

NATIONAL SECURITIES CLEARING CORPORATION

Disclosure Framework for Covered Clearing Agencies and
Financial Market Infrastructures

December 2017

The logo for DTCC, consisting of the letters 'DTCC' in a bold, white, sans-serif font.

Securing Today. Shaping Tomorrow.®

Responding Institution: National Securities Clearing Corporation (“NSCC”)
Jurisdiction: State of New York, United States of America
Authorities: U.S. Securities and Exchange Commission

Except as noted in Section II, the information provided in this Disclosure Framework is accurate as of December 31, 2016; financial information and certain other data are provided as of the dates specified.

This Disclosure Framework can also be found at www.dtcc.com.
For further information, please contact CPMI-IOSCO@dtcc.com.

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I. Executive Summary

The Committee on Payments and Market Infrastructures and the Technical Committee of the International Organization of Securities Commissions (collectively, “CPMI-IOSCO”) recognize that financial market infrastructures (“FMIs”), which include payment systems, central securities depositories, securities settlement systems, central counterparties (“CCPs”), and trade repositories, each play a critical role in the financial system and the broader economy. FMIs facilitate clearing, settling, and recording of monetary and other financial transactions, contributing to the goal of financial stability. CCPs, such as National Securities Clearing Corporation (“NSCC”), interpose themselves between counterparties to financial transactions. CPMI-IOSCO has recognized that, while properly managed FMIs bring great benefits to promoting market safety, they also have the potential to concentrate risk. Therefore, it is important that FMIs, such as NSCC, have effective risk controls and adequate financial resources.

In April 2012, CPMI-IOSCO issued a report on the Principles for financial market infrastructures (the “FMI Principles”), which harmonized, and in some cases strengthened, existing international standards applicable to FMIs. The report contains 24 FMI Principles covering the major types of risks faced by FMIs. One key objective of the FMI Principles is to encourage clear and comprehensive disclosure by FMIs, through a public “Disclosure Framework” that explains how their businesses and operations reflect each of the applicable FMI Principles. The U.S. Securities and Exchange Commission (“SEC”), in Rule 17Ad-22(e)(23), has adopted a similar approach to disclosure by covered clearing agencies.¹

This Disclosure Framework covers NSCC, a wholly-owned subsidiary of The Depository Trust & Clearing Corporation (“DTCC” or the “Company”), which provides central counterparty services to its customers with respect to securities transactions in equities, corporate bonds, municipal securities and unit investment trusts in the U.S. NSCC is a clearing agency registered with, and under the supervision of, the SEC. In July, 2012, NSCC was designated as a systemically important financial market utility (or “SIFMU”) under Title VIII of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 (“Dodd-Frank”).

This Disclosure Framework is intended to provide relevant disclosure to NSCC’s stakeholders, including its participants and indirect users, on NSCC’s key services and the methods it uses to manage the risks to itself and others of providing these services. In addition, this document facilitates NSCC’s compliance with CCAS 17Ad-22(e)(23).

¹ 17CFR 240.17Ad-22(e)(23). *See*, Standards for Covered Clearing Agencies, Exchange Act Release No. 34-78961, 81 Fed. Reg. 70786 (Oct. 13, 2016); referred to hereafter as the “Covered Clearing Agency Rules” or “CCAS”.

II. Summary of Major Changes since the Last Update of the Disclosure

This Disclosure Framework, which was comprehensively updated as of December 31, 2016, was published in adherence with CPMI-IOSCO's recommendation for FMIs to review and update the Disclosure Framework every two years at a minimum. The following is a summary of major changes since December 31, 2016 through December 31, 2017:

- As an update to Part III (General Background of NSCC) and Principles 1, 4, 6, 8 and 13, NSCC implemented its "Accelerated Trade Guaranty" proposal on April 24, 2017. At year-end 2016, NSCC received regulatory approval to move its trade guaranty forward to the point of trade validation (for locked-in trades) and point of trade comparison and validation (for trades compared through NSCC). This initiative is referred to as the "Accelerated Trade Guaranty" or "ATG." The proposal also included related Clearing Fund formula enhancements. See SEC 1934 Act Release Nos. 34-79598 (December 19, 2016) and 34-79592 (December 19, 2016), available at www.sec.gov and at www.dtcc.com.
- As an update to Part III (General Background of NSCC) and Principles 4, 7 and 21, on September 5, 2017, NSCC implemented a shortened settlement cycle (from T+3 to T+2) for transactions in equities, corporate and municipal bonds and unit investment trusts and financial instruments comprised of the foregoing products traded on the secondary market. This was part of a collective effort across the U.S. securities industry. See SEC 1934 Release Nos. 34-79734 (January 4, 2017) and 34-81306 (August 3, 2017), available at www.sec.gov and at www.dtcc.com.
- As an update to Principles 3, 6, 13 and 20, NSCC and The Options Clearing Corporation ("OCC") entered into a new "Stock Options and Futures Settlement Agreement" (the "New Accord"), which replaced the Third Amended and Restated Options Exercise Settlement Agreement, dated February 16, 1995, as amended. The New Accord expands the categories of securities that are eligible for settlement and guaranty under the NSCC-OCC arrangement and modifies the time of transfer of responsibilities from OCC to NSCC and when OCC's guarantee of obligations under OCC's Bylaws and Rules with respect to such transactions ends and NSCC's obligations under its Rules and Procedures begin, among other things. See SEC 1934 Release Nos. 34-81260 and 34-81266 (July 31, 2017), available at www.sec.gov and at www.dtcc.com.
- As an update to Principles 3, 4, 18 and 19, NSCC received regulatory approval to enhance its "Credit Risk Rating Matrix," which is used to rate certain participants from a credit risk management perspective and utilizes both quantitative and qualitative factors. See SEC 1934 Release Nos. 34-80731 (May 19, 2017) and 34-80734 (May 19, 2017), available at www.sec.gov and at www.dtcc.com.
- As an update to Principle 6, NSCC received regulatory approval to expand application of its "family-issued securities charge," through which NSCC mitigates wrong-way risk when it acts as counterparty to a participant with respect to positions in securities that are issued by that participant or that participant's affiliate ("family issued securities"). The family-issued securities charge constitutes an application of a haircut-based margining methodology to the net unsettled long positions in family-issued securities of participants and has been expanded to all full-service participants (where it was previously applied only to participants on surveillance status). See SEC 1934 Release No. 34-81545 (September 7, 2017), available at www.sec.gov and at www.dtcc.com.

- Since the 2016 publication of the Disclosure Framework, the CCAS have become effective. This update is also intended to facilitate NSCC's compliance with CCAS 17Ad-22(e)(23). The Covered Clearing Agency Rules can be found at <https://www.gpo.gov/fdsys/pkg/FR-2016-10-13/pdf/2016-23891.pdf> (see note 1 above). They are numbered in a manner that corresponds to the FMI Principles, so that the summary narrative that follows under Section IV of this Disclosure Framework for each Principle also addresses the corresponding Covered Clearing Agency Rule. The next comprehensive update of this Disclosure Framework, expected to be published by 2018 year-end, will include more detailed updates reflecting the implementation of the CCAS.

Except for the foregoing, the information provided in this Disclosure Framework is accurate as of December 31, 2016; financial information and certain other data are provided as of the dates specified.

III. General Background of NSCC and Key Metrics

A. *General Description of NSCC and Organization*

NSCC provides clearing, settlement, risk management, and central counterparty (“CCP”) services for broker-to-broker trades involving equities, corporate and municipal debt, exchange-traded funds, and unit investment trusts in the United States.

Regulatory, supervisory, and oversight framework

NSCC was organized in 1976 as a business corporation under New York law, and is a clearing agency registered with the SEC pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934, as amended (the “Exchange Act”). As a registered clearing agency, NSCC is subject to the requirements that are contained in the Exchange Act and in the SEC’s regulations and rules thereunder. These requirements include Exchange Act Rule 17Ad-22 (the “Clearing Agency Standards”) which was adopted by the SEC in 2012 in accordance with Dodd-Frank, became effective on January 1, 2013 and has recently been amended to provide enhanced standards for entities that meet the definition of “covered clearing agency.”² The Clearing Agency Standards establish minimum requirements regarding how registered clearing agencies must maintain effective risk management procedures and controls as well as meet the statutory requirements under the Exchange Act on an ongoing basis. It is designed to enhance the regulatory framework for the supervision of clearing agencies.

In accordance with Dodd-Frank, NSCC’s designation as a SIFMU requires that it meet prescribed risk management standards and heightened oversight by the SEC in order to promote robust risk management and safety and soundness, reduce systemic risk, and support the stability of the broader financial system. NSCC is also a “clearing corporation” within the meaning of Article 8 of the New York Uniform Commercial Code. These laws, regulations and rules are readily accessible to NSCC’s participants and the general public via the internet and through other public sources.

Organization

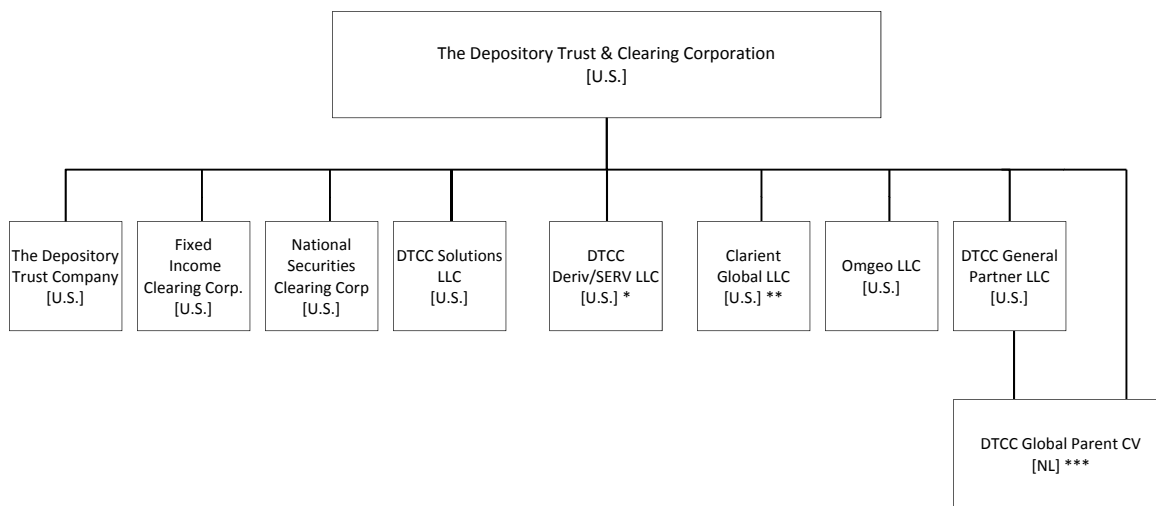
DTCC is the parent company of NSCC. DTCC is a non-public holding company that owns a number of FMIs, including three SIFMUs, and related businesses. In addition to NSCC, DTCC also owns The Depository Trust Company (“DTC”), the world’s largest central securities depository and a registered clearing agency for the settlement of securities transactions for eligible securities and other financial assets, and Fixed Income Clearing Corporation (“FICC”), a registered clearing agency and CCP that operates two divisions. FICC’s Government Securities Division provides clearing, netting, settlement and CCP services to the U.S. government securities market. The Mortgage-Backed Securities Division provides such services to the U.S. mortgage-backed securities market. DTC and FICC are also SIFMUs.

DTCC, through its other subsidiaries and joint ventures, provides critical information, post-trade processing and transactional services, including through global trade repositories, to financial market participants in the U.S. and globally.

² See SEC Release 34-78961, File No. S7-03-14, September 28, 2016. The standards for covered clearing agencies became effective on December 12, 2016, with a compliance date 120 days thereafter. As a SIFMU, NSCC is subject to the enhanced standards as a covered clearing agency under the amended rule.

DTCC’s common stock is owned by the financial institutions that are participants of its registered clearing agency/SIFMU subsidiaries. DTCC’s governance arrangements—and those of its clearing agency subsidiaries—are designed to promote the safety and efficiency of its clearing agency subsidiaries, support the stability of the broader financial system, and promote the objectives of its participants. These governance arrangements are more fully described in response to Principle 2 (Governance) below.

DTCC’s direct subsidiaries are shown in the following chart:



* This entity holds DTCC’s interest in the U.S. data repository and the credit default swap warehouse.

** Joint venture among DTCC and six co-founder banks.

*** This entity indirectly holds DTCC’s interest in non-U.S. data repositories and other non-U.S. businesses.

A description of the activities of DTCC’s principal subsidiaries is available at www.dtcc.com.

B. Key Services: System Design and Operation

The following is a brief description of the core services and functions performed by NSCC.

Trade Capture

NSCC’s core services are trade capture through its Universal Trade Capture (“UTC”) system, and clearance and settlement through its Continuous Net Settlement (“CNS”) System. Trade capture, the first step in the clearance and settlement process, involves the daily receipt of trade data from over 50 trading venues in the United States, including all U.S. securities exchanges and from automated trading facilities, and from NSCC Members³ submitting transaction data directly. That data is then compared or recorded. Trade comparison consists of validating and matching the buy and sells sides of a securities transaction, and results in a compared trade that is reported to Members. Today over 99% of trade data is submitted

³ NSCC has several types of membership with different access levels to services. For ease of description, when summarizing various services and NSCC Rules in this Disclosure Framework, unless otherwise indicated by the context, the term “Member” is used throughout to denote a full-service participant that has access to NSCC’s CCP services; the term “participant” is used to denote all membership categories.

to NSCC on a “locked-in” basis, meaning that it is already compared by the marketplace of execution. When submitted, locked-in trades are validated and recorded, via NSCC’s UTC system, and reported to Members. The only trade comparison currently being done by NSCC is for fixed income (corporate and municipal bond and unit investment trust) securities processing;⁴ NSCC also, separately, offers Members a service (the Obligation Warehouse service, or “OW”, described below) to enable them to match over-the-counter (“OTC”) transactions that are not otherwise generally matched through other facilities.

CNS

Compared and recorded transactions in CNS-eligible securities are processed in the CNS system. To be CNS-eligible, a security must be eligible for book-entry transfer on the books of DTC, and must be capable of being processed in the CNS system; for example, securities may be ineligible for CNS processing due to certain transfer restrictions (e.g., 144A securities) or due to the pendency of certain corporate actions.⁵ Under the CNS system, all eligible compared and recorded transactions for a particular settlement date are netted by issue into one net long (buy), net short (sell) or flat position per Member. As a continuous net system, those positions are further netted with positions of the same issue that remain open after their originally scheduled settlement date (usually T+3), so that trades scheduled to settle on any day are netted with fail positions to result in a single deliver or receive obligation for each Member for each issue in which it has activity. NSCC becomes the contra-party for settlement purposes, assuming the obligation of its Members that are receiving securities to receive and pay for those securities, and the obligation of Members that are delivering securities to make the delivery. CNS netting thus reduces the costs associated with securities transfers by reducing the number of securities movements required to settle transactions. In 2015, NSCC reduced the value of obligations requiring settlement by 97% or US\$226.0 trillion, from US\$233.1 trillion to US\$7.1 trillion.

CNS relies on an interface with DTC for the book-entry movement of securities to settle transactions. CNS short positions are compared against Members’ DTC accounts to determine availability of securities for delivery. If securities are available, they are transferred from the Member’s account at DTC to NSCC’s account at DTC to cover the Member’s short obligations to CNS. To control the automatic delivery of securities from their DTC accounts (for example, to prevent the automatic delivery of customer fully-paid securities), Members can use CNS exemption procedures. Partial settlements are permissible.

The allocation of CNS long positions to receiving Members is processed in an order determined by an algorithm built into the system. Securities are automatically allocated to Members’ long positions as the securities are received by NSCC. Members can request that they receive priority for some or all issues on a standing or override basis. Submission of buy-in notices and other specified activity will also affect the priority of a Member’s long position.

