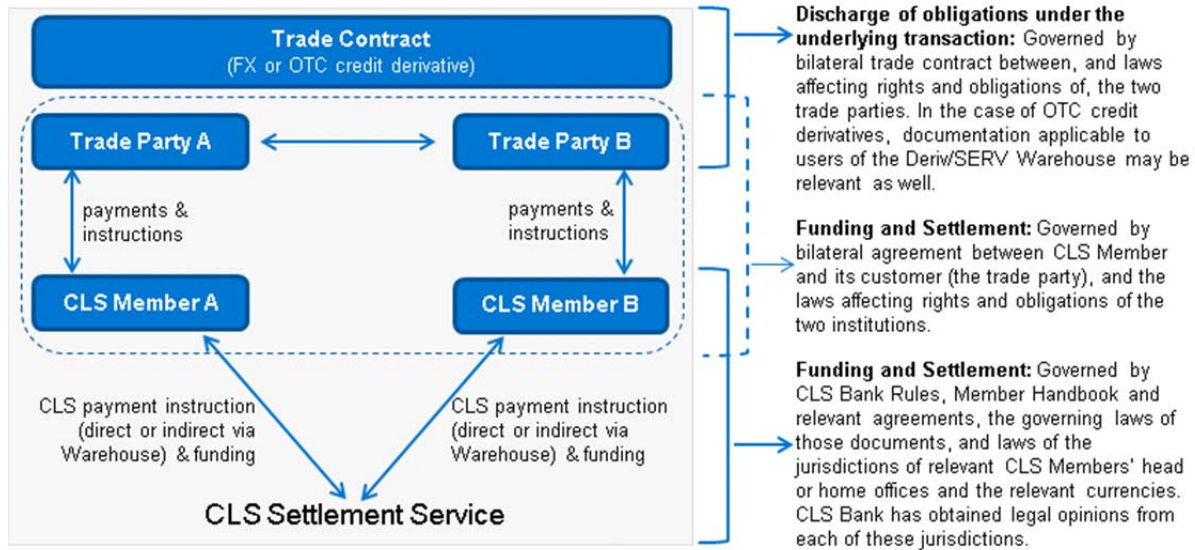
The Settlement Service is supported by a well-established legal framework primarily based on rules, operating procedures, contractual agreements, laws and regulations.

Diagram 1 below provides an overview of the governing laws and agreements supporting the Settlement Service.

¹⁰ECHO and Multinet were developed by the private sector in Europe and North America, respectively, to address pre-settlement risk by multilaterally netting FX transactions for settlement through a CCP.

¹¹The provisions of Section 25A were added to the United States Federal Reserve Act by the Edge Act, which Congress passed in 1919 to facilitate international banking transactions.

Diagram 1



See Principle 1 and Principle 2 for additional detail as to CLS Bank’s legal framework, and the legal basis supporting each material aspect of CLS Bank’s activities.

As an Edge Act corporation, CLS Bank is regulated and supervised by the Federal Reserve. Additionally, the 18 central banks whose currencies are settled in CLS Bank have established the *CLS Oversight Committee*, organized and administered by the Federal Reserve, as a mechanism to carry out their individual responsibilities for the safety and efficiency of payment and settlement systems, and the stability of the financial system. In jurisdictions outside the United States and United Kingdom, some of these central banks and other regulatory bodies have granted CLS Bank certain exemptions from their local regulatory requirements, based on their exercise of oversight through participation in the CLS Oversight Committee. In addition to the European Central Bank, the CLS Oversight Committee also includes five other Eurosystem¹² central banks. This brings the total to 23 central bank members of the CLS Oversight Committee.

The CLS Oversight Committee operates in accordance with the *Protocol for the Cooperative Oversight Arrangement of CLS* (the “**OC Protocol**”).¹³ The OC Protocol was adopted by the CLS Oversight Committee to minimize duplication of effort by the central banks, foster consistent, transparent communications between the central banks and CLS Bank, and enhance transparency regarding applicable regulatory policies in the 24 jurisdictions where Settlement Members have their head or home offices or where CLS Bank settles the currency (the “**CLS Jurisdictions**”). Pursuant to the OC Protocol, CLS Bank also provides proposed waivers or amendments to the CLS Bank Rules (the “**Rules**”) or CLS Bank Member Handbook (the “**Member Handbook**”) to the CLS Oversight Committee for review and comment prior to implementation. Extensions to the Settlement Service offered by CLS Bank to include new types of payment instructions or new currencies are also subject to regulatory review and approval.

Title VIII of the Dodd-Frank Act generally requires a designated FMU to provide notice to its supervisory agency in advance of any changes to its rules, procedures, or operations that could materially affect the nature or level of risks presented by the designated FMU. As discussed in the Executive Summary, CLS Bank is subject to Regulation HH as a designated FMU for which the the Board of Governors of the Federal Reserve is the Supervisory Agency. Regulation HH establishes advance notice requirements and approval requirements for proposed material changes to the Rules, procedures, or operations of a designated FMU. Proposed key initiatives that may impact CLS Bank’s risk profile require advance notice to and approval by the Board of Governors under Regulation HH.

¹¹Belgium, France, Germany, Italy, and the Netherlands.

¹³The OC Protocol is available at: www.federalreserve.gov/paymentsystems/cls_protocol.htm; see also *Central Bank Oversight of Payment and Settlement Systems*, issued by CPSS in May 2005.

System Design and Operations

General Background on the CLS System

The CLS system consists of hardware and software that processes payment instructions for settlement in the relevant settlement session, subject to the satisfaction of certain risk management tests (see *Risk Management Tests* below). The CLS system provides real-time information to Settlement Members on the status of their respective payment instructions. All information is exchanged and authenticated between the CLS system, the Members, central banks and the applicable Real Time Gross Settlement (“**RTGS**”) systems using highly secure, resilient and available network connections and encryption services. Pursuant to the IBM Agreement (detailed under Principle 17), IBM provides operational services for the CLS system, as well as service management and support functions.

Eligible Transactions and Currencies

FX payment instructions settled by CLS Bank include those relating to underlying spot market transactions, forward contracts and certain exchange-traded futures contracts, wherein a Member exchanges a “sell currency” for a “buy currency.” In a spot market transaction settled during the Main Session, the exchanging Members will typically specify a T+2 (*i.e.*, the second business day following submission of the payment instructions) or earlier settlement date, whereas transactions specified for same day settlement are settled on the same day in the SDS Session. Forward contracts will generally stipulate a settlement date of T+>2. CLS Bank also settles payment instructions relating to FX transactions resulting from the exercise of FX option contracts. The resultant payment instructions submitted by Members following any such exercise are indistinguishable from payment instructions related to spot market and forward transactions described above.

FX swaps constitute another general category of underlying transactions in respect of which payment instructions are settled by CLS Bank. As noted above, CLS Bank also settles CCS payment instructions relating to the initial and final notional exchanges of CCS transactions.¹⁴ MarkitSERV validates and matches eligible CCS transactions booked through its MarkitWire platform (“**MarkitWire**”)¹⁵, and is the conduit for submitting CCS payment instructions to CLS Bank on behalf of participating Members. These CCS payment instructions are similar in nature to FX swaps, and are settled by CLS Bank similarly to the payment instructions for FX swaps submitted to the Main Session.¹⁶

CLS Bank also settles payment instructions related to certain underlying OTC credit derivatives transactions. CLS Bank settles a single amount due under one or more types of such transactions maintained in the Trade Information Warehouse (the “**Warehouse**”) of DTCC Deriv/SERV LLC (“**Deriv/SERV**”), a wholly-owned subsidiary of the Depository Trust & Clearing Corporation.¹⁷ Deriv/SERV centrally calculates the payments for OTC credit derivative transactions for which the Warehouse maintains the official legal record, or matches and affirms payments for OTC credit derivative transactions for which the Warehouse maintains basic economic information. Payment instructions related to these transactions may then be submitted to CLS Bank for settlement in the Main Session, either through Deriv/SERV or an affiliate thereof approved by CLS Bank. The Warehouse does not support all of the 18 Eligible Currencies, so CLS Bank only settles payment instructions relating to OTC credit derivative transactions in some of these currencies.

CLS Bank does not guarantee the settlement of any payment instruction submitted for settlement. Payment instructions must pass three risk management tests (see *Risk Management Tests* below), and Settlement Members must satisfy their funding obligations to CLS Bank in order for their payment instruction to settle. Furthermore, CLS Bank does not become a counterparty to any underlying transaction. The PvP process, however, ensures that the

¹³ CCS are OTC derivatives closely related to interest rate swaps, but involve the exchange of the principal at commencement and on maturity. For CLS Bank, the focus is on the FX swap component of the product and the settlement of the initial and final principal payments. CLS Bank does not settle interim interest rate payments.

¹⁵ MarkitWire is a CCS trade booking platform operated by MarkitSERV, a subsidiary of IHS Markit.

¹⁶ For the purposes of this Disclosure, unless otherwise indicated, the term “payment instructions” refers to a payment instruction related to an underlying FX transaction as well as any payment instruction related to an initial or final notional exchange of a CCS transaction.

¹⁷ The Warehouse is intended to provide a comprehensive, centralized trade database with the most up-to-date record of each OTC credit derivative transaction, as well as a central processing capability to standardize and automate “downstream” processing of payments and other post-confirmation processes.

principal amount involved in the settlement of the FX payment instruction is protected. For FX payment instructions, CLS Bank simultaneously settles the two payment instructions, thereby eliminating the risk that one payment is made without the corresponding payment being made (a risk which exists when payments arising from the two legs of an FX transaction are settled separately).

Participating Institutions; Access to the Settlement Service

The Rules provide for two types of Members of CLS Bank: *Settlement Members* and *User Members*¹⁸ (together, “**Members**”). Specifically, subject to meeting the initial and ongoing eligibility requirements described in detail under Principle 18, the following institutions are eligible to become Members:

- A qualifying shareholder of CLS Group Holdings (or affiliate of such shareholder) is eligible to become a Settlement Member
- A qualifying institution that has chosen to pay a monthly minimum fee in lieu of shareholding in CLS Group Holdings is eligible to become a non-shareholder Settlement Member (“**Non-shareholder Member**”)
- A central bank which issues or (if applicable) otherwise circulates a currency that is settled by CLS Bank
- A qualifying affiliate of one of the above institutions is eligible to become an Affiliate Settlement Member (“**Affiliate Member**”).

Unless specifically indicated, Non-shareholder Members, Affiliate Members, and Settlement Members are referred to collectively as Settlement Members in this Disclosure. As of December 31, 2016, CLS Group Holdings had 79 shareholders, and CLS Bank had 66 Members.¹⁹

Each Settlement Member maintains a single multicurrency account with CLS Bank (an “**Account**”).²⁰ A User Member does not have an Account and must be sponsored by a Settlement Member: a Settlement Member agrees to be responsible for all funding obligations arising from an identified User Member’s payment instructions and to have these payment instructions processed for settlement through the Settlement Member’s own Account.

Institutions that are not Members may have indirect access to the CLS system through Settlement Members who, on behalf of such institutions, agree to be responsible for submitting payment instructions to CLS Bank with respect to those institutions’ underlying transactions (such institutions are commonly referred to as CLS Bank “**third parties**”). These third parties do not have any contractual relationship with CLS Bank, and all funding with respect to their payment instructions takes place only between CLS Bank and the Settlement Members acting as third party service provider for such third party.²¹ The terms on which a Settlement Member agrees to provide these services to third parties are governed by private, bilateral, contractual arrangements between the relevant Settlement Member and its third party(ies). In some cases a third party’s relationship with its Settlement Member is governed by a contractual arrangement between the Settlement Member and a non-Member intermediary (these third parties are commonly referred to as “fourth parties”). However, CLS Bank requires any Settlement Member providing third party CLS-related services to provide advance notice and obtain CLS Bank’s written consent prior to adding or modifying third party services for a third party that is an FMI or G-SIFI. See Principle 19 for a more fulsome discussion of third parties.

Each Settlement Member is responsible as principal, and not as agent or trustee, for the funding obligations arising from payment instructions that are settled through its Account, regardless of whether the payment instructions are: (i) submitted by the Settlement Member in respect of its own underlying transactions; (ii) submitted by a User

¹⁸CLS Bank has two “User Members” that are affiliated with Settlement Members; however, they simply serve as submission locations for the relevant Settlement Members rather than act under the User Member provisions of the Rules and Member Handbook. Currently, CLS Bank does not offer the User Member functionality.

¹⁹ The number of shareholders differs from the number of Members because a shareholder may be an institution which has not yet become a Member, or a Member may be a Non-shareholder Member or an Affiliate Member. Also, in limited cases, shareholders are institutions which have ceased to be Members, or which have ceased to be prospective Members, or affiliates of such Members.

²⁰CLS Bank may, in certain merger scenarios, allow a Settlement Member to maintain two Accounts on the books of CLS Bank for a limited period of time.

²¹Third party payment instructions are not currently submitted for settlement in the SDS Session.

Member and authorized by the relevant Settlement Member; or (iii) submitted by the Settlement Member in relation to a third party's underlying transaction.

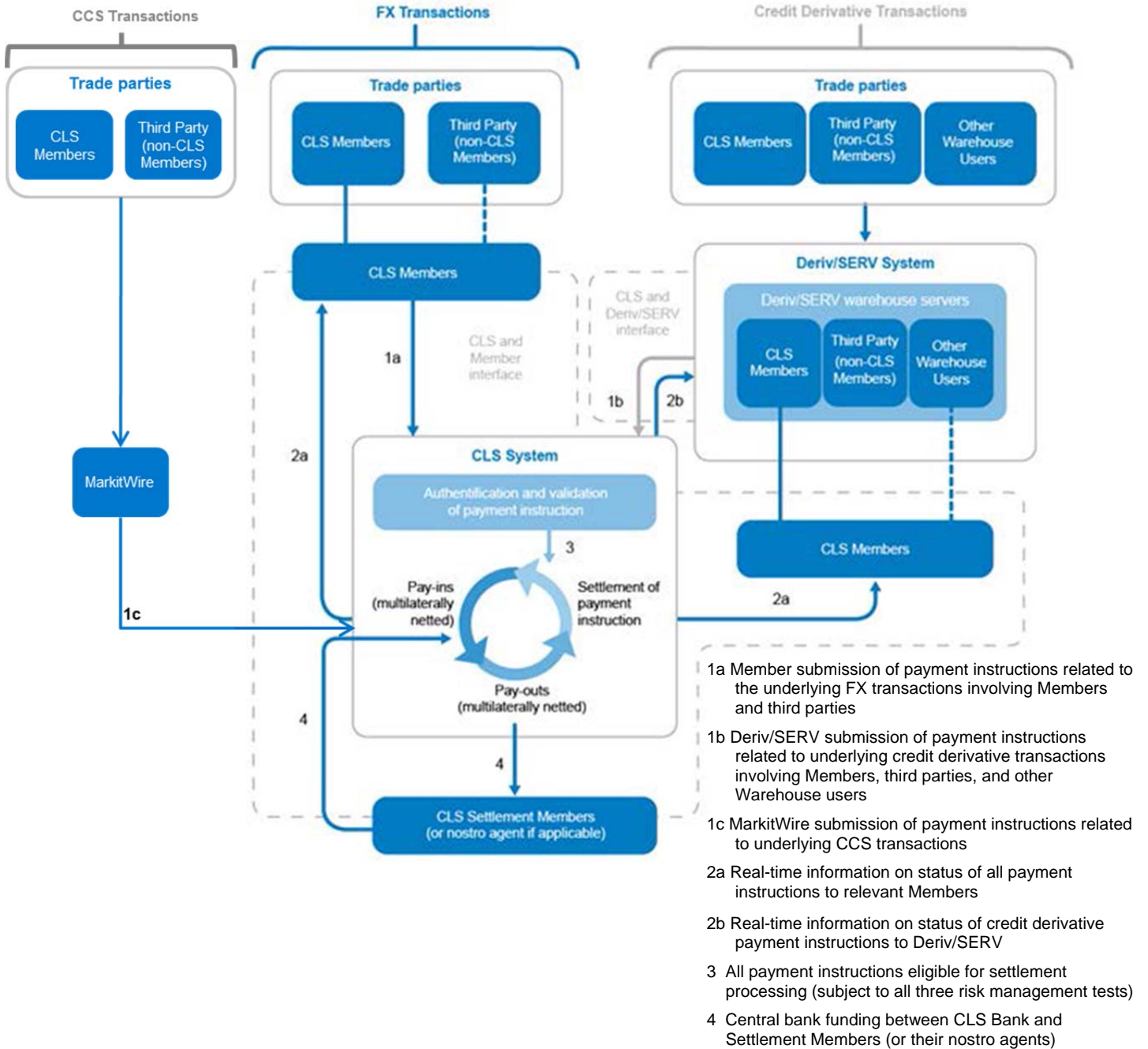
Each Member connects to the CLS system via two standards-based connectivity methods: (i) a CLS XML Channel that utilizes ISO 20022-based XML messages; and (ii) a browser-based Graphical User Interface. Information is exchanged between CLS Bank and the Member over SWIFTNet InterAct, SWIFTNet Browse, and/or the SWIFT FIN service. Members may utilize any of those connectivity methods.

Payment instructions for underlying FX transactions are submitted to the CLS system by Members or, in the case of CCS payment instructions, by MarkitWire, using SWIFTNet InterAct, SWIFTNet Browse, and/or the SWIFT FIN service. These are the methods for submitting all FX payment instructions to the CLS system, including FX payment instructions resulting from the Aggregation Service provided by CLSAS (discussed in greater detail under *CLSAS* below) or from Compression (discussed in greater detail under *Compression* below).

OTC credit derivative payment instructions may only be submitted to the CLS system indirectly through Deriv/SERV, which is responsible for identifying the paying and receiving Members within the CLS system. Deriv/SERV connects to the CLS system through a Transaction Delivery Agent service, and information is exchanged between CLS Bank and Deriv/SERV over SWIFTNet InterAct. Once these payment instructions are received from Deriv/SERV, the CLS system provides Members with information regarding these payment instructions directly (*i.e.*, separate from any information that Deriv/SERV may provide to the Members as users of the Warehouse).

Diagram 2 below provides an illustration of the interaction between Members and the CLS system.

Diagram 2



Operational Timeline for the Main Session and SDS Session

CLS Bank’s Main Session and SDS Session each operate on Central European Time (“CET”), except from the last Sunday in March to the last Sunday in October, during which time the sessions operate on Central European Summer Time (“CEST”). CLS Bank settles payment instructions in the Main Session on each business day on which the RTGS systems for at least two Eligible Currencies are open. With respect to the SDS Session, the USD and CAD RTGS systems must both be open. Members may submit payment instructions to the CLS system with respect to the Main Session at any time, subject to the operational timeline, with the exception of those relating to OTC credit derivatives. For any OTC credit derivatives, payment instructions must be received from Deriv/SERV before 20:45 CET on the business day preceding the settlement date to be settled in the Main Session. Payments instructions for the SDS Session can be submitted from 23:00 CET the day before a payment instruction is scheduled to settle until 18:00 CET on the settlement date.

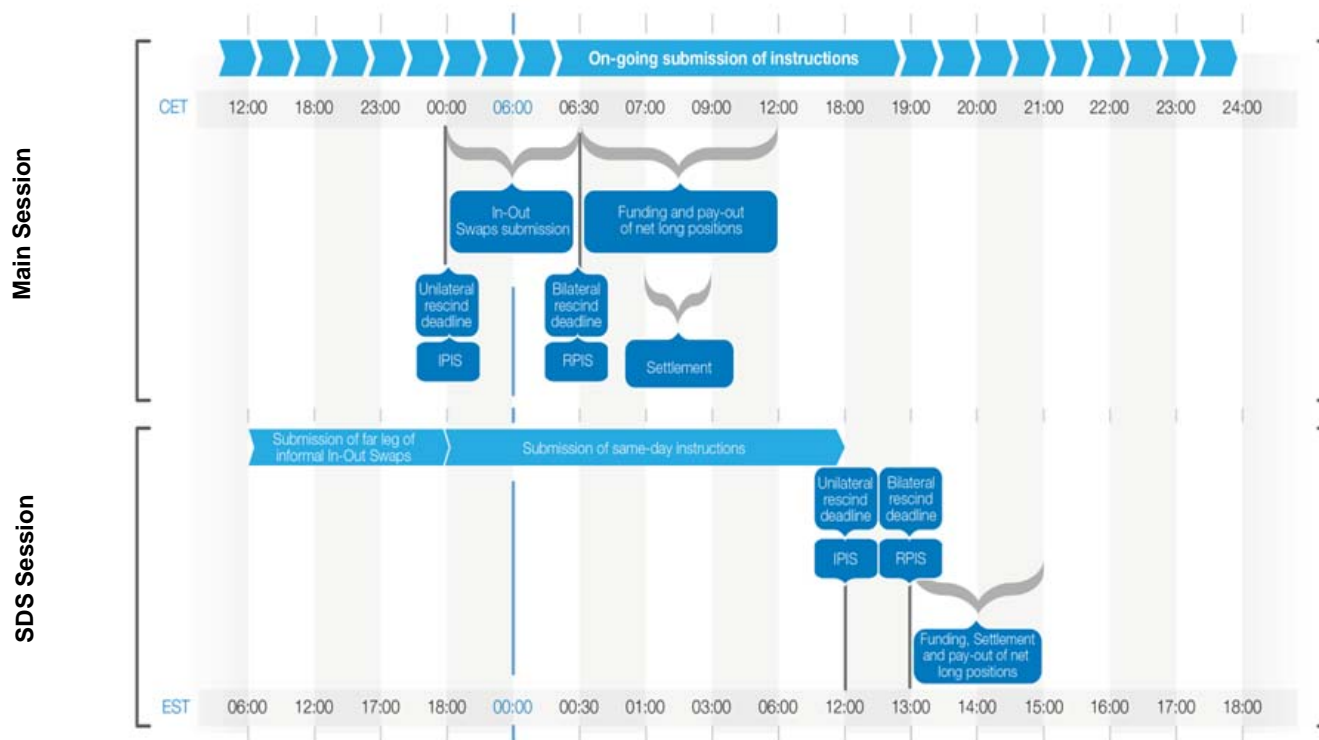
Settlement and Funding in the CLS System

Settlement and funding in the CLS system are separate processes, but are linked, and run in parallel operationally. Settlement in the Main Session takes place over a two-hour period (07:00 – 09:00 CET). Due to CLS Bank’s extension of Settlement Member-specific Aggregate Short Position Limits to Settlement Members (discussed in greater detail below under *Risk Management Tests*), funding takes place over a longer, five-hour period (07:00 – 12:00 CET). In the SDS Session, funding and settlement occur over a two hour period (19:00 – 21:00 CET).²² In contrast to settlement, which is reflected on a gross basis across the Accounts on CLS Bank’s books, funding requirements are calculated on a multilaterally netted basis, taking into consideration all the Settlement Members’ payment instructions scheduled for settlement in the relevant settlement session for each Eligible Currency on the relevant settlement date.

Payment instructions are processed without regard to whether they are two-currency FX payment instructions or single-currency OTC credit derivative payment instructions.

Diagram 3 below provides an illustration of the operational timeline for the settlement and funding processes in CLS Bank for both the Main Session and SDS Session on each business day.

Diagram 3



Overview of Settlement

Upon receipt of a payment instruction, the CLS system authenticates and validates certain information included in the payment instruction. If the payment instruction is not successfully authenticated and validated, it will be rejected by the CLS system.

²²Although the Rules and Member Handbook specify the relevant times with respect to the SDS Session in CET, these times will adjust twice per year based on EST. EST is also provided in **Diagram 3** for completeness.

Large value payment instructions (those payment instructions above a certain specified threshold specific to each Eligible Currency) are split into two or more payment instructions²³ for risk management purposes and in order to process the payment instructions more efficiently for settlement. Large value payment instructions are split into smaller payment instructions such that the resulting payment instructions each involve amounts below the applicable splitting threshold for that Eligible Currency. Once the splitting of a large value payment instruction has taken place, CLS Bank treats the payment instructions resulting from the splitting as separately submitted payment instructions.

CLS Bank does not guarantee the settlement of the payment instructions submitted to it. Any settlement of an authenticated, validated payment instruction, including a separate payment instruction resulting from splitting, is contingent on the satisfaction of three specific risk management tests (see *Risk Management Tests* below). Furthermore, the failure of a Settlement Member to satisfy its funding obligations to CLS Bank may result in a delay in settlement, or settlement of fewer than all of the payment instructions submitted by the Settlement Member (for example, the settlement of one or more matched pairs of payment instructions resulting from splitting, while other pairs resulting from splitting do not settle).

If a payment instruction is authenticated and validated, and satisfies the three risk management tests described below, CLS Bank settles each payment instruction on its settlement date by making the appropriate debit and credit across the Accounts of the relevant Settlement Members on CLS Bank's books. For FX payment instructions involving two-currency payments, CLS Bank settles each pair of matched FX payment instructions simultaneously and separately (*i.e.*, each on a gross basis). CLS Bank also settles single-currency payment instructions relating to OTC credit derivative transactions on a gross basis.

Overview of Funding

As discussed above, each Settlement Member is responsible for all funding requirements arising from the settlement of its payment instructions through its Account. This means all fund transfers in the CLS system occur between CLS Bank on one hand and a Settlement Member (or its nostro agent) on the other hand.²⁴ Nostro agents implement and maintain their own private arrangements with Settlement Members in respect of the services they provide the Settlement Member and do not have any contractual relationship with CLS Bank.

Whereas payment instructions settle in Settlement Members' Accounts across CLS Bank's books on a gross basis as described above, funding between CLS Bank and its Settlement Members occurs on a multilaterally netted basis. Specifically, the funding requirements for each Settlement Member with respect to each settlement session for a particular settlement date are based on a multilateral net calculation of the expected debits and credits in each Eligible Currency, taking into consideration all payment instructions submitted by Settlement Members scheduled for settlement on that settlement date (without any distinction based on the type of underlying transaction associated with the payment instructions). The multilateral netting applies with respect to both Pay-Ins and Pay-Outs, as described below.

Each Settlement Member satisfies its funding obligations to CLS Bank by making payments to CLS Bank's central bank accounts in the relevant Eligible Currencies through the applicable RTGS systems for those currencies ("**Pay-Ins**"). CLS Bank also makes its payments to Settlement Members from CLS Bank's central bank accounts through the applicable RTGS systems ("**Pay-Outs**").

The central banks of the 18 Eligible Currencies have contributed to the effectiveness of the Settlement Service by maintaining central bank accounts for CLS Bank and by collectively creating a *settlement window* during which all of the RTGS systems for the Eligible Currencies are open at the same time, to accommodate the funding necessary for the settlement of payment instructions. The benefits of participation in a PvP system are maximized, and the liquidity implications of such participation are mitigated, by the use of such a settlement window.

All transfers of funds for the Main Session occur during a three-hour period for Asia-Pacific Eligible Currencies, which for this purpose includes the Israeli shekel and the Hungarian forint (07:00 - 10:00 CET), and a five-hour

²³Each Eligible Currency has an established splitting threshold, as documented in the Member Handbook.

²⁴A nostro agent is a bank at which a nostro account is held. A nostro account is a bank account of a payer or payee in a jurisdiction other than that of the payer or payee, denominated in the currency of the foreign jurisdiction.

period for all other Eligible Currencies (07:00 - 12:00 CET). Funding for the SDS Session occurs between 19:00 CET and 21:00 CET.

The CLS system issues two Pay-In Schedules for each settlement session for each settlement date. An initial Pay-In schedule (“**Initial Pay-In Schedule**” or “**IPI**”) is generated per the operational timeline in **Diagram 3** above, and includes the expected net Pay-In and Pay-Out amounts resulting from the settlement of payment instructions that have been classified as eligible for settlement pursuant to the Rules (“**Settlement Eligible Instructions**”) at the Initial Pay-In Schedule deadline. CLS Bank generates an Initial Pay-In Schedule at 00:00 CET for the Main Session and at 18:00 CET for the SDS Session.

CLS Bank also generates a revised Pay-In schedule (“**Revised Pay-In Schedule**” or “**RPIS**”) at 06:30 CET for the Main Session and at 19:00 CET for the SDS Session. The Revised Pay-In Schedule differs from the Initial Pay-In Schedule due to the inclusion of same-day payment instructions (payment instructions that were designated as Settlement Eligible Instructions after the relevant Initial Pay-In Schedule deadline), reductions in funding requirements due to participation in the In/Out Swap Program, payment instructions that were bilaterally rescinded, and/or the taking into account of the application of any overnight balances held in a Settlement Member’s Account.

The Initial Pay-In Schedule for the Main Session issued at 00:00 CET is the basis for the calculation of In/Out Swaps, discussed in detail below. At 01:00 CET, CLS Services issues each participating Settlement Member’s In/Out Swap trade advices for that settlement date. Participating Settlement Members must input relevant In/Out Swap related payment instructions by 06:30 CET to ensure the new positions, as well as required Pay-Ins and Pay-Outs, are reflected in the RPIS for the Main Session (issued at 06:30 CET).

Upon receiving RPIS, Settlement Members instruct their payment departments and/or their nostro agent(s) in one or more Eligible Currencies to transfer funds to the relevant CLS Bank central bank account(s) per the funding requirements in the Revised Pay-In Schedule. CLS Bank makes Pay-Outs from its central bank accounts to Settlement Members in accordance with a Pay-Out algorithm. The Pay-Outs are transferred from CLS Bank’s central bank accounts, in accordance with directions previously provided by the Settlement Member to CLS Bank, either to the Settlement Member’s or its nostro agent’s account at the relevant central bank.

In normal circumstances, where settlement of all payment instructions is completed in line with applicable deadlines²⁵, CLS Bank completes Pay-Outs of the long balances from its central bank accounts to Settlement Members (or their nostro agents) before the close of each RTGS system. As a result, each Settlement Member will have a zero balance in its Account, and CLS Bank will have no funds in its central bank accounts, at the end of each business day.²⁶

In/Out Swap Program

The majority of Settlement Members participate in the In/Out Swap Program provided by CLS Services as a liquidity management tool. As discussed in Section 1.6.1, CLS Services acts as calculation agent for participating Settlement Members and analyzes all participating Settlement Members’ currency positions to identify bilateral positions that could be traded down through an In/Out Swap trade in order to reduce the participating Settlement Members’ funding obligations.

The payment instruction relating to the first leg (the “in” leg) of an In/Out Swap transaction is submitted to the Main Session by the two relevant Settlement Members. The second leg (the “out” leg) of such swap transaction is settled on that same day and subject to the exception below, outside CLS Bank. Consequently, settlement risk exists with respect to this “out” leg. As it is possible to submit the “out” leg of a USD/CAD transaction in the SDS Session, CLS Bank encourages Settlement Members that enter into In/Out Swaps and that participate in the SDS Session²⁷ to submit those payment instructions for settlement in the SDS Session, in order to mitigate the related settlement risk.

²⁵ Including the settlement completion target time prescribed for each settlement session (the “**Settlement Completion Target Time**”).

²⁶ CLS Bank maintains small trial balances in its central bank accounts for the purposes of periodic trialing.

²⁷ An applicable In/Out Swap would be proposed for two Settlement Members, both of whom are participating in the SDS Session, resulting in payment instructions in USD and CAD for submission in the SDS Session.

Risk Management Tests

In order to mitigate the credit, market and liquidity risk associated with providing the Settlement Service, the CLS system automatically applies the following three risk management tests to the settlement processes, regardless of the type of underlying transaction involved. At no time will the CLS system settle a payment instruction if such settlement would result in a Settlement Member's Account failing to meet all three of the following conditions (all three conditions must be met before the CLS system will settle a payment instruction):

- **Positive Adjusted Account Balance (Applying Currency-Specific Haircuts)**. The CLS system will not settle a payment instruction if such settlement would cause a Settlement Member's Account Balance, expressed as a USD equivalent, to be less than zero following the application of currency-specific haircuts. CLS Bank applies these haircuts to each Currency Balance in the Settlement Member's Account, which for purposes of this risk management test results in an increase of each "short" position and a decrease of each "long" position. Application of these haircuts is designed to ensure that no Settlement Member's Account Balance falls below zero, even during periods of extreme FX market volatility.²⁸

The application of haircuts is discussed in detail under Principle 7; an example is provided in **ANNEX B**.

- **Short Position Limits (Currency-Specific)**. The CLS system will not settle a payment instruction if such settlement would cause a Settlement Member's Account to have a short position in any Eligible Currency in excess of the Short Position Limit established and periodically re-evaluated by CLS Bank for that Eligible Currency. The Short Position Limit for each Eligible Currency is the same for each Member. Because the settlement of payment instructions occurs against value in a Settlement Member's Account, the extension of short positions (within the pre-set limits) may permit settlement of a payment instruction submitted by the Settlement Member even if CLS Bank has not yet received a Pay-In from such Settlement Member in the relevant Eligible Currency. Liquidity facilities are discussed in detail under Principle 7.

Because the Short Position Limit for an Eligible Currency at any given time, and the amount of the liquidity facilities available for such Eligible Currency at such time, are related to each other, events such as a drawdown on a liquidity facility would trigger a re-evaluation of that Short Position Limit, as discussed in detail under Principle 7 and Principle 13. Subsequent to any such drawdown, CLS Bank is obligated to re-deliver the acquired Eligible Currency to the Liquidity Provider, which would thereby restore the capacity of the liquidity facility to the original amount. Any such re-delivery would also likely result in a further re-evaluation of the relevant Short Position Limit.

For the SDS Session, both CAD and USD Short Position Limits are currently set to zero and there are no liquidity facilities available. For the Main Session, each Eligible Currency's Short Position Limit is based on the amounts of CLS Bank's available, committed liquidity facilities for that Eligible Currency.

- **Aggregate Short Position Limit (Member-Specific)**. The CLS system will not settle a payment instruction if such settlement would cause a Settlement Member's Account to have an Aggregate Short Position in excess of the Aggregate Short Position Limit established by CLS Bank for that Settlement Member. This limit represents the maximum amount of all short positions permitted in the Settlement Member's Account, taken together (expressed as a USD equivalent). The Aggregate Short Position Limit does not restrict the volume or value of payment instructions that a Member may submit for settlement. This limit only controls the extent to which payment instructions can be successfully settled across the Settlement Member's Account as Pay-Ins are made during the settlement session.

The Aggregate Short Position Limit is specific to each Settlement Member and is determined from time to time by CLS Bank for each Settlement Member based on specific criteria, and CLS Bank may adjust a Settlement Member's Aggregate Short Position Limit at any time on the basis of several factors, as discussed under Principle 4. For the SDS Session, the Aggregate Short Position Limits are currently set to zero for each Settlement Member.

²⁸Haircuts affect a Settlement Member by causing CLS Bank to withhold value in the Settlement Member's Account through reduced Pay-Outs until the Settlement Member covers the entire amount of its short positions through its Pay-Ins to CLS Bank.

An example of the application of the three risk management tests is provided in **ANNEX C**.

In respect of an Eligible Currency and a settlement session, there is a specific time at which the CLS system will, in the ordinary course of business, reject payment instructions on the settlement processing queue that have not settled (the “**Currency Close Deadline**”). If CLS Bank is unable to settle a pair of matched payment instructions by the relevant Currency Close Deadline because any of the above risk management tests have not been satisfied (either for one of the submitting Members, or both), these payment instructions will be rejected by the CLS system.

In the case of a rejection of payment instructions caused by a Settlement Member failing to satisfy the three risk management tests because it has failed to make a required Pay-In, one or more other Settlement Members may receive a Pay-In Call as a result of such failure, as detailed in Section 7.3.4. The Settlement Member which has failed to satisfy the risk management test(s) giving rise to such rejection of payment instructions will be liable for the other Settlement Member(s)’ funding costs in connection with such Pay-In Call. Any such liability, however, must be enforced by the affected Settlement Member(s) rather than CLS Bank.

Liquidity Facilities; Alternative Currency Pay-Outs

CLS Bank maintains committed liquidity facilities for certain Eligible Currencies based on its assessment of certain criteria.²⁹ These liquidity facilities are described in more detail under Principle 4, Principle 7 and Principle 13. During the Main Session, either the inability of CLS Bank to draw on its liquidity facilities or the continued failure of more than one Settlement Member to satisfy its funding obligations to CLS Bank could create a situation where CLS Bank has sufficient value to satisfy its Pay-Out obligations to other Settlement Members relating to payment instructions that have settled, but not necessarily in the Eligible Currency(ies) that the other Settlement Members are expecting to receive. Alternative currency Pay-Outs are discussed under Principle 7 and Principle 13.

CLSAS

In 2010, CLSAS was created as a majority-owned (51%) subsidiary of CLS Bank to provide a specialized service to Members and their affiliates. The minority owner (49%) of CLSAS is Traiana Inc., which is in turn majority-owned by ICAP, an interdealer broker. CLSAS offers Members a service in which spot market FX transactions involving the same pair of transaction counterparties (which may be Settlement Members or affiliates of Settlement Members, referred to as “**Aggregation Parties**”) and the same currencies are aggregated together to comprise a cumulative amount of “sell” currency (such service, the “**Aggregation Service**”). In this manner, CLSAS consolidates multiple transactions into one transaction. Payment instructions in respect of these aggregated transactions are then submitted by the relevant Member to CLS Bank for settlement.

It should be noted that CLSAS does not net or settle transactions, or provide any other services apart from the Aggregation Service. Also, aggregated transactions are not sent by CLSAS to CLS Bank, but rather are sent back to the Aggregation Parties for their own submission of payment instructions related to those aggregated transactions to CLS Bank. The Aggregation Service is intended to address operational risk and capacity issues arising from high-frequency, low-value FX transactions; for example, transactions attributable to algorithmic trading, prime brokerage and retail aggregators, and thereby provide economic benefits to users while reducing demands on the CLS system, as discussed in Section 17.7.1.

Compression

In 2015, Compression was launched as a non-exclusive arrangement between CLS Services and TriOptima to reduce operational, credit and counterparty risk for institutions and enhance capital efficiency, in line with regulatory expectations and requirements for a more robust and transparent post-trade environment. In this arrangement, CLS Services or CLS Bank provide matched FX forward-dated trade data to TriOptima on behalf of participating entities (“**Compression Participants**”). TriOptima, in turn, operates the Compression service by leveraging its existing regulatory position and infrastructure for other asset classes. The output of each Compression cycle is a set of termination and replacement trades agreed to by Compression Participants.

²⁹ Including, but not limited to, credit and liquidity risk considerations.

It should be noted that the payment instructions resulting from Compression are not sent to CLS Bank by TriOptima. Rather, the results of Compression are sent by TriOptima to the Compression Participants, who cancel the original transactions and book replacement trades in exactly the same manner that all other FX payment instructions are submitted to CLS Bank (see *Participating Institutions: Access to the Settlement Service* above).

Principle 1: Legal basis

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

1.0 Summary

The Settlement Service is supported by a well-established legal framework primarily based on rules, operating procedures, contractual agreements, laws and regulations. CLS Bank confirms the soundness and enforceability of this legal framework by obtaining legal opinions from external counsel in each of the CLS Jurisdictions, and ensures that the legal basis for each material aspect of its activities (finality of settlement and funding, netting/unity of account, default rules and procedures and liquidity facilities) is made clear and transparent by making its Rules publicly available and by publicly disclosing information about CLS Bank and the CLS system in accordance with applicable international principles and public policy objectives.

Key Consideration 1. The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.

1.1 The CLS Bank Legal Framework

The legal framework supporting the Settlement Service is comprehensive and consists of: (i) the Rules; (ii) the Member Handbook; (iii) Member Agreements;³⁰ (iv) agreements with Liquidity Providers;³¹ (v) agreements with central banks/RTGS systems; (vi) agreements relating to other CLS group entity services; and (vii) relevant laws and regulations in each of the CLS Jurisdictions, each discussed in detail below. The Rules, Member Handbook, and Member Agreements are referred to collectively herein as the “**CLS Bank Documents.**”

1.1.1 The Rules

The Rules are governed by English law and comprise the written record of the consensus reached by the shareholders of CLS Group Holdings, the Members, and the regulatory community as to the business, risk, regulatory, legal and system functionality requirements for the Settlement Service. The Rules are binding on CLS Bank, CLS Services and each Member.

1.1.2 The Member Handbook

The Member Handbook is also governed by English law and is also binding on CLS Bank, CLS Services and each Member. The Member Handbook describes certain procedural requirements and other information relating to participation in the Settlement Service.

The Member Handbook provides for CLS Bank to establish and publish “protocols” relating to best practices surrounding post-trade processes which have been developed and generally agreed upon within the industry. All Members, by agreeing in their Member Agreements to be bound by the Member Handbook, agree to adhere to any such protocols that are listed in the Member Handbook.³²

1.1.3 Agreements with Members

Each Settlement Member executes a single Settlement Member Agreement, and each User Member executes a single User Member Agreement, with CLS Bank and CLS Services. Each such Member Agreement creates a legally binding relationship among CLS Bank, CLS Services and the relevant Member. It is a requirement under the Rules that each executed Member Agreement must be accompanied by an opinion of counsel to the Member (see Section 1.16). The Member Agreements contain software and trademark licensing terms, as well as confidentiality provisions, and each Member agrees in its Member Agreement to, amongst other things, abide by the provisions of the Rules and Member Handbook. The Member Agreements are governed by New York law.

³⁰The Member Agreements are based on a template and are not separately negotiated with each Member.

³¹Agreements with Liquidity Providers are based on a template, and are not separately negotiated with each Liquidity Provider.

³²The CLS Bank FX Protocol is described in Section 1.4.

1.1.4 Agreements with Liquidity Providers

When CLS Bank requires liquidity in a particular Eligible Currency, it uses other Eligible Currencies to obtain the required funds. In order to raise the liquidity in the Eligible Currency that CLS Bank requires, in exchange for an Eligible Currency in which it has balances on its central bank accounts, CLS Bank maintains committed liquidity facilities with one or more Liquidity Providers for applicable Eligible Currencies.

CLS Bank enters into a Foreign Exchange Liquidity Agreement with each Liquidity Provider (“**Liquidity Agreement**”). The Liquidity Agreement (which is governed by New York law) sets out the terms under which the Liquidity Provider provides the liquidity facility to CLS Bank and incorporates by reference the provisions of the 1997 International Foreign Exchange Master Agreement (IFEMA).

The liquidity facilities are described in more detail in Section 1.3.5 and under Principle 7.

1.1.5 Agreements with Central Banks / RTGS Systems

CLS Bank maintains a central bank account with the relevant central bank for each Eligible Currency. Pay-Ins are received by CLS Bank, and Pay-Outs are made by CLS Bank, into and out of these central bank accounts. CLS Bank has an agreement with each central bank (and also in some cases, separately with the applicable RTGS system) that governs CLS Bank’s central bank account. Each agreement with a central bank is governed by the laws of the central bank’s jurisdiction.

Payments to and from CLS Bank’s central bank accounts are made via the applicable RTGS system, described below.³³

- Australian dollar (AUD) – Reserve Bank Information and Transfer System (“RITS”). CLS Bank is a member of and direct participant in RITS, the AUD RTGS system operated by the Reserve Bank of Australia. CLS Bank has an exchange settlement account with the Reserve Bank of Australia. CLS Bank is a member of the High Value Clearing System operated by the Australian Payments and Clearing Association, of which CLS Bank is also a member.
- Canadian dollar (CAD) – Large Value Transfer System (“LVTS”). CLS Bank does not participate directly in LVTS, the CAD payment system operated by Payments Canada. The Bank of Canada participates in LVTS on CLS Bank’s behalf, with which it exchanges payment and reconciliation messages via the SWIFT FIN network. CLS Bank has a central bank account with the Bank of Canada.
- Danish krone (DKK) – KRONOS. CLS Bank is a member of and participant in KRONOS, the DKK RTGS system operated by Danmarks Nationalbank. CLS Bank has a central bank account with Danmarks Nationalbank.
- Euro (EUR) – TARGET2-ECB. CLS Bank has access to the Trans European Automated Real-time Gross settlement Express Transfer system (“TARGET2”), the RTGS system for the EUR. TARGET2 is characterized by a single technical platform called the Single Shared Platform and legally structured as a multiplicity of payment systems. The European Central Bank participates in TARGET2 through its component system, TARGET2-ECB. CLS Bank has a central bank account with the European Central Bank.
- Hong Kong dollar (HKD) – Clearing House Automated Transfer System (“CHATS”). CLS Bank is a member of and participant in HKD CHATS, the RTGS system for HKD clearing operated by Hong Kong Interbank Clearing Limited. CLS Bank has a central bank account with the Hong Kong Monetary Authority.