⁴ With respect to fixed income securities (corporate and municipal bonds), virtually all transactions are effected in the over-the-counter markets and submitted to NSCC directly by Members on a bilateral basis. Average daily fixed income transaction volume is less than 1% of NSCC’s daily volume.

⁵ Securities and/or transactions that are not processed in the CNS system may be processed as Balance Orders (described below), or on a trade-for-trade basis, depending on the security, the transaction and the nature of the participants party to the transaction. For example, 144A securities settle on a trade for trade basis. Similarly, same day settling equity trades that are received by NSCC after the applicable cutoff time would settle on a trade-for-trade basis. NSCC does not guarantee trade-for-trade settlement.

Daily money settlement for CNS activity is based on the value of all settled positions plus or minus mark-to-the-market amounts for all open CNS positions, and occurs through NSCC. The CNS deliveries made through DTC are made free of payment.

When DTC and NSCC moved to same day funds settlement in 1996, certain cross-guarantees and arrangements between NSCC and DTC were established to permit transactions to flow smoothly between DTC's system and the CNS system in a collateralized environment. Under this arrangement, DTC provides a guarantee to NSCC of all CNS long allocations (deliveries from CNS), and NSCC provides a guarantee to DTC for all CNS short covers (i.e., deliveries from the broker to CNS to satisfy a CNS delivery obligation). These guarantees ensure, among other things, that debits created in DTC's system continue to be collateralized when the securities serving as collateral are delivered into the CNS system as short covers and reduce risk at NSCC by ensuring that long allocations, or the approximate value of long allocations, will be made available to NSCC to cover certain exposures. These arrangements are described in more detail in response to Principle 20 (FMI Links) below.

Balance Order processing

For securities that are ineligible for processing in CNS, NSCC provides a Balance Order Accounting system that produces netted and allotted receive and deliver instructions for NSCC Members. The portion of a Balance Order that is settled through NSCC is the "Clearance Cash Adjustment", which is essentially a mark-to-market payment of the netted position to effectively bring the netted position contract price to a common market price at the time when Balance Order receive and deliver order instructions are issued by NSCC. The Clearance Cash Adjustment is not linked to the actual settlement of the Balance Order; it is due irrespective of whether the securities settle on the scheduled settlement date. Its purpose is to enable the processing of netted and allotted Balance Orders, by providing an adjustment to a common mark-to-market price. Settlement of this funds amount is part of NSCC's Balance Order trade guaranty, described in further detail in Addendum K to NSCC's Rules. NSCC does not become a counterparty to Balance Order transactions, but does provide a trade guaranty to the receive and deliver parties, which remains effective through the close of business on the scheduled settlement date. The settlement of Balance Order transactions generally occurs outside of NSCC. As a result, NSCC's guaranty for these transactions is effectuated as follows: In the event of the insolvency of a Member, Members are required to close out the open guaranteed Balance Order transactions they had with the insolvent party and report gains or losses to NSCC. Any gains must be paid to NSCC, and NSCC will cover the losses on such closed-out transactions.

Money Settlement

Members are obligated to designate a settling bank to effect daily money settlement on their behalf. They may designate a settling bank of their own choosing, provided the bank meets certain financial criteria, is a Federal Reserve member, and agrees to settle through use of the Federal Reserve System's National Settlement Service ("NSS"). Money settlement at NSCC occurs at the end of the day and, from an operational perspective, is centralized with DTC's end-of-day money settlement so as to provide common participants with consolidated reporting and a single point of access for all settlement information.

Throughout the day, money debit and credit data generated by participant activities are recorded in the settlement system. At the end of the processing day, the data is summarized by NSCC product category (i.e., CNS, Mutual Fund Services, Insurance Services and Retirement, Envelope Settlement Services, etc.) and netted to produce an aggregate money debit or credit for each participant. Similarly, DTC activity is also recorded and netted, separately. Following the determination of final net numbers for each participant for each clearing agency, these amounts are further netted to produce a consolidated net

money settlement obligation. So, for example, a participant with a settlement debit at NSCC and a settlement credit at DTC will have that debit netted against the DTC credit.

Settling banks, who may settle on behalf of multiple NSCC Members and/or DTC Participants, must separately acknowledge the respective settlement balances of their customer participants at each clearing agency. The consolidated net balances of their respective participant customers are then further netted to produce a single net-net settling bank consolidated debit or credit. Settlement of these net-net balances occurs through use of the NSS, whereby DTC, on its own behalf and as NSCC's settlement agent, submits instructions to have the Federal Reserve accounts of the settling banks charged for their net-net debit balances and credited with their net-net credit balances.

Correspondent Clearing / Special Representative Service

This service permits NSCC Members to clear and settle transactions executed for them by other Members acting as Special Representative (executing broker) (i) to accommodate a Member with multiple affiliate accounts that wishes to move a position resulting from a trade in the process of clearance from one of its affiliates to another; and (ii) to accommodate a Member that relies on its Special Representative to execute a trade in any market on its behalf to enable the resulting position to be moved from the Special Representative to that Member.

Through NSCC's Correspondent Clearing Service, the NSCC Member acting as Special Representative submits offsetting trades to NSCC for transactions it has executed on behalf of the Member. If the original trade is a purchase order, the Special Representative would input a transaction where it is the seller and the Member is the buyer, effectively netting the Special Representative out of the original transaction. Correspondent Clearing transactions are processed through NSCC's UTC system.

Additional services

In addition to the core services described above, NSCC offers a number of other services, developed over the years in response to industry requests and initiatives. These services—which are not guaranteed by NSCC and for which it does not act as a CCP—include:

Wealth Management Services. NSCC provides a family of non-guaranteed services to support mutual funds ("Mutual Fund Services"), alternative investment products ("Alternative Investment Product Services") and insurance and retirement products ("Insurance and Retirement Services"). NSCC's Mutual Fund Services are the industry standard for processing fund transactions, communicating account-related information, and linking fund companies with their network of distribution firms. The Fund/SERV® service automates purchases, registrations, redemptions and settlement of fund transactions. Other Mutual Fund Services capabilities include coordinating account information between funds and firms; processing defined contribution transactions; settling commission and fee payments; transferring accounts between firms, and assets in IRAs between fund companies; and, through the Mutual Fund Profile Service, providing a centralized repository for information about funds, including information contained in a fund's prospectus.

Alternative investment products are primarily private investment vehicles that are purchased, redeemed and valued periodically rather than being valued and processed on a daily basis. NSCC's Alternative Investment Product Services include the automated processing of new accounts, purchases and redemptions, position reporting, activity reporting, fund offering terms and valuation, and commission payments.

NSCC's Insurance & Retirement Services include processing of annuity and life insurance policy applications and premiums, licensing and appointments, commission payments, reporting of client positions and valuations, asset pricing, financial activity reporting and annuity customer account transfers. The aim of these services is to automate and provide seamless end-to-end communication between insurance carriers, distributors and their solution providers for the sale, processing and money settlement of insurance products nationwide.

Automated Customer Account Transfer Service ("ACATS"). ACATS provides NSCC Members with the ability to transfer customer accounts and assets from one firm to another. To accomplish this in an automated fashion, the service interfaces with CNS (through a separately tracked account) for the delivery and settlement of CNS-eligible securities, with Fund/SERV® to expedite the re-registration of mutual fund positions, with Insurance Services to facilitate the re-registration of annuity positions, and with DTC for (non-CNS) DTC-eligible securities.

Envelope Settlement Services ("ESS"). ESS standardizes and controls Member-to-Member physical delivery of securities in the New York metropolitan area. The Inter-city Envelope Settlement Service standardizes and controls the physical delivery of securities among Members between New York and Toronto.

Obligation Warehouse ("OW"). OW is a service that supports real-time bilateral matching of failed obligations and of transactions that are not otherwise submitted by the applicable marketplaces or Members themselves for trade comparison or recording through other NSCC trade capture services. Obligations held in the OW are maintained until they are either closed or cancelled. For example, on a daily basis the OW adjusts obligations for certain applicable corporate actions, and checks obligations for CNS eligibility. CNS-eligible obligations are exited from the OW and forwarded to CNS. Additionally, failed non-CNS obligations are periodically re-priced and re-netted.

DTCC Limit Monitoring. Introduced in 2014, DTCC Limit Monitoring is an NSCC tool that provides NSCC Members with a way to monitor trading activity on a post-trade basis, and is intended to supplement Members' existing internal risk management processes. Through this service, NSCC Members can monitor trading activity against limits that they have pre-set, and can review notifications that are delivered when these pre-set limits are being approached and when they are reached. (Any actions Members determine to take in response to these alerts is their responsibility and is taken away from NSCC.)

Risk management

Risk management is the foundation for NSCC's ability to guarantee settlement, as well as the means by which it protects itself and its Members from the risks inherent in the settlement process. Procedures are in place to ensure that Members comply with NSCC's Rules. NSCC maintains strict membership standards, including minimum financial requirements and Members are subject to ongoing review following admission. NSCC's Clearing Fund addresses potential Member exposure through a number of risk-based component charges (as margin) calculated and assessed daily. In addition, NSCC maintains liquidity resources, including a committed credit facility. The Clearing Fund, together with these resources, provide NSCC with sufficient liquidity to complete end-of-day money settlement. The Clearing Fund (which, in the aggregate, also operates as NSCC's default fund) provides the collateralization required to cover a Member's exposure. The Clearing Fund consists of deposits posted by Members in the form of cash and eligible securities. NSCC's key risk management practices and procedures, including its process for closing out the open positions of a defaulting Member and allocating any consequent losses, are discussed in more detail under Principles 3 through 7 and Principle 13. To

date, including through the 2008 well-publicized broker-dealer closeouts, NSCC has never invoked its membership loss allocation procedures.

Settlement Cycle

In the U.S., transactions in equities, corporate and municipal bonds and unit investment trusts currently settle three days after trade date (referred to as “T+3”). Shortening the U.S. settlement cycle from the current three-day cycle to two-days (“T+2”) will reduce operational, systemic and counterparty risk, lower liquidity needs and limit procyclicality, while aligning the U.S. with other T+2 settlement markets across the globe. The U.S. securities industry, working collectively, has set a target implementation date of September 5, 2017 for the U.S. move from T+3 to a T+2 settlement cycle. This is contingent upon obtaining regulatory support in amending applicable rules in a timely manner, and upon the successful completion of industry-wide testing during Q2 and Q3 of 2017.

C. *Key Metrics for NSCC*

As a CCP, NSCC provides specific quantitative disclosures with respect to certain FMI principles. These disclosures are intended to complement the narrative disclosures included in this Disclosure Framework. The NSCC Quantitative Disclosures for Central Counterparties can be found at www.dtcc.com.

IV. Principle-by-Principle Summary Narrative Disclosure

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.

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.

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

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.

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.

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.

Legal basis for material aspects of NSCC’s operations; relevant jurisdictions

NSCC has a well-founded, clear, transparent and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.

The material aspects of NSCC’s activities include: (1) trade capture, comprising trade comparison, recording, and validation, (2) trade guarantee, netting and assignment and assumption of delivery and receive obligations, (3) end-of-day net funds settlement and finality, (4) risk management and collateral arrangements, (5) default procedures and liquidity resources (including closing out a defaulting Member’s open positions and closeout netting), and (6) links with other CCPs and depositories.

In evaluating the legal basis for NSCC’s core activities, the United States is the critical venue for NSCC’s operations and the markets it serves, the location of collateral held by NSCC, and the principal location of its customers and settling banks. NSCC is a New York corporation, and NSCC’s Rules & Procedures (collectively referred to as “NSCC’s Rules” or the “Rules”) and NSCC’s liquidity arrangements are expressly governed by New York law.

All NSCC participants are required to execute membership agreements under which they agree to be bound by NSCC’s Rules, and agree, *inter alia*, that the Rules shall be a part of the terms and conditions of every contract or transaction that they may make or have with NSCC and that New York law is the governing law of the agreements. Entities acting as settling banks on behalf of participants execute agreements covering such arrangements, and are required, under the Rules, to be either a Member or a “Settling Bank Only Member”; as such they execute a membership agreement under which they also agree to be bound by NSCC’s Rules (which include the requirements for money settlement). NSCC’s Rules are public, and can readily be found on the DTCC website, www.dtcc.com.

NSCC ensures that its legal basis provides a high degree of legal certainty for each material aspect of its activities in all relevant jurisdictions:

1. By structuring its activities and its Rules in accordance with the laws of the relevant jurisdictions.

NSCC's activities and its Rules are structured in accordance with the laws of the State of New York and the United States. The principal laws comprising the legal framework under which NSCC operates include: (1) the Exchange Act, particularly Sections 17A and 19, (2) the New York Business Corporation Law, (3) the New York Uniform Commercial Code (the "New York UCC"), particularly Articles 8 and 9, (4) the Securities Act of 1933, as amended, (5) the Federal Deposit Insurance Act, as amended ("FDIA"), (6) the U.S. Bankruptcy Code (the "Bankruptcy Code"), (7) the Federal Deposit Insurance Corporation Improvement Act of 1991, as amended ("FDICIA"), (8) Dodd-Frank, particularly Title II, regarding orderly liquidation authority ("OLA"), and Title VIII, referred to as the "Payment, Clearing, and Settlement Supervision Act of 2010," and (9) the Securities Investor Protection Act of 1970, as amended ("SIPA").

The ability of NSCC to enforce its Rules to accomplish its core clearance and settlement and risk management functions has been repeatedly confirmed through over 35 years of operations.⁶ Moreover, courts have routinely held that state-law challenges to the existence or operation of NSCC's SEC-approved programs are federally preempted because they conflict with congressional directives as set forth in Section 17A of the Exchange Act.⁷

2. Through the Proposed Rule Change and Advance Notice Processes.

As a clearing agency registered with the SEC, the Exchange Act provides a clear framework under which NSCC's Rules are adopted and enforced. NSCC's Rules are filed with and reviewed by the SEC.⁸ As a clearing agency registered under Section 17A of the Exchange Act, a self-regulatory organization subject to Section 19 of the Exchange Act, and a SIFMU under Title VIII of Dodd-Frank, NSCC is required to follow: (1) a specified process⁹ whenever it proposes a new rule or a change or amendment to its Rules (a "Proposed Rule Change," and the process, the "Proposed Rule Change Process") and (2) a specified process¹⁰ whenever it proposes to make a change to its rules, procedures or operations that could materially affect the nature or level of risks presented by NSCC (a "Material Change," and the process, the "Advance Notice Process").

⁶ See generally *Pet Quarters, Inc. et al. v. Depository Trust and Clearing Corporation et al.*, 559 F.3d 772 (8th Cir. 2009); *Whistler Investments, Inc., et al. v. The Depository Trust and Clearing Corporation et al.*, 539 F.3d 1159 (9th Cir. 2008); *Nanopierce Technologies, Inc. et al. v. The Depository Trust and Clearing Corporation et al.*, 168 P.3d 73 (Nev. 2007).

⁷ See *Whistler Investments*, 539 F.3d at 1167 (affirming the district court's dismissal of all claims on the grounds of preemption by Section 17A of the Exchange Act); *Pet Quarters*, 559 F.3d at 780; *Nanopierce Technologies*, 168 P.3d at 76 (concluding that "because the state law on which [plaintiffs] base their claims poses an obstacle to [DTCC, DTC and NSCC's] accomplishment of congressional objectives as explicitly stated in and gleaned from the Securities Exchange Act's framework, and because [DTCC, DTC and NSCC's] compliance with both state and federal requirements concerning the securities transactions at issue in this case is impossible, section 17A of the Securities Exchange Act preempts [plaintiffs'] claims.").

⁸ NSCC's Rules, as originally in effect at the time of its registration as a clearing agency, were filed with and reviewed by the SEC as part of the registration process. Subsequent changes in NSCC's Rules have been similarly filed with and reviewed by the SEC.

⁹ This process is set forth in Section 19(b) of the Exchange Act and Exchange Act Rule 19b-4.

¹⁰ This process is set forth in Section 806(e) of Dodd-Frank and Exchange Act Rule 19b-4.

Under the Proposed Rule Change Process, generally, before a Proposed Rule Change may take effect, (1) the change and an explanatory statement must be filed with the SEC and posted by NSCC on DTCC's website, (2) notice of the filing and the substantive terms or description of the change must be published by the SEC in the Federal Register for public review and comment, and (3) the SEC must approve the change (or the change must otherwise be permitted¹¹ to take effect). The SEC is required to disapprove a Proposed Rule Change if it does not find that the change is consistent with the requirements of the Exchange Act and the rules and regulations thereunder that are applicable to NSCC.

Similar submission, disclosure and publication requirements apply to the Advance Notice Process, where, generally, NSCC must provide 60 days advance notice to the SEC (an "Advance Notice") before a Material Change may take effect, describing the nature of the change, its expected effects on risks to NSCC, its Members or the market, and how NSCC plans to manage any identified risks. A copy of the notice must also be: (1) provided by NSCC to the Board of Governors of the Federal Reserve System (the "FRB"), (2) posted by NSCC on DTCC's website and (3) published by the SEC in the Federal Register for public review and comment. The SEC must consult with the FRB in regard to a Material Change, and may object to the change if it determines that the change would be inconsistent with the objectives and principles for risk management standards described in Section 805(b) of Dodd-Frank or the rules and regulations thereunder that are applicable to NSCC.

3. By requiring or otherwise obtaining legal opinions, analyses or advice.

NSCC requires applicants for membership to provide a legal opinion to the effect that the membership agreement (which incorporates the Rules) will be binding and enforceable on the applicant when it becomes a Member. To the extent that the applicant is organized under the laws of a jurisdiction outside of the United States, the required opinion must, in addition, specifically address issues such as NSCC's ability to enforce its Rules (including its netting, guaranty/assumption and assignment, and default management rules) under the applicable insolvency rules of the applicant's home jurisdiction, and the enforceability of the choice of New York law to govern the membership agreement and the Rules. NSCC also obtains legal analyses or advice as it deems appropriate in connection with new services, changes in law, and other matters.

NSCC's role as CCP, trade guaranty and netting

NSCC's authority to clear and settle securities transactions and act as a CCP is provided through: (1) its registration as a clearing agency under the Exchange Act, which provides for the registration and regulation of clearing agencies, and also prescribes standards for their operation and governance; (2) the New York UCC, which contains provisions for the operation of clearing corporations (including registered clearing agencies such as NSCC); and (3) general New York contract law, which provides the legal basis under which NSCC guarantees trades and, where it acts as a CCP, assumes the obligation and obtains the right, through assignment and assumption, to pay for and receive securities delivered from the delivering (short) Member, and to deliver securities and receive payment from the receiving (long) Member. The timing of NSCC's assumption of liability for guaranteed transactions and as a CCP is clearly set forth in NSCC's Rules; the Rules generally provide that CNS and Balance Order transactions are guaranteed as of the later of midnight of T+1 and midnight of the day the transaction is reported to

¹¹ In certain limited circumstances, including fee changes, Proposed Rule Changes may become effective upon filing. Proposed Rule Changes may also become effective summarily if it appears to the SEC that such action is necessary for the protection of investors, the maintenance of fair and orderly markets, or the safeguarding of securities or funds. However, any Proposed Rule Change that becomes effective upon filing or summarily is subject to SEC review and the right of the SEC to take action thereafter.

Members as compared or recorded.¹² For Balance Order transactions, this guarantee remains effective through the close of business on the scheduled settlement date.

NSCC's legal basis supports the enforceability of its netting arrangements. As a general matter, U.S. law supports netting arrangements relating to securities transactions. In particular, the definition of "clearing agency" in the Exchange Act clearly recognizes that one of the roles of a clearing agency is to "reduce the number of settlements of securities transactions." FDICIA supports "netting contracts" (which include the rules of a clearing organization), providing for the netting of payment obligations and payment entitlements between and among clearing organizations (including registered clearing agencies such as NSCC) and their members (including liquidation or closeout values relating to such obligations or entitlements). "Payment" includes both cash payments and noncash deliveries. The NSCC Rules (including the netting and limited cross guaranty agreements with other registered clearing agencies to which NSCC is a party¹³) are a "netting contract" within the meaning of FDICIA.

FDICIA provides: (1) that provisions of any security agreement or arrangement or other credit enhancement related to one or more netting contracts between any two members of a clearing organization (including the clearing organization itself) shall be enforceable in accordance with their terms (with a limited exception not applicable to NSCC); (2) that, notwithstanding any other provisions of State or Federal law (with limited exceptions), the payment entitlements and obligations of members of a clearing organization (including the clearing organization itself) shall be terminated, liquidated, accelerated and netted in accordance with and subject to the conditions of any applicable netting contract; and (3) that no stay, injunction, avoidance, moratorium or similar proceeding or order, whether issued or granted by a court, administrative agency or otherwise, shall limit or delay application of otherwise enforceable netting contracts.

The provisions of FDICIA applicable to clearing organization netting therefore override any conflicting provisions of state or federal law, including the Bankruptcy Code, SIPA and FDIA (except to the extent otherwise expressly provided). The netting provisions of FDICIA were designed to reduce systemic risk to the financial markets. In addition, amendments to FDIA, FDICIA, the Bankruptcy Code and SIPA in 2005 and 2006 include provisions that validate master netting agreements in respect of securities, commodities, forward, swap and repurchase transactions.

NSCC's legal basis supports the finality of transfers of financial instruments and funds, and the effectiveness of its risk management and default procedures (including the closeout of positions of an insolvent Member).

NSCC's Rules provide (1) the timing of, and requirements for, settlement, and (2) procedures that will be followed in the event of a failure of a Member to perform its obligations, including the insolvency of a Member. As a general matter, U.S. law, including general New York contract law, the New York UCC, FDIA, FDICIA, the Bankruptcy Code, SIPA and Title II of Dodd-Frank support the settlement of securities transactions in accordance with NSCC's Rules, and the ability of NSCC to effectuate its risk management and default rules (including closing out the open positions of an insolvent Member).

¹² At year-end 2016 NSCC received approval to move the trade guaranty forward to the point of trade validation (for locked-in trades) and comparison (for trades compared through NSCC). This initiative is referred to as the "Accelerated Trade Guaranty" or "ATG." See SEC 1934 Act Rels. Nos. 34-79598 and 34-79592 (December 19, 2016), available at www.sec.gov and at www.dtcc.com. The implementation of these changes, and the related Clearing Fund formula enhancements, will be announced via Important Notice. For more information, go to www.dtcc.com.

¹³ These arrangements are described under Principles 9 (Money settlements), 13 (Participant-default rules and procedures) and 20 (FMI links).

Settlement Finality. NSCC’s Rules provide that if securities of a Member are delivered to NSCC in the CNS system, the Member will be paid. Pursuant to NSCC Rule 12 (Settlement), securities deliveries/movements to Members are final at the “effective time.” Generally, the “effective time” occurs when it is clear that NSCC has either been paid, or is in a credit position with respect to a Member or its settling bank. These provisions are enforceable against the parties under general New York contract law and the New York UCC, and are protected in the event of the insolvency of a Member (with limited exceptions) by relevant provisions of FDIA, FDICIA, the Bankruptcy Code, SIPA and Title II of Dodd-Frank.

NSCC, through its affiliate, DTC, utilizes the NSS, a payment system operated by the Federal Reserve System (“FRS”) to effect end-of-day net money settlement.¹⁴ As noted in the General Background (Key Services: System Design and Operation) above, money settlement occurs at the end of the day and, from an operational perspective, is centralized with DTC’s end-of day money settlement. As part of this process, and to further reduce the number of funds transfers, each Member’s net debits or credits at NSCC are netted with its net debits or credits at DTC. Following an acknowledgement process, settling banks, who may settle on behalf of multiple NSCC Members and/or DTC Participants, have the consolidated net balances of their respective participant customers further netted to produce a single net-net settling bank consolidated debit or credit. On each settlement day, DTC, on its own behalf and as NSCC’s settlement agent, collects net-net debits from, and distributes net-net credits to, the designated settling banks over NSS. Each settling bank then debits or credits the account of each NSCC Member and/or DTC Participant for which the bank settles. Funds transfers become final at the time that funds are moved through NSS.

Clearing Fund payments are currently paid by wire transfer through the Fedwire® Funds Service (“Fedwire”), a payment system operated by the FRS.¹⁵ Payment to the receiving party (NSCC) through Fedwire is final and irrevocable upon the crediting of the receiving party’s account, or when the payment order is sent to the receiving party, whichever is earlier. Payment orders generally are processed immediately following the Federal Reserve Bank’s receipt of a transfer message.¹⁶

Risk Management and Default Procedures. NSCC’s Rules also provide risk management tools: Rule 4 provides for the collection of Clearing Fund (margin) from Members, the form and manner in which such funds or collateral is provided, and the means by which losses are to be allocated. Procedure XV sets forth the Clearing Fund Formula. In addition, the Rules (Rule 15) provide NSCC with the ability to obtain adequate assurances of a Member’s ability to perform its operational and financial obligations. Additionally, the cross-guaranty arrangements described under Principles 9 (Money settlements) and 13 (Participant-default rules and procedures) are structured as netting contracts under FDICIA.

Legal support for the validity of these provisions, including the validity of NSCC’s lien and collateral protections, is found principally in the New York UCC and general New York contract law. (In the case of deposits of Clearing Fund cash, title is transferred to NSCC by the transfer of the funds to accounts of NSCC.)

¹⁴ NSS is governed by Federal Reserve Bank Operating Circular 12 “Multilateral Settlement.”

¹⁵ Funds transfers through Fedwire are governed by Subpart B of Regulation J, which incorporates the provisions of Article 4A of the UCC, and Federal Reserve Bank Operating Circular 6 “Funds Transfers Through the Fedwire® Funds Service.”

¹⁶ See FRB, The Fedwire® Funds Service Assessment of Compliance with the Core Principles for Systemically Important Payment Systems, July 2014, at 23, available at http://www.federalreserve.gov/paymentsystems/files/fedfunds_coreprinciples.pdf.

In the case of a Member default or insolvency, NSCC may cease to act for the Member, and in that event, proceed to close out the open CNS positions of the Member¹⁷ (or, in the case of Balance Order transactions, direct the Members who are the contra-side to Balance Order receive and deliver instructions to close out their respective positions), and once that is completed, determine a net gain or loss on the closeout.¹⁸ NSCC Rule 46 (Restrictions on Access to Services) sets out the circumstances under which NSCC may cease to act for a Member and the types of actions it may take.

As discussed more fully below, clearing agency closeout provisions (including access to and retention of collateral) are supported (with limited exceptions) under FDICIA, the Bankruptcy Code, SIPA, FDIA and Title II of Dodd-Frank.

(a) FDICIA

As noted above, FDICIA supports the effectiveness of “netting contracts”, which include the rules of a clearing organization, providing for the netting of payment obligations and payment entitlements between and among clearing organizations and their members (including liquidation or closeout values relating to such obligations or entitlements). “Payment” includes both cash payments and noncash deliveries. The NSCC Rules are a “netting contract” within the meaning of FDICIA.

Further, Section 404(h) of FDICIA provides that the provisions of any security agreement or arrangement or other credit enhancement related to one or more netting contracts between any two members of a clearing organization (including the clearing organization itself) shall be enforceable in accordance with their terms (with a limited exception not applicable to NSCC), and shall not be stayed, avoided or otherwise limited by any State or Federal law (except to the extent expressly stated to be applicable). FDICIA also provides that (1) Section 404 of FDICIA shall be given effect notwithstanding that a Member is a failed Member, and (2) no stay, injunction, avoidance, moratorium or similar proceeding or order, whether issued or granted by a court, administrative agency, or otherwise, shall limit or delay application of otherwise enforceable netting contracts in accordance with Section 404 of FDICIA.

(b) The Bankruptcy Code, SIPA, FDIA and Title II of Dodd-Frank

The insolvency regime applicable to an NSCC Member is determined by the form of organization of the Member and its regulatory oversight; the regimes include Chapter 11 of the Bankruptcy Code (reorganization), subchapters III and IV of Chapter 7 of the Bankruptcy Code (liquidation), SIPA (with respect to members of the Securities Investor Protection Corporation (“SIPC”)), FDIA (with respect to insured depository institutions) and Title II of Dodd-Frank regarding OLA (with respect to covered financial companies).

The insolvency of an NSCC Member that is not a member of SIPC, insured depository institution or covered financial company is typically handled under Chapter 11 of the Bankruptcy Code or subchapter III or IV of Chapter 7 of the Bankruptcy Code. Although the automatic stay, prohibitions on ipso facto provisions and avoidance powers of the bankruptcy trustee are generally applied with respect to cases

¹⁷ With respect to such defaulting Member, under NSCC Rule 18, NSCC will exit from its system non-guaranteed transactions (such as trade-for-trade transactions) and those transactions that have not reached the point where NSCC’s trade guaranty attaches, unless the Board of Directors determines otherwise. Accordingly, NSCC may determine to process (i.e., “optionally guarantee”) transactions through completion that have not yet been guaranteed. Such decision may have a financial impact on the membership.

¹⁸ The process by which NSCC closes out transactions of a defaulting Member is described in greater detail under Principle 13 (Participant-default rules and procedures).

conducted under Chapters 11 and 7 of the Bankruptcy Code, the Bankruptcy Code contains various exceptions and safe harbors to those provisions that support the finality of securities transactions processed through securities clearing agencies and the clearing agency's closeout of the insolvent member's open positions.¹⁹ The Bankruptcy Code also provides similar exceptions and safe harbors that apply to master netting agreements.

The insolvency of an NSCC Member that is a member of SIPC, and whose customers would be entitled to advances from the SIPC fund created under SIPA to protect customers, is handled under SIPA. Although SIPC proceedings generally involve (1) a protective decree of a federal district court that, among other things, freezes a Member's assets, and (2) the application of the Bankruptcy Code's automatic stay and avoidance powers, there are exceptions in SIPA, as well as provisions typically included in such protective decrees, that support the finality of securities transactions processed through securities clearing agencies and their ability to close out the open positions of the insolvent Member.²⁰

The insolvency and receivership of an NSCC Member that is an insured depository institution is handled under FDIA. Although stays, prohibitions on walkaway provisions, avoidance powers of the Federal Deposit Insurance Corporation ("FDIC"), and powers of the FDIC to disaffirm or repudiate certain contracts and leases are generally applied with respect to cases under FDIA, there are exceptions and safe harbors in FDIA that support settlement of securities transactions through clearing agencies.²¹

FDIA does provide for up to a one-business-day stay of closeout actions while the FDIC determines whether to transfer all the insured depository institution's positions to a successor institution. In the event that the FDIC is appointed as receiver for a Member, NSCC expects to be in discussions with the FDIC regarding NSCC's acceptance of such a successor institution as a substitute Member.

¹⁹ Examples of such exceptions include: Sec. 362(b)(6) (exceptions from the automatic stay); Sec. 546(e) (limitations on avoidance powers); Sec. 555 (contractual right to liquidate, terminate, or accelerate a securities contract); Sec. 561 (contractual right to terminate, liquidate, accelerate, or offset under a master netting agreement and across contracts; proceedings under chapter 15).