³³CLS Bank participates in an RTGS system on a “remote access” basis via the SWIFT FIN network when direct access to the RTGS system is otherwise limited to institutions with offices in the relevant jurisdiction.

- Hungarian forint (HUF) – VIBER. CLS Bank is a member of and direct participant in VIBER, the RTGS system for HUF operated by the Magyar Nemzeti Bank (the central bank of Hungary or “MNB”). CLS Bank has a central bank account with the MNB.
- Israeli shekel (ILS) – ZAHAV System. CLS Bank is a direct participant in the ZAHAV system, the ILS RTGS system operated by the Bank of Israel. CLS Bank has a central bank account with the Bank of Israel.
- Japanese yen (JPY) – Foreign Exchange Yen Clearing System (“FXYCS”) and the Bank of Japan Financial Network System (“BOJ-NET”). CLS Bank has access to BOJ-NET, the JPY RTGS system, through FXYCS, operated by the Japanese Bankers Association, with which CLS Bank has a special relationship short of full membership. CLS Bank has a central bank account with the Bank of Japan.
- Mexican peso (MXN) – Sistema de Pagos Electrónicos Interbancarios (“SPEI”). CLS Bank participates in SPEI, the MXN RTGS system operated by Banco de México, on a remote access basis and exchanges payment and reconciliation messages with SPEI. CLS Bank has a central bank account with Banco de México.
- New Zealand dollar (NZD) – Exchange Settlement Account System (“ESAS”). CLS Bank is a member of and direct participant in ESAS, the NZD RTGS system operated by the Reserve Bank of New Zealand. CLS Bank has a central bank account with the Reserve Bank of New Zealand.
- Norwegian krone (NOK) – Norwegian Interbank Clearing System (“NICS”) and NBO. CLS Bank is a member of and participant in NBO, the NOK RTGS system operated by Norges Bank. CLS Bank has a central bank account with Norges Bank.
- Singapore dollar (SGD) – New MAS Electronic Payment and Book-Entry System (“MEPS+”). CLS Bank is a member institution of MEPS+, the SGD RTGS system operated by the Monetary Authority of Singapore. CLS Bank has a central bank account with the Monetary Authority of Singapore.
- South African rand (ZAR) – South African Multiple Option Settlement system (“SAMOS”). CLS Bank is a member of and direct participant in SAMOS, the ZAR RTGS system operated by the South African Reserve Bank. CLS Bank has a central bank account with the South African Reserve Bank.
- South Korean won (KRW) – BOK-Wire+. CLS Bank is a member of and direct participant in BOK-Wire+, the KRW RTGS system operated by the Bank of Korea. CLS Bank has a central bank account with the Bank of Korea.
- Swedish krona (SEK) – RIX. CLS Bank is a member of and direct participant in RIX, the SEK RTGS system operated by Sveriges Riksbank. CLS Bank has a central bank account with Sveriges Riksbank.
- Swiss franc (CHF) – Swiss Interbank Clearing system (“SIC”). CLS Bank is a member of and direct participant in the SIC system, the CHF RTGS system operated by SIX Interbank Clearing on behalf of the Swiss National Bank. CLS Bank has a settlement account in SIC itself and a master account with the Swiss National Bank. The separation of the accounts is of a technical nature, from a legal point of view both accounts are considered as one (the sight deposit account at the Swiss National Bank).
- UK pound sterling (GBP) – CHAPS. CLS Bank is a member of and participant in CHAPS, the GBP RTGS system operated by CHAPS Clearing Company Ltd. CLS Bank has a central bank account with the Bank of England.
- United States dollar (USD) – Fedwire. CLS Bank is a member of and direct participant in Fedwire, the USD RTGS system operated by the United States Federal Reserve System. CLS Bank has a central bank account with the Federal Reserve Bank of New York.

1.1.6 Agreements Relating to Other CLS Group Entity Services

Other CLS group entities also have agreements in place with respect to services they provide that are complementary to the Settlement Service. CLS Services and participants in the In/Out Swap Program enter into an *Agreement Relating to the Provision of Services by CLS Services Ltd. to CLS Settlement Members Participating in the In/Out Swap Program* (the “**In/Out Swap Agreement**”). CLSAS and Aggregation Participants enter into Aggregation Participant Agreements. CLS Services also enters into *Agreements Relating to Disclosure of Information in respect of Trade Compression* with Compression Participants in order for CLS Services to provide matched, forward-dated trade data to TriOptima for use in operating the Compression service.

1.1.7 Relevant Laws and Regulations in Each of the CLS Jurisdictions

The laws and regulations in each CLS Jurisdiction are another key element of the CLS Bank legal framework. Most importantly, they provide CLS Bank and its Members with a high degree of legal assurance as to finality of settlement and funding and unity of account (including the enforceability of netting), in each case even in the event of a Member becoming subject to insolvency proceedings.

1.2 The Settlement Service and the Relevant Jurisdictions

The Settlement Service provided by CLS Bank is described in detail in the Introduction under *General Background on the FMI*. The legal basis for CLS Bank’s activities includes certain rules, operating procedures and contractual agreements, by which participants in the Settlement Service are required to abide. The material aspects of the activities in which CLS Bank engages, in providing the Settlement Service (see Section 1.3), are supported by these rules and contractual provisions, which, together with relevant laws and regulations in the CLS Jurisdictions, establish the terms upon which the Settlement Service is provided to Members.

Given that the CLS group is composed of several international entities, CLS Bank has Settlement Members with their head or home offices in multiple different jurisdictions globally, and CLS Bank settles payment instructions in 18 Eligible Currencies, the legal regimes of a number of jurisdictions around the world are relevant to, and required to be taken into account by, CLS Bank. More specifically:

- CLS Bank and CLS Services have offices located in the United States and the United Kingdom, respectively, and as such are generally subject to the applicable laws and regulations of those jurisdictions;
- CLS UK Intermediate Holdings has two representative offices, one located in Hong Kong and the other in Japan. Due to the limited activities these two offices engage in, the scope of local regulations applying to these offices is also limited;
- the Rules and Member Handbook are governed by English law, and the Member Agreements, Liquidity Agreements, In/Out Swap Agreements and Aggregation Participant Agreements are governed by New York law;³⁴ and
- relevant laws and regulations in the CLS Jurisdictions, including those of the European Union, must be taken into account in the operation of the Settlement Service.

³⁴Prior to launching the Settlement Service in 2002, CLS Bank determined that this type of dual governing law structure would afford maximum protection to the CLS system available under finality and netting legislation in the EU and US. Statutory finality and netting protection in the EU under the Settlement Finality Directive are only available to payment systems which are governed by the laws of an EU member state. CLS Bank therefore determined that the Rules would be governed by English law, which is both the law of an EU member state and widely accepted in international FX transactions. In addition, the Federal Deposit Insurance Corporation Improvement Act (“**FDICIA**”) of 1991 generally provides that, notwithstanding any other provision of Federal law, certain payments between two financial institutions shall be netted in accordance with the terms of the “netting contract” (12 U.S.C. 4403). As a result of the fact that prior to amendments to FDICIA in 2005, only contracts governed by US State or Federal law qualified as “netting contracts,” CLS Bank specified New York law to govern the Member Agreements.

1.3 How CLS Bank Ensures that the Legal Basis for Each Material Aspect of its Activities (as described under Sections 1.3.1 to 1.3.5) has a High Degree of Certainty in all Relevant Jurisdictions and is Well-Founded, Clear, Transparent and Enforceable.

1.3.1 Settlement and Funding

Because each Settlement Member is responsible for all funding requirements arising from the settlement of its payment instructions, whether such payment instructions are with respect to underlying transactions that are proprietary to that Settlement Member or that pertain to third party transactions,³⁵ all fund transfers (Pay-Ins and Pay-Outs) via the CLS system occur between CLS Bank on one hand and a Settlement Member (or its nostro agent) on the other hand. As noted in the Introduction, nostro agents do not have any contractual relationship with CLS Bank, and CLS Bank has no contractual involvement in matters pertaining to the relationship between a Settlement Member and its nostro agent for any given Eligible Currency.

CLS Bank ensures that, in each of the CLS Jurisdictions, there is a well-founded legal basis supporting the processes undertaken in the CLS system to accomplish settlement and funding by establishing clear and comprehensive provisions in this regard in the Rules and Member Handbook, obtaining legal opinions from external counsel in England and the United States as to the enforceability of the CLS Bank Documents and obtaining legal opinions from external counsel in each CLS Jurisdiction confirming that compliance with the Rules would not cause a Member in the jurisdiction to violate any law in that jurisdiction. The various legal opinions obtained by CLS Bank are described in more detail in Section 1.7.

1.3.2 Finality of Settlement and Funding

Finality of settlement of payment instructions across CLS Bank's books and finality of funding into and out of CLS Bank's central bank accounts are critical aspects of CLS Bank's activities. In the absence of fraudulent or other inequitable conduct by CLS Bank, settlement and funding should be final and irrevocable, even in cases where a Settlement Member is subject to an insolvency proceeding. The concept of finality of settlement and funding may be expressed, in general terms, as "protection" from insolvency and other laws that might otherwise permit a post-settlement reversal of payment instructions, or a post-settlement "claw back" of settled amounts.³⁶

CLS Bank ensures that, in each of the CLS Jurisdictions, there is a well-founded legal basis supporting the finality of settlement and funding in the CLS system.³⁷ Its approach can be summarized as follows:

(i) *CLS Bank Rules and Member Handbook*

As described under Principle 8, the Rules and Member Handbook establish that payment instructions are settled by CLS Bank with finality. The Rules provide that settlement of settlement eligible instructions shall be "final and irrevocable" once the relevant Settlement Member accounts have been debited or credited, and shall be binding upon the submitting Members of such payment instructions, the Settlement Members through whose accounts such payment instructions are settled and CLS Bank.

The Rules and Member Handbook also establish finality of funding. Settlement Member Pay-Ins must be made to CLS Bank's accounts at the relevant central banks through the relevant RTGS systems (see Section 1.1.5). Once CLS Bank has received confirmation from a central bank stating that a payment by a particular Settlement Member has been credited to CLS Bank's account at the central bank as a result of a funds transfer from that Settlement Member or its nostro agent and completed its internal procedures with respect to that credit, such payment is, according to the Rules, final and irrevocable.

³⁵Third party participation in the Settlement Service is discussed in more detail under Principle 19.

³⁶Finality of settlement and funding should apply irrespective of how the underlying transaction would be treated in the event of a dispute between the transaction counterparties. In other words, any such dispute should be resolved "outside" CLS Bank, without the possibility of any reversal of payment instructions settled by CLS Bank or claw back of Pay-Ins made to, or Pay-Outs made by, CLS Bank.

³⁷As noted in the Introduction, CLS Bank treats payment instructions resulting from splitting as separately submitted payment instructions. In the event that a large value payment instruction is split into separate payment instructions, one or more matched pairs of the split payment instructions may settle while other pairs do not settle. As discussed under Principle 8, the splitting process does not affect the finality and irrevocability of split payment instructions that have settled.

(ii) *Legislation Protecting Finality of Settlement and Funding*

One of the criteria for an Eligible Currency under the Rules is that CLS Bank has determined that there is legislation or regulation (or equivalent) in the jurisdiction of the Eligible Currency³⁸ that provides for the finality of settlement of payment instructions across CLS Bank's books and Pay-Ins and other settlement-related payments received by CLS Bank through the relevant RTGS system for such Eligible Currency (or, alternatively, that the jurisdiction has finality protections within its local law that are comparable to the finality protections afforded to CLS Bank in the other CLS Jurisdictions, as determined by the board of directors of CLS Group Holdings (the "**CLS Group Board**")). Finality is required to apply in all cases, even where a Settlement Member is subject to an insolvency proceeding.

In 21 of the 24 CLS Jurisdictions, in order to benefit from such finality protections, a payment system must have been granted special statutory protections under relevant local law by the relevant governmental or regulatory authority (typically the central bank). The CLS system benefits from this special protection by virtue of specific designations under the relevant finality legislation in the following CLS Jurisdictions:

- European Union member states (seven Eurozone jurisdictions, plus Denmark, Hungary, Sweden, England and Wales, and Scotland): as a "designated system" under the EC "Settlement Finality Directive" - Directive 98/26/EC of the European Parliament and of the Council of May 19, 1998 on settlement finality in payment and securities settlement systems, and the Financial Markets and Insolvency (Settlement Finality) Regulations 1999 that implement the Settlement Finality Directive in the United Kingdom (each as amended).
- Norway: as a "designated system" under the Settlement Finality Directive and the UK-implementing regulations as described above. Although not a European Union member state, Norway has applied the Settlement Finality Directive as a member of the European Economic Area.
- Australia: as a "netting market" under the Payment Systems and Netting Act 1998.
- Canada: as a "clearing and settlement system" under the Payment Clearing and Settlement Act.
- Hong Kong: as a "designated system" under the Payment Systems and Stored Value Facilities Ordinance.
- Israel: as a "designated supervised system" under the Payment Systems Law, 5768-2008.
- New Zealand: as a "designated settlement system" under the Reserve Bank of New Zealand Act.
- Singapore: as a "designated system" under the Payment and Settlement Systems (Finality and Netting) Act 2002.
- South Africa: as a "designated settlement system" under the National Payment System Amendment Act, 2004.
- South Korea: as a "designated payment and settlement system" under the Debtor Rehabilitation and Bankruptcy Law.

The following four jurisdictions do not have similar laws that require any such special designation to support the finality of settlement and funding in the CLS system:

- Japan: finality of settlement and funding is supported by applicable insolvency laws, case law and the Deposit Insurance Act of 1971.

³⁸The requirement also applies for each jurisdiction in which a Settlement Member has its head or home office.

- Mexico: finality of settlement and funding is supported by applicable payment systems laws, insolvency laws, case law and the Mexican Banking Institutions Law.
- Switzerland: finality of settlement and funding is supported by applicable insolvency laws, including the Swiss Federal Act on Financial Market Infrastructures of 19 June 2015, as amended, and FINMA's Ordinance on the Insolvency of Banks and Securities Dealers of 30 August 2012, as amended.
- United States: finality of settlement and funding is supported by the Federal Deposit Insurance Corporation Improvement Act of 1991, as amended ("**FDICIA**") (see footnote 34), applicable insolvency laws, case law and Article 4A of the Uniform Commercial Code.

(iii) *Legal Opinions Obtained by CLS Bank as to Finality of Settlement and Funding*

In addition to confirming that requisite finality protections are enacted under, or otherwise provided for by, the laws and regulations of each CLS Jurisdiction, CLS Bank confirms that finality of settlement and funding is supported in each of the CLS Jurisdictions by obtaining reasoned legal opinions from its external counsel in each CLS Jurisdiction on an annual basis (with consultation throughout the year as necessary). The legal opinions obtained by CLS Bank are described in more detail in Section 1.7.

(iv) *Suspension of an Insolvent Settlement Member*

In the CLS Jurisdictions, the finality and/or netting protections that CLS Bank confirms exist may terminate a short time after the commencement of an insolvency. Accordingly, to mitigate legal risk, CLS Bank takes a conservative approach in the event of the insolvency of a Settlement Member, and would generally suspend an insolvent Settlement Member upon confirming the occurrence of an insolvency, even if this means the suspension takes place during a settlement session. CLS Bank's policy with respect to a Settlement Member insolvency as well as rapidly evolving resolution regimes and relevant resolution tools are discussed in additional detail under Principle 13. The legal opinions obtained by CLS Bank describe the specific types of insolvency events in each of the CLS Jurisdictions and the legal ramifications for CLS Bank as a result of the commencement of an insolvency of a Settlement Member.

In order to maximize the likelihood that CLS Bank will become aware of a possible or actual insolvency as soon as possible, CLS Bank conducts comprehensive round-the-clock monitoring of its Settlement Members by various means, including through the receipt and review of real time news alerts relating to Settlement Members and subscriptions to regulatory alert services recommended by CLS Bank's external counsel. CLS Bank has also provided emergency contact details for key personnel at CLS Bank to regulatory authorities in the CLS Jurisdictions.

1.3.3 Netting of a Settlement Member's Account Balance and Unity of Account

As detailed in the Introduction, each Settlement Member maintains a single multicurrency Account with CLS Bank.³⁹ CLS Bank settles payment instructions in these Accounts across its books.

CLS Bank relies on being able to take certain actions with respect to each such Account. CLS Bank confirms, for instance, that it will be entitled in all cases, whether before or after a Settlement Member becomes insolvent, and irrespective of whether or not CLS Bank has suspended the Settlement Member from settling its payment instructions in the CLS system, to treat the Settlement Member's Account as a single net balance in accordance with the Rules. Per the Rules, CLS Bank must be able to net long positions in a Settlement Member's Account against short positions and regard the combined long/short positions as a single Base Currency Equivalent balance. Furthermore, CLS Bank must be able to make debits and credits following a liquidity draw from a Liquidity Provider (discussed in Section 1.3.5), and make necessary adjustments in respect of Settlement Member failures. Furthermore, if CLS Bank were to terminate a Settlement Member and close out its Account for any reason, including a Settlement Member's insolvency, CLS Bank must at all times be able to have a claim or obligation to receive or pay only the net balance expressed as the termination amount.

³⁹ Members (or their nostro agents) also have individual central bank accounts at the central banks of the Eligible Currencies.

The operation of a single multicurrency Account with a single Account Balance, and the various failure management tools set forth in the Rules, are premised upon the recognition of “unity of account” in each CLS Jurisdiction, *i.e.*, CLS Bank’s ability to treat the Account of each Settlement Member as a single net balance, even if a Settlement Member becomes subject to an insolvency.

CLS Bank ensures that, in each of the CLS Jurisdictions, there is a well-founded legal basis supporting the netting of Settlement Members’ Account Balances, and unity of account. Its approach can be summarized as follows:

(i) *Contractual Provisions and CLS Bank Rules*

The Settlement Member Agreement provides that each of CLS Bank and the Settlement Member agrees that the Settlement Member Agreement shall be a “netting contract,” as defined in FDICIA, and that the obligations of each of CLS Bank and the Settlement Member to make payments to or from the Account of such Settlement Member shall be covered contractual payment entitlements or covered contractual payment obligations, as the case may be, as defined in FDICIA. In addition, the Settlement Member Agreement provides that in all cases the obligations and entitlements of each of CLS Bank and the Settlement Member with respect to the Account of the Settlement Member shall be a net amount calculated in accordance with the definition of Account Balance contained in the Rules, less all interest, fees, obligations, costs and expenses and other liabilities associated with such amounts due from the Settlement Member. Similar language is set forth in the Rules.

(ii) *Netting Protections*

CLS Bank confirms that in the CLS Jurisdictions there is legislation or regulation (or equivalent) which provides for recognition of netting in those jurisdictions. For example, both FDICIA and the relevant English regulation implementing the Settlement Finality Directive in the United Kingdom contain netting protections.

The English implementing regulation, referred to as the Financial Markets and Insolvency (Settlement Finality) Regulations 1999, (the “**SF Regulations**”) as amended, provides explicit statutory protections for the “default arrangements” of designated systems. “Default arrangements” are generally understood to be the arrangements put in place by a designated system to limit systemic and other types of risk which arise in the event of a participant appearing to be unable, or likely to become unable, to meet its obligations in respect of a transfer order, including any default arrangements relating to netting.⁴⁰

(iii) *Legal Opinions as to Netting/Unity of Account*

CLS Bank obtains legal opinions from its English external counsel confirming the enforceability of the Rules and Member Handbook, and from external counsel in each CLS Jurisdiction, confirming the ability of CLS Bank to treat each Settlement Member’s Account as a single Account Balance in accordance with the Rules. The various legal opinions obtained by CLS Bank are described in more detail in Section 1.7.

1.3.4 Default Procedures

CLS Bank has established certain default rules and procedures under its Rules and Member Handbook to address situations where a Settlement Member defaults on its obligations, discussed in detail under Principle 13. The primary default rules and procedures include failure adjustments, general loss allocations, combined loss allocations, and termination of CLS Bank membership. Members’ commitments, obligations and responsibilities under the default procedures, such as exposure to potential loss allocations, are clearly set forth in the Rules and Member Handbook.

CLS Bank ensures that, in each of the CLS Jurisdictions, there is a well-founded legal basis supporting the default rules and procedures under the Rules and Member Handbook by: (i) establishing clear and comprehensive provisions in this regard in the Rules and Member Handbook; (ii) obtaining legal opinions from

⁴⁰“Netting” is defined in the English implementing regulation as “the conversion into one net claim or obligation of different claims or obligations between participants resulting from the issue and receipt of transfer orders between them.”

its English counsel confirming the enforceability of the Rules and Member Handbook; and (iii) obtaining legal opinions from external counsel in each CLS Jurisdiction confirming that compliance with the Rules would not cause a Member in that jurisdiction to violate any law in that jurisdiction. The legal opinions obtained by CLS Bank are described in more detail in Section 1.7.

1.3.5 Liquidity Facilities

As described in the Introduction and detailed in Section 1.1.4 and under Principle 7, in the event that a Settlement Member fails to make a Pay-In, such that CLS Bank requires liquidity in a particular Eligible Currency, CLS Bank exchanges one or more Eligible Currencies in which it has long balances on its central bank accounts for the Eligible Currency that it needs through committed liquidity facilities that CLS Bank maintains with one or more Liquidity Providers in applicable Eligible Currencies. These liquidity facilities enable CLS Bank to enter into FX swaps or outright currency purchases on an intraday basis, with any transfers of funds between CLS Bank and the relevant Liquidity Provider made via central bank accounts using the applicable RTGS systems.

CLS Bank ensures that, in each of the CLS Jurisdictions, there is a well-founded legal basis supporting these liquidity facilities by: (i) establishing clear and comprehensive provisions in this regard in the Rules and Member Handbook and in the Liquidity Agreements; (ii) obtaining an opinion from its United States legal counsel as to the enforceability of each Liquidity Agreement under New York law; (iii) at the time of entering into each Liquidity Agreement, obtaining a legal opinion from local counsel to each Liquidity Provider that the Liquidity Provider's execution of each Liquidity Agreement would not violate any existing law of the CLS Jurisdiction applicable to each Liquidity Provider; and (iv) obtaining legal opinions from external counsel in each CLS Jurisdiction confirming that compliance with the Rules would not cause a Liquidity Provider in that jurisdiction to violate any law in that jurisdiction. The various legal opinions obtained by CLS Bank are described in more detail in Section 1.7.

1.4 CLS Bank Protocols

As mentioned in Section 1.1.2, CLS Bank has the ability to establish and publish "protocols" under the Member Handbook. The purpose of such protocols is to offer market participants a way to address certain issues relating to standards that have been developed and agreed generally by the industry surrounding post-trade processes, where related payment instructions are submitted to the CLS system for settlement.

CLS Bank has established an *FX Protocol*. The purpose of the FX Protocol is to offer market participants an efficient way to address legal and operational issues that arise in connection with FX transactions whose related payment instructions are submitted to the CLS system for settlement. The FX Protocol provides that notification by CLS Bank that the CLS system has matched a pair of payment instructions is a confirmation of the FX transaction. Participation in the FX Protocol is open to all market participants (Members and non-Members of CLS Bank). There is no adherence fee required for market participants wishing to participate in the FX Protocol.

1.5 Anti-Money Laundering

As a United States financial institution, CLS Bank must comply with all applicable United States Anti-Money Laundering laws and regulations, including the record-keeping requirements of the Bank Secrecy Act, the USA PATRIOT Act, and regulations promulgated by the United States Department of the Treasury's Office of Foreign Assets Control ("**OFAC**") involving specific countries, or specific companies and individuals known as "Specially Designated Nationals." CLS Bank implements compliance programs to meet applicable requirements. It must be noted that, in certain circumstances, CLS Bank's compliance with these laws and regulations could lead to the rejection of payment instructions or to CLS Bank withholding funds instead of making Pay-Outs.

1.6 Complementary Services Provided by Other CLS Group Entities

In addition to the Settlement Service, the CLS group entities offer Settlement Members certain services under an In/Out Swap Program through CLS Services and an Aggregation Service through CLSAS. CLS Bank and CLS Services also act as a data provider to TriOptima, enabling Compression Participants to participate in Compression through entry into an *Agreement relating to Disclosure of Information in respect of Trade Compression*. In addition,

CLS Bank and CLS Services make aggregated trade volume data available for subscription to all FX market participants through a commercial arrangement with Quandl, a platform for financial and economic data.

1.6.1 The In/Out Swap Program

The In/Out Swap Program is provided by CLS Services and is a distinct service from the Settlement Service offered by CLS Bank. Under CLS Services' agreement with each Settlement Member that elects to participate in the In/Out Swap Program, CLS Services agrees to act as calculation agent to identify potential swap transactions that would reduce the participating Settlement Members' funding obligations to CLS Bank. It is not mandatory for Settlement Members to participate in the In/Out Swap Program. Participating Settlement Members use the In/Out Swap Program as a liquidity management tool.

CLS Services executes an In/Out Swap Agreement with each Settlement Member that participates in the In/Out Swap Program. Each Settlement Member participating in the In/Out Swap Program also executes a protocol⁴¹ in respect of such participation, the effect of which is to create a binding contractual relationship among all Settlement Members participating in the In/Out Swap Program with respect to certain matters relating to the In/Out Swap Program.

An example of the functioning of the In/Out Swap Program is provided in **ANNEX D**.

1.6.2 The Aggregation Service

The Aggregation Service, discussed briefly in the Introduction, is supported by its own Aggregation Service Rules (the "**Aggregation Service Rules**") and Aggregation Participant Agreements, which are governed by New York law. These rules and agreements are separate and distinct from the documentation governing the Settlement Service, and set forth the Aggregation Parties' obligations in connection with the Aggregation Service. The Aggregation Service Rules establish the legal framework that governs and sets high-level parameters for the delivery of the Aggregation Service by CLSAS. The Aggregation Service Rules are made available to the Aggregation Parties through a secure website and are also provided to the Federal Reserve and the CLS Oversight Committee.

1.6.3 Compression Service

As described in the Introduction, the Compression service is operated by TriOptima. CLS Services or CLS Bank passes FX-forward dated trade data to TriOptima, on behalf of Compression Participants each of which has entered into an agreement with CLS Services and CLS Bank relating to the disclosure of information in respect of trade compression.

1.6.4 Data Services

CLS Bank and CLS Services make aggregated trade volume reports available for subscription through Quandl. The reports contain trade volume information, including both the number of trades and the total value in USD. The data can be distributed to subscribers in multiple formats including through Quandl's website, application program interfaces and analysis tools. Quandl manages customer onboarding, technical production issues and billing.

1.7 Legal Opinions Obtained by CLS Bank from External Counsel in the CLS Jurisdictions

As indicated above, in ensuring that the CLS Bank legal framework provides a high degree of certainty with respect to the material aspects of CLS Bank's activities in all relevant jurisdictions, CLS Bank commissions reasoned legal opinions from external counsel in each CLS Jurisdiction on an annual basis. These opinions confirm elements of the rules, contracts, statutes, regulations and other laws that comprise the CLS Bank legal framework. The matters confirmed in the legal opinions provide CLS Bank with a high degree of certainty as to the robustness, clarity, transparency and enforceability of the legal basis for the material aspects of its activities in the CLS Jurisdictions.

⁴¹Third Protocol in Respect of the Participant Agreement Relating to In/Out Swaps, dated July 11, 2004.

Copies of the opinions are made accessible to Members through a secure member website and are also provided to the Federal Reserve and the CLS Oversight Committee.

1.7.1 Annual Legal Opinions

The annual legal opinion re-confirmation process occurs over the course of several months, during which time CLS Bank is in frequent contact with its external counsel in each CLS jurisdiction in connection with the preparation of their legal opinions. Through this process, CLS Bank is advised of any enacted or proposed changes in relevant laws in the CLS Jurisdictions and their potential impact on CLS Bank. Additionally, CLS Bank reminds its jurisdictional counsel to remain continuously vigilant with respect to evolving laws and regulations in the CLS Jurisdictions relevant to CLS Bank and requests counsel to continue to bring any relevant proposed legislative amendments to CLS Bank's attention immediately. The legal opinions received from external counsel primarily confirm the following:

- recognition of the choice of English law in the Rules and New York law in the Member Agreement;
- finality of the settlement of payment instructions across CLS Bank's books and finality of the funding received from and funds paid to Settlement Members through CLS Bank's central bank accounts. CLS Bank requires favorable legal opinions to the effect that (in the absence of fraudulent or other inequitable conduct by CLS Bank) settlement and funding should be final and irrevocable, even if a Settlement Member is subject to an insolvency proceeding. In addition, external counsel is asked to confirm that there is no "zero-hour" or similar rule in their jurisdiction which would have the general effect of causing a reversal of CLS Bank's settlement of payment instructions or a Pay-In made to CLS Bank in central bank funds if, on the same day, a Settlement Member subsequently becomes subject to an insolvency proceeding;⁴²
- that, in their jurisdiction, CLS Bank should be able to treat the multicurrency Account of a Settlement Member as a single net balance in accordance with the Rules, even if a Settlement Member becomes subject to insolvency proceedings and irrespective of whether CLS Bank has suspended the Settlement Member from settling its payment instructions in the CLS system;
- that there would be no adverse impact on finality of settlement or funding, or as to unity of account, even if it were ever determined that there had been a violation of antitrust laws by CLS Bank in their jurisdiction;⁴³
- that the laws of their jurisdiction would permit the payment by Settlement Members of their loss-sharing obligations in accordance with the Rules, and that such payment would be final and irrevocable;
- that compliance with the Rules would not cause a Settlement Member to violate any law in their jurisdiction;
- whether there are any regulations in their jurisdiction applicable to CLS Bank in the settlement of payment instructions arising out of In/Out Swap Program transactions;
- the impact of any laws relating to resolution regimes or the use of resolution tools in their jurisdiction which give government authorities powers to take actions with respect to financial institutions experiencing financial difficulties, including laws applying before a financial institution becomes insolvent (including a potential transfer of CLS Bank membership to a third party purchaser or bridge institution);
- that there is no conflict between the terms of CLS Bank's agreement with the relevant central bank (or between any separate agreement that may have been entered into with the relevant RTGS system) and the material aspects of CLS Bank's activities, including the basis for finality of settlement and funding and netting arrangements;

⁴²Principle 8 also addresses settlement finality.

⁴³For purposes of rendering a legal opinion on this issue, counsel is asked to consider a *hypothetical* violation of antitrust laws by CLS Bank.

- whether there are any relevant currency exchange controls in their jurisdiction and, if so, what their impact would be on the Settlement Service;
- (From English counsel) that the Rules and Member Handbook (governed by English law) are enforceable under English law;
- (From New York counsel) that the Member Agreements (governed by New York law) would be enforceable under New York law;
- (From New York counsel) that the form of Liquidity Agreement and form of Aggregation Participant Agreement would each be enforceable under New York law; and
- (From local counsel to each Liquidity Provider) that, at the time of entering into the relevant Liquidity Agreement, the Liquidity Provider's execution of the Liquidity Agreement would not violate any existing law of the CLS Jurisdiction applicable to the Liquidity Provider.

CLS Bank requires these legal opinions because the material elements of CLS Bank's activities, such as finality and irrevocability of settlement and funding, can be affected by the laws of the CLS Jurisdictions. If CLS Bank were to determine that the legal opinion of external counsel in a given CLS Jurisdiction was unsatisfactory, such that CLS Bank or its Members were subject to undue risk of unenforceability in that jurisdiction, CLS Bank would, in the first instance, work with its jurisdictional counsel to find a solution to mitigate the risk. If no satisfactory solution were found, CLS Bank would take appropriate steps to exclude the relevant jurisdiction's currency and/or Members from participating in the Settlement Service. To the extent that CLS Bank is advised by its jurisdictional counsel that there were no legal developments in the intervening period since the last annual legal opinion was prepared (the "**Prior Opinion**"), that would materially or adversely affect the conclusions set out in the Prior Opinion, a more limited form of bring-down opinion is required to be provided to CLS Bank.

1.7.2 Bring-Down Legal Opinions

Bring-down legal opinions are sought by CLS Bank when a situation arises that may result in a material change to an existing annual legal opinion given by external counsel in a CLS Jurisdiction. This could, for example, arise from a material amendment being made to the Rules or Member Handbook (as was the case, for example, with respect to the introduction of the SDS Session in 2013), a change in law in a particular jurisdiction, or a change in the services offered by CLS Bank. If such a situation arose out of a change to an existing CLS Bank Protocol or the adoption of a new CLS Bank Protocol, bring-down opinions would be sought. This would be considered on a case-by-case basis, depending on the nature of the new Protocol or Protocol amendment.

1.7.3 Transparency of Rules and Member Handbook

The elements of the CLS Bank legal framework, and the bases supporting their soundness, are clear and transparent. The Rules are published on the CLS group corporate website and are therefore publicly available.⁴⁴ Members have access to the Member Handbook via a secure member website. Although Members are obligated to keep the terms of the Member Handbook and their Member Agreements confidential, a Member is permitted to disclose certain relevant information to its third party customers and institutions who have signed a confidentiality agreement.

The relevant laws and regulations in the CLS Jurisdictions are publicly available in each CLS Jurisdiction. Additionally, CLS Bank publicly discloses information about CLS Bank and the CLS system in accordance with applicable international principles and public policy objectives. The annual legal opinions are provided to the Federal Reserve and the CLS Oversight Committee and are accessible by Members through a secure member website.

⁴⁴<https://www.cls-group.com/Membership/Documents/CLSBankInternationalRules%2823Jan17%29.pdf>

Key Consideration 2. An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.

1.8 Clear and Understandable Rules

CLS Bank's rules, procedures and contracts are clear, understandable and consistent with relevant laws and regulations. The Rules are drafted in a clear and understandable manner and are accompanied by an equally clear and comprehensive Member Handbook. The Member Handbook contains additional provisions and details on matters related to corresponding provisions in the Rules. Additionally, CLS Bank:

- provides, where appropriate, the Rules, Member Handbook, procedures, and contracts to Settlement Members, the CLS Oversight Committee, Liquidity Providers, and external jurisdictional counsel, as applicable. These parties are encouraged, and have the opportunity, to ask questions and seek clarification as to provisions contained in the documents provided to them, in order to ensure that the documents are clear and understandable to them;
- responds to inquiries from Settlement Members, central banks and other regulators, the CLS Oversight Committee, Liquidity Providers, and CLS Bank's external counsel;
- provides, where appropriate, memoranda to relevant parties explaining or describing Rules and/or Member Handbook changes, or detailing important updates; and
- amends the Rules and/or Member Handbook to the extent necessary to make CLS Bank's practices, procedures, policies and requirements clearer.

1.9 Contractual Agreements

As described in Sections 1.1.3 and 1.1.4, CLS Bank enters into agreements with its Members and Liquidity Providers. These are standardized agreements and are drafted in a clear, concise manner.

1.10 Consistency of Rules, Procedures and Contracts with Relevant Laws and Regulations

As discussed in Section 1.7, CLS Bank confirms that the Settlement Service complies with the laws and regulations of each CLS Jurisdiction. CLS Bank obtains legal opinions from external counsel in order to confirm that the legal basis for the documentation supporting, and activities engaged in by CLS Bank in providing, the Settlement Service is consistent with relevant laws and regulations in each CLS Jurisdiction. CLS Bank also confirms with its external counsel in each CLS Jurisdiction that there is no conflict between the terms of CLS Bank's agreements with the relevant central bank (or between any separate agreement that may have been entered into with the relevant RTGS system) and the material aspects of CLS Bank's activities. Additionally, external counsel in England delivers a legal opinion to CLS Bank annually on the enforceability of the Rules and Member Handbook under English law. CLS Bank also obtains a legal opinion as to the enforceability of the Member Agreements under New York law from its external counsel in the United States.

To the extent that jurisdictional counsel identifies any violations (actual or potential), CLS Bank would work with counsel to determine the best approach to take to avoid or remedy the violation. If no satisfactory solution could be found, CLS Bank would take appropriate steps to prohibit the jurisdiction's currency and/or Members from participating in the Settlement Service.

1.11 Review and Assessment of Rules, Member Handbook, Procedures and Contracts by External Authorities or Entities and Changes to the Rules, Member Handbook, Procedures and Contractual Agreements

The Rules and Member Handbook were established with the approval of CLS Bank's regulators upon the formation of CLS Bank. Since then, all material changes to the Rules and Member Handbook have been, and continue to be, reviewed and assessed by the Federal Reserve and by the CLS Oversight Committee in accordance with applicable regulations and protocols. As discussed in the Introduction, Regulation HH approval is required for material changes to the Rules, Member Handbook, and any new or amended key procedures.

The Rules contain provisions describing the procedures to be undertaken if a change is to be made to the Rules or the Member Handbook. In general, the approval process for amendments to the Rules requires endorsement or approval by the board of directors of CLS Bank (“**CLS Bank Board**”) and relevant internal committees, as appropriate, as well as specific regulatory approvals. Amendments to the Rules become effective after Members have had time (sixty days) to comment on the proposed amendments. Amendments to the Member Handbook become effective on the thirtieth day following the date on which the amendments are generally distributed to the Members.

1.12 Vendor Contracts

CLS Bank also enters into contracts with vendors, consultants and other service providers. Depending on the classification and value of the agreement, CLS Bank’s vendor management office (“**VMO**”) will either arrange for the review and approval for the relevant agreement from the CLS Bank Legal division, or review and approve the agreement itself. Certain categories of agreements are permitted for review and approval by the VMO itself; namely, (i) standard or tactical low risk agreements with annual cost values not exceeding £20,000 (or USD equivalent); (ii) statements of work and work request type agreements made against the terms of an existing reviewed and approved agreement; (iii) rollover / renewal agreements; and (iv) agreements on a CLS standard template. The CLS Bank commercial negotiations are balanced with risk management throughout the sourcing lifecycle. Activities to identify, mitigate, monitor, and review are conducted and include risk-based segmentation, competitive tendering, financial due diligence, oversight and monitoring of vendors, business continuity and information security considerations. The VMO operates pursuant to the CLS Group Vendor Management Policy and associated VMO procedures, as discussed under Principle 17. The VMO focuses on several fundamental principles: financial viability; value; risk; performance; internal control; and acting appropriately.

Key Consideration 3. An FMI 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.

CLS Bank articulates the legal basis for its activities to relevant authorities, participants and, where relevant, participants’ customers in a clear and understandable way, as discussed below.

1.13 Disclosure of Information About CLS Bank and the CLS System

The December 2014 Disclosure was the first Disclosure under the PFMI published by CLS Bank. CLS Bank publishes this Disclosure in accordance with the CPSS-IOSCO Disclosure framework and Regulation HH, which require this Disclosure to be updated, at a minimum, every two years, or following material changes to CLS Bank’s operations. This Disclosure is made publically available on the CLS group corporate website.

1.14 Memoranda / Member Notices

CLS Bank regularly prepares memoranda and notices of various types that are submitted to the Federal Reserve, the CLS Oversight Committee, and to Settlement Members, as appropriate (for example, to explain the reasons for changes to the Rules).

1.15 Access to Rules, Member Handbook and Annual Legal Opinions

The Rules are publicly available on the CLS group corporate website. The Rules and Member Handbook are available to Members via a secure member website. The Rules and Member Handbook are also provided to the Federal Reserve, the CLS Oversight Committee, CLS Bank’s external counsel in the CLS Jurisdictions and each Liquidity Provider. Copies of all the annual legal opinions obtained by CLS Bank from its external counsel in each CLS Jurisdiction are provided to the Federal Reserve and the CLS Oversight Committee and are accessible by Settlement Members through a secure member website.

Key Consideration 4. An FMI 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 FMI under such rules and procedures will not be voided, reversed, or subject to stays.

1.16 Enforceability of the CLS Bank Documents and Contractual Agreements

External counsel in England delivers a legal opinion to CLS Bank annually on the enforceability of the Rules and Member Handbook under English law, and the legal opinions from external counsel in each CLS Jurisdiction confirm that: (i) the choice of English law contained in the Rules should be recognized by courts in that CLS Jurisdiction; (ii) there is no law in that CLS Jurisdiction which would render the Rules unenforceable in accordance with their terms in that CLS Jurisdiction; and (iii) that compliance with the Rules would not cause a Member in that CLS Jurisdiction to violate any law in that CLS Jurisdiction.

CLS Bank also obtains a legal opinion as to the enforceability of the Member Agreements under New York law from its external counsel in the United States, and receives legal opinions from its external counsel in each CLS Jurisdiction that there is no law in that CLS Jurisdiction which would render the Member Agreement unenforceable in accordance with its terms in that CLS Jurisdiction.

The risk that the obligations under the Rules, the Member Handbook or the Member Agreements are not enforceable against Members is also mitigated by a requirement in the Rules that each executed Member Agreement must be accompanied by an opinion of counsel from the Member. This legal opinion confirms due execution and authorization of the Member Agreement by the Member, and confirms the Member's ability to perform its obligations under the Member Agreement, the Rules and the Member Handbook.

CLS Bank has also obtained a legal opinion from New York counsel confirming the enforceability of the form of Liquidity Agreement under New York law. Furthermore, at the time when a Liquidity Provider is brought onto the CLS system, external counsel for both CLS Bank and the Liquidity Provider deliver a legal opinion regarding the due execution, legality and enforceability of the Liquidity Agreement.

1.17 Avoidance, Reversal or Stays – CLS Bank Insolvency

CLS Bank has developed its plan for its own recovery or orderly wind-down, which contemplates recovery or orderly wind-down under circumstances, in which CLS Bank is solvent and could continue to operate the Settlement Service, and would do so in accordance with its current legal and risk management frameworks. Nevertheless, it is possible that actions taken by CLS Bank under its Rules, Member Handbook and contractual agreements could become voided, reversed or subject to stays in the event of the insolvency of CLS Bank. At the time of publishing this Disclosure, CLS Bank's understanding is that:

- In the event of CLS Bank's insolvency in the United States, different authorities may administer the insolvency of CLS Bank, depending on the circumstances. Because CLS Bank is an Edge Act corporation, the Board of Governors of the Federal Reserve System has the right to appoint a conservator for CLS Bank pursuant to the United States Bank Conservatorship Act or a receiver pursuant to the United States National Bank Act, under certain circumstances, including if CLS Bank's assets are insufficient to cover its obligations or if CLS Bank is unable to meet its obligations in the normal course of business.
- The Board of Governors of the Federal Reserve System also has the power to direct such a conservator or receiver to file a petition in bankruptcy on behalf of CLS Bank under the United States Bankruptcy Code. Furthermore, the Orderly Liquidation Authority ("OLA") provisions of Title II of the Dodd-Frank Act may apply to the insolvency of CLS Bank. OLA only applies under certain circumstances and is subject to an affirmative vote of at least two-thirds of both the Board of Governors of the Federal Reserve System and the Board of Directors of the United States Federal Deposit Insurance Corporation.

1.18 Rule of Law Risk

In addition to obtaining legal opinions which confirm the soundness of the legal framework in each CLS Jurisdiction, CLS Bank is mindful that a material risk of improper application of relevant laws or regulations, or the risk of uncertainty as to whether such laws and regulations would be properly applied in practice, could translate into a risk

that actions taken by CLS Bank or by participants in the Settlement Service under the Rules and procedures are voided, reversed or subject to stays.