²⁰ Examples of these exceptions include 15 U.S.C. §78eee(b)(2)(C), which provides that the automatic stay shall not apply to "any contractual rights [including rights set forth in a rule or bylaw of a securities clearing agency] of a creditor to liquidate, terminate, or accelerate a securities contract, commodity contract, forward contract, repurchase agreement, swap agreement, or master netting agreement, as those terms are defined in [the Bankruptcy Code], to offset or net termination values, payment amounts, or other transfer obligations arising under or in connection with one or more of such contracts or agreements, or to foreclose on any cash collateral pledged by the debtor, whether or not with respect to one or more of such contracts or agreements." Moreover, protective decrees often recite many of the stay exceptions found in the Bankruptcy Code and SIPA and also contain additional stay exceptions not contained in the Bankruptcy Code and SIPA, including those designed to enable clearing agencies to timely effectuate a closeout.

²¹ Examples of these exceptions and safe harbors include 12 U.S.C. § 1821(e)(8)(C), which provides that, notwithstanding any Federal or State law relating to the avoidance of preferential or fraudulent transfers, the FDIC, whether acting as such or as conservator or receiver of an insured depository institution, "may not avoid any transfer of money or other property in connection with any qualified financial contract [including a securities contract] with an insured depository institution" (except in cases involving an intent to hinder, delay or defraud). FDIA also provides for: (1) the right to exercise any right to liquidate a qualified financial contract ("QFC") with an insured depository institution which arises upon the appointment of the FDIC as receiver at any time after such appointment; (2) the right to exercise any right under a security agreement or other credit enhancement that relates to one or more such QFCs; and (3) the right to offset or do closeout netting in connection with one or more such QFCs, including under any master agreement for such QFCs (such as NSCC's Rules).

The provisions of Title II of Dodd-Frank regarding OLA provide for the appointment of the FDIC as receiver for certain systemically important entities (defined in Title II of Dodd-Frank as “covered financial companies”). As under FDIA, stays, prohibitions on walkaway provisions, avoidance powers of the FDIC, and powers of the FDIC to disaffirm or repudiate certain contracts and leases are generally applied with respect to cases under OLA, with exceptions and safe harbors under OLA similar to those under FDIA that support settlement of securities transactions through clearing agencies. As under FDIA, OLA provides for up to a one-business-day stay of closeout actions while the FDIC determines whether to transfer all the covered financial company’s positions to a successor institution. In the event that the FDIC is appointed as receiver for a Member under OLA, NSCC expects to be in discussions with the FDIC regarding NSCC’s acceptance of such a successor institution as a substitute Member.

The exceptions and safe harbors contained in FDICIA, the Bankruptcy Code, SIPA, FDIA and Title II of Dodd-Frank that support the finality of securities transactions and the closeout of the insolvent Member’s open positions provide NSCC with a high degree of certainty as to the effectiveness of its risk management and default management procedures.

Transparency of NSCC’s Rules

The laws and regulations governing the operations of NSCC and the rules, procedures and contractual provisions for NSCC’s Members are clearly stated, internally coherent and readily accessible to participants and the public.

NSCC makes the following resources, among others, available to the public on the DTCC website: (1) the NSCC Rules themselves; (2) filings of Proposed Rule Changes and Advance Notices; (3) white papers and other reports addressing initiatives under consideration or in process, or other issues of import to stakeholders, including the membership; (4) Important Notices that address issues of import to NSCC’s membership (including notice of when NSCC ceases to act for a Member, and information as to how it will handle pending transactions of the defaulting Member), and (5) this Disclosure Framework and/or NSCC’s prior assessments against the CPSS-IOSCO Recommendations for Central Counterparties.

The Proposed Rule Change Process and Advance Notice Process, as described above, provide for proposed changes to be made available publicly – both by the SEC by publication in the Federal Register,²² and by NSCC by posting on the DTCC website. Interested parties are provided an opportunity to comment publicly on such proposals, including the ability to raise any applicable concerns. Any such concerns would be addressed or responded to as part of the SEC’s review and approval/non-objection process.

The SEC is required to disapprove a Proposed Rule Change if it does not find that the change is consistent with the requirements of the Exchange Act and the rules and regulations thereunder that are applicable to NSCC. Similarly, the SEC may object to a Material Change that is the subject of an Advance Notice if it determines that the change is inconsistent with the objectives and principles for risk management standards described in Section 805(b) of Dodd-Frank or the rules and regulations thereunder that are applicable to NSCC.

²² The SEC also makes proposed changes publicly available by posting them on its website.

Degree of certainty for rules and procedures; conflict of laws issues

NSCC achieves a high level of confidence that the rules, procedures and contracts related to its operations are enforceable in all relevant jurisdictions:

1. By obtaining legal opinions, analyses and advice and other legal comfort.

NSCC's Rules and, generally, NSCC's material contracts, are (1) governed by the laws of the State of New York and (2) adjudicable in federal and state courts located in New York. As described above, U.S. and New York law provide a clear and comprehensive framework for the enforceability of NSCC's Rules and material contracts.

NSCC identifies, analyzes and mitigates legal risks arising from potential conflict of law issues in a variety of ways. NSCC's operations are based in the United States, and NSCC's Members are predominantly U.S.-domiciled entities. With respect to membership of non-U.S. entities, Addendum O to NSCC's Rules sets forth NSCC's policy with respect to the admission of such Members. Among the requirements for such applicants is the provision of a legal opinion of counsel qualified in the applicant's home jurisdiction, to the effect that (1) the choice of New York law to govern the membership agreement and Rules and the submission to jurisdiction of the federal and state courts located in New York will be enforceable against the Member in its home jurisdiction, and (2) the foreign jurisdiction will recognize the judgment of a federal or state court located in New York. In addition, as noted above, the opinion must specifically address issues such as NSCC's ability to enforce its Rules (including its netting, guaranty/assumption and assignment, and default management rules) under the applicable insolvency rules of the applicant's home jurisdiction. These opinions facilitate analysis of any legal risk that may arise as a result of the applicant's participation in NSCC. NSCC can mitigate conflicts of laws risks or other legal risks that may be identified as a result of such opinions and analysis by, among other things, imposing conditions on membership or additional requirements and/or requiring special representations from an applicant.²³

NSCC also obtains legal opinions, analyses and/or advice, as it deems necessary or appropriate, to confirm, among other things, that its Rules and material contracts are consistent with relevant laws and regulations prior to becoming effective. NSCC will also obtain legal opinions, analyses and/or advice in the future, as it deems necessary or appropriate, to address new services, changes in law, or other matters.

2. Through the Proposed Rule Change and Advance Notice Processes.

As noted above, generally before a Proposed Rule Change may take effect, the SEC must approve the change. In order to do so, it must determine that the change is consistent with the requirements of the Exchange Act and the rules and regulations thereunder that are applicable to NSCC. Similarly, generally before a Material Change takes effect, the SEC may object to the change if it determines that the change is inconsistent with the objectives and principles for risk management standards described in Section 805(b) of Dodd-Frank or the rules and regulations thereunder that are applicable to NSCC. These processes, together with the opportunity for public review and comment provided thereby, provide a clear

²³ For example, NSCC Rule 4 (Clearing Fund) and Addendum O (Admission of Non-U.S. Entities as Direct NSCC Members) provides that NSCC reserves the right to require the entity to deposit additional amounts to the Clearing Fund and to post a letter of credit in an instance where NSCC, in its sole discretion, believes the entity presents legal risk.

record and statutory basis for the enforceability of NSCC's Rules. The ability of NSCC to enforce its Rules has been repeatedly confirmed throughout its 35+ years of operations.

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.

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.

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.

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.

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).

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.

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.

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.

Ownership and Board structure

NSCC is a wholly-owned subsidiary of DTCC. DTCC is user owned and governed pursuant to a Shareholders Agreement.²⁴ The DTCC common shareholders include approximately 297 banks, broker-dealers, and other companies in the financial services industry that are participants of one or more of DTCC's clearing agency subsidiaries, including NSCC. DTCC common shares are allocated to

²⁴ The Fourth Amended and Restated Shareholders Agreement, dated January 27, 2015 (the "Shareholders Agreement"), among DTCC, DTC, NSCC, FICC, and the common shareholders, Series A preferred shareholders and Series B preferred shareholders of DTCC.

participants in accordance with a formula based on their relative usage of the services of the three clearing agencies.

Individuals elected to the DTCC Board of Directors are also elected to the Boards of Directors of NSCC and of its affiliates, DTC and FICC, and these boards generally operate together with the DTCC Board (collectively, the “Board”). DTCC (and NSCC) is a New York business corporation. As such, DTCC’s business is subject to the oversight of the Board, and managed on a day-to-day basis by DTCC’s senior management.

The Board is currently composed of 20 directors. Twelve of the directors represent clearing agency participants, including broker/dealers, custodian and clearing banks and investment institutions (“participant directors”); four are non-participant directors; two directors are designated by DTCC’s Series A and Series B preferred shareholders (NYSE and the Financial Industry Regulatory Authority, respectively); one director is DTCC’s Non-Executive Chairman; and one director is from DTCC senior executive management (the President and Chief Executive Officer).²⁵ The non-participant directors are not employed by any user of DTCC’s services. Non-participant directors bring additional skills and expertise to the Board, mitigate potential conflicts of interest among participant directors and introduce different perspectives. Collectively, the participant directors, non-participant directors, the Non-Executive Chairman, the management director and representatives of the Series A and B preferred shareholders provide a diverse representation of DTCC’s stakeholders and ensure that the broad interest of the public is represented. All directors, except those designated by the preferred shareholders, are elected annually to one-year terms.

As noted in the Board of Directors Mission Statement and Charter (available on the DTCC website), the Board is responsible for providing direction to and overseeing the conduct of the affairs of the corporation in the interests of the corporation, its shareholders and other stakeholders including investors, issuers and participants in the financial markets that DTCC serves. The Board plays a key role in policy development, and establishment of corporate objectives, financial management, and operational planning.

The names and backgrounds of the members of the Board and DTCC senior management are available on the DTCC website.

Mission and objectives

NSCC’s objectives are aligned with those of its parent company, DTCC, as targeted to the services of NSCC and its membership base. DTCC’s long term objective is to safeguard the stability and integrity of global financial markets, and to drive positive change. As expressed on the DTCC website:

Risk management is the primary function of DTCC and has been since the organization’s inception more than 40 years ago. The company’s risk management role entails effective and efficient identification, measurement, monitoring and control of credit, market, liquidity, systemic, operational and other risks for the DTCC enterprise, its users and the marketplace.

²⁵ As part of its capital raising plan, in 2015 DTCC issued an additional series of preferred stock via a private 144A offering to qualified institutional investors. These shares, 1,600 shares of Series C Fixed-to-Floating Rate Non-Cumulative Perpetual Preferred Stock, have a liquidation preference of \$250,000 per share (the “Series C Preferred Stock”). The Series C Preferred Stock does not have any voting rights, except in specified circumstances (including with respect to fundamental changes in the terms of the Series C Preferred Stock and the right to appoint two directors in the event of certain dividend arrearages) and except as specifically required by New York law.

In applying these objectives to the Board’s oversight role, the Mission Statement provides that:

The Board will discharge its oversight responsibilities and exercise its authority in a manner, consistent with applicable legal and regulatory provisions and with regulatory expectations of a systemically important financial market infrastructure, that:

- Promotes the safe, sound and efficient operation of DTCC and its subsidiaries, including the clearance and settlement activities conducted by its registered clearing agency subsidiaries;
- Fosters the safe, sound and efficient operation of services provided by DTCC and its subsidiaries supporting the global system for processing transactions in financial instruments and related activities;
- Seeks to develop the services and businesses of DTCC and its subsidiaries in a manner promoting further safety, soundness and efficiency broadly in the global system for processing transactions in financial instruments and related activities; and
- Leverages DTCC’s role as a leader in financial services with respect to risk management and systemic risk management, promoting sound practices in governance and in transparency to its membership and user community and in its role as a systemic component of the financial market infrastructure supporting the operation of orderly and efficient markets in the interest of the investing public.

DTCC’s performance management framework consists of two major components: annual corporate goals (“Corporate Goals”) and a “Balanced Business Scorecard” (“BBS”). Together they provide the basis for assessing DTCC’s overall performance in supporting the industry and the financial markets throughout the year. The Corporate Goals are strategic in nature, focusing on the key projects or improvements that DTCC plans to deliver during the year. The BBS focuses more on actual performance, assessing it against a series of measures organized into four quadrants (Stakeholder/Financial, Customer/Service Delivery, Strategic Positioning and Employee/Enabler). In designing these metrics and setting targets for them, the BBS deliberately recognizes that various corporate priorities must be “balanced” to achieve the optimum level of organizational achievement.

In furtherance of its Mission Statement, relevant public interest considerations are identified and reflected in DTCC’s objectives through the Corporate Goals. The Corporate Goals are developed based on consultation with individual participants, members of the Board, standing advisory councils, industry associations, regulators and others. Individual product managers are actively engaged with relevant industry groups and associations in partnering to identify ways that the DTCC can continue to develop operational, technological and risk mitigation solutions for the financial services industry.

DTCC management prioritizes safety and efficiency through review of businesses and initiatives by enterprise-wide management committees organized to focus on such issues, including the Management Committee, the Management Risk Committee (“MRC”), the Operating Committee and the New Initiatives Committee (“NIC”). Initiatives are also reviewed at the Board level by the relevant Board committee, as appropriate. For example, risk initiatives are reviewed by the MRC, and escalated as appropriate to the Board Risk Committee. The Compensation and Human Resources Committee, in consultation with the Board Risk Committee, seeks to ensure that compensation policies do not encourage excessive risk-taking and meet evolving standards on compensation practices.

DTCC works to foster a culture of openness and dialogue at the management and Board levels with its regulators (sometimes referred to as the “supervisors”).

Governance structure and arrangements

The governance arrangements, which also identify the roles and lines of responsibility and accountability within DTCC, are described in by-laws, the Board of Directors Mission Statement and Charter, the Procedures for the Annual Nomination and Election of the Board, and each of the Board Committee Charters, all of which are publicly available on the DTCC website. The Board Charter includes provisions relating to board composition, meetings, election of directors, board committees, duties and responsibilities of directors, and director qualification standards. With respect to management, the roles and responsibilities of management, including reporting lines, are provided in job descriptions.

The Board currently has designated seven (7) standing Committees, and each director serves on at least one Board committee. The committees are briefly described below:

Audit Committee: The Board has established an Audit Committee to assist the Board in overseeing: (1) the integrity of DTCC's financial statements and financial reporting; (2) the overall effectiveness of DTCC's internal control environment; (3) the effectiveness of DTCC's process for monitoring compliance with applicable laws, regulations and the Code of Conduct; (4) the performance and coverage of the internal audit function; (5) the external auditor's independence, performance and coverage; and (6) legal, compliance and regulatory risks. The roles and responsibilities of the Audit Committee are outlined in the DTCC Audit Committee Charter.

Businesses, Technology & Operations Committee: The Board has established a Businesses, Technology & Operations Committee (the "BTOC") to facilitate the oversight of DTCC's business strategy and assess performance against that strategy, as well as oversight of the operational and technology capabilities that support DTCC's business lines that are responsible for implementing that strategy. Consistent with this purpose, the BTOC oversees the performance of DTCC's existing businesses, including the review and approval of plans and fees of such businesses and extensions to such businesses. The BTOC reviews and recommends for Board approval material proposed DTCC businesses or services, with particular regard to (i) any significant risks created by the proposed businesses or services, both for DTCC and the financial system more generally, as well as the measures to control and mitigate or eliminate such risks, and (ii) whether there is an acceptable business case for the proposed activity. The BTOC also oversees management's operation and development of the infrastructure capabilities, technology resources, processes and controls necessary to fulfill DTCC's service delivery requirements, and monitor key operational and technology metrics associated with the delivery of DTCC's services. The roles and responsibilities of the BTOC are outlined in the Businesses, Technology & Operations Committee Charter.

Compensation and Human Resources Committee: The Board has established a Compensation and Human Resources Committee to assist it in overseeing DTCC's human capital management programs to ensure that they are aligned with DTCC's strategic goals and objectives and to continually improve business performance. Programs included in the scope of the Compensation and Human Resource Committee's responsibilities include those related to talent acquisition, retention, executive leadership development, performance management, succession planning, total rewards, diversity and the fostering of a high performance corporate culture. The Compensation and Human Resources Committee further advises on the extent to which human capital management programs are periodically reviewed and revised so as to be in alignment with industry and regulatory best practices. The roles and responsibilities of the Compensation and Human Resources Committee are outlined in the Compensation and Human Resources Committee Charter.

Executive Committee: The Board has established an Executive Committee to exercise powers of the Board in the event that an emergency or other time-sensitive matter arises and it is not practicable to

assemble the entire Board. The roles and responsibilities of the Executive Committee are outlined in the Executive Committee Charter.

Finance/Capital Committee: The Board has established a Finance/Capital Committee to facilitate the oversight of DTCC's financial strategy and assess performance against that strategy. Consistent with this purpose, the Finance/Capital Committee recommends financial policies, goals, and budgets that support the mission, values, and strategic goals of DTCC. The Finance/Capital Committee also reviews DTCC's financial performance against its goals and recommends for Board approval major transactions in which DTCC proposes to become engaged. The roles and responsibilities of the Finance/Capital Committee are outlined in the Finance/Capital Committee Charter.

Governance Committee: The Board has established a Governance Committee to assist the Board in: (1) identifying, screening and reviewing individuals qualified to serve as directors and recommending to the Board candidates for nomination for election at the annual meeting of shareholders or to fill Board vacancies; (2) developing, recommending to the Board and overseeing implementation of DTCC's Corporate Governance Policy and DTCC's Board Code of Ethics; and (3) reviewing on a regular basis the overall corporate governance of DTCC and recommending improvements when necessary. The roles and responsibilities of the Governance Committee are outlined in the Governance Committee Charter.

Risk Committee: The Board has established a Risk Committee (the "Board Risk Committee" or "BRC") to assist the Board in fulfilling its responsibilities for oversight of DTCC's risk management activities focusing on three critical aspects: (1) oversight of enterprise risk management systems and processes designed to identify and manage credit, market and liquidity risks to DTCC's domestic subsidiaries; (2) oversight of operational risks to DTCC arising from the operation of DTCC's subsidiaries; and (3) oversight of DTCC's efforts to mitigate certain systemic risks. In order to provide additional dedicated focus and align oversight of specialized risk categories with the domain expertise of particular committees, certain risks will be overseen by other Board committees. While these risks will not be directly overseen by the BRC, the BRC will, nonetheless, coordinate risk oversight with these Board committees as appropriate to achieve a comprehensive and holistic oversight of the organization's risk-related matters. The BRC directly oversees the following: credit, liquidity, market, operational, new initiatives and systemic risks. The BRC's role is one of delegated oversight on behalf of the Board. The Board retains the authority to review matters brought to the BRC and request immediate escalation to the full Board should the Board deem appropriate. It remains the responsibility of DTCC's management team, including through the activities of the MRC, to identify, manage and mitigate risk as appropriate. The roles and responsibilities of the BRC are outlined in the Risk Committee Charter.

Review of Board performance and conflicts of interest

The Governance Committee of the Board reviews and addresses director conflicts of interest. Directors are subject to the DTCC Board Code of Ethics. The Board Code of Ethics, which is available on the DTCC website, describes how conflicts of interest are identified and how they are to be addressed. The Board Code of Ethics is reviewed by the Governance Committee.

The Board conducts an annual self-evaluation of its performance and the performance of its Committees. The Governance Committee is responsible for coordinating and providing oversight of the annual self-evaluation, including determining the methodology for the evaluation, and overseeing its execution. The results of the self-assessments are reviewed by the Governance Committee and reported to the Board.

Director nomination process

As a registered clearing agency, NSCC is subject to Section 17(A) of the Exchange Act, which provides that the rules of a clearing agency must assure a “fair representation of its shareholders and participants in the selection of its directors and administration of its affairs....” DTCC’s shareholders are the participants and members of its three clearing agency subsidiaries, including NSCC’s Members. This “fair representation” requirement is currently satisfied by allocating shares, pursuant to the Shareholders Agreement, with attendant voting rights to elect directors, in accordance with a formula based on usage of the services of the three clearing agencies.

Each year, typically in December, a nominations solicitation letter along with a copy of the Procedures for the Annual Nomination and Election of the Board of Directors (“Procedures”) is sent to the participants of DTC, NSCC and FICC, and is also provided via Important Notice on DTCC’s website. This begins the process by which participants of the clearing agency subsidiaries may nominate individuals for election as participant directors. Using cumulative voting, DTCC’s common shareholders vote on director nominees at the annual shareholders’ meeting.

The Procedures set forth the skill sets that are necessary for Board members. The skill sets are reviewed annually by the Governance Committee and changes, if any, are recommended to the Board for approval.

Each director is required to complete a skills and experience questionnaire. In accordance with its Committee Charter, on a yearly basis, the Governance Committee reviews the skills and experience of the current directors and determines, among other things, whether there are any gaps in skills or experiences that would be desirable to have filled by a new director nominee. Each Board Committee Charter contains a list of skill sets that the committee members should have.

Individuals are nominated for election as directors based on their ability to represent DTCC’s diverse base of participants, and DTCC’s governance is specifically structured to help achieve this objective. The non-participant Board members are individuals with specialized knowledge of financial services, but who bring an independent perspective since they are not employed by firms that use DTCC services. Collectively, the Board composition reflects an appropriate balance of participant and non-participant directors. Board members serve on a variety of Board committees with responsibility to oversee aspects of DTCC and its clearing agency subsidiaries’ operations.

The Board plays an integral role in the oversight of the firm, ensuring DTCC services (including those provided by NSCC) continue to meet the evolving needs of participants.

Management experience, skills, integrity and performance

DTCC has talent management programs and succession planning programs that are reviewed, updated and presented to the Compensation and Human Resources Committee annually. As needed, and generally on an annual basis, the full Board is updated on the company’s succession planning process and on the status of development plans for key individuals. For very senior level positions, multiple members of the Management Committee and selected Board Members may be involved in the interview and selection process. For the most senior levels of the organization (e.g., CEO, Chairman, etc.) a search committee of the Board may be formed to conduct the process.

Performance appraisals are prepared on an annual basis for employees, including Managing Directors.

On an annual basis, the CEO reviews the performance of the Management Committee members and discusses the performance with the members of the Compensation and Human Resources Committee.

The performance and compensation of the CEO and Non-Executive Chairman are reviewed by the Compensation and Human Resources Committee and presented to the full Board for approval.

A Risk Assessment of the Management Committee (and selected additional Managing Directors) is conducted on an annual basis by the Group Chief Risk Officer, the Chief Compliance Officer and the General Auditor and reviewed with the Compensation and Human Resources Committee and the Chairs of the Risk and Audit Committees.

The Board of Directors measures management's performance against the Corporate Goals periodically throughout each year through (i) the review of status reports prepared by management, and (ii) the Board Committees that have oversight responsibilities for particular activities. In addition, the Board's Compensation and Human Resources Committee receives periodic updates throughout the year on the achievement of the Corporate Goals and Balanced Business Scorecard metrics. As provided in its Committee Charter, the Compensation and Human Resources Committee is also responsible for the following:

- In consultation with the Board Risk Committee Chair, assuring that corporate goals and objectives are aligned with the interests of DTCC's stakeholders and do not encourage executive officers to take undue risks;
- Reviewing and assessing, in consultation with the Board Risk Committee Chair, whether the compensation program promotes:
 - appropriate approaches to the management of risk and, specifically, does not encourage executive officers to take unnecessary and excessive risks, interpreted in the broadest possible sense; and
 - management activities to proactively identify and manage risk, including a regular assessment of the appropriateness of key performance indicators to measure and compensate executive officers, while also maintaining a high level of responsiveness to concerns and recommendations raised by regulators;
- Obtaining input from the Group Chief Risk Officer, General Auditor and Chief Compliance Officer regarding executives' performance in relation to risk management/behaviors and considering that input when determining compensation; and
- Ensuring that critical matters and material systemic risk concerns are escalated to the full Board.

Employee integrity is a core DTCC value. DTCC maintains a Code of Ethics that sets forth the foundational principles that govern DTCC's business. All employees and consultants must comply with the Code of Ethics and are expected to have a clear understanding of and commitment to the high ethical standards outlined in the Code.

Risk management framework

DTCC has established a Corporate Risk Framework pursuant to which it oversees, manages and governs the risks arising from its business activities and operations. The goal of the Corporate Risk Framework is to define DTCC's risk management program and provide guidelines to manage risks across the organization in a comprehensive, consistent and effective manner, enabling DTCC to achieve its strategic objectives while remaining consistent with its risk tolerances. While risk types are diverse, their effective management requires a core set of common processes for identifying, assessing, measuring, monitoring, mitigating and reporting risks. The Corporate Risk Framework is subject to Board oversight – with

primary and dedicated Board oversight provided by the Board Risk Committee under delegated authority of the Board – and management oversight by the MRC.

DTCC’s Corporate Risk Framework is documented through the DTCC Corporate Risk Framework Policy, which includes 12 Risk Tolerance Statements. Each Risk Tolerance Statement pertains to a specified risk within the “risk family framework” established to guide DTCC’s discussion of risk. The DTCC Corporate Risk Framework Policy is reviewed, updated (as appropriate), and approved by the MRC and Board Risk Committee at least annually.

The DTCC Corporate Risk Framework Policy is the overarching policy from which all risk management policies and procedures within the primary purview of the Group Chief Risk Office derive. The Group Chief Risk Office consists of the following areas: (i) Financial & Operational Risk Management (“FORM”), (ii) the Chief Security Office (“CSO”), and (iii) Enterprise Data Management (“EDM”).

Each area within the Group Chief Risk Office has its own risk management policies designed to address that area’s specific domain of expertise. These policies are reviewed and updated (as appropriate) annually.

Oversight for the structure, staffing, and resources of the Group Chief Risk Office is the responsibility of the Board Risk Committee. The Group Chief Risk Officer has a direct reporting line to the Chair of the Board Risk Committee and reports, administratively, to the DTCC President and Chief Executive Officer. The Chair of the Board Risk Committee has responsibility to review and approve the compensation of the Group Chief Risk Officer. The specialized Board oversight and reporting line of the Group Chief Risk Office and Group Chief Risk Officer, respectively, are designed to provide the Group Chief Risk Office with independence from the operating business areas of DTCC.

The Corporate Risk Framework is more fully described under Principle 3 (Framework for the comprehensive management of risks).

Internal Audit

The mission of the Internal Audit Department’s (“IAD”) is to provide independent, objective assurance and advisory services to assist the enterprise in maintaining effective risk management and control practices. IAD supports the Board in its oversight of the governance, risk and control framework and seeks to achieve and maintain the highest level of professional standards, while helping the company achieve its objectives. The Audit Committee is responsible for overseeing the internal audit function. IAD is governed by policies reviewed and approved by the Audit Committee and the Board.

IAD’s assurance services include evaluating operations and internal controls to validate that the enterprise’s assets and member assets held by DTCC and its subsidiaries (including NSCC) are safeguarded, and that policies, standards, and procedures are being followed. Additionally, IAD provides proactive advice to the enterprise to help management identify risks for new businesses, products, and jurisdictions, and to properly maintain controls in existing and expanding businesses.

The scope of IAD’s activities is subject to the Audit Committee’s review and approval, but is not otherwise restricted. The General Auditor directs all internal audit activities in support of its mission to support the Board and to enhance the control environment.

IAD is expected to be independent in the execution of its activities. As noted above, independence is achieved through organizational placement and reporting lines. To help maintain independence, staff assignments are rotated periodically as is practicable. In addition, the General Auditor, among others, periodically meets privately with the Audit Committee, without members of management or the external

accounting firm present. The General Auditor's performance rating and compensation are reviewed and approved by the Audit Committee.

Disclosure

Major decisions of the Board that are not confidential are disclosed to relevant stakeholders, as appropriate. To the extent such decision is reflected in a change to the Rules of NSCC or constitutes a material change to the operations of NSCC, disclosure is made through public regulatory filings with the supervisors, as applicable, as well as the issuance of Important Notices, which are published on the DTCC website. Decisions and information with a more broad impact or of more general interest are disclosed through press releases, articles, white papers and other materials posted to the DTCC website, including DTCC's Annual Reports and the financial statements of the clearing agency subsidiaries. Section VI of this Disclosure Framework provides a list of information and documents that is publicly available on the DTCC website.

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.

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.

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.

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.

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.

Risk management framework

DTCC's Corporate Risk Framework – which applies to all of DTCC's subsidiaries, including NSCC – is the overall approach through which DTCC's risk tolerances are established, communicated, and monitored. The Corporate Risk Framework (as documented through the DTCC Corporate Risk Framework Policy) defines the organization's risk management program and provides guidelines for managing NSCC's key risks in a comprehensive, consistent, and effective manner, enabling achievement of strategic business objectives while remaining within established risk tolerance thresholds. While risk types are diverse, their effective management requires a core set of common principles and common processes for identifying, assessing, measuring, monitoring, mitigating, and reporting risk. The Corporate Risk Framework includes policies, procedures, processes, controls, and systems designed to achieve this purpose. The DTCC Corporate Risk Framework Policy is reviewed and approved at least annually by the Group Chief Risk Officer, the Management Risk Committee ("MRC"), and the Board Risk Committee ("BRC").

The Corporate Risk Framework identifies five (5) key risk types, with a number of sub-types, applicable to NSCC. They are:

- Market Risk
- Credit Risk
- Liquidity Risk
- Operational Risk, which includes the following:
 - Financial Risk
 - Legal & Regulatory Compliance Risk

- Processing and Operations Risk
- Cyber and Information Protection Risk
- Information Technology Risk
- Human Capital/People Risk
- Business Continuity Risk
- Strategic Risk, which includes the following:
 - General Business Risk
 - New Initiatives Risk

Realization of any one of these risks could result in one or more negative impacts to NSCC, including: business disruption, financial loss, customer dissatisfaction, regulatory censure, and/or reputational loss. In addition, these risks, whether alone or in combination, could have or cause a systemic impact to the broader marketplace.

To mitigate these risks, materializing, the Board of Directors has delegated to management responsibility for identifying, managing, mitigating, and reporting of these risks through the establishment of corporate level controls. These corporate level controls include Risk Tolerance Statements, as well as business line and functional unit Risk Profiles.

- Risk Tolerance Statements: For each key risk (or sub-type, as the case may be), management has developed a specific Risk Tolerance Statement that (i) defines the risk, (ii) establishes the amount of risk (including the quantity and type of risk) that management is willing to accept in pursuit of its business objectives, and (iii) measures the risk using defined targets and thresholds. Application of the Risk Tolerance Statements requires that management communicate risk tolerance thresholds and appropriately respond to risk exposures, which are measured as deviations from risk tolerance thresholds. Responses include risk avoidance, reduction, mitigation, or acceptance. Senior management is charged with developing new Risk Tolerance Statements, as applicable, and reviewing and refining existing Risk Tolerance Statements, on at least an annual basis. The BRC reviews and approves the Risk Tolerance Statements at least annually.
- Risk Profiles: To identify and assess day-to-day risks more granularly, key business lines and functional units are monitored using tailored Risk Profiles. The Risk Profiles consolidate pertinent risk and control data (and may include incidents, audit findings, compliance testing results, and risk metrics) to support an overall assessment of inherent risk (i.e., the risk that exists in the absence of any mitigating controls) and residual risk (i.e., any risk that remains after application of mitigating controls) within each key business line or functional unit. Business line and functional unit managers and their staff have day-to-day responsibility for identifying, managing, and mitigating risks in their areas. The Group Chief Risk Office assists business line and functional unit managers in identifying proposed and accepted residual risks. Risk Profiles are prepared by the Group Chief Risk Office quarterly or annually, depending on the level of risk assigned to the particular business line or functional unit.