CLS Bank therefore considers a jurisdiction's rule of law as one element of its Eligible Currency criteria.⁴⁵ CLS Bank has implemented a "Rule of Law Framework," which establishes a conceptual structure for it to conduct rule of law risk assessments with respect to particular jurisdictions (including as to the availability of possible rule of law risk/impact mitigants, if material rule of law risks are identified). In conducting such assessments, CLS Bank examines the extent to which, in the subject jurisdiction, the written laws (the "laws on the books") are adhered to, and the extent to which the jurisdiction may be susceptible to factors or circumstances which could materially prejudice application of the written laws in accordance with their terms.

Before designating further Eligible Currencies, CLS Bank will conduct assessments of the relevant jurisdictions under the Rule of Law Framework. CLS Bank will also assess the rule of law in an existing CLS Jurisdiction if a material event or circumstance occurs which CLS Bank deems to warrant further or re-review of the jurisdiction's rule of law.

The legal opinions obtained by CLS Bank (as described in Section 1.7) assist CLS Bank in identifying any relevant rule of law risks and potential conflicts of law issues (see also Section 1.21 below) in the CLS Jurisdictions. Furthermore, by conducting rule of law assessments and review, CLS Bank assesses and, if necessary, mitigates, material risks that may exist that could result in actions taken under CLS Bank's Rules and procedures being voided, reversed, or subject to stays due to rule of law risk.

1.19 Enforceability of Rules and Activities

A court has never, in any CLS Jurisdiction, held any of CLS Bank's activities or arrangements under its Rules and procedures to be unenforceable, and such activities have never been challenged in a court.

1.20 Recovery and Resolution Regimes in the CLS Jurisdictions

It is possible that actions taken by CLS Bank under its rules, procedures and contracts could be voided or subject to stays as a result of the application of resolution regimes to Settlement Members in the CLS Jurisdictions. CLS Bank is not, however, aware of any such actions under its rules, procedures and contracts that could be subject to reversal, voided, or subject to stays as a result of the application of resolution regimes. CLS Bank monitors relevant existing and proposed laws in each CLS Jurisdiction through and with the assistance of its external counsel. Any laws or proposed laws appearing to impact CLS Bank in a negative way, or that could introduce risk that actions taken by CLS Bank under its rules, procedures and contracts could be voided, reversed or subject to stays, would be discussed with the relevant regulatory authorities in the CLS Jurisdiction, to resolve or mitigate the risk.

Key Consideration 5. An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.

1.21 Choice of Law / Conflict of Law

As described in more detail in Section 1.7, CLS Bank obtains legal opinions from its external counsel in the CLS Jurisdictions opining as to whether a court in their respective jurisdictions would recognize the choice of law provisions contained in the Rules and in the Member Agreements, whether compliance with the Rules would cause any Member to violate a law in that jurisdiction, and whether, because of the rule of law in that jurisdiction, or otherwise the provisions of the Rules or Member Agreements would not or may not be enforced in accordance with their terms in that jurisdiction.

While it is difficult to obtain complete legal certainty with respect to enforceability of conflict of law/choice of law provisions, even with advice from external counsel, as considerations such as public policy factor into a conflict of laws determination by a court, CLS Bank monitors relevant conflicts of laws amongst the CLS Jurisdictions with its

⁴⁵In order for a currency to be designated an Eligible Currency that may be settled across CLS Bank's books, specific requirements must be satisfied under the Rules. One such criterion is that the CLS Bank Board, in its sole discretion, may designate a currency as an Eligible Currency only if CLS Bank has determined that the "rule of law" (i.e., the application of written law in practice) in the jurisdiction of such currency is acceptable to CLS Bank.

external counsel and acts on any issues in this regard if they arise. In order to address any potential conflict of law issues, CLS Bank regularly comments on proposed legislation and other laws, and proposes amendments to existing legislation and other laws, that may negatively impact upon any material aspects of CLS Bank's activities. To the extent that significant conflicts of law issues are identified, CLS Bank will consult with, submit comments, and recommend proposed solutions to the relevant regulators.

1.22 Risk Mitigation in the Conflict of Law Context

In the event that CLS Bank were to identify a conflict of law issue, it would work with the relevant external counsel in the relevant CLS Jurisdiction to resolve or mitigate the issue as discussed above. In the absence of such resolution or mitigation, further steps could be taken by CLS Bank. For example, while CLS Bank will try to accommodate a Member in resolution proceedings, if there is a conflict of law issue, CLS Bank may suspend the participation of the Member in the Settlement Service at an earlier time than the Member's regulator(s) may desire, or may suspend Pay-Outs to the Member (on the basis of and subject to the procedures stipulated under the Rules).

Principle 2: Governance

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

2.0 Summary

CLS Bank is subject to the CLS group's governance arrangements, which are driven by the vision statement of the CLS group, as well as a clearly defined corporate strategy. These two key elements place a high priority on the safety and efficiency of the CLS group entities and support the financial stability of the CLS ecosystem.⁴⁶ Additionally, the CLS group entities operate under a clearly documented risk management framework and risk policies developed under an overarching master policy.

The CLS group's governance arrangements clearly specify the roles and responsibilities of the boards of directors of the CLS group entities (including specific requirements for non-executive and independent directors) and CLS group executive management, providing for documented lines of reporting and accountability. The CLS Group Board is responsible for the ultimate direction, support, supervision, and strategy of the CLS group as a whole, as well as for governance and compliance arrangements and relevant control functions. To fully coordinate matters involving both CLS Group Holdings and CLS Bank, the same directors concurrently serve on the boards of both these entities.

The CLS Group Board has delegated responsibility for the CLS group entities' daily activities to the Executive Management Committee ("**EMC**"). The EMC is led by the CLS Group Board-appointed Chief Executive Officer ("**CEO**") and composed of other officers as may be appointed to the EMC from time to time.

Key Consideration 1. An FMI should have objectives that place a high priority on the safety and efficiency of the FMI and explicitly support financial stability and other relevant public interest considerations.

2.1 CLS Vision Statement, Corporate Strategy, and Risk Appetite

As approved by the CLS Group Board in April 2015, the CLS group's vision statement is "*to be the leading provider of risk mitigation and operational services for the global FX market*" (the "**CLS Vision Statement**"). The CLS Vision Statement reflects CLS Bank's fundamental role in the FX market in operating the largest multicurrency cash settlement system to mitigate the settlement risk associated with payment instructions related to FX transactions for its Members and their customers. The CLS Vision Statement also reflects the CLS group's focus and ambition for the future.

The Vision Statement is underpinned by a clearly defined corporate strategy (the "**CLS Corporate Strategy**"), which articulates the strategic priorities of CLS. The CLS Group Board has also approved the risk appetite of the CLS group (the "**CLS Risk Appetite Statement**"), which clarifies the type and amount of risk that the CLS group is willing to accept and manage pursuant to the CLS Vision Statement and CLS Corporate Strategy. As detailed below, CLS Bank recognizes the importance of safety and efficiency, specifically, in the Core pillar of the CLS Corporate Strategy. The importance of providing an effective Settlement Service is clearly defined in CLS Bank's goals and objectives, also discussed under Principle 21.

The CLS Corporate Strategy and the CLS Risk Appetite Statement are subject to annual review and approval by the CLS Group Board.

⁴⁶The CLS ecosystem includes:

- The CLS system's internal infrastructure;
- Settlement Members;
- Nostro agents;
- Third parties and third party service providers;
- Liquidity Providers;
- RTGS systems;
- Certain other FMIs, such as DTCC; and
- Critical service providers, such as SWIFT and IBM.

2.1.1 CLS Corporate Strategy and KPIs

The CLS Corporate Strategy shapes CLS Bank's strategic choices and enables prioritization of various initiatives. The CLS Corporate Strategy encompasses five strategic pillars (the "**CLS strategic pillars**"), as follows:

- **The Core**: Deliver market-leading settlement and risk mitigation services, including:
 - Service stability and reliability;
 - Systemic risk reduction; and
 - End-to-end service enhancements.
- **Optimization**: Create an efficient, resourceful and cost-disciplined organization, including:
 - Cost optimization;
 - Sustainability: provide a strong foundation to growth; and
 - Productivity: create an efficient and effective organization.
- **Growth**: Achieve sustainable growth, including:
 - New products and services;
 - Increased market share (current clients, new clients and currencies); and
 - Brand leadership.
- **People**: Empower employees, including:
 - Attracting, integrating and retaining talent;
 - Building an engaged and diverse workforce; and
 - Developing leaders at all levels.
- **Regulation and Control**: Engage effectively in the regulatory environment, including:
 - Proactive engagement with the ecosystem;
 - Strong and effective relationships with regulators; and
 - An effective internal controls framework.

The EMC and the Chairman's Committee have also defined key performance indicators ("**KPIs**") to support the CLS Corporate Strategy. The KPIs relate to each of the CLS strategic pillars and include corresponding targets, which serve as benchmarks for measuring performance throughout the year. These metrics are reported to the CLS Group Board on a quarterly basis, are reviewed annually, and may be changed as situations warrant.

2.1.2 CLS Master Policy

In 2016, the CLS Group Board approved a Master Policy to govern the documentation of risk management standards, controls and processes (the "**Master Policy**"). The Master Policy is reviewed annually and updates are approved, as needed, by the CLS Group Board. The Master Policy (detailed under Key Consideration 6)

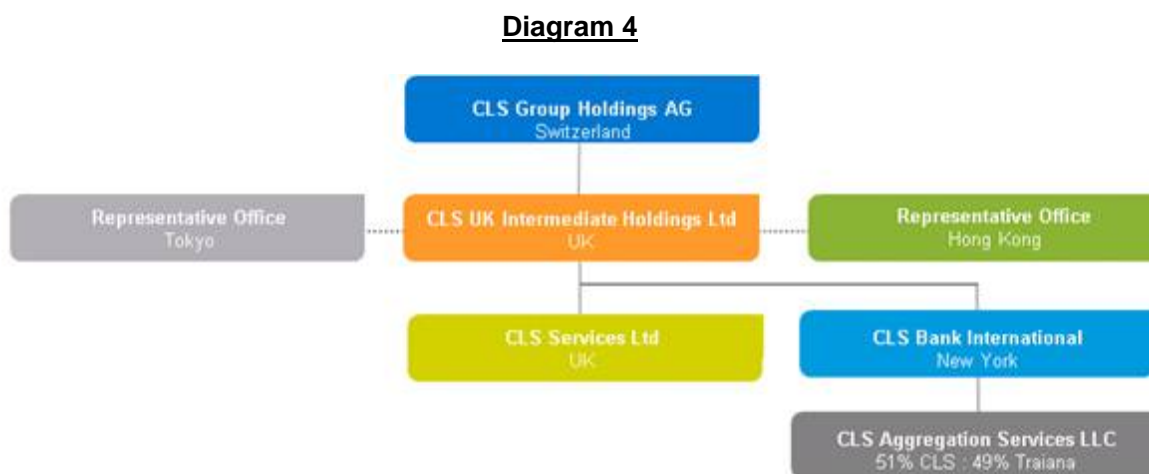
specifies requirements for issuing, approving, publishing, maintaining, and retiring policies, guidelines, and procedures, and defines roles and responsibilities.

Key Consideration 2. An FMI 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.

2.2 CLS Group Corporate Structure

As discussed in the Introduction, CLS Group Holdings AG, a Swiss corporation, is the parent holding company for the CLS group and is owned by seventy-nine shareholders, each of which (with limited exceptions) is a Settlement Member or an affiliate of a Settlement Member. CLS Group Holdings is the sole owner of CLS UK Intermediate Holdings, a United Kingdom company. CLS UK Intermediate Holdings in turn owns CLS Bank and CLS Services. CLS Bank owns 51% of CLSAS, a Delaware limited liability company, with the remaining 49% owned by Traiana Inc., a subsidiary of ICAP plc.

Diagram 4 below details the CLS group's corporate structure.



2.2.1 CLS Group Governance Arrangements

The CLS group's governance arrangements are mandated by applicable law, and by the organizational and constitutional documents of the CLS group entities. In addition, on an ongoing basis, the CLS group adheres to the Swiss Code of Best Practice for Corporate Governance, the UK Corporate Governance Code, and laws, rules and regulations applicable to systemically important FMUs, Edge Act corporations, and bank holding companies subject to regulation and supervision by the Federal Reserve, as required.

At their annual general meetings (each, an "**Annual General Meeting**"), the CLS Group Holdings shareholders elect directors to the CLS Group Board, approve CLS Group Holdings' financials and the independent auditor, and undertake any other business reserved for shareholders. Governance arrangements relating to CLS Group Holdings shareholders are addressed in the Articles of Association of CLS Group Holdings (the "**CLS Group Holdings Articles**"), which may be amended pursuant to a shareholders meeting. CLS Group Holdings shareholders meetings must be held each year and extraordinary shareholders meetings may be called as often as necessary, and in all cases required by applicable law. An Annual General Meeting and an extraordinary meeting of the CLS Group Holdings shareholders were held in each of 2012, 2013, 2014, 2015, and 2016.

The Organizational Regulations of CLS Group Holdings (the "**Organizational Regulations**") establish the organization and administration of CLS Group Holdings and of the CLS group as a whole, and define the responsibilities and authorities of the respective CLS group executives and executive bodies, including the CLS Group Board, Board Committees, the Chairman and Deputy Chairman, the CEO and the EMC. The Organizational Regulations contain, among other things, the charters of the six CLS Group Board Committees, and the nominating process and qualifications for new directors of the CLS Group Board. The Organizational

Regulations may be amended by the CLS Group Board. Additional governance arrangements relating to the CLS Group Board and the EMC are also documented in the CLS group's Directors' Governance Handbook (the "**Directors' Handbook**") and the CLS group's Executive Management Handbook (the "**Executive Handbook**"), respectively.

As provided in the Organizational Regulations, the CLS Group Board approves the governance structure of CLS Group Holdings and the CLS group as a whole. Under the CLS Group Holdings Articles, the CLS Group Board may consist of a minimum of two and a maximum of twenty-six members. As of December 31, 2016, there are twenty-one directors of the CLS Group Board.

Disclosure of CLS Group Governance Arrangements

The CLS Group Holdings Annual Report and consolidated accounts, containing an overview of the governance arrangements for CLS Group Holdings and its subsidiaries, is published annually on the CLS group corporate website where it is publicly available to FX market participants as well as shareholders, Settlement Members, and regulators. The CLS Group Holdings Articles are also publicly available on the CLS group corporate website. The constitutional documents of CLS Group Holdings and subsidiary entities, including the Directors' Handbook and Executive Handbook, policies, codes of conduct and other governance-related materials, are provided as requested to the Federal Reserve and the CLS Oversight Committee.

The CLS group's governance arrangements are disclosed annually to its owners, the CLS Group Holdings shareholders. During each Annual General Meeting, the Chairman presents on CLS group's governance, including an explanation of the roles and responsibilities of the CLS Group Board, the EMC, Risk Management, Audit, Compliance, and Regulatory Affairs. Since CLS Bank's Settlement Members are also shareholders of CLS Group Holdings, Settlement Members receive the same presentation on governance arrangements provided to shareholders at the Annual General Meeting.⁴⁷

Accountability to Stakeholders

The CLS Group Board and the CLS Bank Board are subject to periodic internal and external governance reviews. The results of these reviews are provided to the Nominating and Governance Committee and the CLS Group Board, and are shared with the Federal Reserve along with the CLS group responses.

2.2.2 CLS Bank Governance Arrangements

CLS Bank's governance arrangements are addressed in its Articles of Association (the "**CLS Bank Articles**"), which may be amended by the sole shareholder of CLS Bank, (CLS UK Intermediate Holdings) subject to approval by CLS Bank's regulator. Additional governance provisions relating to CLS Bank are also addressed in its by-laws (the "**CLS Bank By-laws**"). The CLS Bank By-laws may be amended by CLS Bank's sole shareholder, as well as by the CLS Bank Board (any by-law adopted by the CLS Bank Board may be amended or repealed by the CLS Bank sole shareholder).

2.2.3 CLS UK Intermediate Holdings Governance Arrangements

CLS UK Intermediate Holdings, located in London with representative offices in Tokyo and Hong Kong, acts as an intermediate holding company and ensures the effective implementation of CLS Group Holdings resolutions in connection with CLS Bank and CLS Services. Governance arrangements relating to CLS UK Intermediate Holdings are addressed in the CLS UK Intermediate Holdings certificate of incorporation, and articles of association. To the extent they are filed with UK Companies House, the CLS UK Intermediate Holdings certificate of incorporation, and articles of association may be disclosed to the public upon request. As a standard practice, there are three CLS UK Intermediate Holdings board members; each is an officer of the CLS group's executive management.

⁴⁷ While Non-shareholder Members will not participate in the Annual General Meeting, they will have access to information about governance arrangements through the channels described above and in Section 2.11, as well as the general participant discussions and Member working groups described under Principle 3. Non-shareholder Members will also be full participants in reviewing proposed amendments to the Rules and Member Handbook as described under Principle 1, Key Consideration 2.

2.2.4 CLS Services Governance Arrangements

CLS Services, located in London, provides certain administrative, operational and technology related services to CLS Bank pursuant to a Master Services Agreement between CLS Bank and CLS Services. Governance arrangements relating to CLS Services are addressed in the CLS Services certificate of incorporation, and articles of association. To the extent they are filed with UK Companies House, the CLS Services certificate of incorporation, and articles of association may be disclosed to the public upon request. As a standard practice, there are three CLS Services board members; each is an officer of the CLS group's executive management.

2.2.5 CLSAS Governance Arrangements

Governance arrangements relating to CLSAS are addressed in its certificate of formation, as well as in its amended and restated limited liability company agreement (the "**CLSAS LLC Agreement**"). The CLSAS LLC Agreement includes the CLSAS by-laws (the "**CLSAS By-laws**") and defines the roles and responsibilities of Aggregation Participants, directors/board and officers. CLSAS's business and affairs are managed under the direction of the CLSAS board. So long as CLS Bank is the largest holder of common units of CLSAS, CLS Bank may nominate two directors to the CLSAS board. So long as Traiana (together with its affiliates) holds at least ten percent of the outstanding common units of CLSAS, Traiana may nominate one director to the CLSAS board. Certain governance matters are also described in the CLSAS Founding Aggregation Participants Agreement (the "**CLSAS FAPA Agreement**") with respect to additional nominations and appointments to the CLSAS board, as well as certain requirements for amendments to the CLSAS LLC Agreement, CLSAS By-laws and CLSAS FAPA Agreement. As of December 31 2016, there are eleven directors of the CLSAS board. Meetings of CLSAS Members and the CLSAS board are presided over by the CLSAS CEO.

2.2.6 CLS Group Board Directors

Members of the CLS Group Board are elected for a term of office of three years by the CLS Group Holdings shareholders at their annual meeting. Directors may be re-elected after such term, except that no such board member may serve for more than six years in aggregate.⁴⁸ There is no aggregate term limit for a director who is also a member of the EMC, so long as he or she remains a member of the EMC. The CEO is the only director on the CLS Group Board who is also a member of the EMC.

Non-executive directors are individuals who are not employed by, or otherwise engaged by, any CLS group entity. As of December 31, 2016, sixteen of the non-executive directors of the CLS Group Board are employed by or affiliated with a CLS Group Holdings shareholder. **Outside Directors** are non-executive directors who are not employed by, or affiliated with, CLS Group Holdings shareholders. The Organizational Regulations require that at least four Outside Directors, including the Chairman, serve on the CLS Group Board. As of December 31, 2016, there are four Outside Directors, including the Chairman, on the CLS Group Board.

The Chairman and Deputy Chairman of the CLS Group Board are elected by the CLS Group Board. The role of the CLS Group Chairman is separate and distinct from the CEO, who heads the CLS group's executive management. The Chairman is responsible for the leadership of the CLS Group Board, communication with CLS Group Holdings shareholders, and for presiding over CLS Group Board and CLS Group Holdings shareholder meetings. The Chairman also supervises compliance with, and implementation of, the resolutions of the CLS Group Board, and speaks on behalf of the CLS Group Board and the CLS group entities with various regulatory and oversight authorities, including the Federal Reserve and the CLS Oversight Committee. As discussed under Key Consideration 3, the CLS Group Board has established six committees (each, a "**Committee**") to support it in carrying out its oversight responsibilities.

⁴⁸Directors who were in office on December 22, 2011 may continue to serve for up to eight years in aggregate. In addition, pursuant to the CLS Group Articles, if a director is elected as Chairman of the Board, his or her term may be extended for an additional three years, up to a maximum of nine years of CLS Group Board service.

2.2.7 Oversight of the Executive Management Committee

The CLS Group Board has delegated responsibility for undertaking the business and operational activities of the CLS group to the EMC, headed by the CEO. The CEO and the EMC conduct the day-to-day management of CLS Group Holdings and the CLS group as a whole. The CLS group's corporate structure is described in the CLS Group Holdings Annual Report and consolidated accounts, detailed above in Section 2.2, communicated to CLS Group Holdings shareholders, and made publicly available as discussed under Principle 23.

Key Consideration 3. The roles and responsibilities of an FMI'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.

2.3 Roles and Responsibilities

As described above, the CLS Group Board is responsible for the ultimate direction, oversight, and supervision of the CLS group as a whole. Each CLS group entity's board is responsible for the oversight of that specific CLS group entity. Whenever extraordinary matters (including extraordinary business matters, external events or regulatory matters) warrant, the Chairman, Deputy Chairman, or the CEO may convene a special CLS Group Board meeting. CLS group directors are expected to attend all board and relevant Committee meetings, and are entitled to request information on all matters pertaining to the relevant CLS group entity.

2.3.1 Board Committees

Upon annual review by each Committee and the subsequent review and recommendation of the Nominating and Governance Committee, the CLS Group Board approves each Committee's charter, which details the roles, responsibilities and reporting for that Committee. In addition, upon review and recommendation by the Nominating and Governance Committee, the CLS Group Board reviews Committee composition annually and appoints or re-appoints Committee members.

The Committees review and advise on material matters pertaining to CLS Group Holdings, CLS Bank and the other CLS group entities, and review and recommend policies related to their respective areas of responsibility. Each Committee reports its actions, findings, proposals and recommendations to the CLS Group Board. The six CLS Group Board Committees are:

- **Audit and Finance Committee:** the Audit and Finance Committee is charged with: (i) overseeing the CLS group's controls, both its Internal Audit division and the relationship with the external auditor; and (ii) overseeing the Finance division, including financial strategies, capital planning, development of pricing policies, and budget as well as accounting policies and methods and compliance with legal and accounting standards. The Audit and Finance Committee also oversees the CLS group's whistle-blowing policy.
- **Board Strategy Committee:** while the responsibility for the CLS group strategic vision and its implementation lies with the CLS Group Board, the Board Strategy Committee reviews, refines, and advises the EMC regarding the CLS group strategic vision and associated business and resource plans and provides advice, counsel, and recommendations to the CLS Group Board.
- **Chairman's Committee:** the Chairman's Committee provides counsel and approves certain matters pertaining to the Chairman and the CEO on CLS Group Board matters, including agendas and policies, human resources and remuneration, legal, compliance and regulatory affairs.
- **Nominating and Governance Committee:** the Nominating and Governance Committee advises the CLS Group Board regarding the governance of the CLS group, including oversight of vetting and nominating director candidates and ensuring the efficacy of the CLS group's corporate governance practices, including Committee composition, governance documents, board self-evaluation, and director induction and education.

- **Risk Management Committee:** the Risk Management Committee is responsible for reviewing and assessing areas of risk such as credit risk, market risk, liquidity risk, legal risk, compliance risk, payment risk, and operational risk. As discussed under Principle 17, the Risk Management Committee and the Technology and Operations Committee jointly oversee information security risk management. The Risk Management Committee also assists the CLS Group Board in: (i) ensuring adequate requirements and tolerances for the CLS Risk Appetite Statement; and (ii) the proper oversight of CLS Bank's Risk Management division. The Risk Management Committee oversees and reviews the development of, and amendments to, the Rules, including ensuring the engagement of stakeholders or market participants, as needed, monitoring compliance with regulatory notification requirements, and provides counsel and recommendations to the CLS Group Board with regard to proposed amendments to the Rules.
- **Technology and Operations Committee:** the Technology and Operations Committee oversees the Settlement Service and the technological and operational aspects of strategic or significant enhancements or modifications to the CLS system. The Technology and Operations Committee also supports and guides management of strategic technology relationships, the CLS system core platforms, and contingency policies and procedures.

2.3.2 Directors' Code of Conduct and Conflicts of Interest

To support compliance with applicable legal and regulatory requirements, the Organizational Regulations, Directors' Handbook and CLS Group Holdings Directors' Code of Conduct (the "**Directors' Code of Conduct**") apply to directors of any CLS group entity and provide additional guidance regarding the responsibilities of the CLS group boards and Committees, including as to fiduciary duties and conflicts of interest. CLS group directors must attest at least annually as to their understanding and compliance with the Directors' Code of Conduct, including disclosure of business and industry affiliations. Each member of a CLS group board receives annual review and training on the Directors' Code of Conduct, including on conflicts of interest. The Directors' Code of Conduct is reviewed annually by the CLS Group Board and any amendments require CLS Group Board approval.

2.3.3 Self-Assessment Process

For purposes of ensuring accountability, the CLS Group Board undertakes a self-assessment process annually, overseen by the Nominating and Governance Committee, including a review of the CLS Group Board's performance as a whole and that of the Committees. Individual directors are also subject to self-assessments, and reviews are conducted by individual Committee chairs.

Key Consideration 4. The board should contain suitable members with the appropriate skills and incentives to fulfill its multiple roles. This typically requires the inclusion of non-executive board member(s).

2.4 CLS Group Board Members

The CLS Group Board is composed of no more than twenty-six directors, subject to annual review of the composition and qualifications (including skills, knowledge and experience) by the Nominating and Governance Committee to ensure that the CLS Group Board composition is compliant with requirements set forth in its constitutional documents, and to review and determine the CLS Group Board's optimal composition.

The Nominating and Governance Committee also reviews director rotations, results of the annual director and board self-assessments, upcoming business and/or regulatory matters to be addressed by the CLS Group Board in the coming year(s), and identifies skillsets that would support or enhance the function of the CLS Group Board, its Committees and other CLS group boards. The Nominating and Governance Committee evaluates director candidate nominations for alignment with the skillset requirements of the CLS Group Board and CLS Bank Board, and recommends suitable nominees for approval by placing such candidates on the slate of directors for election at CLS Group Holdings shareholder meetings.

2.4.1 Board and Board Committee Performance

In addition to the annual attestation and training on the Directors' Code of Conduct and conflicts of interest, CLS Group Board directors also receive educational sessions on regulatory, risk and strategic issues. Each newly elected director attends an induction program. The CLS Group Board has committed to a biannual review of its governance practices by an independent third party, which also reviews the CLS Group Board's structure, overall performance, and directors' qualifications and performance.

2.4.2 Outside Directors

As described in Section 2.2.6, Outside Directors are deemed to meet additional specific criteria for independence as provided in the Organizational Regulations, in alignment with certain criteria in Regulations O and Y of the Board of Governors of the Federal Reserve System. Outside Directors are not employed by, or affiliated with, a CLS group entity or a CLS Group Holdings shareholder. In addition to the criteria for independence, the CLS group has identified certain attributes and areas of specialized knowledge, expertise, skill or experience required by Outside Directors, including a good understanding of the finance industry and the vision and role of the CLS system, and specialized knowledge, expertise, skill or experience in areas of public interest, technology, risk management or finance.

2.4.3 Board Remuneration

Under the CLS Group Holdings Articles, Outside Directors are remunerated for their services. In light of the significant time commitment and importance of the Outside Director position, Outside Directors receive annual stipends as recommended by the Nominating and Governance Committee, endorsed by the CLS Group Board, and approved by the CLS Group Holdings shareholders.

Non-executive directors of the CLS Group Board who are employed by CLS Group Holdings shareholders are not remunerated for their services. All non-executive directors, or their respective employers, are reimbursed by the CLS group for expenses incurred in fulfilling their board responsibilities, including travel to in-person board meetings. In accordance with its participant-owned model, the CLS Group Board has determined that additional incentives are currently unnecessary to attract directors due to nominations from CLS Group Holdings shareholders. When seeking and nominating director candidates, the CLS group makes clear that non-executive directors employed by CLS Group Holdings shareholders do not receive compensation.

Key Consideration 5. The roles and responsibilities of management should be clearly specified. An FMI'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 FMI.

2.5 The Executive Management Committee

Under the Organizational Regulations, members of the EMC, headed by the CEO, are responsible for the management of the business and operational activities of the CLS group. They conduct the day-to-day management of the CLS group entities, implement the resolutions of the CLS Group Board and Committees, and develop and implement the CLS group business plans.

The EMC is composed of the CEO and such other officers as may be appointed or removed from time to time. The CLS Group Board appoints and removes the CEO. The Chairman's Committee, together with the CEO, recommends appointments and removals of other members of the EMC. The Audit and Finance Committee and the Risk Management Committee are directly involved in the appointment and removal of the Chief Internal Auditor and the Chief Risk Officer ("CRO").

The EMC serves as the primary decision-making body responsible for reviewing, analyzing and defining courses of action for all strategic matters relevant to the CLS group. The EMC determines risk tolerances, manages the CLS group's activities to address issues that arise based on the CLS group's risk and control policies, and ensures that there is an appropriate risk culture across all employees and that CLS Bank's Risk Management division maintains a comprehensive view of the CLS group's risk.

The Executive Handbook addresses the experience, skills, integrity and other qualifications necessary for management positions. The CEO and the EMC evaluate all candidates for a CLS group executive management position; selected candidates are further evaluated by one or more Chairman's Committee members and undergo standard background and reference checks. The Chairman's Committee conducts a periodic review of succession plans for CLS group's executive management and reviews human resource policies relating to management to ensure that they are appropriate for the successful attainment of the CLS Corporate Strategy.

To support executive management accountability and responsibility for decisions within each CLS group division, the Executive Handbook provides descriptions of the roles and responsibilities of executive management for the CLS group entities and contains, among other things, the descriptions of each executive management role as approved by the Chairman's Committee, organizational charts, and the terms of reference for management committees.

2.5.1 Conflicts of Interest

Included in the Executive Handbook is the CLS Employee Code of Conduct (the "**Employee Code of Conduct**"), which is reviewed annually by the EMC and approved, as appropriate, by the CLS Group Board. The Employee Code of Conduct, which informs employees of their responsibility to recognize and deal with ethical issues and conflicts of interest, applies to all employees of the CLS group entities, including officers and non-officers and, where applicable, consultants. Key employee responsibilities include complying with all applicable laws, regulations and the CLS group policies, acting ethically, professionally, in good faith and in the best interests of the CLS group, and using best efforts to avoid conflicts between personal and professional interests where possible.

Each employee receives annual training on, and certifies at least annually his/her understanding and compliance with the Employee Code of Conduct, including conflicts of interest. Employees are responsible for raising all matters that may involve conflicts of interest or reasonably be perceived by others to raise questions about potential conflicts and to promptly report violations of the Employee Code of Conduct to the Chief Compliance Officer or General Counsel. Suspected violations are investigated by the Chief Compliance Officer for appropriate action. The Employee Code of Conduct prohibits any retribution against an individual who reports violations of the Employee Code of Conduct in good faith. The CLS group established both an anonymous whistleblowing hotline and email facility to provide employees protection from victimization, harassment or disciplinary proceedings for raising bona fide concerns about potential or actual ethical issues relating to legal, ethical, accounting, or financial allegations.

2.5.2 Management Performance

As discussed above, the CLS Corporate Strategy and associated KPIs are used to track and measure performance. The Chairman's Committee assesses the performance of CLS group's executive management against the KPIs, and further reviews this with the CLS Group Board. Executive management members undergo assessments twice a year (as do all CLS group employees). The Chairman's Committee recommends executive management remuneration for the CLS Group Board's approval.

Key Consideration 6. The board should establish a clear, documented risk-management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk-management and internal control functions have sufficient authority, independence, resources, and access to the board.

2.6 Master Policy and Governance

The Master Policy applies to all CLS group entities and defines the requirements for relevant policy documents, including issuance, approval, publication, implementation, and ongoing maintenance, review, revision and retirement, as well as monitoring for compliance, as needed. The objective of each CLS group policy is to ensure compliance with applicable laws and regulations and to describe the requirements by which operational, credit, liquidity, and market risks are identified, assessed, managed, monitored and reported throughout the CLS group. In

addition, the policies set forth the relevant governance roles and responsibilities for managing such risks within the organization, requirements for exceptions and escalation of material risks.

Exceptions to the Master Policy and/or the documents it governs must be reported to the Chief Compliance Officer who will escalate, as needed, to the EMC, CEO, Risk Management Committee and CLS Group Board. The relevant EMC owner for the document is responsible for developing an action plan to address the exception. As described below, a number of risk and control policies have been approved under the Master Policy.

2.6.1 Risk Management Framework

CLS Bank has established an Enterprise-wide Risk Management Framework (the “ERM Framework”), which has been reviewed and approved by the CLS Group Board, and remains subject to the CLS Group Board’s oversight. The ERM Framework, covering Liquidity Risk, Operational Risk, Credit Risk, Model Risk, Information Security, Technology, Business Continuity, Crisis and Failure Management, General Business Risk, Communications and Training, Project Management, Vendor Management, Legal Risk, and Compliance Risk, supports a resilient approach for delivering on the CLS Vision Statement and enables the CLS group to undertake a systematic approach to identifying, managing, mitigating and reporting current as well as emerging risks across the organization. Under the ERM Framework, roles and responsibilities are described in order to foster transparency, accountability and ownership for risk oversight and management across the CLS Group Board, Risk Management Committee, CEO, EMC, management committees, the CRO, and CLS Bank’s Internal Audit division. Enterprise-wide risk-related matters are reported and escalated to the CRO and, as appropriate, the EMC and Risk Management Committee. The Risk Management Committee, as appropriate, escalates such matters to the CLS Group Board for a corrective action discussion. The CLS Group Board and the Risk Management Committee also receive quarterly ERM reports.

The ERM Framework is documented through the ERM Framework policy, which is supported by the policies and procedures for each individual risk and control function. It is supplemented by the CLS Risk Appetite Statement, which defines the risk and establishes the associated risk tolerances that CLS group is prepared to accept and manage for CLS as a discrete entity, risks to Settlement Members, and broader systemic risks to the CLS ecosystem. CLS Risk Appetite Statement tolerance levels have specified trigger levels, with a clear governance structure to ensure ownership, accountability and escalation. The CLS Group Board owns, oversees and approves the CLS Risk Appetite Statement, which is reviewed on an annual basis. The Risk Management Committee receives CLS Risk Appetite Statement exception reports and related corrective action plans from the CRO, and reviews and advises the EMC on risk assessment processes and relevant results. The Risk Management Committee also advises the EMC and the CLS Group Board on significant or material operational risks raised, and recommendations submitted, and on control processes, as appropriate. The EMC manages the CLS group entities within the CLS Risk Appetite Statement by incorporating risk identification, measures and mitigation explicitly in decision making. The CRO is responsible for formulating, communicating and monitoring the application of the CLS Risk Appetite Statement and escalates exceptions to the CEO and the Risk Management Committee.

2.6.2 Decision-making Processes in Crisis Situations and Emergencies

CLS Bank has a fully-developed framework for decision-making processes in crisis situations and emergencies, which includes the Crisis Lead Manual and additional supporting crisis documentation. The Crisis Lead Manual defines crisis classifications and establishes processes for crisis invocation and response; it establishes appropriate roles and responsibilities, as well as external escalation and crisis communications procedures. A comprehensive and ongoing training program has been established to support timely, effective and regionally resilient responses in crisis situations and emergencies.

2.7 CLS Recovery and Orderly Wind-Down

As detailed under Principle 15, CLS Bank has developed the CLS Recovery and Orderly Wind-Down Plan. The EMC has reviewed the CLS Recovery and Orderly Wind-Down Plan and approved the related approach and strategic decisions. The CLS Recovery and Orderly Wind-Down Plan was also reviewed by the Chairman’s Committee and subsequently recommended to, and approved by, the CLS Bank Board.

2.8 CLS Bank's Risk Management Division

CLS Bank's Risk Management division and associated roles, responsibilities, authority, reporting lines, and resources are described in the Organizational Regulations (including the Risk Management Committee Charter) and in the CLS group risk policies and procedures. The Risk Management Committee Charter stipulates that the CRO may bring any matter or issue to the Risk Management Committee and/or the CLS Group Board that he or she reasonably believes to be an appropriate matter or issue for consideration. In addition, the Risk Management Committee Chair has free and ready access to bring any matter or issue to the CRO that he or she reasonably believes to be an appropriate matter or issue for the CRO to consider.

As described above, the Risk Management Committee is directly involved in appointing and removing the CRO, and conducts exit interviews with any departing CRO to preserve institutional knowledge, ensure a smooth and orderly transition, and develop its understanding of CLS Bank's Risk Management division. The Chairman's Committee recommends the appointment or removal of the CRO to the CLS Group Board. The Chair of the Risk Management Committee is authorized to report on the Risk Management Committee's proceedings, observations, findings, actions and recommendations to the Federal Reserve and the CLS Oversight Committee as needed, or in response to any inquiry.

2.9 Internal Controls and Audit

The CLS Group Board is ultimately responsible for the preparation of the financial statements of the company in accordance with applicable law and the CLS Group Holdings Articles, including designing, implementing and maintaining an internal control system relevant to the preparation of financial statements that are free from material misstatement, whether due to fraud or error. The CLS Group Board is also responsible for the Internal Audit division of CLS Group Holdings and of the CLS group as a whole, including ensuring an effective system of internal controls satisfying applicable legal and regulatory requirements. Responsibilities of the Audit and Finance Committee include reviewing the scope and effectiveness of the systems established by the CLS group's executive management to identify, assess, manage and monitor financial and non-financial risks.

In addition, monitoring and review of the CLS group's Internal Audit division is the responsibility of the Audit and Finance Committee. The Audit and Finance Committee approves the remit of the Internal Audit division and the annual Internal Audit plan. The Audit and Finance Committee also ensures that the Internal Audit division has adequate resources (both financial and staff) and appropriate access to information to enable the Internal Audit division to perform effectively and in accordance with relevant professional standards. The Audit and Finance Committee approves the appointment and removal of the Chief Internal Auditor. The Audit and Finance Committee Charter provides the Chief Internal Auditor with the right of direct access to the CLS Group Chairman and to the Chairman and members of the Audit and Finance Committee. The Chief Internal Auditor reports to the Chair of the Audit and Finance Committee with an administrative reporting line to the CEO and is a non-voting member of the EMC.

The Audit and Finance Committee makes recommendations to the CLS Group Board, to be put to shareholders for approval at a shareholders meeting, for the appointment, re-appointment and removal of the CLS group's external auditor. The Audit and Finance Committee also oversees the relationship with the external auditor, including ensuring that the CLS group annually assesses the independence of the external auditor and monitoring the external auditor's compliance with relevant ethical and professional guidance.

Key Consideration 7. The board should ensure that the FMI's 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.

2.10 Representative of Participants and Stakeholders' Interests

The CLS Group Board currently includes sixteen non-executive directors who are representatives of the Settlement Members; these directors provide input regarding the interests of both Settlement Members and shareholders of

various sizes and from various jurisdictions. Additionally, as detailed above in Section 2.4.2, the CLS Group Board also contains Outside Directors who are required to meet defined criteria, and represent the public interest.

2.11 Disclosure to Participants and Stakeholders

As described above, the CLS Vision Statement and CLS Corporate Strategy reflect the determination of the CLS Group Board that the CLS group's strategy appropriately reflects the CLS group's priorities. In addition, the objective of the CLS Risk Appetite Statement is to define a balanced risk appetite from the perspectives of the CLS group entities, the Settlement Members and the broader CLS ecosystem. The CLS Vision Statement, CLS Corporate Strategy, and CLS Risk Appetite Statement were approved by the CLS Group Board in consultation with the EMC. The CLS Bank Board may waive or amend terms in the Rules, subject to the process discussed under Principle 1.

2.11.1 Public Disclosure

Major decisions affecting CLS Bank are disclosed to relevant stakeholders and to the public, as discussed under Principle 23. CLS Bank maintains the confidentiality of its Settlement Members and of other participants in the CLS system in accordance with applicable law and the CLS Bank Documents. CLS Bank does not publish anything that permits a recipient to reasonably identify the positions of its customers and their business. Each CLS group entity requires a non-disclosure agreement in advance of any disclosure of non-public information to prospective participants.

Principle 3: Framework for the comprehensive management of risks

An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.

3.0 Summary

CLS Bank operates the Settlement Service based on the CLS risk design,⁴⁹ which underlies all aspects of the CLS system's settlement and funding processes, models and calculations, and procedures for efficient funding on a multilaterally netted basis in parallel with payment instruction settlement under business-as-usual and stress scenarios. CLS Bank's dual private and public obligations arise from the specialized nature of the Settlement Service, which inherently concentrates and transforms risks, as well as the CLS system's broader systemic importance.

CLS Bank has established a risk management framework, aligned with the CLS Risk Appetite Statement and its associated tolerances, which provides for periodic risk assessments as well as enterprise-wide risk monitoring. The risk management framework defines processes and tools for comprehensively identifying, measuring, monitoring, and managing internal and external sources of risk from three perspectives: CLS Bank as a standalone entity, CLS Bank's Members, and the broader CLS ecosystem.

Key Consideration 1. An FMI 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 FMI. Risk-management frameworks should be subject to periodic review.

3.1 Risk Management Framework

The robustness and stability of the Settlement Service relies on a comprehensive risk management framework that is formally documented and regularly reviewed to ensure risk management policies, procedures and systems are effective and take into account fluctuations in risk severity and likelihood, changing environments and market practices.

The risk management framework's policies and procedures are subject to annual review⁵⁰ and approval by the CLS Group Board, the Risk Management Committee, and the EMC or CRO, as relevant. While the CLS Group Board is responsible for the overall strategy and supervision of the CLS group entities, the Risk Management Committee assists by providing oversight and governance for CLS Bank's Risk Management division as well as the risk management framework's policies and procedures.

CLS Bank recognizes that its business model differs from that of a traditional bank and the concept of risk appetite is therefore tailored to the nature of its business. Many of the risks that CLS Bank takes are considered unrewarded risks and CLS Bank's overall risk philosophy is to eliminate or minimize such risks. CLS's Risk Appetite Statement, recommended by management and approved by the CLS Group Board, articulates CLS Bank's philosophy and approach to risk management, defines specific qualitative statements and quantitative tolerances, guides decision making and ensures appropriate governance around risk taking. CLS Bank calibrates its risk appetite to be consistent with the CLS Vision Statement to enhance financial stability by providing risk mitigation and operational services to the global FX market, its status as a systemically important financial market utility, its risk capacity, business strategy and risk vision.

The CLS Risk Appetite Statement is supported by governance frameworks and a suite of policies and procedures, which address the following areas:

- **Enterprise Risk Management:** the ERM Framework, which outlines CLS Bank's governance framework for managing risks introduced by a CLS system, process or human failure, risks imposed on CLS Bank by external

⁴⁹The CLS risk design is CLS Bank's delivery and design of existing processes and services that contribute to the overall management and mitigation of settlement risk and broader risk in the FX market.

⁵⁰Additional reviews may be triggered by major changes in corporate strategy, the regulatory environment, financial market conditions or CLS Bank's risk profile, as well as the discretion of the owner of the relevant policy or procedure.

events like the failure of a CLS Bank participant, RTGS system or a critical service provider and systemic and emerging risks, which are newly developing or rapidly changing risks that may have a major impact on CLS Bank's ability to achieve its Corporate Strategy.