To support the effective management of risk across the organization, DTCC has adopted a “three lines of defense” approach to risk management.

- The first line of defense is comprised of the various business lines and functional units, including Product Management, Operations Management, Information Technology, and other areas critical to the daily operations and functioning. Their mandate is to manage risk proactively.
- The second line of defense is comprised of control functions, including Legal, Privacy, Compliance, and those areas that fall under the Group Chief Risk Officer’s purview, as outlined below. Their mandate is to provide advice and guidance to the first line of defense in adhering to established risk standards and, as applicable, to monitor compliance with those standards.
- The third line of defense is Internal Audit. Internal Audit’s mission is to provide independent, objective assurance and advisory services to assist the organization in maintaining effective risk management and control practices.

The group Chief Risk Office consists of the following areas: Financial and Operational Risk Management (“FORM”), the Chief Security Office (“CSO”), and Enterprise Data Management (“EDM”).

FORM is subdivided into three sub-areas:

- Operational Risk Management (“ORM”)
- the Systemic Risk Office
- Financial Risk Management (“FRM”), which is further subdivided, as follows:
 - o Counterparty Credit Risk
 - o Market Risk Management
 - o Liquidity Risk Management
 - o Quantitative Risk Management
 - o Model Risk Management
 - o Securities Valuation
 - o Risk Data Process & Infrastructure
 - o Reporting Governance, Analysis & Program Management

CSO is subdivided into three sub-areas:

- Global Security Management
- Technology Risk Management
- Business Continuity Management

EDM is subdivided into two sub-areas:

- Data Governance & Stewardship
- Data Quality

Collectively, the three lines of defense are designed to ensure that key risks remain within their risk tolerance thresholds and that any deviation outside a defined risk tolerance threshold is monitored on an ongoing basis and escalated in accordance with the Risk Tolerance Statement applicable to it.

Management and Board Committees and Board Oversight

While the responsibility for proactive, day-to-day management of risk lies with business line and functional unit managers and their staff, senior management oversight is provided within a framework of the following senior management committees:

- The Management Committee provides overall direction for, among other things, all aspects of NSCC’s businesses, technology and operations, and the functional areas that support them. Among its responsibilities, the Management Committee periodically reviews (at least quarterly) and assesses overall performance, including but not limited to, goals, metrics, targets, and budget and approves recommendations for change as necessary, and provides oversight and governance for the management committees/councils set forth below.
- The MRC is responsible for providing oversight over the management of risks in accordance with the policies and procedures included within the Corporate Risk Framework. Among other responsibilities, the MRC (i) reviews the reporting of key risks in conjunction with associated Risk Tolerance Statements and (ii) at least annually, reviews the scope and nature of risk reporting provided to the MRC, making changes as appropriate. The MRC is charged with ensuring that the organization’s risk management culture is supported through appropriate and timely senior management communication, risk management training, maintenance of risk management policies and procedures, organizational structures and staffing consistent with the three lines of defense approach and such other management practices and structures as the MRC deems appropriate.
- The Operating Committee provides oversight, guidance, and decision-making for corporate and business operations and technology strategies and the execution of those strategies, including review and approval (where appropriate) of new NSCC products and business lines, monitoring of financial results and performance against budgets, and the resources and processes necessary to fulfill business, operations and technology requirements.
- The New Initiatives Committee (“NIC”) is responsible for the oversight and governance of new initiatives applicable to NSCC. Among its responsibilities, the NIC reviews the feasibility of proposed new initiatives and evaluates the initiative’s risk in light of its value. The NIC evaluates the success of the execution of new initiatives through the initiative’s life cycle.
- The Technology Risk Management Steering Committee (“TRMSC”) provides oversight, guidance and advice regarding the prioritization and execution of technology risk, information security risk and cyber security risk initiatives.
- The Global Diversity & Inclusion Council is responsible for guiding the strategic agenda and setting the corporate priorities in partnership with Human Resources and senior leadership. Each year, the Council sets DTCC’s corporate diversity and inclusion priorities to address the biggest gaps and opportunities in diversity and inclusion at DTCC.

Board oversight. The Board of Directors is responsible for providing direction to and overseeing the conduct of the affairs of the organization and, in the interests of the organization, its shareholders, and other stakeholders, including investors, issuers, and participants. The Board discharges its oversight responsibilities and exercises its authority in a manner that, among other things, is designed to promote the safe, sound and efficient operation and services of NSCC, and promote further safety, soundness and efficiency broadly in the global system for processing financial transactions. The Board fulfills its role either directly or by delegation of certain responsibilities to committees of the Board. The Board Committees and their responsibilities are described under Principle 2 (Governance).

Internal Audit. As a third line of defense, the internal auditing function provides assurance to the Board and senior management on the effectiveness with which the organization assesses and manages its risks, including the manner in which the first and second lines of defense operate. The General Auditor reports directly to the Board’s Audit Committee, reinforcing the independence and objectivity of the internal

audit function. Internal Audit provides independent validation of the business area's risk and control environment and reviews the adequacy of internal controls, procedures, and records of the company with respect to operational risks (through the audit process).

Policies, procedures and systems

DTCC maintains comprehensive policies, procedures, and systems to measure, report, manage and mitigate risk. DTCC maintains an enterprise-wide repository of corporate policies and procedures. This includes a system that provides automated workflows for the review, approval and dissemination of documents maintained within the repository.

NSCC monitors and manages credit and market risk, addressed more fully under Principles 4 and 6, respectively, through strict membership admission criteria and review (as outlined in NSCC Rules 2 and 2A), ongoing monitoring and review of Members (as outlined in Rule 2B), daily (and, as needed, intraday) collection of Clearing Fund (Rule 4 and Procedure XV), and other tools that enable NSCC to obtain adequate assurances that Members are capable of meeting their membership obligations (Rule 15). FRM's efforts are supported by a number of systems, including the systems that (i) capture and evaluate Member regulatory reports (the Credit Risk Rating Matrix system²⁶), (ii) calculate Member Clearing Fund requirements, (iii) monitor Members' compliance with Clearing Fund requirements, and (iv) evaluate the potential closeout exposure of a given Member portfolio in the event of a default.

Clearing Fund requirements, which include a number of risk-based components, are calculated systemically for each NSCC Member at the end of each day. The core of this system is built around an engine that uses a parametric Value-at-Risk model to estimate market exposure for equities and a haircut-based approach for fixed-income securities. The models for these calculations are regularly back-tested, as well as tested under stress scenarios, designed to identify coverage issues and protect against model risk. This engine has been upgraded to run on frequent intervals, using intraday trade and settlement data and intraday prices. To further mitigate credit risk, NSCC's systems allow the addition of special Clearing Fund charges to specific Members, and NSCC's Rules permit the collection of Clearing Fund on an intraday basis.

NSCC mitigates collateral risk, addressed more fully under Principle 5 (Collateral), by strictly limiting the types, and amount, of collateral it accepts for the Clearing Fund. Eligible collateral types and limitations are described in NSCC Rule 4 and Procedure XV.

NSCC manages its liquidity risk by running daily simulations that measure the amount of liquidity that would be required for NSCC over the settlement cycle in the event that the Member or Member family with the largest aggregate liquidity exposure becomes insolvent. NSCC then seeks to maintain qualified liquidity resources in an amount sufficient to cover this risk, including through maintenance of a committed credit facility with a consortium of lenders. At June 30, 2016, the amount of NSCC's committed facility was \$10.855 billion. The process and NSCC's liquidity resources are described more extensively in the discussion of Liquidity Risk under Principle 7 below.

ORM utilizes several tools to identify, assess and manage operational risks, including internal incident data collection, external loss data collection, operational risk profile risk assessments, scenario analysis,

²⁶ The Credit Risk Rating Matrix (CRRM) is utilized to risk rate banks and broker/dealer Members. An enhanced CRRM model, subject to regulatory approval, will also rate foreign bank Members in addition to domestic banks and broker/dealer Members. The enhanced model will also rely on both quantitative and qualitative factors.

testing by internal and external parties, metrics and key risk indicators, issue tracking and reporting. Operational Risk policies and procedures, including business continuity arrangements, are discussed under Principle 17 (Operational risk).

The Compliance Department performs testing and conducts risk assessments to determine compliance risk levels and assess the effectiveness of compliance controls. The Compliance Department utilizes a number of automated systems to assist in the identification and mitigation of compliance risk. For NSCC, this includes systems that provide (i) “Know Your Customer” due diligence, (ii) a compliance tracking database, and (iii) monitoring of employee investments (to detect and prevent insider trading).

Information and incentives for Member management of risk

Members are provided with a significant amount of information, and incentives, to enable them to monitor and manage the risks they pose to NSCC. First, the Rules, which are publicly available, establish Membership responsibilities, including Members’ daily responsibilities to meet Clearing Fund requirements and complete settlement. While NSCC does not impose trading limits, on a daily basis NSCC provides Members an entire suite of reports showing their activity in all phases of the settlement cycle; this includes transaction messages and reports (reporting to Members validated trade capture), consolidated trade summaries, Clearing Fund requirements, and settlement reports/accounting summaries.²⁷

To assist firms in understanding NSCC’s services and applications, NSCC provides a number of tools, including user guides, as well as training courses through DTCC Learning. Topics covered include not only functional and operational aspects of securities clearing through NSCC, but also risk management practices and methodologies.

Each Member is required to meet its Clearing Fund requirements which are based on the Member’s outstanding positions as well as its intraday trading and settlement activity. Clearing Fund reports help Members manage their market risk on an ongoing basis. The resizing of a Member’s margin requirement (at least once per day) and its close correlation with the amount of risk created by a Member’s trade activity provide incentives for Members to carefully monitor and manage the risks that they pose to NSCC. In addition, NSCC requires that those Members whose default would pose the largest liquidity exposure to NSCC post supplemental liquidity deposits (“SLD”) to the Clearing Fund to cover the heightened liquidity exposure arising around monthly option expiry periods.²⁸ Members have a vested interest in monitoring their Clearing Fund requirements continuously, as these requirements have a direct impact on the amount of collateral and liquidity at their disposal.

NSCC also has the ability to require additional Clearing Fund deposits or other adequate assurances (such as limitations on their activity), as a risk mitigant from those firms it considers may pose a risk to NSCC or its membership.

Further, as all NSCC participants are required to comply with the NSCC Rules, NSCC has a number of disciplinary tools at its disposal, including monetary fines, the consequence of reporting certain incidents to regulators, and, in some cases, limitation on access to one or more services or limitation on activities,

²⁷ In addition, since 2014, NSCC has provided a trade monitoring tool for its Members, the “DTCC Limit Monitoring Risk Management Tool,” designed to enable Members to monitor trading activity on an intraday basis of their organizations and/or their correspondent firms, through review of post-trade data. *See* NSCC Rule 54.

²⁸ SLD requirements are set forth in Rule 4A.

which could ultimately result in termination of membership should a participant fail to meet its requirements to NSCC.

Material interdependency risks

Given its central role in the U.S. securities markets, NSCC potentially poses a number of risks to other entities, while it is also exposed to risks that may originate from other entities.

As regards risk that may be posed by participants, NSCC has established clear and objective membership requirements for each category of membership, which provide fair and open access for firms seeking membership, while maintaining prudent risk management standards that enable NSCC to manage the material risks resulting from participant activities. As described more fully under Principle 4 (Credit risk), NSCC monitors Members on an ongoing basis and assesses credit risk through the use of a Credit Risk Rating Matrix, which is designed to focus the level of scrutiny and ongoing monitoring in a manner consistent with a Member's internal risk rating.

In a similar manner, NSCC has established credit standards for entities providing settling bank services, and investment and custody services. While settling banks are selected by, and act on behalf of, participants, entities providing such services are held to strict operational standards, and are subject to fines and other disciplinary measures (in their capacity as Members or Settling Bank Only Members) should they fail to abide by such requirements.

NSCC manages investment risk, including investment of Clearing Fund cash, through the Board-approved DTCC Clearing Agency Investment Policy ("Investment Policy"). Investment risk is discussed in more detail in Principle 16 (Custody and investment risks).

As discussed above, settlement liquidity risk is managed, in part, by NSCC's maintenance of a committed credit facility with a consortium of lenders to facilitate settlement in the event of a failure to settle. Liquidity risk mitigants are discussed in Principle 7 (Liquidity risk).

Material service providers are subject to a comprehensive vendor review and vetting process that includes both credit and operations risk reviews and controls. Mitigants may take the form of contractual protections, or additional or backup providers where deemed appropriate and feasible. For example, NSCC utilizes price feeds from multiple vendors as an additional risk mitigant, and further employs price review and data scrubbing procedures to minimize the risk of using inaccurate prices.

As described in the General Background section of this Disclosure Framework and Principle 20 (FMI links), NSCC relies on an interface with DTC for the book-entry movement of securities to settle CNS transactions. As part of the interface, DTC and NSCC have established certain limited cross-guarantees and arrangements to permit transactions to flow smoothly between DTC's system and the CNS system in a collateralized environment. The operational risks of the interface are monitored on an ongoing basis through DTCC Operations and Settlement areas, and are subject to DTCC's Operational Risk Management framework. The cross-guaranty arrangements are monitored and managed through DTC's automated Collateral Monitor risk control and Failure-to-Settle system, which are reviewed and tested on a regular basis.

DTC also acts as NSCC's settlement agent, to effectuate daily money settlement through use of the NSS system. As a result, NSCC is indirectly dependent on the availability of NSS to complete daily settlement, as well as on Fedwire®, to effectuate Clearing Fund payments.

NSCC also maintains an arrangement with The Options Clearing Corporation (“OCC”) (an arrangement referred to as the “OCC Accord”) providing for the settlement of exercises and assignments (“E&A”) of options on securities that are cleared and settled through NSCC. The arrangement is designed to facilitate the settlement of the underlying securities upon the exercise or assignment of such options by mitigating, to the extent practicable, duplicative margin requirements. The OCC Accord provides for a two-way guaranty between OCC and NSCC of the mark-to-market amounts for options transactions for which NSCC has guaranteed completion in the event of a mutual participant’s failure. OCC can make this guarantee to NSCC because it continues to margin E&A activity through the settlement date, including collecting mark-to-market amounts. As a result, NSCC does not mark E&A positions to the market. NSCC can make its guarantee to OCC because it collects risk-based margin on the Member’s entire portfolio of E&A activity, including VaR margin.

In addition, CDS Clearing and Depository Services Inc. (“CDS”), the Canadian CSD and CCP, is a full service Member of NSCC, as well as a participant of DTC. The relationship between NSCC and CDS, which has been in place and operated successfully for approximately three decades, enables participants of CDS to clear and settle OTC trades with U.S. broker-dealers through sub-accounts maintained by CDS with DTC and NSCC. CDS is the Member of NSCC (and DTC). CDS’s participants are not Members and NSCC looks to CDS as principal for satisfaction of clearance and settlement obligations; should a CDS participant default on its settlement obligation, CDS is required to meet the settlement obligation to NSCC. NSCC mitigates its exposure to CDS as a result of its participants’ activities by calculating and collecting CDS’s Clearing Fund requirements at the level of each sub-account maintained by CDS for its participants. For its own protection, CDS maintains collateral based on contributions from its participants that use NSCC services.

Given the interdependent nature of financial markets and NSCC’s role as a SIFMU, risks of the various types identified in the Corporate Risk Framework risk framework may occur at a magnitude or in combination with the potential of creating “systemic” impact. Such systemic-type risks and potential mitigants are evaluated by the Systemic Risk Office and discussed with management, the Board of Directors and, through outreach, with NSCC’s Members.

Scenarios that may prevent an FMI from providing critical operations and services

NSCC identifies scenarios that may potentially prevent it from providing its critical operations and services, through the development of recovery and resolution and orderly wind-down plans. As part of these efforts, NSCC has conducted Member failure stress-testing to determine the number of Member failures that NSCC can sustain before a disruption of its critical operations would likely occur. NSCC maintains financial resources—the Clearing Fund (which, in the aggregate currently serves as the default fund for loss mutualization purposes) and a portion of NSCC’s retained earnings - designed to enable it to cover potential losses resulting from the failure of the Member or Member family to which it has the largest credit exposure (a “Cover 1” standard). These tests, in general, show that such resources are sufficient to handle the default of several Members. NSCC’s loss waterfall is discussed under Principle 13 (Participant-default rules and procedures).

In addition, Business Continuity Management maintains plans that address the loss of people, premises and/or technology as an additional element to ensure the continuing operation of critical services. This is discussed in Principle 17 (Operational risk).

Recovery or orderly wind-down plans

NSCC has developed draft plans to address the continued operation of critical services and operations. These include a recovery plan and a separate framework for resolution and orderly wind-down, in the

remote event that recovery strategies prove unsuccessful. The plans include an analysis of stress scenarios, including market events and independent and related risks, which may threaten NSCC's ability to provide its services. The plans have been reviewed by the Management Committee and the Board, and discussed with NSCC's supervisors.

The recovery strategy for NSCC critical services and operations focuses on identifying tools available to management in scenarios where critical services and operations of NSCC could be at risk due to multiple Member defaults, either simultaneously or in quick succession, or due to an idiosyncratic market or operational event. The recovery plan sets forth the recovery tools and steps, based on NSCC's current Rules that NSCC's management may take or implement to recover from such an event. This includes use of NSCC's prefunded resources (as described under Principle 4 (Credit risk)) and loss waterfall arrangements, which are described under Principle 13 (Participant default rules and procedures). The resolution and wind-down framework is designed to provide an approach under existing insolvency laws that would enable critical services to be provided through a failover entity.

The development of these plans is led by the Office of Recovery & Resolution Planning, under the guidance of the General Counsel's Office, pursuant to a policy reviewed and approved by the Management Committee and updated annually, as needed. The Office of Recovery & Resolution Planning reports to the Management Committee, through the Head of Clearing Agency Services. The plans are developed and reviewed internally with a cross-functional team of subject matter experts which includes representatives of FRM, ORM, the General Counsel's Office, the Systemic Risk Office and Finance.

The strategies outlined in the plans are evolving, and subject to modification as applicable regulations are proposed, services are altered or initiated, new risk management tools are developed, and regulatory feedback received. NSCC intends to update the plans annually after they are finalized or upon significant changes to one or more critical operations.

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. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two largest participants and their affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions. All other CCPs should maintain, at a minimum, total financial resources sufficient to cover the default of the one participant and its affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions.

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.

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.

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.

[Not applicable, as NSCC is not a payment system or SSS]

Key consideration 4: A CCP should cover its current and potential future exposures to each participant fully with a high degree of confidence using margin and other prefunded financial resources (see Principle 5 on collateral and Principle 6 on margin). In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover 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 potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. In all cases, a CCP should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount of total financial resources it maintains.

Key consideration 5: A CCP should determine the amount and regularly test the sufficiency of its total financial resources available in the event of a default or multiple defaults in extreme but plausible market conditions through rigorous stress testing. A CCP should have clear procedures to report the results of its stress tests to appropriate decision makers at the CCP and to use these results to evaluate the adequacy of and adjust its total financial resources. Stress tests should be performed daily using standard and predetermined parameters and assumptions. On at least a monthly basis, a CCP should perform a comprehensive and thorough analysis of stress testing

scenarios, models, and underlying parameters and assumptions used to ensure they are appropriate for determining the CCP's required level of default protection in light of current and evolving market conditions. A CCP should perform this analysis of stress testing more frequently when the products cleared or markets served display high volatility, become less liquid, or when the size or concentration of positions held by a CCP's participants increases significantly. A full validation of a CCP's risk-management model should be performed at least annually.

Key consideration 6: In conducting stress testing, a CCP should consider the effect of a wide range of relevant stress scenarios in terms of both defaulters' positions and possible price changes in liquidation periods. 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.

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.

Framework for management of credit risk

The measurement, monitoring and management of credit risk are part of the overall risk management framework described under Principle 3 (Framework for the comprehensive management of risk). As noted in that section, NSCC manages its credit exposures through strict membership admission criteria, on-going Member surveillance, and regular margining.

NSCC's credit risk vis-a-vis Members consists of the risk that a Member defaults in the performance of its obligations to NSCC, whether by virtue of its insolvency, the refusal of its Settling Bank to settle on its behalf or otherwise. NSCC addresses these risks through its margining methodologies, and through participation criteria and ongoing monitoring.

Membership requirements. NSCC has established participation criteria and requirements relating to financial resources, creditworthiness, and operational capability. Rule 2, Rule 2A and Addendum B of NSCC's Rules set forth the specific requirements for each level of membership. Members must meet minimum financial and other criteria for membership, including minimum capital requirements. All applicants for membership must provide NSCC with certain information, which is reviewed by FRM to confirm, among other matters, that the applicant has (1) sufficient financial ability to make anticipated contributions to the Clearing Fund and to meet obligations to NSCC; (2) either an established business history, or personnel with sufficient operational background and experience to ensure the ability of the firm to conduct such a business; and (3) appropriate settling bank arrangements. NSCC employs a robust membership process that entails a thorough review prior to approval by the Board Risk Committee or through its delegated authority to the Management Risk Committee. Details regarding the application process are set forth in response to Principle 18 (Access and participation requirements).

As regards Settling Banks, entities that act as such and that are not otherwise NSCC Members (and thus subject to ongoing financial reporting requirements and surveillance review) are required to be "Settling Bank Only Members"; as such they must meet the minimum financial and credit requirements applicable

for that type of membership. The review and ongoing monitoring of Settling Banks is discussed more fully under Principle 9 (Money settlement).

Ongoing monitoring and surveillance. NSCC monitors its credit exposures with respect to the risk that a Member defaults through the ongoing surveillance of its Members' financial strength and default risk. On an ongoing basis, Members are required to provide financial and other information to NSCC, as outlined in Rule 2B, to ensure that they meet the membership standards on an ongoing basis. FRM reviews earnings releases, equity prices, news, and other publicly available information as part of its Member surveillance. NSCC utilizes the CRRM to evaluate and rate the credit risk of NSCC's U.S. bank and broker-dealer Members, and rank Members based upon their relevant financial information (including information contained in regulatory Call or FOCUS reports). These rankings are used to set surveillance levels and inform the calculation of certain Clearing Fund component charges. All participants are subject to a credit review at least every 12 to 24 months.

Clearing Fund. NSCC collects Clearing Fund deposits from its Members using a risk-based margin methodology. These amounts operate, individually, as the Member's margin, and the aggregate of all such Members' deposits is referred to, collectively, as the Clearing Fund, which operates as NSCC's default fund. This risk-based methodology enables NSCC to identify the risks posed by a Member's unsettled portfolio and to quickly adjust and collect additional deposits as needed to cover those risks. Each Member's Clearing Fund required deposit (their "Required Deposit") is calculated at least once daily pursuant to a formula set forth in Procedure XV of the Rules, designed to provide sufficient funds to cover NSCC's exposure to the Member fully with a high degree of confidence. In addition, NSCC maintains financial resources sufficient to cover a wide range of potential stress scenarios (discussed more fully below), including the default of the Member and its affiliated Members that would cause the largest aggregate credit exposure to NSCC in extreme, but plausible, market conditions. The Clearing Fund formula, discussed more fully under Principle 6 (Margin), takes account of a variety of risk factors through the application of a number of components.

Measurement, monitoring and management of credit risk

NSCC Members are monitored on a daily, monthly/quarterly, and periodic basis. NSCC monitors Members' credit risk through review and analysis of financial and operational information and through regular market, news, and regulatory monitoring. Members are required under the Rules to (i) provide NSCC with regulatory reports and data relating to their financial condition on a monthly or quarterly basis (depending on the reporting frequency of the entity), (ii) provide NSCC with audited financial statements on an annual basis, and (iii) promptly notify NSCC of material events or changes in their business or financial condition. Members' ongoing reporting and information requirements are set forth in Rule 2B.

The CRRM is produced systemically from data contained in the Members' regulatory reports. CRRM uses a rating scale of 1 to 7, with 1 being the strongest and 7 being the weakest. The key financial elements used to set a Member's credit rating focus on that firm's capital, leverage, liquidity and profitability. Once this rating is generated, it is reviewed by an assigned analyst within FRM's Counterparty Credit Risk ("CCR") group. The analyst considers whether qualitative factors (e.g. regulatory history, type of audit opinion issued, and material management changes) warrant a manual downgrade to the model-generated rating. The resulting rating determines the level of financial review that will be performed on that Member and may impact the Member's Clearing Fund requirement.²⁹

²⁹ An enhanced CRRM model, subject to regulatory approval, will also rate foreign bank Members in addition to domestic bank and broker/dealer Members. The enhanced model will also rely on both quantitative and qualitative factors.

Members with a weaker internal credit rating (rated a 5, 6, or 7 on the credit risk rating matrix) are automatically placed on NSCC's Watch List. Members on the Watch List may be subject to additional surveillance and monitored more closely than Members with a stronger credit rating.

CCR also maintains an enhanced surveillance list, which consists of Members for which CCR conducts additional surveillance or requires additional information in order to more closely monitor their risk profile. Members can be added to enhanced surveillance for a variety of reasons, including concerns about regulatory issues, changes to senior management at the Member firm, etc. A Member can be added to enhanced surveillance regardless of the rating generated for the firm by the CRRM.

On a daily basis NSCC calculates a Clearing Fund requirement for each Member based upon their unsettled and pending transactions, using the prior day's securities closing market price. The formula uses a risk-based methodology, and includes a number of components. These currently include, but are not limited to: volatility charges, mark-to-market charges, market-maker domination charges, fail charges (for CNS transactions), "special charges", a charge for certain activity that settles on a shortened process cycle, and a backtesting deficiency charge.³⁰ In addition, NSCC may impose a premium charge when a Member's Required Deposit exceeds its excess net capital. Any shortfalls in a Member's Required Deposit must be paid by 10:00 a.m. EST, each business day. In addition, NSCC may call for additional Clearing Fund on an intraday basis, as needed. Any such amounts must be satisfied within one hour of demand.

For volatility, a parametric value at risk ("VaR") model is used based on historical price movements; for illiquid securities or securities less amenable to statistical analysis, a haircut is applied in lieu of VaR. The mark-to-market component measures the unrealized profit or loss using the contract price versus the current market price (that is, the price for a security determined daily for purposes of the CNS system; generally that is the prior day's closing price). Market maker domination charges are applied to a Member's position in securities in which that market maker so dominates activity that if the market maker were to become insolvent it would be difficult for NSCC to liquidate the position in those securities since there would no longer be as robust a market. CNS transactions that do not settle as scheduled are subject to a fail charge in the form of an additional haircut. Special charges can be assessed on Members in view of price fluctuations in or volatility, or lack of liquidity of any security, and a backtesting charge is assessed for Members with recurring backtesting deficiencies. These charges are generally calculated overnight and notified to Members early the following morning, for collection by 10:00 a.m. EST.³¹

NSCC may also, on an as-needed basis, impose intraday charges. Security pricing is monitored intra-day, and additional Clearing Fund charges may be collected to cover the price movement from those Members with a significant exposure in an identified security. FRM systems also include routines that enable FRM to monitor Members' trading activities throughout the trading day, to determine whether exposures are building up that would require special actions to increase a Member's Clearing Fund deposit. These routines are run frequently throughout the day and generate reports identifying Members' then-current positions and changes in the market value of those positions. These reports are reviewed, and if FRM concludes that action is warranted, it may impose an intraday Clearing Fund charge. As part of NSCC's accelerated trade guaranty proposal, FRM will be measuring NSCC's exposures to its Members in

³⁰ As part of the accelerated trade guaranty proposal, the Clearing Fund formula is being revised as described in more detail under Principle 6 (Margin).

³¹ In September 2017, the U.S. securities market is expected to move to settlement of equities, corporate and municipal bonds and UITs on a T+2 basis, thereby eliminating one day's settlement obligations from NSCC's credit exposure.

frequent intra-day slices, using updated trading activity and price information, and may make intra-day charges to address both market/portfolio changes and potential intra-day backtesting deficiencies.

NSCC employs back-testing and stress-testing to determine the adequacy of its Clearing Fund requirements. The back tests compare the Clearing Fund requirements with actual price changes in a portfolio. The portfolio values are calculated by using the actual positions in an NSCC Member's portfolio and the observed security price changes over the following three days. NSCC employs stress testing to determine whether there will be adequate coverage levels for potential losses incurred during extreme, but plausible, market conditions. The scenarios used in the stress tests fall into two broad categories – historical scenarios and hypothetical scenarios. NSCC maintains policies and procedures, in accordance with the SEC's Clearing Agency Standards, that address the process for conducting these tests and calculating the resulting metrics. Back-testing and stress-testing are discussed more fully below and under Principle 6 (Margin).

As a further mitigant of credit risk, under NSCC Rule 15, NSCC may seek additional assurances of financial responsibility (as well as operational capability) from a participant as it deems necessary or advisable. This may include increased Clearing Fund deposits or additional payments.

Coverage of current and potential future exposures to Members and financial resources

The Clearing Fund formula is designed to calculate individual Member Clearing Fund (margin) requirements at a 99% confidence level, assuming a three day liquidation period. The adequacy of these amounts is measured through back-testing.

In addition, NSCC maintains additional prefunded financial resources sufficient to cover a wide range of potential stress scenarios, including the default of the Member and its affiliated Members that would cause the largest aggregate credit exposure to NSCC in extreme but plausible market conditions (referred to as a "Cover 1" standard).

NSCC clears and settles equity securities, corporate and municipal debt, ETFs and UITs in the U.S. NSCC does not consider these securities to have a more complex risk profile of the type contemplated by Key Consideration 4 or the accompanying explanatory notes to the FMI Principles report. Moreover, NSCC is not systemically important in multiple jurisdictions. Accordingly, NSCC maintains financial resources in amounts required, at a minimum, to meet a Cover 1 standard; this is consistent, and in accordance, with the requirements of Exchange Act Rule 17Ad-22 (b)(3).

The documentation and governance processes that support this approach include asset class reviews of the securities that are cleared by NSCC. These reviews are completed every 6 to 24 months, depending on the level of risk for each asset class. The review is an assessment of key risk dimensions of the security type (credit, market, liquidity, operational, strategic) and mitigants/controls to minimize these risks. Each asset class review is presented to the Management Risk Committee for a final review of recent trends relevant to the class and the overall risk rating.

Additional financial resources

In the event of a Member default, the amounts on deposit to the Clearing Fund from the defaulting Member (along with any other resources of, or attributable to, the defaulting Member that NSCC may access under its Rules, including under available Clearing Agency Cross Guaranty arrangements) is the first source of funds that NSCC would use to cover any losses that may result from the closeout of the defaulting Member's guaranteed positions.

To address potential tail losses, NSCC maintains additional prefunded resources. These consist of (i) the Clearing Fund which, in the aggregate, serves as NSCC's default fund, and (ii) a portion of NSCC's retained earnings. Under Addendum E of NSCC's Rules (Statement of Policy—Application of Retained Earnings-Member Impairments), NSCC has adopted the policy that, in the event of a Member impairment, before applying the Clearing Fund deposits of non-defaulting Members to cover any resulting loss, NSCC will apply at least 25% of its retained earnings existing at the time of the Member impairment.