- **Legal Risk Management:** CLS Bank's legal framework (detailed under Principle 1) ensures a clear, transparent, enforceable legal basis for the material aspects of CLS Bank's activities in all relevant jurisdictions, based on rules, operating procedures, contractual agreements, laws and regulations. The Rules and Member Handbook outline the various processes involved in the CLS system, define the respective responsibilities and obligations of CLS Bank and each Member, and provide the legal underpinning for the CLS risk design.
- **Credit Risk Management:** the credit risk management framework establishes the requirements for identifying, assessing, managing, monitoring and reporting credit risk at CLS Bank, including the calculation and adjustment of Aggregate Short Position Limits and assessment of initial compliance with credit requirements for membership as well as on-going credit eligibility for Settlement Members, Eligible Currencies and Liquidity Providers, as detailed under Principle 4.
- **Liquidity Risk Management:** CLS Bank seeks to minimize funding liquidity demands on Members, subject to its primary mandate to maximize settlement completion. The liquidity risk management framework (detailed under Principle 7) ensures consistent management of liquidity and funding risks that arise in the CLS system. These liquidity risk management tools include an extensive modelling plan that includes CLS risk design optimization, support for CLS strategic initiatives as well as Settlement Member and currency onboarding, a robust, automated back/stress testing program, and risk trade-off analysis.
- **Model Risk Management:** the model risk management framework is aligned with regulatory requirements and defines requirements for robust model development, implementation and use, a sound periodic validation process to ensure that models are performing as expected and in line with their design objectives and business uses, defined roles and responsibilities for clear communication of model limitations and assumptions, and the authority to restrict model usage. More details on model risk management are provided under Principle 7.
- **Operational Risk Management ("ORM"):** CLS Bank has established an integrated approach to operational risk management that aligns with relevant regulatory requirements. As discussed in detail under Principle 17, internal and external sources of operational risk are considered and managed on a divisional as well as firm-wide basis with defined processes for regularly identifying, managing, mitigating, and reporting operational risk and specific requirements for top corporate risks.
- **Information Security Risk:** information security encompasses the preservation of confidentiality, integrity, and availability of information. CLS Bank implements the necessary information security controls in its policies and procedures to protect its information, systems, premises, and employees from all cyber threats, whether internal, external, accidental, or deliberate. As discussed in detail under Principle 17, CLS Bank has in place an information security framework that aligns with CLS Bank's cyber resilience strategy as endorsed by the CLS Group Board. It articulates how CLS Bank determines its cyber resilience objectives and cyber risk tolerance, as well as how CLS Bank identifies, mitigates, and manages cyber risks.
- **Crisis and Failure Management:** tools and processes for managing crisis/failure situations have been developed so that relevant CLS Bank divisions can manage small and larger-scale disruptions, accelerate remedial action, ensure regional resilience, and mitigate systemic risk by meeting various challenges presented by participants in the Settlement Service, as well as internal and external events while minimizing risks to provision of the Settlement Service.
- **Communications and Training:** on-going communication and training processes drive internal stakeholder engagement to reinforce a culture of risk awareness and responsibility throughout the CLS group, as well as establish and maintain proactive risk communication with the external risk management community (including chief/senior risk officers of Member banks, other FMI's, critical service providers, and regulators). CLS Bank also promotes thought leadership in seeking industry solutions related to systemic risks arising from FX settlement, including the potential failure of a CLS Bank nostro agent or third party service provider, or the resolution of a Settlement Member, as discussed under Key Consideration 3.

- **Vendor Risk Management:** as detailed under Principle 17, CLS Bank's Vendor Management Program, seeks to effectively manage the inherent and potential vendor-related risks that arise from using vendors to support CLS Bank's operational activities. CLS Bank's Vendor Management Program was developed in line with current regulatory guidelines, and reflects CLS Bank-specific strategic and risk-management considerations. CLS Bank identifies four distinct vendor categories to distinguish the various vendors and determine the appropriate level of management attention and responsibilities. This process includes evaluating vendors on inherent risks associated with the product or service. Inherent risks include, but are not limited to, data, health & safety, economic loss, intellectual property, geography, reliance and business continuity.
- **Independent Audit and Validation:** as detailed under Principle 2, the CLS group has a comprehensive framework for regularly advising the EMC and the CLS Group Board on the quality of business operations, with particular emphasis on systems of control. The Internal Audit division analyzes CLS Bank's risks and provides proactive independent assurance on the adequacy and effectiveness of internal controls, collaborates with the Risk Management division to facilitate identification and evaluation of risks, and provides recommendations to the EMC for responding to risks.
- **Project Risk Management:** as discussed under Principle 17, CLS Bank has implemented robust change and project management processes under which projects and system changes are subjected to thorough, coordinated due diligence and, as relevant, are submitted for regulatory consultation and/or undergo comprehensive risk assessment and stress testing to insulate the Settlement Service from adverse or unintended impact.
- **General Business Risks:** internal policies are in place to mitigate risk stemming from external events which may occur in both the short and long run, such as shifts in competitive landscape, membership, the economy, regulation, or legislation, as well as risks stemmed from CLS Bank's financial and infrastructure capacities.
- **Relationships with Non-traditional Vendors and Business Partners:** CLS Bank has established an internal procedure to manage and mitigate the unique risks associated with non-traditional vendors and business partners on an initial as well as ongoing basis.

Key Consideration 2. An FMI should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMI.

3.2 Delivering the CLS Vision Statement: To be the leading provider of risk mitigation and operational services for the global foreign exchange market

As the sole multi-currency payment system of its kind, CLS Bank recognizes its responsibility to organize and manage delivery of the Settlement Service in a way that contributes to systemic stability. The CLS risk design protects each Member's principal against settlement risk and provides for a simultaneous discharge of each Member's obligations under the underlying FX transaction, supported by the robust legal framework discussed above under Principle 1. CLS Bank settlement-specific considerations are discussed under Principle 8 and Principle 9.

CLS Bank seeks to mitigate systemic risk through methods including maintaining a robust CLS risk design, reliable daily operations, failure management tools, and ongoing communications across CLS ecosystem constituents, including Members. These bilateral and multilateral communications encourage clear understanding of risks and obligations, as discussed in detail below under Key Consideration 3.

Settlement Members, nostro agents, third party service providers, Liquidity Providers, and central banks have also undertaken a considerable amount of preparatory work to understand the liquidity and systemic risk issues related to participating in the CLS system, including technical as well as operational testing tied to approval processes that are a prerequisite to participation. CLS Bank also maintains a formal vendor management framework with specific review requirements and detailed Service Level Agreements ("**SLAs**"), subject to annual review.

3.3 Incentives for Managing Risks

In addition to the various tools available for controlling or mitigating the credit, operational, and liquidity risks inherent in the CLS system, CLS Bank provides its Settlement Members with numerous incentives for managing these risks.

The use of the Settlement Service is preferable to bilateral settlement because the CLS system eliminates principal risk. Settlement Members are fully aware of the three risk management tests (detailed in the Introduction) governing the settlement of their payment instructions, and the times by which funding requirements must be satisfied. If CLS Bank is unable to settle a payment instruction by the applicable Currency Close Deadline because the three risk management tests have not been satisfied by both relevant Settlement Members, the payment instruction will be rejected by the CLS system. Under these circumstances, the decision as to how to handle the settlement of the payment instructions is made by the Members, and/or their third party customers if applicable. Depending on the reason for the failure, the Members may decide to resubmit the unsettled payment instructions to the CLS system for settlement on another settlement date, settle the payments outside of the CLS system or, in an insolvency or other credit situation, proceed with closing out the transaction under the relevant master agreement. Such uncertainty creates undue complications for Members, so it is in their interest to ensure requirements for settlement via the CLS system are met.

CLS Bank discusses the relevant risks and incentives with direct and indirect participants in the CLS system in bilateral and multilateral forums (detailed below under Key Consideration 3, as well as under Principle 17). In addition, CLS Bank provides Settlement Members with real-time information on the status of each individual payment instruction that the Settlement Member has submitted, and the related Pay-Ins and Pay-Outs in each Eligible Currency. This real-time provision of information strengthens a Settlement Member's crisis management abilities.

With respect to the Main Session, it is in a Settlement Member's best interest to satisfy its funding requirements in a timely manner because, as that Settlement Member pays in funds, CLS Bank can make Pay-Outs in other currencies to that Settlement Member. With respect to the SDS Session, a Settlement Member must satisfy funding requirements prior to settlement.

In the event that a Settlement Member fails to satisfy its funding obligations, CLS Bank will suspend all Pay-Outs to the Settlement Member until it becomes fully compliant with the requirements of its Revised Pay-In Schedule. This is a significant protective mechanism for CLS Bank and is an effective way to provide incentives to Settlement Members to avoid Pay-In failures. Each Settlement Member also has a strong incentive to satisfy its funding obligations in order to avoid costs related to use of CLS Bank's liquidity facilities (in the Main Session), and compensation claims from other Settlement Members that may have received Pay-In Calls as a result of the Settlement Member's failure, as detailed under Principle 13. CLS Bank provides further incentives for timely Pay-In performance through the imposition of fees for late Pay-Ins. The failure of a Settlement Member to satisfy its funding obligations may also result in other sanctions under the Rules (including suspension of membership rights, or reduction to, or elimination of, Aggregate Short Position Limits).

Key Consideration 3. An FMI 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.

CLS Bank calibrates its risk appetite to be consistent with its vision to enhance financial stability by providing risk mitigation and operational services to the global FX market, its status as a systemically important FMI, its risk capacity, and its business strategy. The ERM Framework outlines CLS Bank's governance framework for managing risks introduced by a CLS system, process or human failure, risks imposed on CLS Bank by external events like the failure of a CLS Bank participant, RTGS system, or a critical service provider, and systemic and emerging risks, which are newly developing or rapidly changing risks that may have a major impact to CLS Bank in achieving its Corporate Strategy. CLS Bank has in place top-down/bottom-up risk assessment processes to regularly identify, manage, mitigate, and report on risks (detailed under Principle 17) through the enterprise risk management processes. Material risks are consolidated and reported as part of the firm-wide view of risk information in the ERM report, which is presented to the Risk Management Committee and the CLS Group Board on a quarterly basis.

3.4 Sources of Interdependencies in the CLS Ecosystem

To further manage material risks, as well as the systemic impact that the Settlement Service may have on the broader financial system, CLS Bank identifies the various factors that lead to interdependencies in the CLS ecosystem.

These sources include the following elements:

- **Legal and regulatory elements**
 - The global regulatory environment;
 - Individual central bank policies; and
 - CLS Bank's central bank accounts, maintained with the relevant central bank for each Eligible Currency for CLS Bank to receive Pay-Ins and make Pay-Outs.
- **Internal and external operational and technical infrastructure**
 - Connectivity with RTGS systems to process Settlement Service-related payments; and
 - CLS Bank's internal technical infrastructure as well as ancillary services (*i.e.*, the In/Out Swap Program and Aggregation Service).
- **Direct and indirect participants in the Settlement Service**
 - Settlement Members, which may also be nostro agents, third party service providers, and/or Liquidity Providers;
 - Nostro agents contracted⁵¹ to fund Settlement Member Pay-In requirements;
 - Interactions between Settlement Members and their third party customers, subject to the restrictions and notification requirements discussed under Principle 19; and
 - Liquidity Providers contracted to provide liquidity facilities in a specific Eligible Currency which are not Settlement Members.
- **Reliance on Critical Service Providers**
 - The SWIFT network to transmit payment instruction information between the CLS system and the CLS ecosystem participants;
 - IBM to deliver the technology infrastructure that operates the CLS system;
 - Regional utilities contracted for telecommunications or other infrastructural services; and
 - Other critical vendors, including market-wide data providers (*i.e.*, Bloomberg and Reuters).
- **Other FMIs and FMUs:** CLS Bank monitors its direct and indirect connectivity to other FMIs and FMUs with the objective of mitigating risk concentrations and contagion from adverse events impacting them (*i.e.*, DTCC and certain CCPs).

CLS Bank identifies the various sources of interdependencies in the CLS ecosystem, analyzes relevant risk implications, assesses associated risk management challenges, and monitors and reports the relevant material risks under the ERM Framework, discussed above.

⁵¹As discussed in the Introduction, nostro agents maintain arrangements with Settlement Members and do not have any contractual relationship with CLS Bank.

3.5 Communication of Participant Risks and Interdependencies

CLS Bank is in frequent and regular contact with Settlement Members to discuss all relevant risks associated with participation in the CLS system. In bilateral meetings, CLS Bank discusses each Settlement Member's ability to manage the potential liquidity implications of a disruptive situation in the CLS system. In addition to the work performed before the Main Session "go-live" date in September 2002, and the SDS Session "go-live" date in September 2013, relevant information regarding the results of liquidity simulations and analyses performed during the year (often but not solely in connection with the extension of the Settlement Service or the addition of Eligible Currencies to the CLS system) is shared with the CLS Oversight Committee and Settlement Members. As discussed under Principle 7 and Principle 13, CLS Bank requires Settlement Members and Liquidity Providers to participate in periodic testing and simulations, and conducts daily back/stress testing to evaluate potential risks.

3.5.1 Multilateral Discussions

CLS Bank periodically convenes multilateral forums for Settlement Members and/or other participants, generally for reiterating and maintaining Settlement Member awareness of the respective roles and responsibilities of CLS Bank and the Members, and key aspects of the Settlement Service (including the risk design and failure management processes). Examples of these forums include the CLS Treasurers Working Group, the Technology User Group, and working groups formed in jurisdictions of potential CLS Eligible Currencies. The CRO convenes periodic regional risk forums with senior risk personnel from Members, Liquidity Providers and other relevant participants, and has implemented a network of relationships with Member CROs, meeting annually with the CROs (or their directed delegates) of systemically important Settlement Members (as defined by CLS Bank). Similar CRO meetings are also held annually with specific FMIs (including DTCC and various CCPs) and critical service providers (including SWIFT).

At the end of 2015, CLS Bank and several other FMIs established the FMI Working Group as a forum to discuss important issues of mutual concern on a high level basis.

3.5.2 CLS Thought Leadership on Industry Issues

CLS Bank has led discussions regarding industry issues such as the potential failure of a nostro agent or third party service provider both as part of regular bilateral Settlement Member liquidity dialogues and in multilateral meetings, leading to increased industry awareness and the development of best practices, potential mitigations, and monitoring per a prescribed set of metrics. The *CLS Bank Best Practices for Third Parties and Third Party Service Providers* ("**Third Party Best Practices**"), detailed under Principle 19, are publicly available and have been embedded in bilateral and multilateral discussions. The Third Party Best Practices are designed to identify and mitigate the systemic risks posed by both third party users of CLS Bank, as well as those Settlement Members that provide services to third parties, and include specific requirements for certain categories of third parties. The Third Party Best Practices also specify that third parties should have contingency plans in place in case of a third party service provider failure.

CLS Bank requires advance notification and written consent prior to a Settlement Member providing or amending third party services for an FMI or G-SIFI. CLS Bank has detailed reporting requirements associated with third party service provision for FMIs (including CCPs) or G-SIFIs. The Rules and Member Handbook allow CLS Bank flexibility to impose limits, conditions or restrictions on third party payment instructions, as detailed under Principle 19.

Similarly, the *CLS Bank Best Practices for Nostro Agents and Nostro Clients* ("**Nostro Best Practices**") have been developed and made publicly available as part of an ongoing effort to identify and manage risks that may arise from nostro agent concentration and failure. These Nostro Best Practices recommend nostro contingency plans for Settlement Members' consideration, and have been incorporated in bilateral and multilateral discussions with Settlement Members.

3.5.2.1 Resolution Regimes in the CLS Jurisdictions

In light of the critical role that CLS Bank plays in the global markets, and the regulatory emphasis placed on the need for a financial institution in resolution to maintain access to FMIs, CLS Bank has initiated and

implemented multiple resolution-related work streams in order to maximize the likelihood that a Member in resolution will be able to safely continue to participate in the Settlement Service, including:

- tracking and commenting on proposed implementations of the Financial Stability Board's *Key Attributes of Effective Resolution Regimes for Financial Institutions* in the CLS Jurisdictions;
- implementing amendments to the Rules to provide for a fast-track application process for an existing Member to transfer its membership to a Transition Settlement Member ("**TSM**") in a resolution scenario;
- conducting a series of regional TSM workshops to discuss resolution-related issues with Members; and
- preparing an internal CLS Member Resolution Playbook so that CLS Bank is prepared to respond appropriately in the event that one of its Members becomes subject to resolution.

As these various work streams have evolved, it became increasingly clear that in a resolution scenario there will be many factors outside CLS Bank's control that may impact upon whether the Member in resolution will be able to continue to participate in the Settlement Service. These factors include the decisions and actions of other Members and their clients (as applicable), regulators (including, but not limited to, the resolution authority), nostro agents, and RTGS systems.

As such, in April 2016, CLS Bank designed and hosted a Settlement Member Resolution War Game ("**Member War Game**") at its New York and London offices, attended by a subset of Settlement Members who played the role of hypothetical other Members, and others. The Member War Game was designed to identify and explore issues and assumptions related directly and indirectly to FMI participation and related market-wide issues in the event of a Settlement Member resolution. Specific goals of the exercise included assisting Settlement Members as well as CLS Bank with identifying and exploring issues with respect to the resolution of another Settlement Member, as well as in connection with FMI participation and market response to resolution.

3.5.3 Crisis and Failure Management

CLS Bank maintains effective crisis and failure management capabilities to maximize settlement completion on the intended settlement date within the time constraints of global RTGS systems, as well as robust crisis management capabilities to enable recovery from stress or crisis events of an extreme but plausible nature, while seeking to prevent any negative impact on Settlement Service as well as the CLS ecosystem.

War games are a key element of CLS Bank's comprehensive crisis management framework. War games are desktop exercises where simulated crisis scenarios take place with one of the designated crisis leads managing the scenario through to conclusion, with the assistance of crisis supports and subject matter experts. Scenarios covered in these war games include Settlement Member insolvency, technical issues with the CLS system, RTGS system outages, and exogenous events (*e.g.*, an earthquake).

The purpose of the war games is to provide CLS Bank's crisis management team (crisis leads, crisis supports and subject matter experts) with continuous exposure to the issues, discussions and decision-making processes that arise in specific crisis situations. These war games enable the crisis management team to analyse and agree on what processes to follow dependant on the different available tools.

Crisis simulations are also used as an enhancement to these war games. Crisis simulations are conducted with the crisis management team and involve the use of the CLS system test environment to simulate the interaction with the CLS core system during a crisis scenario. Crisis and failure management considerations, tools, and relevant testing are discussed under Principle 7; participant default management is detailed under Principle 13.

3.5.4 Market-wide Exercises and Business Continuity Tests

The CLS group entities participate in disaster recovery and business continuity tests with key service providers and strategic partners, including SWIFT, as well as participating in market-wide exercises. Disaster recovery, business continuity, and general operational resiliency, as well as relevant testing, are discussed in detail under Principle 17.

3.5.5 CLS-Related Forums

CLS group entity representatives also participate in numerous forums where CLS-related issues are discussed, including:

- Workshops involving operations representatives from the RTGS systems for the Eligible Currencies;
- The New York Foreign Exchange Committee, its Operations Managers Working Group, and the Financial Markets Lawyers' Group, facilitated by the Federal Reserve Bank of New York;
- The London Foreign Exchange Joint Standing Committee and its Operations and Legal Sub-Groups, facilitated by the Bank of England;
- The Euro CLS Group, chaired by the European Central Bank;
- The Australian Financial Markets Association FX Operations Committee;
- The Tokyo Foreign Exchange Market Committee and its Operations Standing Sub-committee, facilitated by the Bank of Japan;
- The New Zealand Financial Markets Association Foreign Exchange Committee; and
- The Australian Foreign Exchange Committee.

CLS Bank is also contacted from time to time to provide information to other regional FX industry groups.

Key Consideration 4. An FMI should identify scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern and assess the effectiveness of a full range of options for recovery or orderly wind-down. An FMI should prepare appropriate plans for its recovery or orderly wind-down based on the results of that assessment. Where applicable, an FMI should also provide relevant authorities with the information needed for purposes of resolution planning.

3.6 Reliability and Recovery

As discussed in detail under Principle 17, the CLS system has a high degree of operational reliability due to its resilient technical architecture and infrastructure design. CLS Bank has documented procedures detailing activities to be conducted under normal operating conditions, as well as a range of failure management processes, tools, and procedures to allow the Settlement Service to recover from a wide variety of disruptive situations. Crisis and failure management are detailed under Principle 7 and Principle 13.

3.6.1 CLS Recovery and Orderly Wind-Down Plan

As discussed under Principle 15, a CLS Recovery and Orderly Wind-Down Plan has been developed, and endorsed by the CLS Bank Board, in recognition that the failure of the Settlement Service could result in systemic disruptions in the financial markets. The CLS Recovery and Orderly Wind-Down Plan focuses on the continuity of the Settlement Service during severe idiosyncratic and systemic stress events not already being mitigated fully by CLS Bank's existing risk framework. The CLS Recovery and Orderly Wind-Down Plan has identified scenarios that could potentially prevent CLS Bank from being able to provide its critical operations and services as a going concern, and considers the recovery tools available to address the scenarios. These scenarios relate to risks associated with negative Settlement Member and CLS Bank's central bank account

balances, legal risk, operational risk and strategic risk. An internal process has been established to manage CLS Recovery and Orderly Wind-Down Plan reviews, which are conducted the earlier of every two years or following material changes to the CLS system or the environment in which CLS Bank operates that would significantly affect the viability or execution of the plan.

3.6.2 Member Recovery and Resolution Considerations

As discussed under Principle 1, the legal opinions obtained by CLS Bank describe the specific types of insolvency as well as resolution events in each of the CLS Jurisdictions and the legal ramifications, if any, for CLS Bank as a result of the commencement of such a proceeding. CLS Bank will seek to permit a Settlement Member subject to resolution to continue participating in the Settlement Service as long as such participation does not compromise the Settlement Service, including CLS Bank's fundamental operational or credit requirements or legal protections. To maximize the likelihood that a Settlement Member subject to resolution will be able to continue to participate in the Settlement Service, CLS Bank has engaged in conversations with various resolution authorities to discuss key issues. The discussion under Principle 13 contains additional detail regarding CLS Bank's policy with respect to insolvencies, as well as rapidly evolving resolution regimes and resolution tools.

Principle 4: Credit risk

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

4.0 Summary

The CLS Bank credit risk management framework measures, monitors, and mitigates credit risks and manages the modest residual credit risk exposures to CLS Bank and the Settlement Members with a high degree of confidence. The Settlement Service is designed to mitigate credit risk, and CLS Bank calibrates an individual Aggregate Short Position Limit for each Settlement Member based on its current credit risk profile. Settlement Members and Liquidity Providers are subject to specific credit-related eligibility criteria for initial and on-going participation in the CLS system. Settlement Member creditworthiness is also significant in the potential event CLS Bank assesses, and seeks to collect, a loss allocation as provided for under the Rules. The initial and on-going creditworthiness of Settlement Members and Liquidity Providers is also important for the long-term commitment, stability and market confidence in the Settlement Service.

Key Consideration 1. *An FMI 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.*

4.1 The CLS Bank Credit Risk Management Framework

CLS Bank's credit risk management framework defines robust processes, tools, and controls to identify, monitor, and manage credit risk. CLS Bank's Credit Risk Management team has primary responsibility for the credit risk management framework, including escalating credit risk-related considerations and/or concerns to the CRO, establishing an internal credit risk rating, validating Aggregate Short Position Limits, and confirming Settlement Member and Liquidity Provider compliance with relevant eligibility criteria. The credit risk management framework is subject to annual review per the Master Policy requirements discussed under Principle 2 as well as the model governance requirements detailed under Principle 7. CLS Bank's credit risk management framework includes:

- **Credit Risk Policy:** outlines the requirements for identifying, assessing, managing, monitoring and reporting credit risk for CLS Bank, including the calculation and adjustment of Aggregate Short Position Limits and the assessment of compliance with initial credit requirements as well as on-going credit eligibility for Settlement Members, Eligible Currencies, and Liquidity Providers, detailed under Key Consideration 2.
- **Country Credit Risk Assessments:** CLS Bank country risk assessments include commentary on the country's economic performance, identify specific sovereign risks (including structural, social, political, reputational, legal and anti-money laundering regime-related risks), systemic banking risks and regulations restricting the ability of issuers domiciled in that country to meet their commercial obligations in full and on time.
- **Regular and Ad Hoc Credit Quality Monitoring and Reporting:** CLS Bank's Credit Risk Management team ensures credit quality and credit risks as relevant to the CLS ecosystem are identified, monitored, reported and reviewed on a regular as well as an ad hoc basis. This monitoring includes:
 - **Selective Daily Monitoring Brief:** Daily monitoring and reporting on a broad range of credit risk-related topics including current market events, credit default swap spreads, equity volatility measures, regional indices, and other publicly available market data.
 - **Monthly Credit Ratings Reporting:** Monthly reporting that reflects updates from any relevant credit risk-related changes and provides credit rating details across the CLS ecosystem as well as prospective Settlement Members and countries.
 - **Periodic Limited Reviews:** Periodically, a limited review is completed for each Settlement Member using the CLS Bank internal rating methodology, discussed under Key Consideration 2. The limited review process calibrates each Settlement Member's Aggregate Short Position Limit to its current credit

risk profile. Any changes to Aggregate Short Position Limits are captured in the monthly reporting noted above.

- **Semi-Annual Aggregate Short Position Limit Portfolio Reviews:** Semi-annually, a review of the overall CLS Bank credit portfolio is completed alongside an assessment for potential credit risk impacts from relevant stress scenarios. The Aggregate Short Position Limit Portfolio Review identifies and measures emerging credit risks and the potential impact of stress scenarios, and is presented to the EMC and the Risk Management Committee.
- **Scheduled Comprehensive Reviews:** Detailed Settlement Member and Liquidity Provider credit reviews (“**Comprehensive Reviews**”) are completed according to a schedule that requires an individual review either annually or every 18 months, depending on the systemic importance of the counterparty as determined by CLS Bank. These are based on the internal rating process detailed below under Key Consideration 2, as well as the internationally accepted five-factor *CAMEL* analytical framework,⁵² and evaluate compliance with relevant eligibility criteria. Comprehensive reviews assess Settlement Member compliance with CLS Bank’s membership requirements and confirm each Liquidity Provider’s on-going suitability.
- **Ad hoc Credit Risk Reviews:** Comprehensive Reviews as well as limited reviews may also be conducted on an ad hoc basis. Such ad hoc credit risk reviews may be triggered by a CLS Bank executive management request, a change in financial condition or public credit rating, credit events, a change in operational performance, and/or based on other relevant public information (including reputational issues), as needed.

Key Consideration 2. An FMI should identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk-management tools to control these risks.

4.2 Credit Risk Exposure

CLS Bank’s credit risk management framework measures, monitors, and mitigates credit risks and manages the modest residual credit risk exposures to CLS Bank and its Settlement Members. The sources of residual credit risk for Settlement Members with respect to the Settlement Service are:

- **Settlement Member Net Credit Risk Exposure:** as discussed under Principle 9, the net credit risk to which a Settlement Member may be exposed to as a result of participation in the CLS system is limited in time and amount. Because of the Positive Adjusted Account Balance risk management test, Settlement Members will have long balances on their Accounts during the settlement and funding period. These long balances represent a credit risk from CLS Bank. Credit risk also may exist between a Settlement Member and any customer for which it provides third party CLS-related services, depending on the terms of their bilateral contractual agreements (in which CLS Bank has no involvement). Tiered participation is discussed in greater detail under Principle 19.

The sources of residual credit risk for CLS Bank with respect to the Settlement Service are:

- **Residual Credit Risk from Settlement Members:** CLS Bank is exposed to modest residual credit risk from each Settlement Member to the extent that Settlement Member incurs a short position in one or more Eligible Currencies. As discussed in the Introduction, the three risk management tests in the Settlement Service require short positions to be covered/offset by a long position in one or more other Eligible Currencies in order for payment instructions to settle across the books of CLS Bank. As a result of the application of those three risk management tests, at no time will CLS Bank settle a payment instruction if such settlement would cause the Settlement Member’s Account Balance to be less than zero.

⁵²The CAMEL methodology is used by international bank supervisory authorities to rate financial institutions based on five factors:

- C - Capital Adequacy
- A - Asset Components and Asset Quality
- M - Management Quality
- E - Earnings Performance
- L - Liquidity and Funding Profile

However, if there is both a continued failure by the Settlement Member to satisfy its funding requirements and significant FX market movements in excess of the haircuts applied to the Account, a credit shortfall would be incurred and would affect the ability of CLS Bank to satisfy its Pay-Out obligations to the non-failing Settlement Members. Because the Rules provide for an assessment of any such losses to the non-failing Settlement Members, the credit risk of a non-paying Settlement Member is ultimately borne by the other Settlement Members. The loss assessment process, including relevant caps and limitations, is detailed below under Key Consideration 7.

- **Settlement and Replacement Cost Risk with Liquidity Providers:** as detailed under Principle 1 and Principle 7, CLS Bank becomes a principal to a transaction when it enters into a today/tomorrow swap with a Liquidity Provider during a liquidity facility draw-down. CLS Bank may be subject to replacement cost risk if the Liquidity Provider fails to pay the counter-currency for the tomorrow leg of the swap and, simultaneously, the subject currency of the swap depreciates in value against the counter-currency at the time of the tomorrow leg's close-out.
- **Country Risk (Expropriation) - CLS Central Bank Accounts:** CLS Bank is exposed to expropriation risk associated with a potential seizure of the balance in its central bank account by the relevant governmental authority. If the balance in CLS Bank's central bank account was expropriated during settlement or funding, CLS Bank would allocate such losses among the Settlement Members as discussed below under Key Consideration 7. Settlement Members may at any time pre-emptively choose to mitigate this risk by not transacting in an Eligible Currency.
- **Transferability and Convertibility Risk:** CLS Bank is generally not exposed to transferability or convertibility risk associated with an Eligible Currency after funding and settlement have been completed. In the event of capital controls or other restrictions being imposed in a country, CLS Bank will decide whether to suspend the Eligible Currency based on restriction severity as well as compatibility with the country continuing as a CLS Jurisdiction. Any risks associated with Pay-Outs in an Eligible Currency being restricted due to capital controls or any other governmental action would be assumed by Settlement Members who transact in that Eligible Currency.

Business-as-usual operations as a Financial Institution - CLS Bank is exposed to credit risk with respect to investing and/or depositing liquid funds for day to day working capital. Specifically:

- CLS Bank is exposed to modest residual credit risk with respect to the financial institutions in which it deposits the CLS group's own liquid funds as part of its business-as-usual finance and treasury processes. These funds are held for day to day working capital purposes as deposits with financial institutions that, due to the nature of CLS Bank's operations, are also Settlement Members.
- CLS Bank's liquid funds that are surplus to those held as deposit placements for day to day working capital purposes may take the form of short-term investments subject to those permitted for CLS Bank as an Edge Act corporation as well as the investment and concentration restrictions defined in the CLS Group Treasury and Capital Policy. These investments are managed on an ongoing basis by CLS Bank's Finance division, as detailed under Principle 16.

To mitigate the modest residual credit risk arising from deposits with Settlement Members, as well as permitted investments with applicable financial institutions, CLS Bank's Credit Risk Management team conducts a quarterly risk assessment to assess any shifts in sovereign or institutional credit risk based on the CAMEL methodology discussed above. The results for each bank and country where investments and/or deposits are held and any resulting recommendations also mitigate the risk that CLS Bank's investments risk the loss of principal.

To mitigate risks associated with FX rate variability, CLS Bank hedges exposures that arise from operating expenses. Predominantly, this is a USD-denominated exposure that arises from expenses related to CLS Bank's US operations, but overall exposures and coverage are assessed as part of the annual budget exercise.

4.3 Tools for Managing and Monitoring Credit Risk

As discussed above, CLS Bank's credit risk management framework and associated processes and tools ensure that the modest residual credit risk exposures arising from participation in the CLS system are mitigated and managed appropriately.

4.3.1 Scheduled Comprehensive Review and Internal Rating Methodology

The Comprehensive Review of a Settlement Member is an assessment prepared by CLS Bank of the counterparty credit, liquidity, and operational risks that the Settlement Member may present to the Settlement Service and broader CLS ecosystem. The Comprehensive Review consists of both a qualitative and quantitative analysis of the Settlement Member's financial condition.

CLS Bank has incorporated an internal rating methodology into its Comprehensive Reviews. This methodology includes elements of both quantitative and qualitative analysis and retains classic drivers of bank credit risk. The fundamental analysis is based mainly on the CAMEL analytical metrics and also incorporates forward looking judgements and assessments of other qualitative considerations including the business model, corporate behavior and the degree of complexity and opacity.

4.3.2 Aggregate Short Position Limits

As discussed above and in the Introduction, the Aggregate Short Position Limit is one of the three risk management tests automatically applied by the CLS system during the settlement process. The Aggregate Short Position Limit test states that a Settlement Member's Account cannot have an Aggregate Short Position in excess of the Aggregate Short Position Limit established by CLS Bank for that Settlement Member.

The Aggregate Short Position Limit is an intraday limit approved for each Settlement Member which allows payment instructions to be settled before all of the Settlement Member's required Pay-Ins are made. This enables funding to be spread over several hours, and may allow additional payment instructions to settle even if a Settlement Member fails to meet its funding obligations. CLS Bank's Credit Risk Management team calibrates a Settlement Member's Aggregate Short Position Limit based on the following seven factors:

- Long-Term Foreign Currency Sovereign Ratings;
- Settlement Member Tier I Capital (converted to USD);
- Settlement Member Tier 1 Capital ratio;
- Moody's Baseline Credit Assessment;
- S&P Standalone Credit Profile;
- Fitch Viability Rating; and
- Internal CLS Long-term rating.

In an effort to effectively limit the systemic consequences of a Settlement Member failure, CLS Bank employs specific Aggregate Short Position Limit caps, which differ for Settlement Members domiciled in investment grade countries as compared to in non-investment grade countries, as well as for Settlement Members assigned a CLS Bank internal rating equivalent to S&P BBB- (or external equivalent). For Affiliate Members, CLS Bank employs a cap on the combined sum of Aggregate Short Position Limits for all Settlement Members within a financial group. It is important to note that the Aggregate Short Position Limit does not restrict the volume or value of payment instructions that a Settlement Member may submit for settlement. This limit only affects which payment instructions can be successfully settled across the Settlement Member's Account as Pay-Ins are made during the Main Session.

In the event of an anticipated change to a Settlement Member's Aggregate Short Position Limit, CLS Bank's Risk Management team engages the Settlement Member in order to prepare them for any potential liquidity impact. If the deteriorating credit condition of a Settlement Member presents undue risk to CLS Bank or the CLS ecosystem, or at the discretion of the CRO, CLS Bank may, on an exceptional basis, override the limited review results and reduce the Aggregate Short Position Limit.

4.3.3 Membership and Liquidity Provider Criteria

CLS Bank's credit risk criteria are objective, risk-based, and intended to limit membership to those financial institutions that are capable of successfully participating in the CLS system without exposing the Settlement Service to undue risk. Each Settlement Member is required to satisfy initial and continuing financial requirements for membership, including capital and capital ratio requirements imposed by its primary regulator. Additionally, CLS Bank requires Liquidity Providers to have a minimum CLS Bank internal long-term credit rating equivalent to S&P BBB- (or external equivalent).

CLS Bank's Credit Risk Management team monitors Settlement Member and Liquidity Provider credit quality and on-going compliance with the eligibility criteria set forth in the CLS Bank Documents, and evaluates relevant deteriorations or exceptions. If a Settlement Member fails to comply with the on-going eligibility criteria, CLS Bank may adjust that Settlement Member's Aggregate Short Position Limit to zero and/or require credit enhancements. The deterioration of a Liquidity Provider below the CLS Bank internal long-term credit rating equivalent to S&P BBB- (or external equivalent) may result in its removal from that Eligible Currency's liquidity facilities, with subsequent adjustment to the Eligible Currency's Short Position Limit, as discussed in greater detail under Principle 7.

As discussed in greater detail under Principle 13, CLS Bank has a transparent, risk-based response to the deterioration of a Settlement Member which is sensitive to systemic risks while preserving Settlement Members' interests. If the deteriorating credit condition of a Settlement Member presents undue risk to CLS Bank or the CLS ecosystem, CLS Bank may take steps to reduce this exposure by reducing the Settlement Member's Aggregate Short Position Limit, or by requiring pre-funding or credit enhancements. However, if the Settlement Member's operational resilience and/or compliance with the liquidity and legal requirements of the Settlement Service are compromised, CLS Bank may take steps to suspend that Settlement Member.

To mitigate the modest residual credit risk arising from deposits with Settlement Members, as well as permitted investments with applicable financial institutions, CLS Bank's Credit Risk Management team conducts a quarterly risk assessment to assess any shifts in sovereign or institutional credit risk, as discussed above. CLS Bank's management of custody and investment risks is discussed in detail under Principle 16.

Key Consideration 3. A payment system or SSS 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 DNS payment system or DNS SSS in which there is no settlement guarantee but where its participants face credit exposures arising from its payment, clearing, and settlement processes, such an FMI 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.

4.4 Exposure Coverage

As discussed under Principle 7, each Eligible Currency has a Short Position Limit assigned to it, based on the aggregate amount of committed liquidity facilities that exist for that Eligible Currency. The extension of short positions exposes CLS Bank to a possible credit shortfall as a result of FX rate fluctuations if a Settlement Member does not satisfy its funding requirements in a timely manner and CLS Bank has settled payment instructions. As discussed in the Introduction, this potential exposure is mitigated both by applying haircuts when calculating the Account Balances as part of the three risk management tests performed before a payment instruction is settled, and also by applying such haircuts before the Pay-Out of any long position is made.

The continued failure of a Settlement Member to satisfy its funding obligations could create a situation where CLS Bank has sufficient funds to satisfy its Pay-Out obligations but not in the Eligible Currencies expected. This may result in an alternative currency Pay-Out, as described under Principle 7. As noted under Principle 5, CLS Bank does not routinely accept or manage collateral.

Key Consideration 7. *An FMI 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 FMI. These rules and procedures should address how potentially uncovered credit losses would be allocated, including the repayment of any funds an FMI may borrow from Liquidity Providers. These rules and procedures should also indicate the FMI's process to replenish any financial resources that the FMI may employ during a stress event, so that the FMI can continue to operate in a safe and sound manner.*

4.5 Loss Allocation

The Rules provide for assessment of FX market losses to the Settlement Members through loss sharing procedures, which provide for two types of loss allocation:

- **Combined Loss Allocation:** As discussed under Principle 7, CLS Bank maintains committed liquidity facilities that are used to raise liquidity to allow CLS Bank to make Pay-Outs in the event of a Settlement Member's failure to cover a short position in its Account. CLS Bank can incur a credit shortfall if this Pay-In failure is coupled with a significant market move in excess of the applicable haircuts. CLS Bank will assess this credit shortfall on those Settlement Members who have settled payment instructions with the failing Settlement Member on the failure date by means of a combined loss allocation. The combined loss allocation assessment cannot exceed the lesser of (a) the amount of a Settlement Member's total bilateral net receives with the failing Settlement Member on the failure date and (b) the resulting negative balance of the failing Settlement Member.

The combined loss allocation assessment includes two components: (i) a primary loss allocation and (ii) a secondary loss allocation. The two components of the combined loss allocation, simultaneously assessed and collected, provide certain benefits not possible under a single allocation mechanism. CLS Bank collects the combined loss allocation during the funding period of a settlement session by directly debiting relevant Settlement Members' Accounts. The secondary loss allocation component helps ensure CLS Bank can recover a loss even if the Settlement Member with the largest primary loss allocation fails to satisfy this obligation.

For financial groups that include Affiliate Members, the Combined Loss Allocation is assessed independently for each Settlement Member Account maintained by the financial group.

- **General Loss Allocation:** CLS Bank will, in certain circumstances, assess a general loss allocation (generally capped at US\$30 million except for losses resulting from certain governmental actions⁵³) on each Settlement Member to cover:
 - a credit shortfall loss not fully recovered from Settlement Members through a combined loss allocation (the difference between the negative Account Balance and the amounts received through a combined loss allocation);
 - certain operating losses (losses paid by CLS Bank to a Member to indemnify them for their loss sustained as a result of the failure of CLS Bank or CLS Services to act or not act in accordance with the CLS Bank Documents, to the extent connected to the CLS system or the processing or settlement of payment instructions, including a loss resulting directly or indirectly from a failure to receive, authenticate, accept, validate, reject, match or otherwise process or settle or not settle a payment instruction or from an error caused by the CLS system, and certain amounts due to a Liquidity Provider to the extent not allocated to Members under combined loss allocation);⁵⁴
 - central bank-related or RTGS system losses; and/or
 - losses resulting from certain governmental actions (*i.e.*, the imposition of capital controls).

⁵³ General loss allocations resulting from certain governmental actions are assessed based on the net positions of Settlement Members that transact in the affected Eligible Currency.

⁵⁴ See also Section 17.10.3.

For financial groups that include Affiliate Members, there is one General Loss Allocation assessed on the entire financial group.

Under certain extreme and remote scenarios, CLS Bank could hypothetically exhaust the amounts available under the general loss allocation. CLS Bank believes, however, that the risk of potential combined and general loss allocations to Settlement Members is mitigated by the haircut methodology and three risk management tests and, most significantly, by CLS Bank's management of residual credit risk exposure through the initial and continuing membership requirements as discussed above.

As discussed in detail under Principle 7, CLS Bank requires periodic Liquidity Provider testing, and Settlement Member Pay-In Call trialing, and conducts daily and quarterly back/stress testing to ensure that the CLS system settles payment obligations with a high degree of confidence under a wide range of potential stress scenarios. Settlement of payment instructions across CLS Bank's books, and funding between Settlement Members and CLS Bank via central bank accounts, is final and irrevocable even in the event that a Settlement Member becomes insolvent, as discussed under Principle 8 and Principle 9.

4.6 Replenishing CLS Bank Resources Exhausted During a Stress Event

As discussed in detail under Principle 7, because an Eligible Currency's Short Position Limit at any time, and the amount of the liquidity facilities in respect to such Eligible Currency available at such time are related to each other, events such as a drawdown on a liquidity facility would trigger a revaluation of that Short Position Limit. Subsequent to a drawdown, CLS Bank is obligated to re-deliver the acquired Eligible Currency to the Liquidity Provider, which would thereby restore the liquidity facility to the original amount. Any such redelivery would also likely result in a revaluation of the relevant Short Position Limit. In the event that the failing Settlement Member is also a Liquidity Provider, the relevant Eligible Currency's Short Position Limit would be adjusted accordingly.

Principle 5: Collateral

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

5.0 Summary

CLS Bank generally does not require that its participants post collateral. In the Main Session, CLS Bank allows Settlement Members' Accounts to have intraday short positions in one or more Eligible Currencies, subject to the requirement that there be sufficient offsetting long balances in other Eligible Currencies in each Account at all times. These offsetting long balances are not collateral; they have the effect of mitigating the credit risk associated with the extension of intraday short positions in the Settlement Service.

Key Consideration 1. An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks.

5.1 Collateral

As noted above, CLS Bank does not routinely accept or manage collateral. In the event that a Settlement Member experiences an adverse change (whether financial, credit, liquidity operational or otherwise) that causes the Settlement Member to be at risk of no longer satisfying CLS Bank's membership criteria, CLS Bank may require the Settlement Member to provide a credit enhancement if CLS Bank is uncertain whether the Settlement Member would be able to meet its obligations under a general loss allocation. In this situation the amount of this credit enhancement would be the unutilized portion of the US\$30 million general loss allocation cap. This enhancement can be in the form of a pledge of cash collateral to CLS Bank or the issuance of an irrevocable standby letter of credit.⁵⁵

Key Consideration 2. An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.

5.2 Haircuts and Valuation for Collateral

Key Consideration 2 does not apply to CLS Bank since it does not routinely accept or manage collateral. CLS Bank applies currency-specific haircuts to Settlement Member's Account Balances, as detailed under Principle 7.

Key Consideration 3. In order to reduce the need for procyclical adjustments, an FMI should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent.

5.3 Stable and Conservative Haircuts for Collateral

Key Consideration 3 does not apply to CLS Bank since it does not routinely accept or manage collateral. As noted above, CLS Bank applies currency-specific haircuts to Settlement Members' Account Balances. The volatility protection of these haircuts is assessed daily and also subject to back/stress testing, as discussed under Principle 7.

Key Consideration 4. An FMI should avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects.

5.4 Investment Policy

Key Consideration 4 does not apply to CLS Bank since it does not routinely accept or manage collateral. As noted above and discussed in detail under Principle 16, CLS Bank invests its own liquid funds in specific and permitted investments, subject to the CLS Group Treasury and Capital Policy. CLS Bank does not collateralize its own investments.

⁵⁵To date, this has never occurred.

Key Consideration 5. An FMI 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.

5.5 Cross-Border Collateral

Key Consideration 5 does not apply to CLS Bank since it does not routinely accept or manage collateral.

Key Consideration 6. An FMI should use a collateral management system that is well-designed and operationally flexible.

5.6 Collateral Management System

Key Consideration 6 does not apply to CLS Bank since it does not routinely accept or manage collateral, and therefore does not have a collateral management system.

Principle 7: Liquidity risk

An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI 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 FMI in extreme but plausible market conditions.

7.0 Summary

CLS Bank is exposed to liquidity risk if a Settlement Member fails to fund its Pay-In obligations as scheduled, which could disrupt CLS Bank's ability to settle payment instructions, triggering market and liquidity risks for other Settlement Members. If a Settlement Member's failure to fund its Pay-In obligations leads to uncovered short positions in that Member's Account, CLS Bank will draw on its liquidity facilities in order to meet its Pay-Out obligations to other Settlement Members. In the event that multiple Settlement Members fail to fund their obligations and as a result, have uncovered short positions, CLS Bank may be required to make Pay-Outs in alternative currencies. CLS Bank is exposed to market risk when a Settlement Member fails to fund its Pay-In obligations, has a short position in its Account, and simultaneously, the haircut percentages applied to the Currency Balances in each Account are insufficient to cover adverse FX rate movements. This market risk would only materialize into a loss in the unlikely event that a continued failure by a Settlement Member to satisfy its funding requirements results in uncovered short positions, simultaneously coupled with extreme FX market movements in excess of the haircuts applied to the Currency Balances in each Account.

Key Consideration 1. An FMI should have a robust framework to manage its liquidity risks from its participants, settlement banks, nostro agents, custodian banks, Liquidity Providers, and other entities.

7.1 The CLS Bank Liquidity Risk Management Framework

CLS Bank's liquidity risk management framework provides robust processes, tools, and controls to identify, monitor and manage liquidity risks as part of the overall risk management framework described under Principle 3. Liquidity risk appetite is defined as part of the overall CLS Risk Appetite Statement, discussed under Principle 2. The effectiveness of the tools and processes associated with liquidity risk management are continually reviewed by CLS Bank internally and through the formal oversight of the Risk Management Committee. CLS Bank's liquidity risk management framework is used to manage liquidity risks on a day-to-day basis as well as to assess and mitigate liquidity risks associated with strategic initiatives. The CLS Bank liquidity risk management framework includes:

- **Liquidity and Market Risk Policy:** outlines the requirements, including the three risk management tests the CLS system automatically applies to the settlement process⁵⁶ (described in the *Risk Management Tests* section of the Introduction) as well as limit and haircut assignment, by which liquidity and market risks are identified, assessed, managed, monitored, and reported.
- **Model Risk Management:** defines model governance, development, implementation, change management and validation policies, procedures, and standards that ensure effective model risk management aligned with regulatory guidance⁵⁷ as detailed under Key Consideration 9.
- **Modelling Plan and Back/Stress Testing:** an extensive and detailed modeling plan for CLS risk design optimization, modeling in support of CLS Bank's strategic initiatives and Settlement Member and currency onboarding, a robust, automated back/stress testing program, and risk tradeoff analysis work.⁵⁸ Modeling and back/stress testing takes into consideration the multiple roles that a Settlement Member may play in the CLS system, including its commitments as a Liquidity Provider or nostro agent, in each Eligible Currency. The modeling plan is reviewed and approved regularly by the Risk Management Committee. The back/stress testing

⁵⁶An example of the application of the three risk management tests is provided in **ANNEX C**.

⁵⁷OCC Bulletin 2011-12 / SR Letter 11-7, *Supervisory Guidance on Model Risk Management*, April 4, 2011.

⁵⁸Pay-In failure simulations using combinations of parameters in different increments are used to analyze risk trade-offs in terms of settlement, liquidity, and market risks and risk impact sensitivity with respect to the changes in these risk control parameters.

program includes daily as well as quarterly testing under various stress scenarios and is discussed under Key Consideration 9.

- **CLS System Deadlines:** The CLS system executes settlement and funding processes for each settlement session based on specific deadlines that trigger certain automatic and manual activities, such as the Currency Close Deadline and the issuance of IPIS and RPIS discussed in the Introduction and illustrated in **Diagram 3**. In failure or crisis management situations, these deadlines can be moved by CLS Bank's Operations department.
- **Proactive Monitoring and Communications:** continuous monitoring of Member payment instructions before, during and after the settlement process, communication with participants, identification of trends, and continuous evaluation and validation of the CLS risk design and parameters as discussed under Key Consideration 2 and Principle 17.
- **Failure and Crisis Management:** provides CLS Bank with the tools to manage small and larger-scale disruptions, speed remedial action, ensure regional resilience, and mitigate systemic risk by meeting various challenges presented by CLS system participants and internal or external events while minimizing risks to the Settlement Service.

Key Consideration 2. An FMI should have effective operational and analytical tools to identify, measure, and monitor its settlement and funding flows on an ongoing and timely basis, including its use of intraday liquidity.

7.2 Tools for Managing Liquidity Risk

The management of liquidity risk begins with CLS Bank monitoring the positions of its Members before, during and after the settlement process, to understand the nature and magnitude of these positions, identify trends, and continuously validate the CLS risk design or adjust associated parameters and limits as necessary. CLS Bank also monitors changes in FX rates and the impact of those changes on haircut levels to validate their adequacy. The CLS system provides real-time information on Settlement Member FX positions, settlement activity and funding performance. CLS Bank uses other computer applications to analyze this real-time information in order to perform the monitoring identified below, including internal models that are subject to the model validation, governance and change management requirements detailed under Key Consideration 9.

7.2.1 Monitoring Settlement and Funding Flows

CLS Bank's monitoring falls into the following categories:

- for the Main Session, identifying large projected Settlement Member and nostro agent positions on the day prior to settlement;
- monitoring Settlement Member and nostro agent Pay-In performance intra-day;
- monitoring trends in nostro agent concentration of Pay-In requirements;
- monitoring trends in Settlement Member bilateral position concentrations;
- monitoring trends in Settlement Member forward book unrealized gains and losses;
- assessment of the haircut levels adequacy for each Eligible Currency in the Main Session;
- analyzing In/Out Swap performance; and
- monitoring the adequacy of Short Position Limits and committed liquidity facilities for the Main Session.

CLS Bank performs the following daily and periodic reviews of the settlement and funding processes:

- review of FX rates used in the CLS system;
- identifying the severity of any late Pay-Ins;
- daily haircut recalculation for the Main Session;
- review of non-PvP settlement activity for the Main Session;
- review of Aggregation activity for the Main Session;
- review of rescind activity;
- review of net funding and In/Out Swap efficiency;
- estimation of next day's gross positions and net funding positions for the Main Session;
- estimation of significantly large positions for the Main Session;
- periodic review of forward positions and identification of bilateral exposures between Settlement Members and transaction counterparties;
- periodic review of trends in settlement and funding activity; and
- periodic assessment of the overall systemic importance of Settlement Members, nostro agents, third parties, third party service providers, and Liquidity Providers.

CLS Bank performs projections for future Pay-In requirements to identify abnormally large funding obligations, and will notify relevant Settlement Members to ensure that they are aware of any such obligation and prepared to handle the associated funding requirements. CLS Bank may also convey Pay-In requirements to other relevant participants (for example, to Settlement Members' nostro agents for the SDS Session). In addition, Settlement Members receive real-time information on the status of all of their payment instructions and related Pay-Ins and Pay-Outs in each Eligible Currency, thereby significantly strengthening their crisis management abilities.

Key Consideration 3. A payment system or SSS, 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.

7.3 Liquidity Risk Management and the CLS Risk Design

The CLS risk design through the application of Short Position Limits ensures that it has sufficient funds to satisfy its Pay-Out obligations relating to settled payment instructions in the Main Session, even if the Settlement Member with the largest Pay-In obligation relating to settled payment instructions fails to satisfy that Pay-In obligation, regardless of whether the failure is caused by operational, legal, credit, or any other issues. For purposes of the CLS risk design, the failing Settlement Member is assumed to be a Liquidity Provider, and therefore is also assumed to fail to fulfill its commitments to provide liquidity.

CLS Bank recognizes that many of its Settlement Members rely on nostro agents to satisfy their Pay-In obligations. If the Settlement Member that fails to satisfy its Pay-In obligation is also a nostro agent, there is a possibility that this failure could lead to multiple Settlement Members being unable to satisfy their Pay-In obligations. In order to strengthen its liquidity risk management, CLS Bank is in the process of developing an enhanced liquidity framework

that will establish standards for the coverage of the short positions of the failing Settlement Member plus those short positions of its Settlement Member nostro clients.

7.3.1 Application of Haircuts

As discussed above and in the Introduction, the extension of short positions to a Settlement Member exposes CLS Bank to possible FX rate fluctuations. This potential exposure is mitigated by applying a currency-specific haircut percentage to each Currency Balance in each Member's Account, providing a cushion against adverse FX rate movements by creating "excess" assets in CLS Bank's central bank accounts. This mitigates the risk of CLS Bank failing to have central bank account balances with an aggregate value sufficient to complete all Pay-Outs to eligible Settlement Members, whether by drawing on CLS Bank's liquidity facilities or by making a Pay-Out in an alternative Eligible Currency.

CLS Bank assesses the volatility protection afforded by the specified haircuts on a daily basis at a minimum, and may review and adjust haircuts on an intraday basis in the event of FX rate volatility, market/geopolitical events, and/or currency holidays. The haircuts are also subjected to the daily back/stress testing discussed under Key Consideration 9.

7.3.2 Assignment of Short Position Limits

The Short Position Limit for an Eligible Currency is based on the aggregate size of the committed liquidity facilities that are available to CLS Bank in that currency. The maximum amount of a Short Position Limit in each Eligible Currency equals the total amount of committed liquidity facilities in each currency, less the amount of the largest commitment for that currency (or such lesser amount as CLS Bank may determine from time to time). Exclusion of the largest Liquidity Provider allows for the possible failure of the largest Liquidity Provider and still provides CLS Bank with access to sufficient committed facilities to cover the Pay-In failure of a single Settlement Member with the largest Aggregate Short Position.

CLS Bank does not currently extend short positions with respect to the SDS Session, and will not settle any payment instructions in the SDS Session without first having received all required funding from the relevant participants.

7.3.3 Settlement Member Failure to Fund Obligations

The continued failure of a Settlement Member to satisfy its funding obligations to CLS Bank potentially creates a situation where CLS Bank has sufficient funds to satisfy its Pay-Out obligations to other Settlement Members relating to payment instructions that have settled, but not necessarily in the currency or currencies that other Settlement Members are expecting to receive. Any such unexpected and continued extension of short positions in the failing Settlement Member's Account must be offset by sufficient long positions in the Account. CLS Bank would then withhold Pay-Outs of long positions to that failing Settlement Member until that Settlement Member has satisfied its Pay-In obligations. If this Settlement Member continued to fail to provide funding, CLS Bank would access its committed liquidity facilities to enable it to make Pay-Outs to other Settlement Members in the expected Eligible Currency(ies). The failure of a Settlement Member to satisfy its funding obligations to CLS Bank will trigger CLS Bank to take mitigating actions as discussed in greater detail under Principle 13.

7.3.4 Pay-In Calls

Pay-In Calls are the first means of raising additional liquidity in the event that a Settlement Member fails to satisfy its Pay-In requirements, regardless of whether the failure is related to an operational or credit issue. However, Pay-In Calls may also pose significant liquidity issues for Settlement Members because they are unexpected. Pay-In Calls are issued at fixed times prior to each Currency Close Deadline.

CLS Bank will temporarily suspend a Settlement Member from receiving Pay-Outs of its long position if such Settlement Member fails to meet 100% of its Pay-In requirements for the first Pay-In installment. This action provides CLS Bank with additional protection against FX rate movements in addition to the protection provided by Haircuts in the event that CLS Bank must later access its liquidity facilities. It is also consistent with a "defaulter pay" risk regime since it is the nonpaying Settlement Member that provides this additional protection

(as Haircut levels affect all Settlement Members equally). This suspension will be lifted to allow Pay-Outs of its long positions in excess of what is needed to cover the short position, including Haircuts, after the Settlement Member is fully compliant with all its Pay-In requirements.

If a Settlement Member has not made any Pay-Ins to CLS Bank, its Account Balance will be zero, or positive if some of its in-the-money payment instructions have settled. CLS Bank will issue a Pay-In Call for “account value” to the applicable non-paying Settlement Member. The purpose of this Pay-In Call is to give a non-paying Settlement Member the opportunity to put value in its Account at CLS Bank so payment instructions can settle. Compliance with this Pay-In Call reduces the impact on other Settlement Members by enabling payment instructions to settle within the non-paying Settlement Member’s Short Position Limits.

7.3.4.1 Pay-In Call for Settlement

CLS Bank will suspend or continue to suspend a Settlement Member from receiving Pay-Outs if the Settlement Member has failed to meet 100% of its Pay-In requirements in any Eligible Currency in which it has a short position. If there are unsettled payment instructions remaining in the Settlement Processing Queue at the Settlement Completion Target Time, CLS Bank will determine if additional payment instructions can be settled. If unsettled payment instructions remain, CLS Bank will issue Pay-In Calls for Settlement.

CLS Bank will first issue a Pay-In Call for Settlement to non-failing Settlement Members that have unsettled payment instructions with a Settlement Member that has failed to satisfy its funding obligations and, as a result of the unsettled payment instructions with a non-paying Settlement Member also have unsettled payment instructions with other non-failing Settlement Members. The Pay-in Call for Settlement is not a mandatory obligation, but is an amount that, if paid, would allow the remaining unsettled payment instructions between non-failing Settlement Members to settle.

7.3.4.2 Pay-In Call for Currency Close

If a Settlement Member previously suspended for Pay-Out has subsequently complied with its Pay-In requirements, CLS Bank will reinstate such Settlement Member for Pay-Out as soon as operationally feasible. After attempting to settle as many additional payment instructions as possible, CLS Bank will issue Pay-In Calls for Currency Close.

CLS Bank will issue a Pay-In Call for Currency Close prior to the closing time of an RTGS system for a particular Eligible Currency. The Pay-In Call for Currency Close is a mandatory obligation issued to any Settlement Member that has an uncovered short position in a closing Eligible Currency (based upon payment instructions submitted by the Settlement Member that have already settled). Following the issuance of a Pay-in Call for Currency Close for a particular Eligible Currency, CLS Bank will no longer attempt to settle any remaining unsettled instructions involving that particular Eligible Currency.

CLS Bank has observed from its modeling (discussed in greater detail under Key Consideration 9) that the failure of a single Settlement Member to comply with its Pay-In Schedule can cause payment instructions to remain unsettled at CLS Bank. Settlement Members submitting payment instructions which remain unsettled will have Currency Balances at CLS Bank that are different than expected. Such Settlement Members may receive a Pay-In Call for Currency Close even though they have complied with their respective Pay-In Schedules. The proceeds from this Pay-In Call are required by CLS Bank to Pay-Out long positions to eligible Settlement Members.

7.3.5 Liquidity Facilities

CLS Bank maintains committed liquidity facilities in applicable Eligible Currencies. These liquidity facilities are used to fund settled payment instructions following a Settlement Member failure to Pay-In a particular Eligible Currency, as opposed to providing liquidity to facilitate further settlement of payment instructions.

Under these liquidity facilities, CLS Bank may call upon its Liquidity Providers to enter into FX swaps or outright currency purchases on an intraday basis. These transactions, in turn, allow CLS Bank to raise the liquidity in the

Eligible Currency required for Pay-Outs, in exchange for Eligible Currencies in which it has balances on its central bank accounts. These balances effectively represent the long positions in the failing Settlement Member's Account, funds which CLS Bank would otherwise have paid out to the Settlement Member in the absence of its failure to cover its short position(s). The haircuts applied to the Eligible Currency Balances in Settlement Members' Accounts, and the withholding of Pay-Outs to failing Settlement Members, together ensure that the value of CLS Bank's central bank balances will be significantly in excess of the value of the Eligible Currency that is to be acquired through the liquidity facility. In the event a Settlement Member's failure to provide funding was coupled with an inability by CLS Bank to access its committed liquidity facilities, Settlement Members could potentially receive Pay-Outs in alternative currencies, as discussed below under Key Consideration 10.

Unless a credit, insolvency or other event has occurred with respect to the failing Settlement Member from which CLS Bank could reasonably conclude that it is unlikely to recover in a timely way and that would lead CLS Bank to execute an outright FX purchase, CLS Bank will execute today/tomorrow swap transactions with its Liquidity Providers.

7.3.6 Testing and Trialing

As a result of mandatory periodic Liquidity Provider testing, trialing and simulations, Settlement Member Pay-In Call trialing (detailed under Key Consideration 7) and daily back/stress testing with detailed liquidity impact analysis for historical values as well as extreme but plausible stress scenarios (detailed under Key Consideration 9), the CLS system settles payment obligations with a high degree of confidence under a wide range of potential stress scenarios.

Key Consideration 5. For the purpose of meeting its minimum liquid resource requirement, an FMI'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 an FMI has access to routine credit at the central bank of issue, the FMI 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.

Key Consideration 5 is not applicable to CLS Bank. As discussed above, CLS Bank maintains committed liquidity facilities for each Eligible Currency that, through the application of Short Position Limits, ensures that it has sufficient funds to satisfy its Pay-Out obligations relating to settled payment instructions in the Main Session, even if the Settlement Member with the largest Pay-In obligation relating to settled payment instructions fails to satisfy that Pay-In obligation. CLS Bank does not need and does not have access to routine credit from central banks. As discussed under Principle 5, CLS Bank does not routinely accept or manage collateral.

Key Consideration 6. An FMI may supplement its qualifying liquid resources with other forms of liquid resources. If the FMI 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 an FMI 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. An FMI should not assume the availability of emergency central bank credit as a part of its liquidity plan.

7.6 Supplements to Liquid Resources

As discussed under Principle 5, CLS Bank does not routinely accept or manage collateral. As discussed above, CLS maintains committed liquidity facilities for each Eligible Currency and may call upon its Liquidity Providers to raise liquidity in the Eligible Currency required for Pay-Outs. If CLS Bank is unable to draw on its liquidity facilities, CLS Bank may make alternative currency Pay-Outs as discussed below under Key Consideration 10.

Key Consideration 7. *An FMI 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 FMI 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. An FMI should regularly test its procedures for accessing its liquid resources at a Liquidity Provider.*

7.7 Liquidity Agreements and Eligibility Criteria

Each liquidity facility is established pursuant to a Liquidity Agreement between CLS Bank and the relevant Liquidity Provider, as detailed under Principle 1. Pursuant to these Liquidity Agreements, Liquidity Providers agree to participate in testing and trialing procedures with CLS Bank and any RTGS system as required. As detailed under Principle 4, CLS Bank has specific initial and on-going eligibility criteria for Liquidity Providers and monitors compliance accordingly.

7.7.1 Pay-In Call Trialing

Given the critical role of Pay-In Calls in the CLS risk design, CLS Bank requires individual, controlled Settlement Member Pay-In Call trialing in the live production system using pre-determined and limited amounts of currency. In each trial, CLS Bank sends a notification to the participating Settlement Member stating the amount of the Pay-In Call. The Settlement Member must acknowledge this request and provide funding to CLS Bank to validate its operational capability for receiving and responding to a Pay-In Call request. Any issues or deficiencies identified during this trialing are subject to implementation of corrective actions, as needed.

7.7.2 Liquidity Provider Simulations

Given the critical role of liquidity facilities in the CLS risk design, CLS Bank has established a bi-monthly, end-to-end simulation program for operational capabilities associated with drawing on CLS Bank's liquidity facilities that replicate the actions CLS Bank would take in the event of a Settlement Member Pay-In failure during the Main Session. CLS Bank performs controlled simulations of the end-to-end internal and external processes associated with today/tomorrow FX swap transactions, with multiple Liquidity Providers and multiple Eligible Currencies across more than one time zone, using pre-determined and limited amounts of currency in CLS Bank's live production system, and in close adherence to existing processes, policies and agreements. Any issues or deficiencies identified during this testing are subject to implementation of corrective actions, as needed.

Key Consideration 8. *An FMI with access to central bank accounts, payment services, or securities services should use these services, where practical, to enhance its management of liquidity risk.*

7.8 Use of Central Bank Funds

As discussed under Principle 9, all Pay-Ins are received, and Pay-Outs made, by CLS Bank using central bank funds, specifically, in CLS Bank's account with each central bank for whose currency CLS Bank provides the Settlement Service.

Key Consideration 9. *An FMI should determine the amount and regularly test the sufficiency of its liquid resources through rigorous stress testing. An FMI should have clear procedures to report the results of its stress tests to appropriate decision makers at the FMI and to use these results to evaluate the adequacy of and adjust its liquidity risk-management framework. In conducting stress testing, an FMI 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 FMI, include all entities that might pose material liquidity risks to the FMI (such as settlement banks, nostro agents, custodian banks, Liquidity Providers, and linked FMIs), and where appropriate, cover a multiday period. In all cases, an FMI should document its supporting rationale*

for, and should have appropriate governance arrangements relating to, the amount and form of total liquid resources it maintains.

7.9 Model Governance

CLS Bank's Model Governance Policy, discussed under Principle 2, defines requirements, governance and oversight responsibilities to mitigate model risk and ensure that a robust model development and implementation process is in place at CLS Bank, including:

- Management committee governance and oversight for all models, with formal review and approval of any changes to existing models, as well as development and implementation of any new models;
- a rigorous independent model validation program under the Model Validation Policy issued by CLS Bank's Internal Audit division, with management committee governance and oversight for any findings;
- adequate model technical and user documentation to establish a consistent and updated record of the model's operation, key assumptions and inputs, limitations and outputs;
- functional requirements specifications to interface between model owners and developers;
- testing prior to model implementation subject to sign-off from a management committee as well as model owners;
- model deployment subject to CLS Bank's deployment and release management procedures;
- periodic model integrity activities to validate models operate as intended, reported to internal management committees;
- model change controls including access controls, versioning and retention of related source codes, change authorization requirements and mandated audit trail maintenance; and
- a comprehensive and up-to-date model inventory, subject to periodic certification processes.

CLS Bank continually assesses models in order to validate that they are fit for purpose as well as identify opportunities to refine and enhance individual models, including inputs, assumptions, and underlying methodologies and logic.

7.10 Back and Stress Testing Program

CLS Bank has implemented a comprehensive and sustainable back and stress testing program with relevant documentation covering the testing methodology, testing frequency, roles and responsibilities, and the process for reviewing results, under which CLS Bank conducts testing on a daily as well as quarterly basis to ensure robust monitoring and proactive communications with participants. The testing program uses live data and allows CLS Bank to assess the risk impact of potential Member Pay-In failure for the upcoming settlement date. Scenarios in daily and quarterly testing include single and multi-Member failure as well as hypothetical failure scenarios, to evaluate the impact on the platform, currency and participant (Settlement Member, nostro agent, and Liquidity Provider) levels across a variety of metrics.

As noted above, CLS Bank's Liquidity Providers are subject to extensive testing and trialing, as well as bi-monthly operational simulations, and each Settlement Member is required to participate in Pay-In Call trials. Testing and trialing, simulations, and back/stress testing ensure participants are aware of the associated liquidity risks, as well as enable CLS Bank to validate the CLS risk design or identify the need for improvements across a range of business-as-usual and stress scenarios. CLS Bank also continually assesses the models and methodologies underpinning the back and stress testing program to validate that they are fit for purpose as well as identify opportunities to refine and enhance its testing.

7.10.1 Back and Stress Testing Methodology and Scenarios

Back testing measures the CLS risk design parameters (including Short Position Limits, Aggregate Short Position Limits and haircuts), validates against historical data, and may lead to appropriate adjustment, as necessary. Stress testing measures and assesses the settlement, liquidity, and market risks associated with the Settlement Service under severe market conditions, including the failure of one or more Members, nostro agents, and/or Liquidity Providers, combined with extreme FX rate moves, for historical stress scenarios as well as extreme but plausible hypothetical scenarios. Resulting risk metrics allow CLS Bank to assess the impact on the failing and innocent Member(s) as well as on the CLS Bank platform, in terms of settlement, liquidity, alternative currency Pay-Out, and value loss distribution.

7.10.2 Back and Stress Testing Results

Based on the back/stress testing results, CLS Bank may choose to take specific actions and/or implement changes, including but not limited to:

- Short Position Limit and/or Aggregate Short Position Limit level adjustments;
- haircut adjustments to ensure sufficient cushion against FX rate movements or market volatility;
- periodic communications with Members to discuss results, unusual liquidity demands or patterns, and potential impact on the Member itself as well as on innocent Members; and/or
- improvements to the CLS risk design, to mitigate systemic risk.

The results of the daily back and stress testing are consolidated in a dashboard and distributed across CLS Bank's Risk Management division. Any deviations or significant changes are highlighted with explanations or recommendations, as appropriate. On a quarterly basis, the results of back and stress testing, as well as other analysis conducted under the overall modeling plan are presented to the Risk Management Committee as well as internal management committees. The quarterly update includes a summary of analysis, findings, recommendations, and next steps.

Key Consideration 10. An FMI should establish explicit rules and procedures that enable the FMI 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 FMI'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.

7.11 Managing a Pay-In Failure or Participant Default

As discussed under Principle 3, CLS Bank provides Settlement Members with incentives to manage the risks inherent in the CLS system and to satisfy their funding obligations in a timely fashion. In the event a Settlement Member fails to satisfy its funding obligations, CLS Bank will suspend all Pay-Outs to the Settlement Member until it becomes fully compliant with its Pay-In Schedule requirements. This may also result in other sanctions under the Rules, including reduction or elimination of an Aggregate Short Position Limit. Participant default is detailed under Principle 13.

7.11.1 Liquidity Facilities and Loss Allocation

The combined loss allocation and general loss allocation processes (detailed under Principle 4) provide a further means of mitigating market risk if FX rates have moved such that the haircuts have not ensured that CLS Bank has sufficient value in its central bank accounts to meet its Pay-Out obligations. In addition, the haircuts are designed to ensure that CLS Bank does not suffer an FX market-related loss after it enters into a transaction under a liquidity facility, by creating "excess" assets in CLS Bank's central bank accounts. For example, after settling the first part of an FX swap with a Liquidity Provider (the "today" leg), it is possible that the value of

Eligible Currency that CLS Bank is obligated to return to the Liquidity Provider in the second leg (the “tomorrow” leg) rises in value. In the event that CLS Bank has to purchase such Eligible Currency in the market due to a failing Settlement Member’s continued failure to make the required Pay-In in that Eligible Currency, these excess assets in CLS Bank’s central bank accounts would provide a cushion against such adverse FX rate movements.

7.11.2 Settlement Finality

Settlement of payment instructions across CLS Bank’s books, and funding between Settlement Members and CLS Bank via central bank accounts, is final and irrevocable once the relevant accounts have been appropriately debited and credited, even in the event that a Settlement Member becomes insolvent. This is detailed under Principle 8 and Principle 9.

7.11.3 Alternative Currency Pay-Outs

As a result of the CLS risk design, even if CLS Bank were unable to draw on the largest liquidity facility in the Eligible Currency that a Settlement Member has failed to pay in to CLS Bank, CLS Bank nonetheless would have sufficient funds and liquidity facilities in place to obtain this Eligible Currency, and therefore would be able to make Pay-Outs to the other Settlement Members in the expected Eligible Currency in connection with payment instructions that have settled. If, however, this Settlement Member failure is coupled with either the inability of CLS Bank to draw on multiple liquidity facilities, and/or the failure of an additional Settlement Member or Members to satisfy Pay-In obligations to CLS Bank, CLS Bank may resort to making Pay-Outs to other Settlement Members in an alternative currency; that is, in an Eligible Currency other than the Eligible Currency expected by the non-failing Settlement Members in connection with payment instructions that have settled.

Settlement Members may elect in advance not to receive an alternative currency Pay-Out on the Pay-In failure date. Due to the time at which CLS Bank would make alternative currency Pay-Outs on a failure date with respect to the Asia Pacific currency funding period on the operational timeline,⁵⁹ CLS Bank will not make alternative currency Pay-Outs in the Eligible Currencies of Asia Pacific jurisdictions on the failure date.

On the subsequent business day to the failure date, non-failing Settlement Members who received an alternative currency Pay-Out on the failure date will repay these funds to CLS Bank. CLS Bank will proceed to make Pay-Outs to eligible Settlement Members using either: (a) funds received from the non-paying Settlement Member to comply with its previously unsatisfied Pay-In obligations, or (b) proceeds collected through the loss allocation process described under Principle 4. If the non-paying Settlement Member continues to fail to satisfy its Pay-In obligations on the subsequent business date, the alternative currency Pay-Out shall be deemed to discharge fully CLS Bank’s payment obligations.

7.11.4 Replenishing Liquidity Facilities

Because an Eligible Currency’s Short Position Limit at any time, and the amount of the liquidity facilities in respect to such Eligible Currency available at such time are related to each other, events such as a drawdown on a liquidity facility would trigger a revaluation of that Short Position Limit. Subsequent to a drawdown, CLS Bank is obligated to re-deliver the acquired Eligible Currency to the Liquidity Provider, which would thereby restore the liquidity facility to the original amount. Any such redelivery would also likely result in a revaluation of the relevant Short Position Limit. In the event that the failing Settlement Member is also a Liquidity Provider, the relevant Eligible Currency’s Short Position Limit would be adjusted accordingly.

⁵⁹[Diagram 3](#) contains the operational timeline, including the three hour Asia Pacific currency funding period for the Main Session.

Principle 8: Settlement finality

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

8.0 Summary

Settlement of payment instructions across the books of CLS Bank, and funding between Settlement Members and CLS Bank via central bank accounts, is final and irrevocable once the relevant accounts have been appropriately debited and credited. Settlement and funding take place each business day within the settlement window for the Main Session and the SDS Session, respectively. As discussed under Principle 1, settlement of payment instructions by CLS Bank and funding in the CLS system using central bank accounts is final and irrevocable, even in the event that a Settlement Member becomes subject to insolvency proceedings.

Key Consideration 1. An FMI's rules and procedures should clearly define the point at which settlement is final.

8.1 Settlement Finality and Finality of Funding

The Rules specify that a payment instruction shall be considered to have been properly entered into the CLS system upon being authenticated, validated, matched (where appropriate), and classified as a Settlement Eligible Instruction. The Rules also provide that settlement of payment instructions is final and irrevocable once the relevant Settlement Member Accounts have been debited or credited, and shall be binding upon: (i) the submitting Members of such payment instructions;⁶⁰ (ii) the Members through whose Accounts such payment instructions are settled; and (iii) CLS Bank.

Furthermore, pursuant to the Rules, the obligations of Members in respect of settled payment instructions are automatically and immediately discharged by CLS Bank debiting and crediting the relevant amounts from and to the relevant Settlement Members' Accounts. This includes the discharge of: (x) the obligations of such Members to make payments of the amounts of currencies as specified in such payment instructions (*i.e.*, discharge of the "payment obligation"); and (y) the obligations of such Members to make payments of the amounts of currencies as specified in such payment instructions to each other pursuant to the underlying transaction to the extent that both counterparties to the underlying transaction to which the settled payment instructions relate are Members (*i.e.*, discharge of the "underlying transaction obligation"). In the case of underlying transaction obligations where a pair of payment instructions has been split by CLS Bank (as described in the Introduction), if not all the separate payment instructions resulting from such split have settled on the settlement date, the underlying transaction obligations between transaction counterparties that are both Members are discharged by final settlement of the related payment instruction only to the extent provided by agreement between such Members (*i.e.*, as may be provided for in an underlying ISDA master agreement).

Such discharge by the settlement of payment instructions, or lack thereof, does not affect the obligations owing between any Settlement Member and CLS Bank in respect of the Settlement Member's Account Balance, after giving effect to such discharge, or the obligations of each Settlement Member to make payments to CLS Bank in accordance with Pay-In Schedules, Pay-In Calls and as otherwise provided in the Rules.

The Rules also provide for finality of funding. Each Pay-In made by a Settlement Member must be made to CLS Bank's account at the relevant central bank through the relevant RTGS system. After CLS Bank has: (a) received confirmation from a central bank stating that a payment by a particular Settlement Member has been credited to CLS Bank's account at the central bank as a result of a funds transfer from that Settlement Member or its nostro agent; and (b) completed its internal procedures with respect to such credit, such payment shall, according to the Rules, be final and irrevocable and CLS Bank will credit the applicable Currency Balance in the Settlement Member's Account for that payment received in CLS Bank's account at the central bank. When CLS Bank credits the Settlement Member's Account (in the amount of the Pay-In), the CLS system notifies the Settlement Member of this credit.

⁶⁰This includes all payment instructions, whether or not the party to the underlying transaction is a Member or a third party.

CLS Bank confirms the legal basis supporting the finality of the settlement of payment instructions across CLS Bank's books and finality of the funding from and to Settlement Members through CLS Bank's central bank accounts by obtaining annual reasoned legal opinions from external counsel. CLS Bank requires favorable legal opinions to the effect that (in the absence of fraudulent or other inequitable conduct by CLS Bank) settlement and funding should be final and irrevocable, even if a Settlement Member is subject to an insolvency proceeding. In addition, external counsel is asked to confirm that there is no "zero-hour" or similar rule in their jurisdiction which would have the general effect of reversing CLS Bank's settlement of payment instructions or a Pay-In made to CLS Bank in central bank funds if, on the same day, a Settlement Member subsequently becomes subject to an insolvency proceeding.⁶¹

Key Consideration 2. An FMI should complete final settlement no later than the end of the value date, and preferably intraday or in real time, to reduce settlement risk. An LVPS or SSS should consider adopting RTGS or multiple-batch processing during the settlement day.

8.2 Operational Timeline

The structure of the CLS system is designed to provide final settlement of payment instructions on the settlement date. A Member may submit payment instructions indicating the settlement date to the CLS system at any time prior to or on the specified settlement date, subject to the operational timeline discussed in the Introduction. As a matter of practice, payment instructions relating to FX transactions are typically submitted within hours of the execution of the underlying transactions. This is also the case for payment instructions relating to underlying FX transactions that are aggregated by the Aggregation Service, as well as those resulting from Compression.

Payment instructions relating to OTC credit derivative transactions are transmitted by Deriv/SERV to the CLS system on the day prior to settlement, after Deriv/SERV has calculated the net payment obligations under the transactions. CCS payment instructions are transmitted by MarkitSERV to the CLS system. In all cases, however, each payment instruction received by the CLS system must be successfully authenticated, validated and matched (except for OTC credit derivative payment instructions that have been pre-matched by the Warehouse) before the time at which Revised Pay-In Schedules are issued to the relevant Settlement Members.

Pay-In Schedules are structured to ensure that settlement of all payment instructions occurs by the settlement completion target time (09:00 CET for the Main Session and 21:00 CET for the SDS Session). Under normal circumstances, in the Main Session the settlement period is from 07:00 CET to 09:00 CET on the settlement date, with approximately 99% of payment instructions settled by 08:00 CET and the remaining 1% of payment instructions settled by 09:00 CET. For the SDS Session, the commencement of the settlement session is, approximately, between 19:00 CET and 21:00 CET on the settlement date, once all Settlement Members have fulfilled their Pay-In requirements; provided, however, that if any Settlement Member has not fulfilled its Pay-In requirements by 21:00 CET, the commencement of settlement for the SDS Session is approximately 21:00 CET.

CLS Bank issues a Pay-In Schedule binding Settlement Members to make Pay-Ins to CLS Bank of certain amounts in the various Eligible Currencies by certain times. The Pay-In Schedule is generated by the CLS system using certain pre-set parameters, based on the actual and projected settlement activity occurring during each settlement session. This algorithm may generate a different Pay-In Schedule each day (because settlement activity changes from one day to the next), but, for the Main Session, generally results in approximately 80% of all Pay-In obligations being required to be paid by 10:00 CET, with the remaining 20% to be paid to CLS Bank by 12:00 CET. In the SDS Session, 100% of all Pay-In obligations must be paid by 21:00 CET.

Funding requirements are calculated on a multilaterally netted basis, taking into consideration all of the Settlement Members' payment instructions scheduled for settlement on that settlement date and without distinction regardless of the particular type of underlying transaction. A pair of matched payment instructions that relate to an FX transaction, or a single-currency payment instruction in the case of an OTC credit derivative transaction, will not settle if, following settlement, a Settlement Member's Account would not satisfy the three risk management tests detailed in the Introduction. However, it should be noted that the failure of one payment instruction submitted by a pair of Settlement Members (in the case of an FX transaction) or by a single Settlement Member (in the case of a single-currency transaction) does not affect the ability of other payment instructions submitted by these Settlement

⁶¹Principle 1 also discusses settlement finality and the legal opinion process.

Members to settle in the CLS system (and has no effect on any payment instruction which has already been settled). Even so, a failure to fund may disrupt the settlement of certain payment instructions.

As discussed in the Introduction, CLS Bank completes Pay-Outs to Settlement Members of the long balances in its central bank accounts before the close of each RTGS system. Although the Rules allow for settlement deferral in certain limited circumstances as discussed in Section 17.7, CLS Bank has never experienced a deferral of final settlement to the next business day.

Key Consideration 3. An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.

8.3 Irrevocability

As provided in the Rules and Member Handbook, a payment instruction becomes irrevocable if it is not rescinded within certain specified time periods. Members may amend or rescind payment instructions submitted to the CLS system, subject to the unilateral rescind deadline and the bilateral rescind deadline. For the Main Session, Settlement Eligible Instructions may be amended or rescinded on a unilateral basis before IPIS is issued at 00:00 CET on the settlement date (payment instructions that are not Settlement Eligible Instructions at the time the IPIS is issued at 00:00 CET on the settlement date, will become irrevocable after they have been classified as being Settlement Eligible Instructions) and may be rescinded on a bilateral basis before RPIS is issued at 06:30 CET on the settlement date. In the SDS Session, payment instructions may be amended or rescinded on a unilateral basis before IPIS is issued at 18:00 CET and may be rescinded on a bilateral basis before RPIS is issued at 19:00 CET.

The failure of Settlement Members to satisfy their respective funding requirements by the relevant deadlines may result in delayed settlement, or settlement of less than all of their payment instructions. As discussed under Principle 7, in the event of a Member Pay-In failure, CLS Bank will issue a Pay-In Call for Settlement to Members that have unsettled payment instructions with the failing Settlement Member, so as to maximize the number and value of settled payment instructions. A Pay-In Call for Settlement is not a mandatory obligation, but, if not met, will result in unsettled payment instructions.

CLS Bank may allow an extension to a revocation deadline in the rare event that the CLS system experiences operational difficulties.

Principle 9: Money settlements

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

9.0 Summary

Funding and settlement in the CLS system are separate and distinct, but related, processes. Payment instructions are settled across the books of CLS Bank and funding is made to and from CLS Bank via the central bank accounts CLS Bank has with respect to each Eligible Currency. Due to the design of the CLS system, Settlement Members' exposure to credit and liquidity risk with respect to the funds due to them from CLS Bank (*i.e.*, Pay-Outs) is limited.

Key Consideration 1. An FMI should conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks.

9.1 Settlement of Payment Instructions on CLS Bank's Books and Funding in Central Bank Money

Payment instructions are settled across the books of CLS Bank by CLS Bank making the appropriate credits and debits to the Accounts of the relevant Settlement Members. The multilaterally netted funding to and from CLS Bank (Pay-Ins and Pay-Outs) is effected through central bank accounts.

CLS Bank receives a notice from the relevant central bank of each Pay-In made by a Settlement Member (or its nostro agent) once the funds have been credited to CLS Bank's account at that central bank. These long positions are CLS Bank's funds and CLS Bank's claim on the relevant central bank. Similarly, a Settlement Member (or its nostro agent) receives a notice from the relevant central bank of each Pay-Out made to the Settlement Member (or nostro agent) by CLS Bank once the funds have been credited to the Settlement Member's (or nostro agent's) central bank account at that central bank.

Once a Pay-In is received by CLS Bank, CLS Bank creates a credit in the appropriate amount in the relevant Eligible Currency in the Settlement Member's Account. Payment instructions are settled across CLS Bank's books by CLS Bank making the appropriate credits and debits of the gross amounts of the payment instructions across the relevant Settlement Members' Accounts. Pay-Outs are reflected as a debit in the appropriate amount in the appropriate Eligible Currency in the Settlement Member's Account. Individual Currency Balances within each Settlement Member's Account are updated on an ongoing basis to reflect all credits and debits to that Account.

The long positions of a Settlement Member in its Account are claims on CLS Bank. However, as described under Principle 1, CLS Bank is able to treat the multicurrency Account of each Settlement Member as a single net balance (off-setting long and short positions of the Settlement Member).⁶²

Key Consideration 2. If central bank money is not used, an FMI should conduct its money settlements using a settlement asset with little or no credit or liquidity risk.

Key Consideration 2 does not apply to CLS Bank. As discussed above, funding to and from CLS Bank is effected through its central bank accounts and payment instructions are settled across the books of CLS Bank (discussed in greater detail under Key Consideration 4).

⁶²CLS Bank's ability to treat the multicurrency Account of a Settlement Member as a single net balance, even if the Member becomes insolvent, prevents the relevant insolvency official cherry-picking long and short balances in the Member's Account.

Key Consideration 3. *If an FMI settles in commercial bank money, it should monitor, manage, and limit its credit and liquidity risks arising from the commercial settlement banks. In particular, an FMI 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. An FMI should also monitor and manage the concentration of credit and liquidity exposures to its commercial settlement banks.*

Key Consideration 3 does not apply to CLS Bank. As discussed above, funding to and from CLS Bank is effected through its central bank accounts and payment instructions are settled across the books of CLS Bank (discussed in greater detail under Key Consideration 4).

Key Consideration 4. *If an FMI conducts money settlements on its own books, it should minimise and strictly control its credit and liquidity risks.*

9.2 Management of Credit and Liquidity Risks in Settlement

Payment instructions are settled on a gross basis across the books of CLS Bank. As discussed under Principle 4, Settlement Members are exposed to some credit and liquidity risk with respect to the funds due to them from CLS Bank. However, these risks are limited due to the design of the CLS system, which uses carefully tested, CLS system-administered algorithms to ensure the efficient use of central bank funds during funding periods discussed in the Introduction. CLS Bank maintains committed liquidity facilities that are used to raise liquidity from committed Liquidity Providers to allow CLS Bank to make Pay-Outs in the event of a Settlement Member's failure to cover a short position in its Account. CLS Bank can incur a credit shortfall if this Pay-In failure is coupled with a significant FX market move in excess of the applicable haircuts. CLS Bank will assess this credit shortfall on those Settlement Members who have settled payment instructions with the failing Settlement Member on the failure date by means of a combined loss allocation.

Settlement Members' long positions are offset by their short positions (consisting of obligations due from the Settlement Member to CLS Bank). As these short positions are paid in by a Settlement Member, long positions are paid out to the Settlement Member, subject to the application of the haircuts discussed under Principle 7. The resulting net long positions (following application of the relevant haircuts) are retained in the CLS system only as necessary to retain value in each Account as determined to be required to satisfy the three risk management tests (detailed in the Introduction). CLS Bank will make Pay-Outs of Settlement Members' long positions more quickly if the Settlement Member covers its short positions by satisfying its Pay-In obligations to CLS Bank in a timely manner. This process is handled automatically by the CLS system's Pay-Out algorithm.

The SDS Session Short Position Limits for USD and CAD are set to zero, requiring all Pay-Ins to be made prior to any settlement of payment instructions. If the SDS Session Short Position Limits are raised above zero, the above-mentioned Main Session funding considerations, procedures, processing and risks will apply equally to the SDS Session.

9.2.1 Credit Risk During Settlement

The net credit risk to which a Settlement Member is exposed by participating in the CLS system is limited in time and amount. Each Settlement Member is exposed to the credit risk of CLS Bank with respect to the net balance in its Account. However, because the CLS system algorithms are designed to minimize liquidity impacts, Settlement Members only have intraday credit exposure to CLS Bank. This net credit risk is further limited by the five-hour funding period in the Main Session, the two-hour funding period in the SDS Session, and the efficiency of the Pay-In and Pay-Out algorithms.

9.2.2 Liquidity Risk During Settlement

The amount of funding which must be paid to CLS Bank, and the required timing of such funding, has liquidity implications for the Settlement Members. CLS Bank performs projections of anticipated future Pay-In requirements to identify abnormally large funding obligations and notifies relevant Settlement Members to ensure that they are aware of large projected funding obligations. CLS Bank also conveys Pay-In requirements to other relevant parties (for example, to Settlement Members' nostro agents for the SDS Session). In addition,

Settlement Members receive real-time information on the status of all of their payment instructions and the related Pay-Ins and Pay-Outs in each Eligible Currency, thereby significantly strengthening their crisis management abilities.

Key Consideration 5. An FMI'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 FMI and its participants to manage credit and liquidity risks.

Key Consideration 5 does not apply to CLS Bank. CLS Bank settles payment instructions on a gross basis across its own books. Therefore, CLS Bank does not have legal agreements with any settlement banks.

Principle 12: Exchange of value

If an FMI 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.

12.0 Summary

Continuous linked settlement, an arrangement designed to eliminate settlement risk, is a simultaneous, PvP settlement of each of the payment instructions related to an underlying FX transaction. Each Settlement Member has a multicurrency Account with CLS Bank and payment instructions are settled by simultaneously debiting the respective Settlement Members' Accounts by the amounts of Eligible Currencies being sold and crediting them by the amounts of Eligible Currencies being bought. Settlement of payment instructions and funding between Settlement Members and CLS Bank are final and irrevocable once the relevant accounts have been appropriately debited and credited.

Key Consideration 1. An FMI that is an exchange-of-value settlement system should eliminate principal risk by ensuring that the final settlement of one obligation occurs if and only if the final settlement of the linked obligation also occurs, regardless of whether the FMI settles on a gross or net basis and when finality occurs.

12.1 Elimination of Principal Risk

The CLS risk design and PvP process of the Settlement Service detailed in the Introduction ensures that the principal amounts relating to underlying FX transactions are protected. Because the Settlement Service settles the two payment instructions relating to an underlying FX transaction simultaneously, it eliminates the financial risk of loss, specifically the risk of loss of principal. In contrast to two-currency payment instructions, settlement risk is not applicable to single-currency payment instructions, though they are also eligible for processing in the CLS system. Settlement of payment instructions with respect to OTC credit derivative transactions occurs in a single currency without a corresponding payment of any kind.

Settlement of payment instructions across CLS Bank's books, and funding between Settlement Members and CLS Bank in central bank funds, is final and irrevocable once the relevant accounts have been appropriately debited and credited, based on the legal framework discussed under Principle 1 and settlement finality considerations discussed under Principle 8.

Principle 13: Default rules

An FMI 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 FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations.

13.0 Summary

The Rules, Member Handbook and relevant procedures clearly define the roles, obligations, and requirements with respect to membership in CLS Bank, outline participant default management when these requirements are not met, define actions CLS Bank may take to mitigate the impact of a default, and detail the probable sequencing of actions and the tools for managing resulting liquidity pressures and, if necessary, containing and allocating any losses. These procedures have strict deadlines that dictate when certain actions must be taken by CLS Bank (*i.e.*, executing a Liquidity Provider transaction). These deadlines ensure that CLS Bank can take timely action. The CLS risk design ensures that CLS Bank has sufficient funds to satisfy its Pay-Out obligations relating to settled payment instructions even if the Settlement Member with the largest Pay-In obligation fails to satisfy this obligation and is also a Liquidity Provider.

Participants in the CLS system are also made aware of the relevant default rules and procedures through ongoing bilateral and multilateral communications. To ensure relevant participants are aware of, and operationally capable of, taking steps required for managing a default in the CLS system, CLS Bank has implemented Liquidity Provider simulations and Settlement Member Pay-In Call trials. CLS Bank's comprehensive back/stress testing program (discussed under Principle 7) facilitates the understanding and management of potential participant default impacts. The CLS risk design, and the back/stress testing program used to validate it, are both agnostic with respect to the cause of a Settlement Member's Pay-In failure.

Key Consideration 1. An FMI should have default rules and procedures that enable the FMI to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.

13.1 CLS Participant Default Management and Risk Controls

The CLS system's settlement and funding processes, algorithms, risk controls, and procedures ensure efficient funding occurs in parallel with FX payment instruction settlement even in the event of a participant default, and are designed to mitigate the potential impacts of such an occurrence. These include:

- **Aggregate Short Position Limits:** as discussed under Principle 4, CLS Bank establishes an Aggregate Short Position Limit for each Settlement Member for settlements occurring in the Main Session. This Aggregate Short Position Limit enables funding to be spread out over several hours, and improves settlement efficiency by enabling payment instruction settlement prior to completion of funding. The Aggregate Short Position Limit may also help lessen the impact of a Settlement Member operational failure by allowing additional payment instructions to settle, subject to the three risk management tests. The extension of short positions to a Settlement Member exposes CLS Bank to a possible loss in the unlikely scenario of a Settlement Member's failure to satisfy its funding obligations, resulting in uncovered short positions, is simultaneously coupled with extreme FX market movements in excess of the relevant haircuts. As discussed in detail under Principle 4, the Rules provide for an assessment of any such losses to the non-failing Settlement Members.
- **Risk Management Tests:** as described in the Introduction, the CLS system imposes three risk management tests on the settlement and Pay-Out processes. For the Pay-Out process, one of the risk management tests ensures that no amounts are paid out to a Settlement Member that would cause the Settlement Member's Account Balance to be less than zero.
- **Randomness of the Settlement Queue:** unsettled instructions arising from failed Pay-Ins may cause considerable liquidity and market risk to Settlement Members. In order to not give preference to any Settlement Member, Settlement Eligible Instructions matched prior to the Initial Pay-In Schedule deadline are placed on the Settlement Processing Queue based upon a random sequence number. In the event that more than one

payment instruction is assigned the same random sequence number, the order will be based upon the submission time of the payment instruction.

- **Splitting:** as discussed in the Introduction, the CLS system will split large value FX payment instructions⁶³ into two or more payment instructions based on an established threshold for each Eligible Currency. Splitting facilitates efficiency during the settlement process. In the event of a Settlement Member Pay-In failure, the splitting process would also reduce the failure impact by reducing the knock-on effects of a participant default.

13.2 Default Management and Tools

The Rules and Member Handbook explicitly provide parameters and tools for managing an operational failure as well as a participant default resulting from insolvency, and are described in more detail below.

13.2.1 Pay-In Calls

Pay-In Calls are the first means of raising additional liquidity in the event that a Settlement Member fails to satisfy its Pay-In requirements, regardless of whether the failure is related to an operational or credit issue. However, Pay-In Calls may also pose significant liquidity issues for Settlement Members because they are unexpected. Pay-In Calls are issued at fixed times prior to each Currency Close Deadline. There are two types of Pay-In Calls relevant to participant default management: Pay-In Calls for Settlement and Pay-In Calls for Currency Close, described in detail under Principle 7.

13.2.2 Liquidity Facilities and Alternative Currency Pay-Outs

As discussed in detail under Principle 7, CLS Bank maintains committed liquidity facilities necessary for each applicable Eligible Currency that are used to raise liquidity to allow CLS Bank to make Pay-Outs to other Settlement Members in the event of a Settlement Member's failure to cover a short position on its Account. Even if CLS Bank were unable to draw on the largest liquidity facility in the Eligible Currency that a Settlement Member has failed to pay, CLS Bank nonetheless would have sufficient funds and liquidity facilities in place to obtain this Eligible Currency.

If, however, a Settlement Member failure situation is coupled with either:

- CLS Bank's inability to draw on multiple liquidity facilities; and/or
- the failure of an additional Settlement Member or Members to cover a short position,

CLS Bank may resort to making Pay-Outs to the other Settlement Members in an alternative Eligible Currency(ies); that is, in an Eligible Currency other than the Eligible Currency expected by the non-failing Settlement Members in connection with payment instructions that have settled, as discussed under Principle 7.

13.2.3 Loss Allocation

In the unlikely event a continued failure by a Settlement Member to satisfy its funding obligations results in uncovered short positions, and is simultaneously coupled with extreme FX market movements in excess of the relevant haircuts, a loss of value could potentially impact CLS Bank's ability to satisfy its obligations to make Pay-Outs to other, non-failing, Settlement Members. A loss will be incurred from a Settlement Member's Pay-In failure if:

- the non-paying Settlement Member's Account is subject to a failure adjustment due to a Pay-In failure or suspension of the Settlement Member;
- the failure adjustment or suspension causes the non-paying Settlement Member's Account Balance to become negative as a result of an adverse FX rate movement in excess of the relevant haircuts; and

⁶³Payment instructions related to OTC credit derivatives (single currency, non-PvP payment instructions) are not split into smaller components.

- the non-paying Settlement Member cannot or will not cover its negative Account Balance on a timely basis.

The Rules provide for assessment of these losses to the Settlement Members, as discussed under Principle 4.⁶⁴

13.3 Suspension of Settlement Members

CLS Bank may suspend a Settlement Member from participation in the Settlement Service (both the Main Session and SDS Session) in certain circumstances, including:

- when the Settlement Member has violated any material provision in its Member Agreement, the Rules or the Member Handbook and suspension is in the best interests of CLS Bank or its Settlement Members or there has been a material adverse change with respect to the Settlement Member; and/or
- upon confirmation that an insolvency has occurred with respect to the Settlement Member, if necessary for the protection of CLS Bank or its Settlement Members.⁶⁵

As discussed under Principle 1, in the CLS Jurisdictions, statutory protections that assure finality of settlement and funding may terminate a short time after an insolvency. Therefore, in order to mitigate legal risk, it is generally CLS Bank's policy to suspend an insolvent Settlement Member as soon as it has learned of, and is reasonably able to confirm, the insolvency. Prompt suspension of an insolvent Settlement Member upon such confirmation protects CLS Bank from legal risk by ensuring that key fundamental legal protections (e.g., finality and/or netting protections) continue to apply to the Settlement Service,⁶⁶ provides certainty to participants in the Settlement Service (Members as well as their third party customers), enables counterparties to plan their own respective contingency measures, and protects CLS Bank from potentially costly and disruptive litigation.

As part of the annual legal opinions process detailed under Principle 1, CLS Bank engages with its external counsel on an ongoing basis to understand and assess the applicability and impact of rapidly evolving laws relating to resolution regimes and resolution tools that give government authorities powers to take actions with respect to financial institutions experiencing financial difficulties (including laws applying before a financial institution becomes insolvent). Some of these regimes may constitute an insolvency, resulting in suspension, depending on the specific regulatory regime and the impact on the Settlement Service.

CLS Bank will seek to permit a Settlement Member subject to resolution to continue participating in the Settlement Service as long as such participation does not compromise the CLS Settlement Service (e.g., by subjecting the CLS Settlement Service to legal risk, or risk relating to a Settlement Member's inability to or failure to comply with CLS Bank's legal, operational, liquidity, and credit requirements). In order to maximize the likelihood that CLS Bank's requirements will be met and that a Settlement Member subject to resolution will be able to continue to participate in the Settlement Service, CLS Bank has engaged in conversations with various resolution authorities to discuss various issues, including the need for as much advance notice as possible with respect to any potential transfer of membership. In connection with a transfer of membership, many time-sensitive legal, operational, liquidity, and credit issues would need to be addressed.

13.3.1 Suspension Functionality in the CLS System

Once the functionality to suspend an insolvent Settlement Member in the CLS system is utilized and the suspension is effective, any payment instructions in the CLS system submitted by that Settlement Member (regardless of whether the underlying transaction is a proprietary, affiliate or third party customer transaction) will not be eligible for settlement. Suspended payment instructions are rejected from the CLS system at the

⁶⁴ The loss assessment process, including relevant caps and limitations, is detailed under Key Consideration 7 in Principle 4.

⁶⁵ If, as a result of the insolvency, fundamental legal protections such as finality and/or netting protections have terminated or have been called into question, CLS Bank will suspend the insolvent Settlement Member.

⁶⁶ Legal regimes vary in the CLS Jurisdictions. In certain jurisdictions, fundamental statutory protections are keyed off knowledge of an insolvency. For example, in the UK, statutory protections will terminate if a system operator should have had notice of the insolvency at the time that the transfer order became irrevocable. In addition, in certain jurisdictions, statutory protections may be linked to specific time periods, such as the end of the "day," which is defined in the local legislation.

applicable Currency Close Deadline on the settlement date identified in the payment instructions. All Settlement Members who have unsettled payment instructions with the suspended Settlement Member are made aware of the suspended payment instructions.

Even if CLS Bank were to confirm an insolvency during a settlement session, CLS Bank would be able to immediately suspend the insolvent Settlement Member, and any payment instructions in the CLS system submitted by the Settlement Member would have a suspension flag and therefore be ineligible for settlement in the CLS system.

Suspension allows other Settlement Members to avoid having to rescind instructions involving an insolvent Settlement Member, in order to prevent the continued processing of payment instructions relating to transactions that might otherwise be required to be terminated or permitted to be terminated under an applicable master agreement. This is particularly important after the applicable rescind deadlines have passed, as discussed under Principle 8.

13.4 Rescinds

The ability to rescind payment instructions submitted to the CLS system provides a degree of flexibility and control to Settlement Members in managing their exposures and positions and correcting operational errors in a timely fashion. However, Settlement Members also have a strong interest in retaining, and having other Settlement Members retain, payment instructions in the CLS system because this provides some level of comfort and certainty regarding cash positions for each settlement date, even though such settlement is not guaranteed. A Settlement Member balances its interest in cash management against the desire or need to rescind payment instructions from the CLS system due to:

- (i) credit-related concerns by the Settlement Member providing services to a third party; or
- (ii) close-out/liquidation of the underlying transaction to which the payment instruction relates.

In the first case, the Settlement Member may wish to rescind payment instructions involving its third party in order to control or reduce its exposure. As discussed above, suspension of an insolvent Settlement Member reduces the need for other Settlement Members to rescind unsettled payment instructions with that insolvent Settlement Member. In the second case, however, rescinds may still be required due to Settlement Member system/technical requirements. The motivation for rescinding any payment instruction from the CLS system is not known to CLS Bank.

13.4.1 Rescind Deadlines

The rescind deadlines are critical for defining payment instruction irrevocability, as discussed under Principle 8. The operational timeline in **Diagram 3** indicates two rescind deadlines for each settlement session. The time at which IPIS is generated is the unilateral rescind deadline, and the time at which RPIS is generated is the bilateral rescind deadline.

13.4.2 Bulk Rescind Tool

The CLS system functionality includes a bulk rescind tool, which enables CLS Services to assist a Settlement Member in the event that it needs to rescind all payment instructions with a specific counterparty on one or more settlement dates.

Key Consideration 2. An FMI should be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in its rules.

13.5 Implementing Default Rules and Procedures

As noted above, the procedures CLS Bank has in place to manage a participant default allow for the suspension of the relevant Settlement Member from the CLS system, and the Rules provide for allocation of any resulting losses.

The CLS system's functionality allows for immediate suspension of a Settlement Member at any point in the operational timeline.⁶⁷

CLS Bank would notify the Federal Reserve and the relevant central bank of the defaulting Settlement Member that CLS Bank is implementing its default rules and procedures. CLS Bank would also notify its Settlement Members that CLS Bank is suspending the defaulting Settlement Member from settlement.

As discussed under Principle 7, CLS Bank does not currently extend short positions with respect to the SDS Session, and will not settle any payment instructions in the SDS Session without first having received funding from the relevant participants. If CLS Bank raises Short Position Limits or Aggregate Short Position Limits above zero for the SDS Session in the future, the same procedures and processing would be implemented as currently exist in the Main Session, including haircuts, alternative currency Pay-Outs, dedicated liquidity facilities, and participant default management rules and procedures.

Key Consideration 3. An FMI should publicly disclose key aspects of its default rules and procedures.

13.6 Public Disclosure

As detailed under Principle 1 and Principle 23, the Rules are publicly available.

Key Consideration 4. An FMI should involve its participants and other stakeholders in the testing and review of the FMI'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.

13.7 Participant Default Communication and Testing

The Rules and Member Handbook explicitly provide parameters and tools for managing an operational failure, as well as for managing a participant default resulting from insolvency. Participants in the Settlement Service periodically review the default rules and procedures in bilateral and multilateral communications and, depending on the role(s) they play within the CLS ecosystem, are required to participate in relevant mandatory testing, trialing, and simulations as discussed under Principle 4 and Principle 7. CLS Bank's Risk Management division also conducts daily back and stress testing to assess the risk impact of potential participant default. The resulting metrics allow CLS Bank to evaluate the settlement and liquidity impacts on the platform, Eligible Currency and participant (Settlement Member, nostro agent, and Liquidity Provider) levels for escalation and heightened monitoring during settlement, trend analysis, and incorporation in relevant discussions.

In bilateral meetings, CLS Bank discusses each Member's ability to manage the potential liquidity implications of a disruptive situation in the Settlement Service. For each Settlement Member, customized failure impact analysis and relevant metrics are presented alongside a walk-through of the general and combined loss allocation processes. Each periodic regional risk forum covers the CLS risk design and includes detailed discussions on participant default implications and management, liquidity facilities and ongoing testing, Pay-In Calls and trialing, and loss allocation.

As discussed in detail under Principle 3, CLS Bank maintains ongoing bilateral and multilateral communications across the CLS ecosystem, assess interdependencies with other FMIs and associated risks, periodically tests and evaluates crisis and failure management capabilities, and participates in market-wide exercises and business continuity tests. CLS Bank's disaster recovery, business continuity, and general operational resiliency, as well as relevant testing, are discussed in detail under Principle 17.

⁶⁷To date, implementation of CLS Bank's default rules has never occurred.

Principle 15: General business risk

An FMI 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 materialize. Further, liquid net assets should at all times be sufficient to ensure a recovery or orderly wind-down of critical operations and services.

15.0 Summary

CLS Bank has a robust framework to identify, monitor and manage its general business risks. This framework includes ongoing monitoring and management, monthly reporting and established indicators of, and responses to, business risks.

In addition to this framework, CLS Bank holds unencumbered liquid financial assets, such as cash or highly liquid securities, which are sufficient to cover the greater of six months operating expenses or the cost to implement plans to address general business losses as defined in the CLS Recovery and Orderly Wind-down Plan. At December 31, 2016, CLS Group Holdings held £267 million (of which CLS Bank held £157 million)⁶⁸ in cash and cash equivalents to comply with regulatory requirements. CLS Group Holdings is also required to hold an additional capital and liquidity buffer that has been approved by the CLS Group Board. In addition, CLS Bank has a detailed monitoring and planning process which encompasses equity requirements, liquidity resources, tactical pricing, and investment decisions. During most recovery scenarios, CLS Bank believes that its capital cushion, coupled with any revenue it may receive during the scenario, will be sufficient to achieve full recovery.

Key Consideration 1. An FMI 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.

15.1 Management and Control of General Business Risks

CLS Bank has a robust management and control system to identify, monitor and address its general business risks. The regular review of CLS Bank's financial position includes monitoring revenue and operating/capitalized expenses on a monthly basis and reviewing performance against projections. CLS Bank's exposures are monitored continuously using various risk metrics and indicators, including emerging risks, to ensure risk-taking is within established risk appetite tolerances. To perform enterprise risk monitoring, various risk management inputs across CLS Bank are reviewed. CLS Bank will take appropriate actions if any measures are outside pre-agreed parameters. CLS Bank monitors and manages business risks and stands ready to respond to potential losses arising from:

- Administration of operations;
- Poor business strategies;
- Ineffective operations;
- Negative cash flows;
- Unexpected or unusually large operating expenses;
- Legal risks and losses;
- Investment risk and loss in value of investments; and/or
- Fraud, theft, or other operational losses.

⁶⁸ These are the preliminary, unaudited figures available at the time of publication of this Disclosure. The latest available audited financials are publicly available on the CLS group corporate website.

If CLS Bank were to experience capital or liquidity shortfalls, the EMC maintains a number of response mechanisms (depending on the category), including price increases, expense reductions, and/or actions to restore liquidity/capital. Other potential mitigants include:

- Postponing, reconsidering or cancelling projects, subject to agreement by the EMC and the CLS Group Board;
- Borrowing to strategically fill any immediate cash flow shortfalls;
- Maintaining more frequent communication with stakeholders to keep information current and if necessary, react in a timely manner to an unexpected loss;
- Ensuring increased governance over the reporting of the financial position, projections and key risks (e.g., sharing information with the CLS Group Board at each board meeting); and/or
- Invoking recapitalization tools per CLS Bank’s Capital Raising Plan (the “**CLS Capital Raising Plan**”).

Indicators have been established to support CLS Bank’s ongoing monitoring processes. These indicators are intended to alert the EMC of potential capital or liquidity shortfalls, and are aligned with executive management responses in three categories: normal operations, recovery situations, and orderly wind-down scenarios. Implementation of business strategy is carefully monitored and constantly reviewed with the EMC to ensure that business objectives are achieved.

Key Consideration 2. An FMI should hold liquid net assets funded by equity (such as common stock, disclosed reserves, or other retained earnings) so that it can continue operations and services as a going concern if it incurs general business losses. The amount of liquid net assets funded by equity an FMI should hold should be determined by its general business risk profile and the length of time required to achieve a recovery or orderly wind-down, as appropriate, of its critical operations and services if such action is taken.

15.2 Liquid Net Assets

CLS Bank holds liquid net assets funded by equity (“**LNAFE**”) at a sufficient level to cover the costs of recovery following a significant loss and the subsequent orderly wind-down of the Settlement Service. The amount of LNAFE is equal to six months of current operating expenses and is also sufficient to fund the recovery and orderly wind-down of CLS Bank’s business. Furthermore, CLS Group Holdings and CLS Bank hold an additional capital and liquidity buffer as approved by the CLS Group Board. Six months of current operating expenses will be recalculated annually based on CLS Bank’s last annual audited financial statements, and assumptions associated with the cost of an orderly wind-down will be reconsidered each time the CLS Recovery and Orderly Wind-Down Plan is updated. The CLS Recovery and Orderly Wind-Down Plan is reviewed the earlier of two years or following changes to the CLS system or the environment in which CLS Bank operates that would significantly affect its viability or execution.

Risk mitigation for an *extreme* general business risk scenario is detailed in the CLS Recovery and Orderly Wind-Down Plan, which includes the following tools that could be used to recover CLS Bank’s business in the event extreme business risks materialize:

- expense reductions (defer or reduce capital expenditures and operating costs); and
- recapitalization (either through debt or equity).

Key Consideration 3. *An FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets funded by equity to implement this plan. At a minimum, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses. These assets are in addition to resources held to cover participant defaults or other risks covered under the financial resources principles. However, equity held under international risk-based capital standards can be included where relevant and appropriate to avoid duplicate capital requirements.*

15.3 CLS Bank's Recovery and Orderly Wind-Down Plan

The CLS group meets the capital requirements described above. The CLS group is required to hold cash or highly liquid securities that are sufficient to cover the greater of six months operating expenses or the cost to implement plans to address general business losses as defined in the CLS Recovery and Orderly Wind-Down Plan. To determine the cost to implement the CLS Recovery and Orderly Wind-Down Plan, CLS Bank considered several recovery scenarios and then modelled several assumptions. In the case of an orderly wind-down, CLS Bank calculated the cost to wind-down the business in an orderly manner while continuing to provide its critical services in accordance with its legal and risk management frameworks and maintain the confidence of the market.

Key Consideration 4. *Assets held to cover general business risk should be of high quality and sufficiently liquid in order to allow the FMI to meet its current and projected operating expenses under a range of scenarios, including in adverse market conditions.*

15.4 Assets Held to Cover General Business Risk

As an Edge Act corporation; CLS Bank is subject to regulation which restricts the type of products in which it can place investment funds to the following:

- cash;
- treasury / term deposits with depository institutions and other Edge Act corporations;
- money market instruments (including repurchase agreements with respect to such instruments) such as banker's acceptances, federal funds sold and commercial paper; or
- short or long term obligations of or fully guaranteed by, federal, state, and local governments and their instrumentalities.

As per the CLS Group Treasury and Capital Policy, the following key financial condition metrics are reported quarterly to the Finance Committee, composed of relevant EMC members and senior managers in the Finance and Risk Management divisions:

- LNAFE, including the level of assets held in excess of the regulatory requirement;
- Cash flow forecasts;
- Maturity profile of investments (*i.e.*, longer-dated instruments such as money market deposits); and
- Investment balances reported by currency, institution, maturity, product type, and working capital limits.

The EMC also reviews the capital and liquidity framework requirements to monitor for changes in strategic risk by:

- Reviewing the operational risk assessment arising from CLS Bank's rolling risk self-assessment schedule;
- Adapting the capital and liquidity models to changes in CLS Bank's risk assessment; and
- Using any industry risk information, assessing if such information presents any update to the framework in terms of both operating risks and enhancing the qualitative estimates of risk probabilities used in the framework, if necessary.

Key Consideration 5. An FMI should maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed. This plan should be approved by the board of directors and updated regularly.

CLS Bank seeks at all times to:

- hold sufficient capital for CLS Bank's continued operations and capital investments, above and beyond the regulatory minimum;
- operate the business in a way that creates appropriate profits and receives new capital from new shareholders;
- tactically monitor and set annual operating budgets and constraints;
- monitor multiple sets of current and forward indicators within the EMC and board processes; and
- guide progress in the case of an extreme stress event, through the many stages of any recovery and wind-down following the key stages set out below.

CLS Bank has carefully considered recapitalization as a recovery tool either for a scenario involving a one-off loss or for a scenario involving ongoing business losses. In December 2013, the CLS group successfully completed a capital raise of net £160 million from existing CLS Group Holdings shareholders to meet heightened regulatory capital requirements and to fund further growth and development of its services. In order to address the above loss scenarios and to satisfy regulatory requirements, CLS Bank has prepared the CLS Capital Raising Plan which was approved by the CLS Group Board after endorsement by its Audit and Finance Committee on July 30, 2014. Since recapitalization in December 2013, with the retention of all profits since that date, CLS Bank has further enhanced its ability to absorb losses not directly related to the Settlement Service (e.g., losses arising from a legal action, natural disaster, or unexpected expenses).

CLS Bank seeks to ensure that it will meet all regulatory capital and liquidity requirements and will, if necessary, increase capital and/or liquidity if any shortfalls occur or are projected to occur. The Chief Financial Officer regularly reviews and monitors capital levels and reports routinely to the EMC and the Audit and Finance Committee, as well as the CLS Bank Board.

If the EMC deemed it necessary to invoke the recapitalization tool, the Chief Financial Officer would request that the CLS Group Board consider whether it should begin the process of raising capital. The CLS Capital Raising Plan would be put into action only after CLS Bank had exhausted all other recovery tools such as expense reductions, and only if the CLS Group Holdings shareholders and/or CLS Bank Settlement Members indicate a willingness to continue to participate in and thus pay for the Settlement Service. A recapitalization would require approval first by the EMC and then the Audit and Finance Committee, followed by the CLS Group Board. While an undertaking of short-term financing could be finally approved by the CLS Group Board, any issuance of additional shares must be approved by the CLS Group Holdings shareholders.

As regards to recapitalization, only the CLS Group Board has the right to increase and issue shares in CLS Group Holdings, subject to the availability of CLS Group Holdings shareholder-authorized and unsold shares. However, in order for a recapitalization to be successful, those participating in the capital raise (likely the CLS Group Holdings shareholders) will need to be satisfied as to the competence of the CLS Group Board and management going forward and the viability of any plan for the continued operation of the Settlement Service.

Principle 16: Custody and investment risks

An FMI should safeguard its own and its participants' assets and minimize the risk of loss on and delay in access to these assets. An FMI's investments should be in instruments with minimal credit, market, and liquidity risks.

16.0 Summary

One of the primary objectives of the CLS Group Treasury and Capital Policy is to minimize surplus cash balances and safeguard against the loss of principal while maintaining flexibility in short term management of funds. As an Edge Act corporation, CLS Bank's net liquid assets are invested only in short-term and low risk investments.

Key Consideration 1. An FMI 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.

16.1 CLS Bank Assets and Investments

The CLS group does not hold any participants' assets and therefore the controls identified below refer to controls regarding its own assets.

The CLS Group Treasury and Capital Policy states that any institutions in which investments are held must be either:

- shareholders of CLS Group Holdings; or
- central banks representing their government institutions' investments and whose national currencies are available for settlement within CLS Bank.

As such, these institutions are supervised, regulated entities and CLS Bank's due diligence processes will have ensured they have robust accounting practices, safekeeping procedures, and internal controls.

On an ongoing basis, CLS Bank controls and monitors adherence to the CLS Group Treasury and Capital Policy through the following mechanisms:

- CLS Bank's Credit Risk Management team conducts a quarterly risk assessment to assess any shifts in sovereign or institutional credit risk, as noted under Principle 4;
- no investment is made in a type of instrument that risks the loss of principal;
- treasury balances by institution and sovereign are reported regularly to the EMC;
- treasury balances by institution and sovereign are reported on a regular basis to the Audit and Finance Committee; and
- reports detailing the currency positions and balances outstanding by tenure are maintained and authorized by the CLS group's financial controller.

Key Consideration 2. An FMI should have prompt access to its assets and the assets provided by participants, when required.

16.2 Access to CLS Bank Assets

CLS Bank's net liquid assets are invested only in the following:

- cash;
- treasury / term deposits with depository institutions and other Edge Act corporations;
- money market instruments (including repurchase agreements with respect to such instruments) such as banker's acceptances, federal funds sold and commercial paper; or
- short or long term obligations of or fully guaranteed by, federal, state, and local governments and their instrumentalities.

To further ensure prompt access to its assets, the CLS Group Treasury and Capital Policy specifies certain permitted investments and percentage limits. Working capital liquidity is invested in cash or cash equivalents. Mid-month daily surpluses are maintained in interest bearing overnight sweep accounts or short-term deposits.

Key Consideration 3. An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.

16.3 Exposure to Custodian Banks

CLS Bank evaluates and understands any exposures associated with the deposits and investments based on the permitted limits detailed above. The custodian banks for CLS Bank's liquid funds are also Settlement Members, and may play other roles in the CLS ecosystem. As detailed under Principle 4, CLS Bank's Credit Risk Management team conducts Limited Reviews and Comprehensive Reviews, which mitigates residual risk arising from deposits and investments held with Settlement Members, as well as quarterly risk assessments to assess any shifts in sovereign or institutional credit risk. The results of these reviews and assessments provide recommendations which mitigate risks associated with the loss of principal.

Key Consideration 4. An FMI'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.

16.4 CLS Bank's Investment Strategy

Treasury activity within CLS Bank supports the business with its cash and financial risk management activities while operating as a service center rather than a profit-making unit. As such, CLS Bank's investment policy seeks to ensure appropriate levels of cash balances are held as well as maintaining adequate day-to-day working capital for the other CLS group entities and ensuring that any surplus funds are invested in specific authorized and defined categories with appropriate maturities. The primary focus for CLS Bank is to safeguard against the loss of principal and to maintain flexibility in short-term fund management. To provide for rapid liquidation with minimal adverse price effects, sufficient working capital is maintained in each CLS group entity to avoid inter-company loans arising between different entity tax jurisdictions. Inter-company service charges are settled in cash as they are invoiced between entities.

Principle 17: Operational risk

An FMI 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 fulfillment of the FMI's obligations, including in the event of a wide-scale or major disruption.

17.0 Summary

Operational risk in the CLS system is managed under a comprehensive framework that provides processes and tools for adequate controls, transparency, and accountability, as well as resilience and reliability in the Settlement Service. Operational risk in the CLS system is mitigated through the CLS risk design and its architecture, which jointly drive system integrity, security and availability. Policies and procedures for all aspects of operations are formally documented and reviewed at least annually to reflect changes to the CLS system (system applications as well as products or services). Detailed procedures define operational risk assessment, including specific requirements for identification and reporting on material risks, as well as processes under normal operating conditions and failure management scenarios.

Operational reliability and resiliency is facilitated by straight-through-processing and by employing carefully-tested system administered algorithms, including those used for calculating Pay-In Schedules and Pay-Outs of long positions. System functionality allows for straight-through-processing of Pay-Ins from Settlement Members, and operational aspects of the CLS system, as well as SLAs, are exactly the same for both the Main Session and SDS Session. The CLS system has a high degree of operational reliability due to its resilient technical architecture and infrastructure, which enables CLS Bank to provide the Settlement Service to its Members. CLS Bank has fully resilient systems and communications infrastructure supported by the provision of network and system management services. The CLS system is designed with the objective of satisfying the 2-hour recovery time objective (“RTO”) for critical infrastructures as well as other requirements specified by globally recognized standards.⁶⁹ Contingency operations are tested on a regular basis and operate effectively. Stringent security standards protect the CLS system applications and its payment instructions.

Key Consideration 1. An FMI should establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.

17.1 The CLS Bank Operational Risk Management Framework

CLS Bank's operational risk management framework, consistent with CLS Bank's ERM Framework, provides robust processes, tools, and controls to identify, monitor, and manage operational risks as part of the overall risk management framework discussed under Principle 3. The CLS Risk Appetite Statement discussed under Principle 2 includes firm-wide qualitative statements and quantitative measures for operational risk. The operational risk management framework includes:

- **ORM Policy:** establishes standards for operational risk management and outlines the requirements by which current and emerging risks are identified, assessed, measured, managed, and reported.
- **ORM Framework:** integrates management of operational risk across CLS group business and functional processes, defines operational risk in alignment with relevant regulatory requirements, and details ORM processes, a standard risk classification methodology, and evaluations based on likelihood and severity measurement scales. Specific aspects include:
 - **Risk Assessment and Identification:** periodic top-down and bottom-up risk assessments based on likelihood and severity on a functional as well as a firm-wide basis to develop risk profiles and identify material risks and mitigating actions. Inherent and residual risk ratings are evaluated to determine effectiveness of controls and develop additional mitigations, as needed. The risk categorization methodology

⁶⁹Including the April 2003 *Interagency Paper on Sound Practices to Strengthen the Resilience of the United States Financial System* as well as the June 2016 CPMI-IOSCO *Guidance on cyber resilience for financial market infrastructures*.

associates each operational risk with one or more of the seven categories of operational risk events, aligned with Basel II categories. Each operational risk is also assigned an internal risk category based on eleven key risk types that have been defined specifically in terms of CLS Bank.

- **Risk Measurement and Reporting:** robust metric-based reporting and escalation processes that provide for in-depth analysis of relevant key risk indicators that informs the EMC about corporate and business division risk profiles and assists in the identification of critical issues. External and internal risk factors directly or indirectly impacting the Settlement Service are assessed and reported, as well as any breaches of the thresholds and tolerances defined in the CLS Risk Appetite Statement. Operational risk reporting is a key component of the risk management framework and feeds into the ERM Framework as detailed under Principle 3.
- **Risk Acceptance and Insurance Coverage:** risks may be accepted by divisions or on a firm-wide basis subject to formal documentation, including defined contingency plans. It is possible to insure against certain operational risks, and risk mitigation with insurance is evaluated for operational risks where relevant. Any accepted or insured risks are explicitly identified in the operational risk reporting noted above.
- **Incident Reporting:** specific firm-wide requirements for identification, assessment, monitoring and reporting of both internal and external incidents, errors, and near-misses and associated corrective actions.
- **Quality Assurance Processes:** formal review and validation of ORM processes and procedures to identify and quantify CLS Bank's controls and risks to ensure any gaps are identified and rectified.
- **Model Risk Management:** documented policies, procedures, practices, and standards drive effective management and mitigation of model risk, as discussed under Principle 7. Model governance requirements apply to all CLS Bank models, and include model documentation, certification, validation, and change management.
- **Information Security Risk Management:** information security encompasses the preservation of confidentiality, integrity, and availability of information. CLS Bank implements the necessary information security controls as defined in its policies and procedures to protect its information, systems, premises, and employees from all cyber threats whether internal, external, accidental, or deliberate. CLS Bank has in place an information security framework that aligns with CLS Bank's cyber resilience strategy that is endorsed by the CLS Board. It articulates how CLS Bank determines its cyber resilience objectives and cyber risk tolerance, as well as how CLS Bank identifies, mitigates, and manages cyber risks.
- **Project Risk Management:** defines standards and provides governance for implementing enhancements and/or modifications to maintain the CLS system's robust technical architecture and infrastructure and mitigate associated risks. Change management and implementation is supported by a dedicated project management office under which projects and system changes are subjected to thorough, coordinated due diligence by specific divisions (including Technology and Operations, Legal, and Compliance) to insulate the Settlement Service from adverse or unintended impact. Higher risk projects are subject to risk assessment processes for appropriate risk identification, assessment, mitigation, and management.
- **Vendor Risk Management:** the Vendor Management Program is a framework that establishes CLS Bank's policies, associated guidelines and procedures, which together, articulate the end-to-end process of initiating, controlling, and managing relationships with vendors from whom the CLS group entities can procure products and services. Through the Vendor Management Program, CLS Bank seeks to effectively manage the inherent and potential vendor-related risks that arise from using vendors to support CLS Bank's operational activities. Developed in line with current regulatory guidelines, the Vendor Management Program reflects CLS Bank-specific strategic and risk-management considerations.

Key Consideration 2. An FMI's board of directors should clearly define the roles and responsibilities for addressing operational risk and should endorse the FMI's operational risk-management framework. Systems, operational policies, procedures, and controls should be reviewed, audited, and tested periodically and after significant changes.

17.2 Operational Risk Management Framework Governance

The tools and processes discussed above govern and support a robust operational risk management framework and provide CLS group's executive management, as well as the CLS Group Board, with an overall operational risk profile of CLS Bank. The ERM Framework and associated reporting processes discussed under Principle 3 ensure timely consolidated reporting across executive management, identification of critical themes/issues, and relevant escalations under defined and streamlined governance processes as discussed under Principle 2.

17.2.1 Operational Risk Management Framework Governance

The CLS Bank operational risk management framework is subject to the governance requirements detailed under Principle 2, with specific responsibilities delegated to the following Committees:

- the Risk Management Committee reviews, endorses, and monitors all aspects of the operational risk management framework in line with its remit to provide oversight of CLS Bank's Risk Management division and for the entirety of risk at CLS Bank as a whole;
- the Technology and Operations Committee advises on the development and implementation of the technological and operational aspects of any strategic or significant tactical enhancement or modification to the CLS system. The Technology and Operations Committee also supports and guides management of strategic technology relationships and contingency policies and procedures, and coordinates with the Audit and Finance Committee on relevant financial matters; and
- the Audit and Finance Committee ensures that the overall system of internal controls implemented across the CLS group entities, including CLS Bank, are appropriate per the requirements of applicable laws and regulations and comply with industry best practices.

17.2.2 Review, Audit and Testing

The ORM Policy and ORM Framework, as well as procedures and other critical documents, are reviewed at least annually and subject to governance requirements discussed under Principle 2.

Key Consideration 3. An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.

17.3 Operational Reliability

The CLS system performs reliably on a daily basis. In the 12 months ending December 31, 2016, the CLS system was available 99.97% of the time it had been scheduled for operation.⁷⁰ If operational problems occur, a formal incident reporting and problem management process facilitates the successful resolution of any service incidents. This process defines the roles and responsibilities of CLS Bank and its vendors, and provides a mechanism for tracking an incident from its inception to successful resolution, closure and tracking of resulting actions. As described in detail below, the CLS system has a high degree of operational reliability due to its resilient technical architectural and infrastructural design. Under the IBM Agreement, IBM provides the CLS system with operational services, along with service management and support functions. CLS Bank and IBM review operational performance against predetermined SLAs. These SLAs are reviewed at least annually in connection with changes in CLS Bank business operations for purposes of making operational or technical improvements.

⁷⁰The CLS system is determined to be unavailable during its regularly scheduled hours of operation if an issue arises which prevents any one or more of the following activities: submission of payment instructions; settlement; Pay-Ins; or Pay-Outs.

17.3.1 Resilient Technical Architecture and Infrastructure

The technical architecture and infrastructure of the CLS system enables CLS Bank to provide a reliable Settlement Service to its Members. CLS Bank has a fully resilient systems and communications infrastructure supported by the provision of network and system management services. IBM has established a CLS-dedicated group and command centers for the operation of core production services and service management. Under normal circumstances, the core production service central processors (at the primary or secondary site) are used to provide the Settlement Service. In the unlikely event that these processors become unavailable, CLS Bank has a robust set of crisis management tools to minimize disruption to the market.

The technical architecture and infrastructure design include redundancy of components to eliminate single points of failure, as well as robust operational and security monitoring. The infrastructure design also allows for rapidly switching provision of the Settlement Service from one site to another, including replication of transaction data, with the objective that primary operation of the Settlement Service can be managed out of either site within the 2-hour RTO, detailed below under Key Consideration 6.

Key Consideration 4. An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.

17.4 Capacity Planning

CLS Bank has in place a framework which is reviewed regularly, for performance and capacity planning based on conducting an extensive review of the CLS system's future capacity investment requirements as part of its annual budget and strategic plan. An integral part of this business planning process involves discussions with Settlement Members that are key participants to determine a reasonable forecast of the anticipated volumes to be received by the CLS system in the following year and anticipated overall trends in FX market activity. The framework for performance and capacity planning is explicitly defined in the CLS Risk Appetite Statement. Metrics associated with this defined tolerance are monitored as part of the ORM Framework and reporting discussed above, as well as the ERM Framework and reporting detailed under Principle 3.

Key Consideration 5. An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.

17.5 Security Requirements

Logical security (measures that control user access) is an integral part of the CLS system's layered security model, and is designed to ensure effective authentication, authorization, and accountability across all systems. All IT systems are configured in accordance with defined policies, processes and standards, and compliance verification and vulnerability assessments of systems are routinely undertaken by CLS Bank and external third parties. In connection with these processes, IBM monitors and manages security events affecting operational environments, and reports high severity security events immediately to CLS Bank and reports their status monthly to CLS Bank. An external auditor performs an annual review of IT security as part of its overall audit of the CLS group, and all IT security activities are subject to regulatory oversight. All logical security controls and configurations are the subject of strict change control practices that are enforced across the CLS system and its service providers.

Data within the CLS system, including data contained in payment instructions submitted to the CLS system, are subject to a well-defined data classification policy designed to ensure that data are securely processed and stored to preserve confidentiality and integrity. Data management includes, amongst other controls, routine back-ups, off-site storage, layered defenses including enterprise class firewalls, intrusion detection systems, event management and correlation, data loss prevention tools, and secure communication channels that provide additional protection. Access to data is strictly controlled through access controls and encryption services that are used where required.

Secure operation of the CLS system is ensured by diversely routed and separated communication networks (which are strictly segregated from other networks), and highly resilient command and data centers hosting high availability IT infrastructure and business applications. These centers have fully resilient environmental controls and comprehensive security measures including electronic access control systems, CCTV, intruder alarms, and caged

areas for critical components. Access to all CLS group entity sites is strictly controlled and monitored by dedicated security and reception teams.

CLS Bank's security policies are generally aligned with the United States National Institute of Standards and Technology Cyber Security Framework ("NIST CSF").⁷¹ In reviewing the CPMI-IOSCO *Guidance on cyber resilience for financial market infrastructures*, CLS Bank recognizes strong alignment to the NIST CSF and therefore already sees broad adherence with the CPMI-IOSCO guidance. For its Settlement Service, Aggregation Service, and the CLS Corporate Network, CLS Bank measures the maturity of its security program through the use of Capability Maturity Model Integration, or "CMMI."⁷² Maturity is measured for each of six functional security domains (Compliance & Risk Management, Access Governance, Security Engineering, Threat Intelligence, Threat Management, and Monitoring & Response) in each estate (an "estate" is the set of IT infrastructure and applications that support a functional area, such as the CLS Corporate Network, IBM, or Aggregation). CLS Bank's risk appetite is set using that model, and is part of the CLS Group Board-approved Risk Appetite Statement, which takes in to consideration the 2-hour RTO specified in the CPMI-IOSCO guidance. The Information Security department's project portfolio is determined by what work is necessary to meet the maturity targets as defined in the Risk Appetite Statement.

CLS Bank regularly assesses, mitigates and monitors security risks to its Settlement Service, Aggregation Service, and CLS Corporate Network, as well as those introduced by any new initiative from the conception phase through to implementation, and thereafter. This process involves the identification, assessment, measurement, mitigation, ongoing evaluation and monitoring of actual or potential security risks and exposures to facilitate development and implementation of appropriate controls to reduce these risks to an acceptable level. Communication protocols exist to escalate risks, and established reporting mechanisms ensure proactive management of security risks.

17.5.1 Security Governance Arrangements

The Information Security department reports to the CRO, as well as to the Chair of the Technology and Operations Committee. Formal reporting to both the Technology and Operations Committee and Risk Management Committee during a joint session occurs on a quarterly basis, and an annual report is provided to the CLS Group Board. The Information Security department also participates in CLS Bank management committees tasked with internal governance which also include representatives from the Technology and Operations and Risk Management divisions. As relevant and/or requested, the Information Security department also presents on various topics to management committees and to the EMC. Vulnerabilities and threats are reported on and escalated as necessary through internal governance mechanisms detailed under Principle 2.

Key Consideration 6. An FMI 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 (IT) systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements.

17.6 Business Continuity Plans ("BCP")

CLS Bank has a BCP in place for each CLS group division, including those directly involved in providing or supporting the Settlement Service. Each BCP is predicated on a comprehensive business impact assessment that identifies key risks to technology, people, premises, and utility services, and the development of mitigating controls to ensure that key business processes can be maintained in the event of any type of disaster or incident, even in cases of extreme duration or severity.

Business continuity incidents are managed by the Executive Response Team ("ERT") and the Business Continuity Incident Response Team ("BCIRT") comprised of appropriate representatives from key divisions.⁷³ The ERT and BCIRT have responsibility for making decisions, including, but not limited to, the coordination of CLS Bank

⁷¹ More information about the NIST CSF is available at: <https://www.nist.gov/cyberframework>.

⁷² More information about CMMI is available at: <http://resources.sei.cmu.edu/library/asset-view.cfm?assetID=9661>.

⁷³ ERT and BCIRT representatives have nominated deputies in the event they are unavailable or in a protracted incident.

resources and internal and external communications during such incidents. Both response teams are led by the CLS Bank Chief Information Security Officer, who calls upon a team of specialists, depending on the nature of the incident. In addition, IBM develops and maintains contingency plans to resolve any business or service continuity incidents which could cause the Settlement Service to be unavailable. In a contingency event, IBM would execute recovery plans for the relevant operational services in accordance with these contingency plans as agreed with CLS Bank, and maintains secure backups for the CLS system's operational environments which allow them to be rebuilt.

17.6.1 Business Continuity Testing

All CLS group divisions participate in collective and individual testing as part of CLS Bank's annual BCP testing program. This includes an annual company-wide exercise that typically results in the loss of a site and the fail-over of associated technology, as well as desktop exercises for executives and a quarterly fail-over of CLS Bank's operations to a secondary site. The testing program incorporates realistic but challenging scenarios designed to disrupt customary business operations and activities in order to test and strengthen the ability of the various divisions to manage disruptions. CLS Bank also participates in a number of external industry and market-specific exercises that are sponsored by both governmental and non-governmental third party organizations. In addition, CLS Bank participates in disaster recovery and business continuity exercises with key service providers and strategic partners. Through this testing program, CLS Bank has a high degree of assurance that it meets applicable continuity and recovery targets.

17.7 CLS System Design and Resiliency

The symmetrical design of the CLS system and all significant aspects of its infrastructure are designed to ensure that the system is resilient. CLS Bank can recover its operational activities promptly should there be a complete loss of CLS Bank's or CLS Services' main offices. Disruption to the Settlement Service in the event of a site disaster at the primary data center is limited to the time it takes to start processing at the backup site. The CLS system is designed to allow the resumption of technical processing without loss of data within 40 minutes of the decision to transfer live production to the secondary site. Following such transfer, an additional 20-30 minutes is required before all operational checks are completed and the Settlement Service is fully monitored. The symmetrical design also allows CLS Bank to rotate the operation of its Settlement Service between its two data centers. By performing this rotation approximately every 8 to 12 weeks, the availability of these alternative sites is effectively tested and proven on a regular basis.

CLS Bank maintains highly resilient and redundant data centers which house the systems that conduct the Settlement Service and associated processes. These sites are built to high degrees of internal redundancy and security. All Settlement Service functionality is duplicated between these sites, and the sites are designed with the objective of being able to fail over within the 2-hour RTO, as noted above. The same is true for the operational sites where CLS Bank divisions monitor the Settlement Service and related activity. These operational sites have regional business continuity offices in addition to being able to fail over to each other, in the event that a primary site is rendered unavailable. Data centers and operational sites have their failover capabilities tested on a regular basis as detailed below.

All key network and infrastructure system components used in the Settlement Service are duplicated such that any settlement functionality can be performed at either site. CLS Bank's networks and power sources are also diverse and, consequently, the design of the CLS system allows for recovery and resilience at many different levels. CLS Bank, which is located in New York, and CLS Services, which is located in London, are linked to each other and the representative office of CLS UK Intermediate Holdings in Tokyo by dual and diverse network links. Additionally, there are business continuity sites in both the United States and the United Kingdom, should the main offices of CLS Bank or CLS Services be destroyed or become inaccessible.

There are two main core production service central processors, located in two geographically separate data centers containing identical sets of supporting systems, which are supported by IBM. In the event that one site is not available, the Settlement Service can still be provided to the Members using the alternate site. Information related to payment instructions and other data is replicated between the two data centers on a synchronous basis. This feature allows CLS Bank to provide full out-of-region capability and resilience, and is designed to ensure that the CLS system is aligned with globally recognized standards. The two data centers are supplied by different electricity suppliers from separate sources, and are also connected by two separate fiber networks, each capable of

supporting the full volume of payment instructions received and processed by the CLS system. The data centers are supplied with market data by two Reuters links, one to each data center. Both links are accessible from each data center.

Administrative oversight of the core production service central processors at each data center can be performed at CLS Bank's business operations centers in the United Kingdom and the United States. CLS Bank has four business operations centers, with primary sites in London and New York, and disaster recovery sites for the business operations centers located elsewhere in both the United Kingdom and the United States. These Business Continuity Sites are fully tested over a 24-hour period on a quarterly basis. Each data center is connected to the business operations centers (two in the United Kingdom and two in the United States) using separate networks. The technical and operational functions of the core production service central processors are also monitored at two active command centers maintained by IBM, one located in the United Kingdom and the other in the United States. IBM conducts a series of linked processes internally which are parallel to the processes operated by CLS Bank internally in order to provide the Settlement Service to Members.

The CLS system connects to RTGS systems for CHF, JPY and USD, using two separate links (per RTGS) to global networks. For each of the AUD, CAD, DKK, EUR, HUF, GBP, HKD, ILS, KRW, MXN, NOK, NZD, SEK, SGD and ZAR systems, the CLS system connects using two separate links to the SWIFTNet network or FIN service connectivity. The CLS system has various communication contingency processes in place should these links fail, including the use of stand-alone terminals, secure file transfer mechanisms or authenticated fax messages. CLS Bank is also working with the RTGS system operators on implementing an automated tool that allows for the straight-through-processing of contingency payments into both the Main Session and SDS Session. The CLS system also has payment contingency processes that can be employed in the event of severe operational difficulties affecting a central bank, RTGS system or a Settlement Member (or its nostro agent).

As part of its procedures, CLS Bank performs a "handshake" with each RTGS system to confirm the availability of the RTGS system before CLS Bank commences settlement in the Main Session or the SDS Session. CLS Bank will not commence the settlement of instructions involving an Eligible Currency if CLS Bank is aware the applicable RTGS system for the Eligible Currency is not available. CLS Bank is acutely aware that the commencement of, but failure to complete, settlement can cause significant disruption in the market due to the uncertainty that may result in Settlement Members' cash positions.

In the event a "negative" handshake is received from any RTGS system, CLS Bank will remain in close contact with the RTGS system by telephone to learn from the RTGS system operator its estimated recovery time and assess the impact of this on the Settlement Service. If the affected RTGS system does not recover or is unable to confirm that it will be able to move funds between the central bank accounts of CLS Bank and Settlement Members (or nostro agents, as applicable), CLS Bank will use the settlement deferral functionality to roll forward the settlement date for all the payment instructions involving the affected Eligible Currency to the next available settlement date. This functionality avoids the need for all Settlement Members to resubmit their payment instructions to the CLS system on the next settlement day. Each Settlement Member may still decide to rescind any deferred payment instructions within the applicable rescind deadlines detailed under Principle 8.

Because USD is involved in approximately 90% of the values of payment instructions settled in the CLS system, if the affected Eligible Currency is USD, CLS Bank will use the settlement deferral functionality to roll forward the settlement date for all payment instructions in the CLS system with that date as the settlement date (whether or not matched and in the Settlement Processing Queue).

The CLS system connects to Member systems using two separate links, per data center, to the SWIFTNet network and two different points of presence (located in two jurisdictions) for FIN service connectivity. Similarly, the CLS system connects to Deriv/SERV's system using two separate links, per data center, to the SWIFTNet network. Because all standards of duplicate alternative diverse connections (which apply to the connectivity from and to Members) are also applied to the connectivity from and to Deriv/SERV, the resilience of the CLS system is unchanged by introduction of a new interface with Deriv/SERV's system. Since CLS Bank actively switches between its sites, the resilience of the CLS system is constantly demonstrated.

17.7.1 Aggregation Service

The resilience of the technical architecture and infrastructure of the Settlement Service is not impacted by the Aggregation Service because there are no system linkages between the Settlement Service and the Aggregation Service. CLSAS's system for the Aggregation Service itself is generally aligned with globally recognized standards and is operated in a completely segregated environment, with two data centers which are synchronously linked using standard database synchronization software and satisfy the 2-hour RTO for critical infrastructures set forth in the above-mentioned regulatory guidance. CLSAS's system for the Aggregation Service is appropriately monitored, and management of incidents and crisis escalation is handled in a similar manner to the Settlement Service.

The Aggregation Service Rules require Aggregation Parties to satisfy minimum operating capabilities. Included in these requirements are adequate contingency plans for maintaining operational capabilities if a natural disaster, operational or technical failure, or other extraordinary event occurs. In addition, the Aggregation Service Rules specify clear cut-off times for the receipt of transaction messages for aggregation. These times provide sufficient time for a Member to submit payment instructions relating to eligible aggregated transactions, to the Main Session via the Member's standard CLS system interface and within the deadlines separately specified in the CLS Bank Rules. In the event that a transaction message has been submitted to but not aggregated by the Aggregation Service for any reason, details of the transaction are nonetheless permitted to be submitted to the Settlement Service for matching and settlement in the normal manner.

17.8 Member Responsibilities and Operational Requirements

As discussed under Principle 18, the Rules require Members to maintain minimum operating capabilities as part of CLS Bank's continuing membership criteria, including the maintenance of current and comprehensive BCPs that address both the operational and technical aspects of the Settlement Service. In addition, on an annual basis, each Member is required to certify to CLS Bank that it has successfully tested its BCP within the previous six months, and that this test included the use of its contingency site and the participation of any operational staff nominated by the Member to act in a contingency event affecting the Settlement Service. Members must also certify that they have proven their contingency Pay-In arrangements for each Eligible Currency during the past twelve months, either during a planned test or in response to a real need to invoke a contingency arrangement.

Key Consideration 7. An FMI should identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In addition, an FMI should identify, monitor, and manage the risks its operations might pose to other FMIs.

17.9 Operational Risk to CLS

Participating Members' interactions with the CLS system for the Main Session and SDS Session are identical, with access to each session managed via the methods described in the Introduction. As discussed above, the Rules require Members to maintain minimum operating capabilities as well as confirming their business continuity arrangements via annual certification. CLS Bank requires Settlement Member and Liquidity Provider participation in simulations and testing (detailed under Principle 7), may request detailed information or restrict indirect participant activities (detailed under Principle 19), and generally seeks to mitigate risks that may compromise the safety and soundness of the CLS ecosystem.

17.9.1 Technical Approval and Testing

CLS Bank subjects each Member and Deriv/SERV to an initial technical approval process in which the adequacy of its technical architecture as relates to the CLS system must be demonstrated before it may participate in any aspect of the Settlement Service. As part of this process, the Member or Deriv/SERV is required to demonstrate that it can successfully communicate with the CLS system using a minimum of two alternative sites and provide sufficiently detailed information about its technical architecture to enable CLS Bank's Technology department to assess the resilience and security of the architecture. All new additions to the Settlement Service (Member, Eligible Currency, etc.) or changes to current data are subject to rigorous and defined testing and trialing activities in a dedicated testing environment before being promoted to the "live" service.

IBM conducts active monitoring of the CLS system during testing and produces reports which enable CLS Bank to make this evaluation. In addition, each Member and Deriv/SERV is required to provide written confirmation of its current technical architecture on an annual basis, or more frequently if there are changes to its architecture. Members and Deriv/SERV are required to meet all of the relevant Settlement Service deadlines.

17.9.2 Stress Testing and Modeling

In addition to modeling the impacts of various scenarios during times of normal operations, CLS Bank conducts risk impact analyses for each participant for various stress scenarios (as discussed under Principle 7). The liquidity impact of these scenarios is analyzed for both the CLS system and for individual Settlement Members. The results of these scenarios are discussed with Members, as discussed under Principle 3.

17.9.3 Failure Management

CLS Bank has formal procedures detailing activities and divisions to be conducted under normal operating conditions, as well as failure management processes and procedures. These procedures include those set out in detailed service manuals covering the operational services provided by IBM for the CLS system, including management of incidents with different levels of severity. Specific procedures with Deriv/SERV and MarkitWire are also in place for both business-as-usual operations and managing disruptive situations. Where relevant, these procedures are also documented in coordination manuals maintained with each of the RTGS system operators and are also subject to a rigorous testing and trialing program.

17.9.4 Communications

As discussed under Principle 3, CLS Bank is in frequent and regular contact with its Members to discuss all relevant risks associated with participation in the CLS system. Settlement Members, nostro agents, Liquidity Providers and central banks have also undertaken a considerable amount of preparatory work to understand the operational risk issues related to the CLS system. CLS Bank discusses in its bilateral review with each Settlement Member the ability of the Member to manage potential operational issues and liquidity implications of a disruptive situation in the CLS system. In addition to the work performed before the "go-live" date in September 2002, as well as the SDS Session "go-live" date in September 2013, relevant information regarding the results of liquidity analyses performed during the year (often but not solely in connection with the introduction of new products or currencies to the CLS system) and other aspects of the Settlement Service are shared with the CLS Oversight Committee and Settlement Members.

17.10 Inherent Operational Risk

The CLS system is the sole multicurrency settlement system of its kind, offering both liquidity savings and settlement risk mitigation across major currencies and operating on a global basis. The CLS system links thousands of financial institutions, including many of the largest banks. A failure of or disruption in CLS Bank's operations could substantially increase participants' liquidity risk and reintroduce significant settlement risk among institutions in the FX market.

17.10.1 Notification of Operational Issues Affecting the CLS system

CLS Bank promptly advises Members of operational issues affecting the CLS system, including changes or disruption to the operational timeline or problems experienced by or affecting numerous Members. CLS Bank communications follow established procedures and typically utilize pre-prepared templates to ensure consistency. If appropriate, the central banks and/or nostro agents are also advised. CLS Bank utilizes a crisis communications protocol to ensure market feedback is received in a timely manner and provide a single channel for CLS Bank to reach the wider stakeholder community.

17.10.2 Incident Management and Reporting

IBM monitors, tracks and records all incidents and proposes corrective action plans to CLS Bank. IBM and CLS Bank hold triage and status calls if an incident affects a critical element of operational services. CLS Bank and

IBM will review a major incident follow-up plan prepared by IBM, including analyses of the cause of the incident, an explanation of how it was identified, a chronology of events, work-arounds and program changes made in response, a summary of how the incident was managed, and lessons learned. CLS Bank and IBM also hold daily sweep calls during an incident, and weekly service review calls with SWIFT. The CLS system also has an automated SLA reporting application that measures and reports performance data, tracks system performance against various service targets, and is used to predict future performance.

CLS Bank's Operations department monitors, tracks and records all external (Member, nostro agent and RTGS system) incidents. Root cause, recovery actions and mitigating steps are analyzed. Trend analysis is performed and escalation channels are in place through management committees and to the CLS Group Board via the Technology and Operations Committee. Incidents are also subject to the reporting requirements of the ORM Framework discussed under Key Consideration 1.

17.10.3 Errors

The algorithms in the CLS system allow CLS Bank to limit non-routine or manual transfers of funds that are most susceptible to error. In order to minimize the risk of error, such manual transfers may only be performed under dual operator control to ensure that adequate checks and balances are undertaken prior to any manual transfers. Additionally, controls are in place to ensure that the correct authorization is established prior to any approval of a manual funds transfer.

In the event that an operational error in the CLS system results in a loss to a Settlement Member for which CLS Bank is liable under the Rules or the Member Handbook, CLS Bank may assess this loss to the Settlement Members through the procedure discussed under Principle 4. Settlement Members are aware of their exposure to potential loss allocations, as these obligations are made clear in the Rules and periodic communications. In any such event, CLS Bank would conduct a post-incident review to investigate the root causes of the operational error, identify the issues encountered, and highlight any changes required to mitigate against a recurrence of the error. CLS Bank will then ensure that each required action is implemented.

Principle 18: Access and participation requirements

An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.

18.0 Summary

The Rules, which are publicly available, define the requirements for initial and continuing membership in the Settlement Service. The Rules permit any financial institution that meets the relevant criteria to participate as a Settlement Member. Additionally, as discussed under Principle 19, the Rules permit financial institutions and other entities to participate as third parties. Upon joining, Settlement Members are continuously monitored for adherence to CLS Bank's membership criteria. Failure to abide by these criteria could result in suspension from the Settlement Service.

Key Consideration 1. An FMI 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.

18.1 Eligibility Requirements

The initial and continuing eligibility requirements for direct participation in the CLS system are objective and expressly set forth in the Rules and Member Handbook. These criteria are designed to permit fair and open access based on the goals of protecting the integrity of the settlement and funding processes and mitigating any relevant risks associated with participation in the CLS system. The key criteria are:

- **Shareholding requirement:** other than a Non-shareholder Member or a central bank (as described in the Introduction under *Participating Institutions; Access to the Settlement Service*), each Member must be a qualifying shareholder of CLS Group Holdings or an affiliate of a qualifying shareholder of CLS Group Holdings.
- **Financial requirements:** no Member may have an internal long-term rating assigned by CLS Bank that is less than BB-. Additionally, each Settlement Member must maintain capital equal to or in excess of capital and capital ratio requirements imposed from time to time by its primary regulator. Members must provide financial statements and material regulatory filings to CLS Bank on a periodic basis.
- **Operational requirement:** as discussed under Principle 17, each Settlement Member must: (i) satisfy minimum operational capabilities as established by CLS Bank, including the ability to make payments to and receive payments from CLS Bank in different currencies within specified times; (ii) ensure that adequate contingency plans are in place to address its or its nostro agents' inability to satisfy funding obligations; (iii) be able to maintain its operational capabilities in the event of a natural disaster, operational failure or technical failure; and (iv) ensure that appropriate procedures and contingencies are in place for the effective operation of its connectivity to, and management of, its static data in the CLS system. Members must be able to effectively function within the CLS system and these operational requirements represent the minimum requirements for operational participation.
- **Financial institution requirement:** each Settlement Member must be (i) a financial institution that is subject to prudential supervision by an authority acceptable to CLS Bank, including a bank, trust company, broker-dealer, or investment firm; or (ii) a central bank. Additionally, each Member must be a "financial institution" within the meaning of 12 U.S.C. §4402 and a "participant" within the meaning of the SF Regulations.
- **Jurisdictional legal opinion:** the Member's head or home office must be located in a jurisdiction with respect to which CLS Bank has received a satisfactory legal opinion, as discussed in detail under Principle 1.
- **Anti-Money Laundering:** the Member's head or home office must be located in a jurisdiction which adheres to internationally recognized money laundering standards. Money laundering risks are monitored by CLS Bank on an ongoing basis.

CLS Bank currently has 66 Members that have met these criteria. CLS Bank does not maintain access criteria for third parties, as contracts for the provision of third party services are between Members and third parties. However, as discussed under Principle 19, CLS Bank requires all third party service providers to provide advance notice prior to adding third party services to third parties. Third party service providers must also obtain CLS Bank's written consent prior to adding or modifying third party services for an FMI or G-SIFI. As a result of its fair and open access criteria for Members and third parties, CLS Bank serves over 23,000 institutions of diverse types (international banks, corporations, and funds).

Key Consideration 2. An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to and commensurate with the FMI's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, an FMI should endeavour to set requirements that have the least restrictive impact on access that circumstances permit.

18.2 CLS Bank Membership Requirements⁷⁴

CLS Bank membership is open to all institutions that meet its eligibility criteria. CLS Bank's membership credit criteria are objective, risk-based and publicly disclosed. They are designed to permit fair and open access, while limiting membership to those financial institutions that are capable of successfully participating in the Settlement Service without compromising the safety and soundness of the CLS ecosystem. Because of the considerable responsibilities assumed by Members and the CLS risk design, CLS Bank's membership eligibility criteria are essential to protect the CLS system. The criteria are designed to mitigate the legal, financial, and operational risks that the CLS system faces. In addition, restrictions on the types of institutions (and jurisdictions in which they may have their head or home offices) are necessary to preserve the well-established legal framework that supports the Settlement Service. CLS Bank recognizes the trade-off between complete, open access, and the necessity to maintain membership standards to protect the integrity of its settlement and funding processes and minimize the potential disruptions to other Members.

Further, the impact of the relevant membership eligibility criteria is mitigated by the ability financial institutions and other companies to access the CLS system indirectly as third party customers of a Member. As of December 31, 2016, 25 Members provide third party services on privately contracted financial terms, enabling approximately 23,000 third parties to participate indirectly in the CLS system. While over 90% of such third parties are funds, this group also includes banks as well as corporations and other non-bank financial institutions.

Key Consideration 3. An FMI 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 Rules and Member Handbook are detailed and comprehensive, and clearly set forth the requirements for participation in the Settlement Service. CLS Bank monitors compliance with its participation requirements on an ongoing basis by two means: a self-reporting requirement which requires Members to self-report whenever they fail to comply with any of the participation requirements of the Rules, and the continuous monitoring processes discussed under Principle 4, under which CLS Bank's Credit Risk Management team monitors compliance with relevant participation requirements defined under the Rules. Relevant negative information found based on these daily reviews may trigger a Comprehensive Review, which consists of a qualitative and quantitative analysis of the Member's financial condition, commentary on the domestic banking sector in which the Member operates, and an assessment of its operational performance in the CLS system. Negative results in a Comprehensive Review could result in remedial action, suspension, or termination of a Member. As discussed in detail under Principle 13, the Rules specify clear procedures to be followed for the suspension or orderly exit of an Eligible Currency or participant, including in the event of a participant default.

⁷⁴ The participation requirements discussed herein are applicable in the normal course of business. As discussed under Principle 3, a resolution scenario may require a transfer of membership to a new entity utilizing the TSM category. In such a scenario, CLS Bank will exercise its discretion to be flexible in the extent to which apply individual aspects of these participation requirements.

18.3 Suspension or Removal of an Eligible Currency

Under the Rules, CLS Bank may suspend a currency as an Eligible Currency from the Settlement Service at any time, following consultation with the relevant central bank. Such suspension may be the result of, among other things, perceived risks relating to the availability of liquidity, the viability of the relevant RTGS system, or legal or regulatory requirements. CLS Bank may cause such suspension to become effective prior to consultation with the relevant central bank if CLS Bank determines in its reasonable discretion that exigent circumstances exist which require such suspension to become effective for the protection of CLS Bank or its Members, or to comply with legal or regulatory requirements.

CLS Bank will provide each Member and central bank with notice of any such suspension as soon as practicable and shall attempt to provide notice prior to the effectiveness of such suspension. CLS Bank may reinstate a previously suspended currency as an Eligible Currency after due consideration of any risks to it and its Members arising from reinstatement and after consultation with the relevant central bank. CLS Bank will provide each Member and central bank with notice of any such reinstatement as soon as practicable and shall attempt to provide such notice prior to the effective date of such reinstatement. In addition to the right to suspend a currency, under the Rules, the CLS Group Board may, in its sole discretion, determine at any time, following consultation with the relevant central bank, that a currency is to be removed as an Eligible Currency. Upon such determination, CLS Bank would notify each Member and central bank in writing not less than fourteen days prior to the effective date of the removal of such currency as an Eligible Currency.

18.4 Suspension or Termination of a Settlement Member

The Rules also set forth the eligibility criteria for CLS Bank membership, containing, for example, certain legal requirements, minimum operating capabilities and anti-money laundering criteria that must be satisfied by Members in order to participate in the Settlement Service. Each Member must continue to satisfy and maintain compliance with all membership eligibility criteria, as well as any other criteria upon which its admission was conditioned, to remain a Member. Clearly defined procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the eligibility criteria are contained in the Rules. In addition, as discussed under Principle 13, CLS Bank may suspend or terminate a Member in an insolvency event.

Under the Rules, the failure of a Member to comply with its obligations under the Rules can result in the suspension or termination of rights of membership and eligibility of such Member to participate in CLS system. CLS Bank may terminate a Member's membership in certain circumstances, including if the Member is in default or violation of any material provision or obligation set forth in the CLS Bank Documents, or any direction of CLS Bank given pursuant to any Rule, or if there has been a material adverse change in the business, operations, financial condition or access to liquidity in respect of the Member and CLS Bank determines in its reasonable discretion that terminating such membership in CLS Bank is necessary for the protection of CLS Bank or its Members.

Principle 19: Tiered participation

An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.

19.0 Summary

CLS Bank recognizes the need to identify and mitigate the systemic risks posed by both third party users of the Settlement Service, as well as those Settlement Members that are third party service providers. These risks have arisen and become more complex recently due to the rapid growth in the number of third parties, concentration of third parties with a small number of service providers, and systemic risks associated with CCPs settling their FX payment instructions via the CLS system as third parties. CLS Bank has developed the Third Party Best Practices, which are publicly available and designed to create industry guidance regarding third party use of the Settlement Service.

In the last few years, tighter interdependencies among FMIs have contributed to strengthening the global infrastructure while also increasing the potential for disruptions to spread quickly and widely across multiple systems. At the same time, CCPs have grown, added new products, and altered the scope and scale of their influence on the CLS ecosystem. This has warranted a risk management review of tiered participation activities and FMI - CLS interconnectedness.⁷⁵ CLS Bank requires all third party service providers to provide advance notice and obtain CLS Bank's written consent prior to adding or modifying third party services for an FMI or G-SIFI. The Rules and Member Handbook provide CLS Bank with significant flexibility in determining a Settlement Member's eligibility to provide third party services in the CLS system, including the express ability to apply limits, conditions, or restrictions.

Key Consideration 1. An FMI 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 FMI arising from such tiered participation arrangements.

19.1 CLS Rules and Procedures on Indirect Participants

The Rules and Member Handbook have historically stipulated that Settlement Members may not have business practices, internal risk management controls, or any other factor or condition that would create undue risk for CLS Bank or its Members, and have required each third party to be a corporation or other legal entity, rather than a natural person.

In 2013, a number of amendments were made to the Rules and Member Handbook specifically pertaining to third party service provision, participation, risks and information requirements. These amendments clarified and expanded CLS Bank's existing authority with respect to tiered participation activities, and expand tiered participation arrangements to include fourth parties. They include:

- prior notification and consent requirements for certain tiered participation activities involving FMIs (including CCPs) and G-SIFIs. Given their potential systemic risk and impact on the CLS ecosystem, the detailed reporting requirements are mandatory with respect to adding or modifying third party services for an FMI or G-SIFI. The advance notice reporting requirements include:
 - the potential FMI or G-SIFI's identity, disclosed to all participants upon CLS Bank's consent;
 - a description of the underlying transaction, including its material contract specifications;
 - estimated daily, monthly, quarterly and annual volumes and values; and
 - expectations around use of netting arrangements.

⁷⁵Details on FMI interdependencies and risks are provided under Principle 3.

- clarification regarding CLS Bank’s ability to request any additional information from its Settlement Members that it may deem appropriate in order to identify, monitor, and/or manage any risks to CLS Bank and the CLS ecosystem;
- specify CLS Bank’s authority to limit a Settlement Member’s tiered participation activities (including the express ability to apply limits, conditions, or restrictions); and
- authorization and consent requirements with respect to certain novated or netted FX transactions.

Key Consideration 2. An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.

19.2 Material Dependencies between Direct and Indirect Participants

CLS Bank does not maintain a legal contractual relationship with third parties, which limits its influence on the commercial relationships between third parties and the Settlement Members that provide them third party services. The Third Party Best Practices were developed based on bilateral and multilateral discussions with third party service providers, Members, third parties, regulators, and the CLS group’s executive management. CLS Bank believes that systemic risk is reduced if large institutions settle payment instructions as direct Members, and therefore the Third Party Best Practices include a risk-based recommendation for the conversion of large third parties to Members.

CLS Bank addresses concentration levels and detailed metrics in risk bilateral meetings with third party service providers. As noted above, all third party service providers adding or modifying the scope of third party service for an FMI (including a CCP) or a G-SIFI are subject to a prior notice and consent requirement by CLS Bank. As third party service providers have existing due diligence and risk analysis processes for on-boarding third parties, CLS Bank reminds third party service providers to use the Third Party Best Practices as a supplement to their own on-boarding processes.

19.2.1 CCPs as Indirect Participants

Because of the systemic importance of CCPs, CLS Bank has had on-going discussions with CCP third parties and their third party service providers to ensure that these institutions understand their role and responsibilities with regard to settling payment instructions relating to CCP transactions in CLS Bank and the potential liquidity requirements in the event a CCP clearing member experiences an operational or credit failure event that would cause that clearing member’s instructions not to settle in CLS Bank. In addition, CLS Bank has conducted extensive modeling on the Settlement Member and platform levels to identify and quantify any systemic risks that may materialize in the course of business-as-usual settlement processes as well as specific stress impacts for CLS settlement failure involving CCP related transactions.

Key Consideration 3. An FMI should identify indirect participants responsible for a significant proportion of transactions processed by the FMI and indirect participants whose transaction volumes or values are large relative to the capacity of the direct participants through which they access the FMI in order to manage the risks arising from these transactions.

19.3 Monitoring Indirect Participants

The Third Party Best Practices provide for day-to-day monitoring of third party activity and associated thresholds. CLS Bank monitors concentration levels for all third party activity on a daily basis, and discusses the associated metrics in periodic risk bilateral meetings with third party service providers.

CLS Bank monitors the following settlement and funding metrics of third parties on a daily basis to identify those third parties whose level of activity is similar to the activity of a Settlement Member.

- A third party’s share of total CLS Bank’s daily settlement volume (i.e. number of transactions): The third party service provider may not have the technical capacity to manage increased third party volume levels, resulting in delayed or incomplete third party service provider payment instructions reaching the CLS system.

- A third party's share of total CLS Bank daily settlement value (i.e. the gross value of transactions): CLS Bank recognizes high third party Gross Value is not an accurate indicator of projected Pay-Ins, as positions may net down to low levels. However, CLS Bank considers 'Gross Value Settled' an important indicator of underlying problems that may occur. One example is a change in a third party's trading pattern, causing higher Pay-Ins for the third party service provider. The third party service provider may not be prepared to support the third party's higher liquidity requirement.
- A third party's average daily multilateral net Pay-In requirement: A much larger requirement adds to funding pressure for a third party service provider and its ability to make Pay-ins to CLS Bank in a timely manner.

CLS Bank considers each metric (Volume, Value, Net Pay-In requirement) individually sufficient to trigger a CLS Bank review and discussion with the third party's service provider. The relative importance of each criterion will depend on the profile of the third party in the context of its service provider. CLS Bank also monitors:

- the third party service provider's concentration of total third party activity (by value);
- the third party service provider's total third party activity compared to its proprietary CLS Bank activity; and
- each individual third party's activity in comparison to the third party service provider's proprietary CLS Bank activity.

Along with concentration levels, CLS Bank discusses the third party service provider's largest third parties in bilateral meetings and provides detailed statistics for the relevant third parties:

- gross value and volume concentration in comparison to the third party service provider's total CLS Bank activity; and
- quartiles for each third party's gross value, volume, and net Pay-In, as compared to all other Settlement Members.

19.3.1 Concentration Thresholds and Triggers

High concentration levels are a trigger for CLS Bank to initiate discussions with the third party service provider to understand its business model and risk management practices for mitigating risks associated with high concentrations. When any third party thresholds are exceeded, CLS Bank (supported by the third party service provider) will conduct a risk analysis of that third party's activity to assess its impact on its third party service provider and the CLS ecosystem.

For these thresholds, CLS Bank identifies concentration levels that would place the applicable third party in the top half of current CLS Bank Settlement Members. CLS Bank will first contact the third party service provider of a third party exceeding these thresholds and discuss with the third party service provider an appropriate plan for converting the identified third party to full membership. CLS Bank will also notify the applicable regulatory supervisors of both the third party service provider and the third party of the conversion opportunity identified.

Key Consideration 4. An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.

19.4 Mitigating the Risks Associated with Indirect Participants

The Third Party Best Practices note that CLS Bank will work with the relevant third party service provider to develop and implement appropriate risk mitigation solutions if a third party exceeds the thresholds, but is not eligible for CLS Bank membership. Those solutions could include requiring the third party to split its CLS Bank activity among multiple third party service providers. If a third party exceeds thresholds and qualifies for membership but is unwilling to proceed with application due to the cost of membership or any other reason, CLS Bank will engage the relevant third party service provider and prudential regulatory authority (of both the third party service provider and the third party) to determine appropriate mitigants.

The Third Party Best Practices mention ongoing regulatory work on special resolution regimes to provide a framework for dealing with troubled institutions, and note that third party service providers should understand the nature of these regimes in the jurisdictions of their third party customers. CLS Bank encourages third party service providers to continue to provide CLS Bank services to a third party customer that is subject to a special resolution regime, to the extent that this does not introduce systemic risk into the CLS system.

19.4.1 Managing an Indirect Participant's Insolvency

In the event CLS Bank receives an insolvency notification for a third party from a regulatory authority, CLS Bank will determine whether the insolvent third party has any payment instructions pending in the CLS system and/or will contact the relevant third party service provider for the insolvent third party to discuss managing exposures.

Principle 21: Efficiency and effectiveness

An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.

21.0 Summary

The CLS system efficiently and effectively meets the requirements of its participants and the markets it serves by providing a high-quality Settlement Service. CLS Bank regularly seeks feedback from its Members, actively monitors market developments, and responds accordingly to improve performance or provide additional services that meet the needs of the FX market. The CLS Corporate Strategy and KPIs with associated targets (discussed under Principle 2) are reviewed regularly by the EMC and by the CLS Group Board.

Key Consideration 1. An FMI 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.

21.1 Efficiency

The Settlement Service was specifically designed to effectively and efficiently address settlement risk in the FX market, for which daily turnover averages approximately US\$5.1 trillion equivalent.⁷⁶ The CLS system settles payment instructions related to FX spot, swaps, forwards, initial and final notional exchanges of CCS transactions, and OTC credit derivative transactions in accordance with defined timelines while creating specific liquidity benefits for participants.

As a result of its funding efficiency, the Settlement Service has also continuously provided its participants with significant liquidity benefits. As noted in the Introduction, the multilateral netting aspect of funding for the Main Session yields a payment netting benefit of approximately 95.8% (57% for the SDS Session), and remaining Settlement Member Pay-In obligations are further reduced by In/Out Swap Program transactions for the Main Session. As a result, approximately 0.9% of the total value of the payment instructions is currently required in funding from Settlement Members for CLS Bank to complete settlement on any given day in the Main Session (43% in the SDS Session). This significant reduction in overall funding requirements makes considerable additional liquidity available to the FX market.

While maintaining an efficient Settlement Service, CLS Bank has also facilitated the improvement of operational standards and straight-through-processing, and has helped to reduce the need for reconciliation among its Members. The CLS system's PvP model also significantly reduces the amount of post-settlement workflow as failed payments and resulting compensation claims are reduced. As a result, participation in the CLS system provides potential financial savings in funding, overdraft charges, and interest expense, and fewer resources are required to investigate missing payments and interest claims.

21.2 Effectiveness

As the FX market has evolved, and in direct response to market demand, CLS Bank has continuously sought to enhance and expand its Settlement Service accordingly. It has also developed additional services and tools or discontinuing services as needed. Some of the initiatives and changes implemented to maintain the effectiveness of the CLS system include:

- extending the Settlement Service to payment instructions related to OTC credit derivatives in December 2007;
- introducing the Aggregation Service⁷⁷ in 2010 to improve post-trade efficiency and reduce costs arising from high-frequency, low-value FX transactions;

⁷⁶ Spot, swap, and forward transactions represent 95% of global FX market turnover by instrument (*Foreign exchange turnover by instrument; BIS Triennial Central Bank Survey 2016*, p.6).

⁷⁷ Aggregation Participants also receive the benefit of settlement risk mitigation under the Settlement Service when they submit payment instructions for relevant aggregated transactions to the Main Session.

- launching the SDS Session in September 2013 as a pilot for the settlement of payment instructions related to underlying same-day FX transactions;
- winding down the settlement of payment instructions related to NDFs in November 2013 to create cost savings and in response to regulatory changes mandating clearing requirements;
- undertaking a collaboration with TriOptima to introduce Compression for FX forwards in October 2015; and
- extending the Settlement Service to payment instructions related to CCS transactions, as well as onboarding the Hungarian forint, in November 2015

CLS Bank's ongoing initiatives look to add more currencies and FX products to its offerings and enhance options for direct and indirect CLS Bank membership⁷⁸ while continuing to maintain a robust, resilient Settlement Service that delivers 100% settlement and funding completion for each and every business day.

21.3 Pricing Policy

CLS Bank seeks to provide for greater pricing stability over time by managing its operating costs in line with operating efficiency goals and its target capital return. CLS Bank's pricing policy is developed in cooperation with the Audit and Finance Committee and the CLS Group Board⁷⁹ and is made available to the Members and regulatory bodies. CLS Bank has also publicly disclosed certain elements of its pricing policy on its group corporate (public) website. CLS Bank's sustainable financial model facilitates a steady pricing policy while ensuring that CLS Bank has the financial foundation for its day-to-day operations and renewal of technology infrastructure through on-going capital investment.

In 2014, CLS Bank revised its pricing methodology to increase pricing stability for Members while targeting the long-term financial sustainability of the Settlement Service. The pricing policy has two basic components – one based on payment instruction value and the other based on payment instruction volume (*i.e.*, number of payment instructions). For any particular Member, application of the pricing policy is determined by: (i) the aggregate value of payment instructions submitted by all of the Members; and (ii) the average daily volume of payment instructions submitted by the particular Member.

This methodology places more emphasis on the value-based element of the pricing methodology than the volume, better reflecting the settlement risk mitigation provided by CLS Bank to Members and their customers. The volume-based element of the pricing methodology is transparent, providing Members with predictability in pricing based on their individual payment instruction volumes. This pricing policy also strikes a balance between individual usage and usage by the Settlement Members as a group.

If the other factors in the pricing policy are assumed to be held constant, a sufficiently large increase in the average daily value of all Member payment instructions will generally result in a *decrease* in the costs borne by a Member. Conversely, decreases in the average daily value of all Members may result in cost increases. In addition, a Member may receive the benefit of a reduction in the per-transaction (volume-based) charge based on its own, individual, increased volume of payment instructions. Conversely, decreases in a Member's own, individual, volume of payment instructions may result in an increase in the per-transaction charge.

21.4 Responsiveness to Participants

CLS Bank regularly seeks to improve the efficiency and practicality of the CLS system. As one example of CLS Bank's efforts, CLS Bank conducts a periodic confidential and anonymous survey of customer satisfaction. The survey asks questions about CLS Bank's performance, CLS Bank's responsiveness to customer concerns, the efficiency and price of CLS Bank's services, the effectiveness of CLS Bank's implementation and system upgrades, CLS Bank's choice of products and services, and other areas. Survey results are shared with the CLS group's executive management and are taken into account when planning strategic initiatives.

⁷⁸ Including the addition of Non-shareholder Members as well as Affiliate Members, as described in the Introduction.

⁷⁹Pricing levels are, however, determined by the EMC.

CLS Bank participates in numerous external user group forums to obtain information on best practices, innovations in the market, Member business needs and demand for new features, as well as to drive development of new practices. CLS Bank frequently seeks input on specific issues through one-on-one meetings with Members and focused working group meetings. Feedback is also solicited from Members on proposed operational, IT, risk and/or legal changes which may affect their participation in the CLS system. In addition, CLS Bank's Corporate Strategy and Development and Technology and Operations divisions provide CLS system-specific Member support services.

As discussed under Principle 2, CLS Bank is member-owned, and the CLS Bank Board includes non-executive directors representing the Settlement Members. As Member representatives, these non-executive directors receive regular updates and information on CLS Bank's operations and provide recommendations on how CLS Bank can better meet the needs of its Members.

Key Consideration 2. An FMI 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

21.5 Goals and Objectives

As discussed under Principle 2 and Principle 3, the CLS Risk Appetite Statement, CLS Vision Statement and CLS Corporate Strategy are clearly defined. As detailed in Section 2.1.1, the CLS Corporate Strategy has associated KPIs which CLS Bank uses to set and measure progress towards its goals. The CLS Corporate Strategy explicitly notes the importance of and expectations in providing an effective and sound Settlement Service.

Key Consideration 3. An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.

21.6 Periodic Review

CLS Bank reviews its progress against its KPIs at EMC meetings on a quarterly basis. The KPIs are also reviewed by the Chairman's Committee and the CLS Group Board quarterly. Additionally, the CLS Group Board conducts strategic review sessions on CLS Bank annually.

Principle 22: Communications procedures and standards

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

22.0 Summary

The CLS system uses internationally accepted standards for communicating with Members, RTGS systems, Deriv/SERV, and MarkitWire. SWIFTNet InterAct, SWIFTNet Browse, or the SWIFT FIN service are utilized for the majority of communications, with accommodations made for proprietary message format alternatives and local message formats used by specific RTGS systems.

Key Consideration 1. An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.

22.1 Internationally Accepted Standards

CLS Bank maintains connections with the relevant RTGS systems through which funding for settlement of each of the 18 Eligible Currencies occurs. CLS Bank moves funds via these RTGS systems using its central bank accounts. To facilitate movement of funds through these accounts, and to enable the Settlement Members to communicate their payment instructions to CLS Bank for settlement, the CLS system supports the appropriate internationally accepted standards for the communication of financial instructions. This includes the use of SWIFT messages which are compliant with ISO15022 as well as ISO20022 standards.

For cross border payments, the CLS system supports the local market messaging standards used in the RTGS system for each respective Eligible Currency. This includes the local message formats used by Fedwire, SIC, and BOJ-NET, and the SWIFT FIN formats used in the 15 other RTGS systems. Each of these communication standards represents an internationally accepted standard for the communication of financial instructions.

Principle 23: Disclosure of rules, key procedures, and market data

An FMI 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 FMI. All relevant rules and key procedures should be publicly disclosed.

23.0 Summary

CLS Bank recognizes the need for transparency, and appreciates the need for participants to comprehend fully the risks of participating in the Settlement Service. To facilitate this, CLS Bank maintains comprehensive rules and procedures, made available to the Members and, where appropriate, to the public.

On its corporate (public) website, the CLS group makes public (in English), a significant amount of information about the CLS group entities and the Settlement Service, such as the Rules, the December 2011 CLS Bank Core Principles Self-Assessment, the latest version of this Disclosure, certain market data, regulatory and oversight information (including details on the CLS Oversight Committee and CLS Bank's comments submitted in response to relevant regulatory consultation documents), information on the Eligible Currencies, governance information, annual reports and accounts, basic pricing information, CLS Bank-specific best practices, the CLS Risk Appetite Statement, and press releases.

Key Consideration 1. An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.

23.1 Disclosure

CLS Bank has clear and comprehensive rules and procedures that are fully disclosed to its participants. The key rules and procedures of the Settlement Service are set forth in the Rules, which are publicly disclosed on the CLS group corporate website. The Member Handbook, which describes certain operational procedures, policy statements and other information and instructions relating to CLS Bank, CLS Services and its Members, is readily available to all Members through a secure member website. The Rules and Member Handbook are also provided to Liquidity Providers, the Federal Reserve and the CLS Oversight Committee.

The Rules and Member Handbook enable Members to understand how the Settlement Service works, to assess financial and other risks of participation in the CLS system, and to understand their and CLS Bank's roles and obligations.

23.1.1 The Rules and Member Handbook

The Rules set forth the foundation of the Settlement Service, and the rights and obligations among Members, CLS Bank and CLS Services, including:

- criteria for membership in CLS Bank;
- criteria for the inclusion of a currency in the Settlement Service;
- scope of liability of CLS Bank and CLS Services and indemnification obligations of the Members;
- responsibility of Members for payment instructions, and deadlines for amending and rescinding payment instructions;
- procedures for handling events that may disrupt processing of payment instructions;
- validation requirements and risk management tests applied to payment instructions;
- obligations with respect to Pay-In Schedules, and Pay-In Calls issued to Settlement Members;

- consequences of failure to satisfy such obligations;
- manner in which Pay-Outs are made by CLS Bank to Settlement Members;
- circumstances under which CLS Bank may draw on its liquidity facilities;
- responsibilities of the failing Settlement Member(s) arising from such draw;
- loss sharing arrangements; and
- reasons for which CLS Bank may take remedial action against or terminate a Member (including appeal processes).

The Member Handbook contains additional details concerning matters addressed in the Rules, including:

- overview of the connectivity architecture of the CLS system;
- methodology by which CLS Bank calculates currency-specific Short Position Limits and Member-specific Aggregate Short Position Limits;
- methodology for calculating volatility-based, currency-specific haircuts; and rates used to calculate Base Currency Equivalent;
- details as to how Members receive information regarding their respective payment instructions and accounts;
- approximate operational times and deadlines for processes such as the issuance of Initial and Revised Pay-In Schedules, commencement of the settlement period, completion of settlement, completion of funding, and Currency Close Deadline;
- funding procedures, including minimum Pay-In and Pay-Out requirements;
- requirements necessary to be met by Liquidity Providers;
- details of loss sharing arrangements;
- current pricing policy, fees assessed for failure to fund, and applicable interest rates.

CLS Bank has a clear process for proposing and implementing amendments to the Rules and Member Handbook, as discussed under Principle 1. The approval process for creating or amending key procedures is governed by the Master Policy, detailed under Principle 2.

Key Consideration 2. An FMI should disclose clear descriptions of the system's design and operations, as well as the FMI's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMI.

23.2 CLS System Description

The Member Handbook provides an overview of the connectivity architecture of the CLS system, as well as details as to how Members receive information regarding their respective payment instructions and accounts. As noted below under Key Consideration 3, CLS Bank discusses the CLS system design and participant rights and obligations in multilateral and bilateral forums, and requires all prospective and current Members and Liquidity Providers to participate in extensive testing and trialing to ensure they understand the CLS system design and demonstrate an ability to recover in a timely fashion. Relevant aspects of these discussions are detailed under Principle 3, Principle 7 and Principle 17.

Key Consideration 3. An FMI should provide all necessary and appropriate documentation and training to facilitate participants' understanding of the FMI's rules and procedures and the risks they face from participating in the FMI.

23.3 Participant Understanding

CLS Bank facilitates its Members' understanding of its Rules and procedures and the risks they face from settling payment instructions in the CLS system through frequent and regular contact with Members and other participants in the CLS ecosystem to discuss the Settlement Service and related issues, including risks resulting from participation in the Settlement Service, in a variety of forums as discussed under Principle 3. If participant behavior demonstrates a lack of understanding of the Rules, such as failure to successfully complete testing as discussed under Principle 7, CLS Bank will engage the Member and/or relevant regulators to ensure corrective actions are taken.

If any Member action or other issue affects the CLS system, this information is communicated to the Members by CLS Bank in accordance with well-established procedures, detailed under Principle 17.

Additionally, CLS Bank's work on resolution regimes, including the Member War Game detailed under Principle 3, includes a focus on developing and enhancing Settlement Member understanding of the potential decisions in a Settlement Member resolution scenario as well as the subsequent ramifications of those decisions on the Settlement Member, the Settlement Service, the broader CLS ecosystem, and ultimately, financial markets more generally.

Key Consideration 4. An FMI should publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The FMI should provide clear descriptions of priced services for comparability purposes.

23.4 Fees Disclosure

CLS Bank has publicly disclosed certain elements of its pricing policy on its group corporate (public) website, and a high level summary of the pricing policy is included under Principle 21. The pricing policy is also currently an exhibit to the Member Handbook, and is therefore disclosed to all Members. Amendments to the pricing policy are disclosed to Members in accordance with the process for disclosing other amendments to the Member Handbook, described above and detailed under Principle 1.

Key Consideration 5. An FMI should complete regularly and disclose publicly responses to the CPSS-IOSCO Disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.

23.5 Disclosure and Monthly Data

This Disclosure is published on the CLS group corporate website in line with the CPSS-IOSCO Disclosure framework. CLS Bank also posts data on transaction values and volumes on its corporate website on a monthly basis.

LIST OF PUBLICLY AVAILABLE RESOURCES

(All available at: <http://www.cls-group.com/MC/Pages/Library.aspx>):

1. CLS Group Articles of Association August 2013
2. CLS Bank International Rules (January 23, 2017)
3. CLS Bank Assessment of Compliance with the Core Principles for Systemically Important Payment Systems (December 2011)
4. CLS Statistics on Foreign Exchange Activity (October 18, 2010)
5. CLS Submission to US Treasury re Exemption for FX Forwards and Swaps (November 23, 2010)
6. CLS Best Practices for Third Parties and Third Party Service Providers

The public version of the CLS Risk Appetite Statement is available at <https://www.cls-group.com/MC/Documents/RiskAppetiteStatement.pdf>

Additionally, the *Protocol for the Cooperative Oversight Arrangement of CLS* is available at http://www.federalreserve.gov/paymentsystems/cls_protocol.htm

ANNEX A

Glossary of Defined Terms

Term	Definition
Account	The single, multicurrency account carried on the books and records of CLS Bank for a Settlement Member
Account Balance	As at the time calculated, in respect of a Settlement Member, the sum of the positive and negative Currency Balances included in such Settlement Member's Account, each such Currency Balance expressed in its Base Currency Equivalent
Affiliate Member	A Settlement Member that is a qualifying affiliate of another Settlement Member
Aggregate Short Position	The sum of a Settlement Member's short positions, each such short position expressed in its Base Currency Equivalent and adjusted by the applicable haircut
Aggregate Short Position Limit	In respect of a Settlement Member, the maximum Aggregate Short Position that such Settlement Member is permitted to incur at any time
Aggregation Party	An entity for which a participant in the Aggregation Service has agreed to be responsible as an Aggregation Party for purposes of submitting trade and/or rescind messages through the submission process to the Aggregation Service provided by CLSAS
Aggregation Service	The services provided by CLSAS in which spot market FX transactions involving the same pair of transaction counterparties and the same currencies are aggregated together to comprise a cumulative amount of "sell" currency. In this manner, the Aggregation Service provided by CLSAS compresses multiple transactions into one transaction.
Aggregation Service Rules	The separate set of rules applicable to CLSAS, governed by New York law
Annual General Meeting	The annual general meeting where the CLS Group Holdings shareholders elect directors to the CLS Group Board, approve CLS Group Holdings' financials and the independent auditor, and undertake any other business reserved for shareholders
Base Currency	United States Dollars (USD)
Base Currency Equivalent	As at the time calculated, (i) for any amount denominated in the Base Currency, that amount; and (ii) for any amount denominated in any other Eligible Currency, such amount converted into the Base Currency at the prevailing mid-rate using the average of the bid and offer quotations of the spot rate of exchange of such Eligible Currency (as provided by the rates sources determined by CLS Bank, in its reasonable discretion, to be representative of the market rate for such Eligible Currency)
BCIRT	Business Continuity Incident Response Team
BCP	Business Continuity Plan
Bilateral rescind deadline	In respect of an Eligible Currency and a settlement session, the time on a business day beyond which a Settlement Member may not bilaterally rescind a payment instruction
CCP	Central counterparty
CCS	Cross currency swap
CCS payment instruction	An FX payment instruction relating to the initial or final deliverable leg of a CCS transaction
CEO	Chief Executive Officer
CEST	Central European Summer Time
CET	Central European Time
CLS Bank	CLS Bank International

CLS Bank Articles	The CLS Bank Articles of Association
CLS Bank By-laws	The CLS Bank By-laws
CLS Capital Raising Plan	CLS Bank’s documented recapitalization tools
CLS Corporate Strategy	Articulates the CLS group strategic priorities
CLS Bank Documents	The Rules, Member Handbook, and Member Agreements, collectively
CLS ecosystem	Collectively, the following: <ul style="list-style-type: none"> • The CLS system's internal infrastructure • Settlement Members • Nostro agents • Third parties and third party service providers • Liquidity Providers • RTGS systems • Certain other FMIs • Critical service providers
CLS executive management	Members of the executive management of the CLS group
CLS group	The CLS group of entities, collectively
CLS Group Holdings	CLS Group Holdings AG, the ultimate holding company of all the CLS group entities
CLS Group Holdings Articles	The Articles of Association of CLS Group Holdings
CLS Group Holdings shareholder	An entity which holds at least 1972 registered shares of CLS Group Holdings, which are registered in the name of the entity on the books of CLS Group Holdings as a shareholder in respect of those shares; provided, however, that if such entity is holding shares of CLS Group Holdings on behalf of another unaffiliated entity, the unaffiliated entity shall be considered a “CLS Group Holdings Shareholder” for purposes of the CLS Bank Documents if the unaffiliated entity demonstrates, to the satisfaction of CLS Bank, its beneficial ownership and control of the requisite shares of CLS Group Holdings and associated voting rights.
CLS Jurisdictions	The 24 jurisdictions where Settlement Members have their head or home offices, or where CLS Bank settles the currency: Australia, Belgium, Canada, Denmark, England & Wales, France, Germany, Hong Kong, Hungary, Israel, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Scotland, Singapore, South Africa, South Korea, Spain, Sweden, Switzerland, and the United States
CLS Vision Statement	The vision statement of the CLS group
CLS Recovery and Orderly Wind-Down Plan	A plan that contemplates the recovery and/or orderly wind-down of the Settlement Service.
CLS Risk Appetite Statement	The risk appetite of the CLS group, which clarifies the type and amount of risk that the CLS group is willing to accept and manage pursuant to the CLS Vision Statement and CLS Corporate Strategy
CLS Services	CLS Services Ltd.
CLS strategic pillars	The five pillars of the CLS Corporate Strategy
CLS UK Holdings	CLS UK Intermediate Holdings, Ltd.
CLSAS	CLS Aggregation Services LLC
Comprehensive Reviews	Detailed Settlement Member and Liquidity Provider credit reviews
Compression	The triReduce CLS Forward FX Compression Service that CLS Services and CLS Bank facilitate by providing TriOptima with matched FX forward-dated trade data for participating Members
Compression Participants	Entities participating in Compression that have entered into <i>Agreements Relating to the Disclosure of Information in respect of Trade Compression</i> with CLS Services and CLS Services

CPSS	Committee on Payment and Settlement Systems
CPSS-IOSCO Disclosure framework	The <i>Principles for financial market infrastructures: disclosure framework and assessment methodology</i> , published by CPSS-IOSCO in December 2012
CPMI	Committee on Payments and Market Infrastructure
CRO	Chief Risk Officer
Currency Balance	As at the time calculated, the current amount (positive or negative) of a particular Eligible Currency included in an Account, as indicated on the books and records of CLS Bank. A Currency Balance is not a separate Account
Currency Close Deadline	In respect of an Eligible Currency and a settlement session, the time at which the CLS system will, in the ordinary course of business, reject payment instructions on the settlement processing queue that have not settled
December 2014 Disclosure	CLS Bank's December 2014 Disclosure publication
Directors' Code of Conduct	CLS Group Holdings Directors Code of Conduct, which provides additional guidance regarding of the responsibilities of the CLS Group Boards and Committees, including fiduciary duties and conflicts of interest
Directors' Handbook	CLS Group Directors Governance Handbook
Dodd-Frank Act	Dodd-Frank Wall Street Reform and Consumer Protection Act
DTCC Deriv/SERV	DTCC Deriv/SERV LLC or an affiliate thereof
Eligible Currency	A currency that has been (and remains) designated as an Eligible Currency pursuant to the Rules, with respect to which CLS Bank offers the Settlement Service
EMC	Executive Management Committee
Employee Code of Conduct	CLS Group Employee Code of Conduct
ERM Framework	CLS Bank's Enterprise-wide Risk Management Framework
ERT	Executive Response Team
EST	Eastern Standard Time
Executive Handbook	CLS Group Executive Management Handbook
FDICIA	The Federal Deposit Insurance Corporation Improvement Act of 1991
FMI	A financial market infrastructure that is a multilateral system among participating institutions, including the operator of the system, used for the purposes of clearing, settling, or recording payments, securities, derivatives, or other financial transactions (including a systemically important payment system, central securities depository, securities settlement system, trade repository, or CCP), or an affiliate of such a system
FMU	A multilateral system that provides the essential infrastructure for transferring, clearing, and settling payments, securities, and other financial transactions among financial institutions or between financial institutions and the system
FX	Foreign exchange
FX payment instruction	An instruction relating to an underlying FX transaction
FX transaction	A single deliverable FX spot or forward transaction, a single leg of a deliverable FX swap transaction, an initial or final deliverable leg of a CCS transaction, a single exercised deliverable FX option and any similar single deliverable FX transaction or any other type of deliverable FX transaction specified in the Member Handbook; provided that, except as otherwise expressly permitted in the Member Handbook, an FX transaction may not be the result of an agreement to novate or other agreement to combine the legal obligations associated with two or more

	FX transactions into a single FX transaction.
Group of Twenty	A group of financial institutions that joined forces beginning in 1994 to develop a risk-reducing, multicurrency FX settlement service to protect against the loss of principal in the settlement of FX transactions
G-SIFI	Global Systemically Important Financial Institution
Haircut	With respect to an Eligible Currency, the percentage increase of a negative Currency Balance or reduction of a positive Currency Balance based on (a) the volatility of the historic FX movements in the applicable Eligible Currency determined by CLS Bank, (b) an add-on components and (c) any other factors that CLS Bank may identify in the Member Handbook
IBM Agreement	The Services Agreement between IBM and CLS Bank under which IBM provides operational services for the CLS system, as well as service management and support functions
In/Out Swap Agreement	The Agreement Relating to the Provision of Services by CLS Services to Settlement Members participating in the In/Out Swap Program
In/Out Swap Program	A service under which CLS Services agrees to act as calculation agent, to identify potential swap transactions that would reduce the participating Settlement Members' funding obligations to CLS Bank
Initial Pay-In Schedule / IPIS	An initial Pay-In Schedule generated per the operational timeline in Diagram 3 that includes the expected net Pay-In and Pay-Out amounts resulting from the settlement of instructions that have been classified as Settlement Eligible Instructions
Initial Pay-In Schedule deadline	With respect to a settlement session, the time on a business day at which CLS Bank will, in the ordinary course of business, begin to generate the Initial Pay-In Schedule for that settlement session
IOSCO	Technical Committee of the International Organization of Securities Commissions
KPIs	Key performance indicators
Liquidity Agreement	The Foreign Exchange Liquidity Agreement entered into between CLS Bank and its Liquidity Providers
Liquidity facility	A liquidity facility entered into with a Liquidity Provider pursuant to a Liquidity Agreement
Liquidity Provider	A financial institution with which CLS Bank enters into and maintains liquidity facilities
LNAFE	The amount of liquid net assets funded by equity
Long position	In respect of Currency Balance that is greater than zero, the amount by which such Currency Balance is greater than zero
Main Session	The main settlement session for which payment instructions may be submitted by a Member
MarkitWire	A CCS trade booking platform operated by MarkitSERV, a subsidiary of IHS Markit
Master Policy	The overarching CLS group policy which governs the documentation of risk management standards, controls, and processes
Member	A Settlement Member or a User Member
Member Agreement	A Settlement Member Agreement or User Member Agreement, as applicable
Member Handbook	The Member Handbook of CLS Bank
Member War Game	CLS Bank's Member Resolution War Game
NDF	Non-Deliverable Forward
NIST CSF	The United States National Institute of Standards and Technology Cyber Security Framework
Non-shareholder Member	A Settlement Member that is not a CLS Group Holdings shareholder or an affiliate of a CLS Group Holdings shareholder

Nostro agent	A financial institution that acts as agent for a Settlement Member to facilitate payments from or to such Settlement Member's Account in an Eligible Currency
Nostro Best Practices	CLS Bank Best Practices for Nostro Agents and Nostro Clients
OFAC	U.S. Department of the Treasury's Office of Foreign Assets Control
OLA	The Orderly Liquidation Authority provisions of Title II of the Dodd-Frank Act
Organizational Regulations	The Organizational Regulations of CLS Group Holdings, which establish the organization and administration of the company and of CLS Group as a whole and define the responsibilities and authorities of the respective CLS group's executive bodies, including the CLS Group Board, Board Committees, the Chairman and Deputy Chairman, the CEO and CLS executive management
ORM	Operational Risk Management
OTC	Over-the-counter
Outside Director	Outside Directors are deemed to meet additional specific criteria for independence as provided in the Organizational Regulations and are not employed by or affiliated with a CLS group entity or a CLS Group Holdings shareholder
Pay-In	A payment made by a Settlement Member to CLS Bank in accordance with the Rules
Pay-In Call for Currency Close	Means CLS Bank will issue a Pay-In Call for Currency Close prior to the closing time of an RTGS system for a particular Eligible Currency, where a Settlement Member has an uncovered short position in a closing currency (based upon payment instructions submitted by the Settlement Member that have already settled)
Pay-In Call for Settlement	Means a request by CLS Bank for Pay-Ins by Settlement Members that have unsettled payment instructions with a Settlement Member that has failed to satisfy its funding obligations. The Pay-in Call for Settlement would be an amount that, if paid, would allow the remaining Settlement Eligible Instructions between non-failing Settlement Members to settle
Pay-In Schedule	With respect to a settlement session, a schedule delivered by CLS Bank to a Settlement Member indicating the currency amounts that such Settlement Member must Pay-In on or before certain specified times on a given business day in accordance with the Rules. A Pay-In Schedule may also include other information relevant to a Settlement Member, and shall include estimated Pay-Outs to be made to such Settlement Member for such settlement session by the end of such business day in each Eligible Currency assuming settlement of all its Settlement Eligible Instructions with a settlement date equal to such business day.
Pay-Out	A payment made by CLS Bank to a Settlement Member in accordance with the Rules
Payment instruction	(i) a payment instruction submitted by a Member through the submission process directing CLS Bank to settle certain payment entitlements and obligations arising pursuant to a transaction and (ii) an instruction resulting from the split of Settlement Eligible Instructions.
PFMI	The <i>Principles for financial market infrastructures</i> , published by CPSS-IOSCO in April 2012
Positive Adjusted Account Balance	An Adjusted Account Balance that is greater than or equal to zero
Prior Opinion	The last annual legal opinion as prepared for CLS Bank by its jurisdictional counsel
PvP	Payment-versus-payment

Revised Pay-In Schedule / RPIS	Differs from the Initial Pay-In Schedule due to the inclusion of same-day instructions (<i>i.e.</i> , payment instructions that were designated as Settlement Eligible Instructions after the Initial Pay-In Schedule deadline), payment instructions that were bilaterally rescinded, the application of In/Out Swaps, and/or application of any overnight balances held in a Settlement Member's Account
RTGS	Real Time Gross Settlement
RTO	Recovery time objective
Rules	The CLS Bank International Rules
Same-day instruction	A payment instruction that is classified as a Settlement Eligible Instruction after the Initial Pay-In Schedule deadline on the settlement date specified in such payment instruction
SDS Session	Also referred to as the <i>Americas Same Day Settlement Session</i> , a settlement session dedicated to the settlement of payment instructions relating to underlying same-day USD/CAD FX transactions
Settlement Completion Target Time	The settlement completion target time prescribed for each settlement session
Settlement date	The date specified in a payment instruction as the date on which such payment instruction is scheduled for settlement by CLS Bank
Settlement Eligible Instructions	Matched payment instructions which are classified as eligible for settlement pursuant to the Rules
Settlement Member	An entity that has been approved as a Settlement Member of CLS Bank has received an executed copy of its Settlement Member Agreement from CLS Bank and has not been terminated
Settlement Member Agreement	With respect to each Settlement Member, the agreement among such Settlement Member, CLS Bank and CLS Services substantially in the form set forth in the Member Handbook
Settlement Processing Queue	The list of all Settlement Eligible Instructions to be processed by CLS Bank on a particular business day
Settlement Service	CLS Bank's service for settling its Members' FX payment instructions
Settlement session	The Main Session or the SDS Session, as applicable
SF Regulations	The Financial Markets and Insolvency (Settlement Finality) Regulations 1999
Short Position	In respect of Currency Balance that is less than zero, the amount by which such Currency Balance is less than zero
Short Position Limit	In respect of an Eligible Currency and a settlement session, the maximum short position a Settlement Member may have at any time in that Eligible Currency and, unless otherwise reduced by CLS Bank, shall equal (i) the total amount of all available committed liquidity facilities in such Eligible Currency (or such lesser amount that CLS Bank may determine from time to time) minus (ii) any amounts drawn under such liquidity facilities minus (iii) the amount of the largest available committed liquidity facility among such liquidity facilities (after taking into account any amounts already drawn)
SLA	Service Level Agreement
Third parties	Institutions that may have indirect access to the CLS system through Settlement Members who, on behalf of such institutions, agree to be responsible for submitting payment instructions to CLS Bank with respect to such institutions' underlying transactions
Third Party Best Practices	CLS Bank Best Practices for Third Parties and Third Party Service Providers
TSM	Transition Settlement Member
TriOptima	TriOptima AB
Unilateral rescind	In respect of an Eligible Currency and a settlement session, the time on a

deadline	business day beyond which a Member may not unilaterally rescind a payment instruction pursuant to the Rules
User Member Agreement	With respect to each User Member, the agreement among such User Member and CLS Bank substantially in the form set forth in the Member Handbook
VMO	CLS Bank's vendor management office
Warehouse	Trade Information Warehouse of Deriv/SERV, a wholly-owned subsidiary of DTCC

ANNEX B

Example of the Application of Haircut Percentages

Example of haircut percentages (hypothetical) of 25% for each of the EUR and USD. Instruction of Member to buy EUR 100,000,000 for USD 115,000,000.

Assumption: Member's actual Currency Balances are EUR -50,000,000 and USD 85,000,000 (after the prior settlement of several other instructions submitted by the Member).

- A. The CLS system evaluates, as part of the Settlement Processing Queue, the Member's instruction to buy EUR 100,000,000 and sell USD 115,000,000.
- B. In evaluating the instruction against the risk management tests, the CLS system simulates pro forma balances of EUR 50,000,000 and USD -30,000,000.
- C. The EUR balance of 50,000,000 is converted to the USD Base Currency Equivalent. Assuming a EUR-USD exchange rate of 1.36 to 1, the CLS system simulates a USD Base Currency Equivalent balance of 68,000,000:

	<u>Simulated Balance</u>	<u>Exchange Rate</u>	<u>Simulated Balance in Base Currency Equivalent</u>
EUR	50,000,000	1.3600	68,000,000
USD	-30,000,000	1.0000	-30,000,000

- D. Application of Haircuts – Applying the haircut percentages of 25% (hypothetical) for both the EUR and USD, the Member is treated as having a EUR balance of 51,000,000 (Base Currency Equivalent) and a USD balance of -37,500,000, yielding an “Adjusted Account Balance” of 13,500,000 (Base Currency Equivalent).

	<u>Simulated Balance in Base Currency Equivalent</u>	<u>Haircut</u>	<u>Simulated Haircut- Adjusted Currency Balance</u>
EUR	68,000,000	25%	51,000,000
USD	-30,000,000	25%	-37,500,000
Adjusted Account Balance (following application of haircuts)			13,500,000

Because the overall account balance is 13,500,000 (*i.e.*, positive) following the application of the haircuts, this instruction does settle.

- E. Failure to Make Pay-Ins – If the Settlement Member then fails to cover its short position of US\$30 million and does not respond to a Pay-In Call for Currency Close, the short position is more than offset by the Member's long position in EUR.

CLS Bank will access its committed USD liquidity facilities to acquire the US\$30 million it needs to complete its Pay-Out obligations to Members with long positions in USD. In accessing its liquidity facilities, CLS Bank would exchange currency in which CLS Bank has balances in its central bank accounts; in this example, part of the EUR long position in the failing Member's Account.

The haircuts are designed to ensure that CLS Bank does not suffer an FX market-related loss after it enters into a transaction under a liquidity facility, by creating “excess” assets in CLS Bank's central bank accounts – without such excess assets created by the haircuts, the instruction would not have settled in the first place.

After completing the first part of the FX swap with a Liquidity Provider (the “today” leg), the value of USD (*i.e.*, the currency that CLS Bank is obligated to return to the Liquidity Provider) could rise in value against the Euro. In this example, there are potentially 38,000,000 (USD Base Currency Equivalent) of excess assets in Euro central bank funds. Some of these funds may be paid out to Members with long positions in USD, in accordance with the Pay-Out algorithm. The remaining funds will provide a “cushion” against this type of rise in value of USD against EUR, in the event that CLS Bank has to purchase USD in the market based on the failing Member’s continued failure to make the required Pay-In.

ANNEX C

Example of FX Two-Currency Payment Instructions and Single-Currency Payment Instructions

Assume the CLS system receives the following payment instructions relating to two separate FX transactions and two separate single-currency transactions from a Settlement Member for settlement on Day 1.

Payment Instruction	CCY	Buy / Sell	Amount	CCY	Buy / Sell	Amount
FX 1	EUR	Buy	100,000,000	USD	Sell	-115,000,000
Single ccy1				USD	Sell	-5,000,000
Single ccy2				USD	Buy	10,000,000
FX 2	EUR	Sell	-50,000,000	USD	Buy	75,000,000

Based on the above positions, the Settlement Member has a Pay-In requirement of 35 million USD.

STEP 1. The CLS system begins processing payment instructions on the settlement processing queue for settlement at 07:00 CET, starting with the evaluation of FX payment instruction 1 against the three risk management tests.

CCY	Settlement Member's actual Currency Balance (original currency)	FX Payment Instruction 1	Simulated Currency Balance (original currency)	Currency Rate	Simulated Currency Balance (base currency)	Haircut	Simulated Haircut Adjusted Currency Balance
EUR	0	100,000,000	100,000,000	1.3600	136,000,000	10.0%	122,400,000
USD	0	-115,000,000	115,000,000	1.0000	-115,000,000	10.0%	-126,500,000
<i>Simulated Account Balance</i>					21,000,000		
<i>Simulated Adjusted Account Balance</i>							-4,100,000

Result: FX payment instruction 1 does not settle because settlement would result in a negative Adjusted Account Balance.

STEP 2. The CLS system continues to process the payment instructions on the queue by evaluating the payment instructions, in this case payment instruction single-currency 1, against the three risk management tests:

CCY	Settlement Member's actual Currency Balance (original currency)	Single-Currency Payment Instruction 1	Simulated Currency Balance (original currency)	Currency Rate	Simulated Currency Balance (base currency)	Haircut	Simulated Haircut Adjusted Currency Balance
EUR	0	0	0	1.3600	0	10.0%	0
USD	0	-5,000,000	-5,000,000	1.0000	-5,000,000	10.0%	-5,500,000
<i>Simulated Account Balance</i>					-5,000,000		
<i>Simulated Adjusted Account Balance</i>							-5,500,000

Result: Payment instruction single-currency 1 does not settle because settlement would result in a negative Adjusted Account Balance.

STEP 3. The CLS system continues to process the payment instructions on the queue by evaluating the payment instructions, in this case single-currency payment instruction 2, against the three risk management tests:

.CCY	Member's actual Currency Balance (original currency)	Single-Currency Payment Instruction 2	Simulated Currency Balance (original currency)	Currency Rate	Simulated Currency Balance (base currency)	Haircut	Simulated Haircut Adjusted Currency Balance
EUR	0	0	0	1.3600	0	10.0%	0
USD	0	10,000,000	10,000,000	1.0000	10,000,000	10.0%	9,000,000
<i>Simulated Account Balance</i>					10,000,000		
<i>Simulated Adjusted Account Balance</i>							9,000,000

Result: Single-currency payment instruction 2 does settle because settlement would result in a positive Adjusted Account Balance.

STEP 4. The CLS system continues to process the payment instructions on the queue by evaluating the payment instructions, in this case FX payment instruction 2, against the three risk management tests:

CCY	Member's actual Currency Balance (original currency)	FX Payment Instruction 2	Simulated Currency Balance (original currency)	Currency Rate	Simulated Currency Balance (base currency)	Haircut	Simulated Haircut Adjusted Currency Balance
EUR	0	-50,000,000	-50,000,000	1.3600	-68,000,000	10.0%	-74,800,000
USD	10,000,000	75,000,000	85,000,000	1.0000	85,000,000	10.0%	76,500,000
<i>Simulated Account Balance</i>					17,000,000		
<i>Simulated Adjusted Account Balance</i>							1,700,000

Result: FX payment instruction 2 does settle because settlement would result in a positive Adjusted Account Balance.

STEP 5. The CLS system continues to process the payment instructions on the queue by evaluating the payment instructions, in this case FX payment instruction 1, against the three risk management tests:

CCY	Member's actual Currency Balance (original currency)	FX Payment Instruction 1	Simulated Currency Balance (original currency)	Currency Rate	Simulated Currency Balance (base currency)	Haircut	Simulated Haircut Adjusted Currency Balance
EUR	-50,000,000	100,000,000	50,000,000	1.3600	68,000,000	10.0%	61,200,000
USD	85,000,000	-115,000,000	-30,000,000	1.0000	-30,000,000	10.0%	-33,000,000
<i>Simulated Account Balance</i>					38,000,000		
<i>Simulated Adjusted Account Balance</i>							28,200,000

Result: FX payment instruction 1 now does settle because settlement would result in a positive Adjusted Account Balance.

STEP 6. The CLS system continues to process the payment instructions on the queue by evaluating the payment instructions, in this case single-currency payment instruction 1, against the three risk management tests:

CCY	Member's actual Currency Balance (original currency)	Single-Currency Payment Instruction 1	Simulated Currency Balance (original currency)	Currency Rate	Simulated Currency Balance (base currency)	Haircut	Simulated Haircut Adjusted Currency Balance
EUR	50,000,000	0	50,000,000	1.3600	68,000,000	10.0%	61,200,000
USD	-30,000,000	-5,000,000	-35,000,000	1.0000	-35,000,000	10.0%	-38,500,000
<i>Simulated Account Balance</i>					33,000,000		
<i>Simulated Adjusted Account Balance</i>							22,700,000

Result: Single-currency payment instruction 2 now does settle because settlement would result in a positive Adjusted Account Balance.

Following the successful settlement of all four payment instructions (two FX payment instructions and two single-currency payment instructions) of the Settlement Member, if the Settlement Member would then fail to cover its short position of 35 million USD, the short position is fully offset by its long position in EUR. If the Settlement Member does not respond to a Pay-In Call for Currency Close, CLS Bank will access its committed liquidity facilities in USD to acquire the 35 million USD it needs to complete its Pay-Out obligations to Settlement Members with long positions in USD.

It is important to remember that CLS Bank does not guarantee the settlement of any payment instruction. Assume a situation where a Settlement Member has submitted one single-currency payment instruction where the Member is paying currency to another party.

Payment Instruction	CCY	Buy / Sell	Amount	CCY	Buy / Sell	Amount
Single ccy1				USD	Sell	-5,000,000

Based on the above position, this Settlement Member has a Pay-In requirement of 5 million USD. As illustrated below, if this Pay-In is not satisfied, then this payment instruction will not settle because settlement would result in a negative Adjusted Account Balance and, accordingly, be rejected by the CLS system at the end of the currency close for USD.

CCY	Member's actual Currency Balance (original currency)	Single-Currency Payment Instruction 1	Simulated Currency Balance (original currency)	Currency Rate	Simulated Currency Balance (base currency)	Haircut	Simulated Haircut Adjusted Currency Balance
EUR	0	0	0	1.3600	0	10.0%	0
USD	0	-5,000,000	-5,000,000	1.0000	-5,000,000	10.0%	-5,500,000
<i>Simulated Account Balance</i>					-5,000,000		
<i>Simulated Adjusted Account Balance</i>							-5,500,000

The CLS system applies the three risk management tests to each payment instruction in the same manner, without regard as to whether it is a single-currency payment instruction or an FX payment instruction. The application of the tests to single-currency payment instruction 1 is no different from the application of the tests to FX payment instructions.

Assume, for example, a situation where a Settlement Member has submitted one FX payment instruction:

Payment Instruction	CCY	Buy / Sell	Amount	CCY	Buy / Sell	Amount
FX 1	EUR	Buy	100,000,000	USD	Sell	-115,000,000

Based on the above position, this Settlement Member has a Pay-In requirement of 115 million USD. As illustrated below, if this Pay-In is not satisfied, then this payment instruction will not settle because settlement would result in a negative Adjusted Account Balance and, accordingly, be rejected by the CLS system at the end of the currency close for EUR.

CCY	Member's actual Currency Balance (original currency)	FX Payment Instruction 1	Simulated Currency Balance (original currency)	Currency Rate	Simulated Currency Balance (base currency)	Haircut	Simulated Haircut Adjusted Currency Balance
EUR	0	100,000,000	100,000,000	1.3600	136,000,000	10.0%	122,400,000
USD	0	-115,000,000	115,000,000	1.0000	-115,000,000	10.0%	-126,500,000
<i>Simulated Account Balance</i>					21,000,000		
<i>Simulated Adjusted Account Balance</i>							-4,100,000

ANNEX D

Example of In/Out Swap Transactions

Assume that Member In/Out Swap participants have the following Initial Pay-in Schedule positions (in USD equivalent). The target trade-down position is: (i) any short position for non-Asia/Pacific currency and (ii) any long position in an Asia/Pacific currency in excess of 50 (the shaded amounts are in excess of the trade-down target).

Initial Table – Member Positions

Member Positions	JPY	EUR	GBP	USD
M 1	1,250	-3,500	-1,500	3,250
M 2	-2,750	1,500	-1,750	2,750
M 3	-1,500	2,500	3,000	-3,750
M 4	3,000	-500	250	-2,250
Total	0	0	0	0

Also assume that Member In/Out Swap participants have the following counterparty credit limits:

Initial Table – Credit Limits

Member Credit Limits	M 1	M 2	M 3	M 4
M 1	-	500	1,250	250
M 2	1,000	-	750	500
M 3	1,000	500	-	100
M 4	500	500	500	-

The In/Out Swap algorithm targets positions in excess of the trade-down target in descending order based upon USD equivalent value. The algorithm will calculate In/Out Swap transactions by maximizing: (i) the trade-down based upon the value of the counter currency; and (ii) the available credit limit between the two In/Out Swap participants.

In/Out Swap Transaction 1

In this example Member 3 has the largest position in excess of the 50 trade-down target, -3,750 USD. Member 3's largest value counter currency is 3,000 GBP. Two counter parties, Member 1 and Member 2 have opposite USD / GBP positions. The largest counterparty credit limit availability is 1,000 between Member 3 and Member 1. As a result the following In/Out Swap transaction is calculated:

In leg - Member 3 buying 1,000 USD selling 1,000 GBP with Member 1.
Out leg - Member 3 buying 1,000 GBP selling 1,000 USD with Member 1.

The positions are updated:

Table 1A

Member Positions	JPY	EUR	GBP	USD
M 1	1,250	-3,500	-500	2,250
M 2	-2,750	1,500	-1,750	2,750
M 3	-1,500	2,500	2,000	-2,750
M 4	3,000	-500	250	-2,250
Total	0	0	0	0

Also assume that Member In/Out Swap participants now have the following counterparty credit limits available following Transaction 1:

Table 1B

Member Credit Limits	M 1	M 2	M 3	M 4
M 1	-	500	250	250
M 2	1,000	-	750	500
M 3	0	500	-	100
M 4	500	500	500	-

In/Out Swap Transaction 2

Now Member 1 has the largest position in excess of the 50 trade-down target, -3,500 EUR. Member 1's largest value counter currency is 2,250 USD. However, only Member 3 has opposite Currency Balances that could be traded down. No swap is possible because there is no credit availability between Member 3 and Member 1.

Member 1's next largest value counter currency is 1,250 JPY. One counterparty, Member 2, has an opposite EUR / JPY position and available credit limits. As a result the following In/Out Swap transaction is calculated:

In leg - Member 1 buying 500 EUR selling 500 JPY with Member 2.

Out leg - Member 1 buying 500 JPY selling 500 EUR with Member 2.

The positions are updated:

Table 2A

Member Positions	JPY	EUR	GBP	USD
M 1	750	-3,000	-500	2,250
M 2	-2,250	1,000	-1,750	2,750
M 3	-1,500	2,500	2,000	-2,750
M 4	3,000	-500	250	-2,250
Total	0	0	0	0

Also assume that Member In/Out Swap participants now have the following counterparty credit limits available following Transaction 2:

Table 2B

Member Credit Limits	M 1	M 2	M 3	M 4
M 1	-	0	250	250
M 2	500	-	750	500
M 3	0	500	-	100
M 4	500	500	500	-

In/Out Swap Transaction 3

Now Member 4 has the largest position in excess of the 50 trade-down target, 3,000 JPY. Member 1 also has a -3,000 EUR position but has no further credit limit availability to trade down the position. Member 4's largest value counter currency is -2,250 USD. One counterparty, Member 2, has an opposite JPY / USD position and available credit limits. As a result the following In/Out Swap transaction is calculated:

In leg - Member 4 buying 500 USD selling 500 JPY with Member 2.

Out leg - Member 4 buying 500 JPY selling 500 USD with Member 2.

The positions are updated:

Table 3A

Member Positions	JPY	EUR	GBP	USD
M 1	750	-3,000	-500	2,250
M 2	-1,750	1,000	-1,750	2,250
M 3	-1,500	2,500	2,000	-2,750
M 4	2,500	-500	250	-1,750
Total	0	0	0	0

Also assume that Member In/Out Swap participants now have the following counterparty credit limits available following Transaction 3:

Table 3B

Member Credit Limits	M 1	M 2	M 3	M 4
M 1	-	0	250	250
M 2	500	-	750	0
M 3	0	500	-	100
M 4	500	0	500	-

In/Out Swap Transaction 4

Now Member 3 has the largest position in excess of the 50 trade-down target, -2,750 USD. Member 3's largest value counter currency is 2,000 GBP. One counterparty, Member 2, has an opposite USD / GBP position and available credit limits. As a result the following In/Out Swap transaction is calculated:

In leg - Member 3 buying 500 USD selling 500 GBP with Member 2.

Out leg - Member 3 buying 500 GBP selling 500 USD with Member 2.

The positions are updated:

Table 4A

Member Positions	JPY	EUR	GBP	USD
M 1	750	-3,000	-500	2,250
M 2	-1,750	1,000	-1,250	1,750
M 3	-1,500	2,500	1,500	-2,250
M 4	2,500	-500	250	-1,750
Total	0	0	0	0

Also assume that Member In/Out Swap participants now have the following counterparty credit limits available following Transaction 4:

Table 4B

Member Credit Limits	M 1	M 2	M 3	M 4
M 1	-	0	250	250
M 2	500	-	250	0
M 3	0	0	-	100
M 4	500	0	500	-

In/Out Swap Transaction 5

Now Member 4 has the largest positions in excess of the 50 trade-down target, 2,500 JPY and -1,750 USD. Member 4's next largest value counter currency is -500 EUR. One counterparty, Member 3, has an opposite JPY / EUR position and available credit limits. As a result the following In/Out Swap transaction is calculated:

In leg - Member 4 buying 100 EUR selling 100 JPY with Member 3.

Out leg - Member 4 buying 100 JPY selling 100 EUR with Member 3.

The positions are updated:

Table 5A

Member Positions	JPY	EUR	GBP	USD
M 1	750	-3,000	-500	2,250
M 2	-1,750	1,000	-1,250	1,750
M 3	-1,400	2,00	1,500	-2,250
M 4	2,400	-500	250	-1,750
Total	0	0	0	0

Also assume that Member In/Out Swap participants now have the following counterparty credit limits available following Transaction 5:

Table 5B

Member Credit Limits	M 1	M 2	M 3	M 4
M 1	-	0	250	250
M 2	500	-	250	0
M 3	0	0	-	0
M 4	400	0	500	-

In/Out Swap Transaction 6

Now Member 4 has the largest position in excess of the 50 trade-down target, -1,750 USD. Member 4's next largest value counter currency is 250 GBP. One counterparty, Member 1, has an opposite USD / GBP position and available credit limits. As a result the following In/Out Swap transaction is calculated:

In leg - Member 4 buying 250 USD selling 250 GBP with Member 1.

Out leg - Member 4 buying 250 GBP selling 250 USD with Member 1.

The positions are updated:

Table 6A

Member Positions	JPY	EUR	GBP	USD
M 1	750	-3,000	-250	2,000
M 2	-1,750	1,000	-1,250	1,750
M 3	-1,400	2,00	1,500	-2,250
M 4	2,400	-500	0	-1,500
Total	0	0	0	0

Also assume that Member In/Out Swap participants now have the following counterparty credit limits available following Transaction 6:

Table 6B

Member Credit Limits	M 1	M 2	M 3	M 4
M 1	-	0	250	0
M 2	500	-	250	0
M 3	0	0	-	0
M 4	150	0	500	-

In this example, no further In/Out Swap trade-down is possible because of lack of credit limit availability.