As regards the composition of the Clearing Fund, Clearing Fund deposits are cash, but a portion of a Member's Required Deposit may be evidenced by open account indebtedness, secured by certain eligible U.S. government and agency securities, as described in more detail under Principle 5 (Collateral). Not less than 40 % of a Member's Required Deposit must be in cash, and typically the overwhelming majority of the Clearing Fund is comprised of cash. As regards the portion of NSCC's retained earnings that it maintains available to satisfy potential losses arising from a Member default, NSCC maintains sufficient liquid net assets to fund such amounts. All of the prefunded financial resources that NSCC thus relies upon to cover default losses are liquid and readily available to meet its obligations.

Stress-testing

As described above, NSCC employs stress-testing to evaluate whether it will have adequate financial resources to cover potential losses during extreme, but plausible, market conditions.

NSCC employs stress-testing to determine whether it will have sufficient prefunded financial resources to cover potential losses in a wide range of scenarios including, at a minimum, on a Cover 1 standard, during extreme, but plausible, market conditions. The scenarios used to conduct these stress tests fall into two broad categories: historical scenarios and hypothetical scenarios. The historical scenario set includes 50 stress scenarios selected from a rolling look-back period of 10 years. In addition, NSCC supplements the scenarios with historical stresses outside the 10-year period, such as the volatile market situation in the fall of 1987. The hypothetical scenarios are constructed according to potential market conditions. Current positions in a portfolio are used in the stress tests. The appropriateness of both the historical and hypothetical scenarios are reviewed periodically by the Enterprise Stress Test Council (ESTC), and escalated for review by the Management Risk Committee on a quarterly basis.

The ESTC has responsibility for the review, oversight, escalation, and governance of credit stress-testing related activities at NSCC. This council, comprised primarily of FRM management, meets regularly and its responsibilities include (but are not limited to): reviewing stress-testing policies, procedures, methodology, and test results; approving stress scenarios; and ensuring stress-testing activities meet DTCC's risk tolerance requirements.

The stress-testing model is subject to an annual assessment review in accordance with the Model Risk Management Policy. Additionally, an internal Model Risk Governance Council, comprised primarily of FRM management, is responsible for oversight of all risk models. This group meets regularly and discusses any identified issues that might impact model efficacy.

NSCC maintains written policies and procedures that describe its process related to the calculation and monitoring of the following stress test metrics: (i) maximum Member-level daily historical and hypothetical stress test results run daily and reported on a monthly basis; (ii) maximum family-level daily historical and hypothetical stress test results run daily and reported on a monthly basis; and (iii) as a record of the financial resources necessary to meet a Cover 1 standard in accordance with Exchange Act Rule 17Ad-22(c)(1), the maximum observed family-level historical stress deficiency / to total aggregate Clearing Fund requirement, in each case on the last business day of each month.

Stress-tests are conducted daily, and the results are reviewed monthly by FRM. Exceptions identified and substantial changes in stress-test results are reviewed by FRM management in order to identify the causes and formulate responses, as needed. The results of this review and related metrics are reported and discussed monthly with the Management Risk Committee, and shared regularly with the Board Risk Committee and NSCC's Supervisors.

Allocation of credit losses and replenishment of resources

In the event of a Member default, the amounts on deposit to the Clearing Fund from the defaulting Member, along with any other resources of, or attributable to, the defaulting Member that NSCC may access under its Rules, including resources available under applicable Clearing Agency Cross Guaranty arrangements,³² are the first source of funds that NSCC would use to cover any losses that may result from the closeout of the defaulting Member's guaranteed positions. If these amounts are not sufficient to cover all losses incurred, including the repayment of any amounts borrowed for liquidity purposes, then NSCC will apply the following available resources, in the following waterfall order:

- (i) as provided in Addendum E to NSCC's Rules, at least 25% of NSCC's retained earnings existing at the time of the Member default, or such greater amount as the Board of Directors may determine; and
- (ii) in the manner provided in Rule 4, the required Clearing Fund deposits of Members who are non-defaulting Members on the date of default.

If, as a result of applying the Clearing Fund, a Member's actual Clearing Fund deposit is less than its Required Deposit, it will be required to top up such shortfall. In addition, iterative allocations relating to the same loss event may be made, if necessary, to fully eliminate any remaining credit loss. Members may withdraw from membership within specified timeframes after receipt of a loss allocation charge and limit their obligation for future assessments, but they will remain obligated for the charge that triggers their withdrawal, and any other prior charge for which a withdrawal election was not timely made.

³² These resources are described in Principle 13 (Default Management).

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.

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

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

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.

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.

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.

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

Collateral eligibility

NSCC accepts cash (in U.S. dollars) and certain eligible securities as Clearing Fund collateral. Due to the nature of its business, NSCC limits the non-cash securities currently accepted to collateralize a Member's open account Clearing Fund indebtedness to U.S. Government Treasury securities, U.S. Agency securities guaranteed by the U.S. Government, and certain U.S. Agency/Government Sponsored Enterprise pass-through securities (collectively, "Eligible Clearing Fund Securities"). Not less than 40% of a Member's required deposit must be in cash, and typically the overwhelming majority of the Clearing Fund as a whole is comprised of cash.

NSCC does not accept cross-border collateral.

NSCC maintains a collateral management system (the "Clearing Fund Management System" or "CFM") that validates that posted collateral meets security eligibility standards and values aggregate collateral to determine sufficiency of posted amounts.

Collateral haircuts and valuation

NSCC applies haircuts to Eligible Clearing Fund Securities that reflect the potential of such assets' value to decline both in normal and in stressed markets. These haircuts are set forth in Procedure XV (Clearing Fund Formula and Other Matters) of NSCC's Rules, and include additional concentration charges for pass-through securities posted in amounts above specified levels.

Because NSCC limits the collateral it accepts to U.S. Government Treasury securities, U.S. Agency securities guaranteed by the U.S. Government and certain U.S. Agency/Government Sponsored

Enterprise pass-through securities, it faces limited exposure to wrong-way risk with respect to its collateral.

Haircuts are reviewed periodically if FRM determines that the risk of a particular security may have increased significantly. In addition, annual reviews are conducted (i) to determine if the risk of the security or class of securities has changed, and (ii) to assure that haircut rates conform to rates applied by NSCC's liquidity providers (in connection with the annual renewal of NSCC's committed credit facility) in the event such securities are used to collateralize borrowings under that facility. The sufficiency of haircuts is evaluated through use of back tests and stress tests. This review is conducted initially by management within FRM, and any recommended changes are escalated to the Management Risk Committee and the Board Risk Committee. Before making adjustments to the haircuts it applies to such collateral, NSCC measures the potential impact of such adjustments. However, given the limited nature and high quality of acceptable collateral, adjustment of haircuts is infrequent.

Collateral securities are re-priced every night, from pricing sources utilized by FRM's Securities Valuation unit. Pricing updates may be performed instantaneously and will update collateral valuations within NSCC's collateral management system accordingly.

Eligible Clearing Fund Securities are pledged to NSCC through DTC's pledge system, and are within the control of NSCC. Securities pledged by Members to secure their Clearing Fund open account indebtedness thus are available for immediate access by NSCC and may be re-pledged by NSCC to its liquidity providers to facilitate completion of settlement.³³

Collateral management

Clearing Fund management is performed by the Treasury Operations staff, which is part of the Finance Department. This group consists of dedicated staff in multiple locations to facilitate the management of NSCC's Clearing Fund collateral using the CFM system in order to ensure smooth operations even during times of market stress.

Under NSCC's Rules, Members are required to make Clearing Fund deposits within specified timeframes (generally, Required Deposits must be satisfied by 10 am every morning or, for intraday calls, within one hour of demand), and are permitted to request the return of excess amounts and/or substitute collateral, subject to the review of Clearing Fund Management for collateral sufficiency, prior to specified cutoff times. The CFM system interfaces with the system that calculates Clearing Fund requirements, and systemically validates clearing fund parameters (for example, to ensure minimum cash levels are maintained), validates security eligibility and applies security haircuts in order to determine overall sufficiency and timeliness of deposited amounts.

Treasury Operations is also responsible for the investment of Clearing Fund Cash. The Investment Policy governs NSCC's investments of cash, including the custody and overnight investment of Clearing Fund cash. The management and investment of cash is described under Principle 16 (Custody and investment risks).

³³ NSCC Rule 4 (Clearing Fund), Section 12.

Principle 6: Margin

A CCP should cover its credit exposures to its participants for all products through an effective margin system that is risk-based and regularly reviewed.

Key consideration 1: A CCP should have a margin system that establishes margin levels commensurate with the risks and particular attributes of each product, portfolio, and market it serves.

Key consideration 2: A CCP should have a reliable source of timely price data for its margin system. A CCP should also have procedures and sound valuation models for addressing circumstances in which pricing data are not readily available or reliable.

Key consideration 3: A CCP should adopt initial margin models and parameters that are risk-based and generate margin requirements sufficient to cover its potential future exposure to participants in the interval between the last margin collection and the close out of positions following a participant default. Initial margin should meet an established single-tailed confidence level of at least 99 percent with respect to the estimated distribution of future exposure. For a CCP that calculates margin at the portfolio level, this requirement applies to each portfolio's distribution of future exposure. For a CCP that calculates margin at more-granular levels, such as at the sub portfolio level or by product, the requirement must be met for the corresponding distributions of future exposure. The model should (a) use a conservative estimate of the time horizons for the effective hedging or close out of the particular types of products cleared by the CCP (including in stressed market conditions), (b) have an appropriate method for measuring credit exposure that accounts for relevant product risk factors and portfolio effects across products, and (c) to the extent practicable and prudent, limit the need for destabilising, procyclical changes.

Key consideration 4: A CCP should mark participant positions to market and collect variation margin at least daily to limit the build-up of current exposures. A CCP should have the authority and operational capacity to make intraday margin calls and payments, both scheduled and unscheduled, to participants.

Key consideration 5: In calculating margin requirements, a CCP may allow offsets or reductions in required margin across products that it clears or between products that it and another CCP clear, if the risk of one product is significantly and reliably correlated with the risk of the other product. Where two or more CCPs are authorised to offer cross-margining, they must have appropriate safeguards and harmonised overall risk-management systems.

Key consideration 6: A CCP should analyse and monitor its model performance and overall margin coverage by conducting rigorous daily backtesting and at least monthly, and more-frequent where appropriate, sensitivity analysis. A CCP should regularly conduct an assessment of the theoretical and empirical properties of its margin model for all products it clears. In conducting sensitivity analysis of the model's coverage, a CCP should take into account a wide range of parameters and assumptions that reflect possible market conditions, including the most-volatile periods that have been experienced by the markets it serves and extreme changes in the correlations between prices.

Key consideration 7: A CCP should regularly review and validate its margin system.

Overview of margin methodology

NSCC calculates and collects Clearing Fund from its Members using a risk-based margin methodology. These amounts — a Member's Required Deposit — operate as the Member's margin, and the aggregate

of all such Members' deposits is, collectively, the Clearing Fund, which operates as NSCC's default fund. This risk-based methodology enables NSCC to identify the risks posed by a Member's unsettled portfolio and to quickly adjust and collect additional deposits as needed to cover those risks. Each Member's Clearing Fund Required Deposit is calculated at least once daily pursuant to a formula that is outlined in Procedure XV (Clearing Fund Formula and Other Matters) of the Rules, and is designed to provide sufficient funds to cover this risk of loss. The Clearing Fund formula accounts for a variety of risk factors through the application of a number of components, each described in Procedure XV.

A Member's Clearing Fund requirement will vary daily based on its trading activity and financial status. The calculated requirement is based upon the total unsettled (fails) and pending (future settling) transactions of the Member. The amount due each day, payable by 10 a.m. via Fedwire®, is the difference between the Member's calculated Required Deposit and the amount currently on deposit. The formula used for calculating a Member's Required Deposit includes the following major component charges:

- Volatility Charge ("VaR")
- Mark-to-market
- Fail Charges (for CNS transactions)
- Special Charges, including charges for illiquid positions and intraday exposures
- Specified Activity Charge (for non-standard settlement)
- Other (including Market Maker Domination, Backtesting charge and Clearing Fund Premium charges)

NSCC may require additional ("ad hoc") intraday margin should NSCC deem it necessary or appropriate. Intraday market moves and positions are tracked and additional Clearing Fund monies are collected, as deemed necessary. Ad hoc intraday margin calls are typically due within one hour of request.

The components of NSCC's margining methodology are set forth in Procedure XV of NSCC's Rules, available on the DTCC website at www.dtcc.com.

Component charges

The Clearing Fund requirement for each Member currently includes of the following major components:

1. **Value-at-Risk (VaR)** - For volatility, a parametric VaR model is used to determine the potential future exposure of a given portfolio based on historical price movements; for fixed income, illiquid securities or those securities less amenable to statistical analysis, a haircut is applied in lieu of VaR.

For equities cleared through NSCC, the VaR methodology is calculated to achieve at least a 99% confidence level. NSCC assumes a portfolio will take three days to hedge or liquidate. One hundred fifty two days of historical pricing is utilized. Where a haircut is applied in lieu of VaR, haircut levels are also set to at least a 99% coverage level. For illiquid securities or those securities less amenable to statistical analysis, the applicable haircut is at least 10%. For fixed-income products such as corporate or municipal bonds, the applicable haircut is at least 2%.

The sum of the VaR value (for liquid equities) and any haircut applied in lieu of VaR is used to cover the uncertainty of market volatility for the portfolio. This approach assumes no diversification benefit

between securities margined with VaR and those with haircuts applied. To account for extreme future risks and for data quality and consistency, VaR results undergo daily back-testing

2. **Mark-to-Market** – As a cash market CCP, NSCC uses a continuous net system where securities within the settlement system are marked daily to the prior night’s closing price. NSCC does not separately charge and pass variation margin through to its Members. Rather the Clearing Fund formula includes a mark-to-market component to measure the change in market value of the unsettled and pending positions using the contract price versus the current market price (that is, the price for a security determined daily for purposes of the CNS system). The sum of the unrealized market value changes calculated on positions at the Member level is the mark-to-market amount. Net portfolio debits per Member are collected; net portfolio credits are ignored.

3. **CNS Fail Charge** - CNS transactions that do not settle as scheduled are subject to a fail charge in the form of an additional haircut. NSCC takes a haircut on long fail positions ranging from 5 to 10%, plus a haircut on short fail positions ranging from 5 to 10%. (For certain Members on the watch list, an additional haircut of up to 10% may also be applied.) Long and short failed positions are charged equally. The haircuts are based on Member credit risk ratings calculated by ERM.

4. **Special Charges** - Special charges can be assessed in view of price fluctuations, volatility or lack of liquidity of any security. Although NSCC can assess a special charge on any security, NSCC routinely evaluates individual positions in securities that, due to their price (such as bulletin board or pink sheet securities) or price history, may indicate a lack of sufficient market liquidity to liquidate within a reasonable time period. These positions are compared to the average volume in the security, and if the pending position is greater than a designated threshold of a rolling average daily volume, a charge is applied.

5. **Market Maker Domination Charge** - This is a concentration charge applied with respect to market-makers in certain markets. It is applied to a Member that holds a portfolio position in securities in which that Member/market-maker, or the correspondent firm that clears through the Member, so dominates activity in the relevant market that, if the market maker were to become insolvent, the market for those securities would weaken substantially and NSCC would have difficulty liquidating the position.

6. **Specified Activity** - NSCC permits Members to submit transactions that do not conform to the standard settlement cycle of three days. Trades submitted with a shortened process cycle (i.e., less than T+3 or T+3 for “as-of” transactions) introduce unique risk since NSCC guarantees these trades before collecting margin. To mitigate this risk, NSCC takes a charge based on historic activity as it applies to each Member’s use. An amount charged for such activity is based on the average of the Member’s three highest aggregate calculated charges for daily specified activity measured over the most recent 20 settlement days. This component will be eliminated as part of the implementation of the ATG Clearing Fund enhancements.³⁴

7. **Clearing Fund Premium** - NSCC applies this incremental charge should the overall Clearing Fund requirement of a Member (subject to certain adjustments) exceed its current Excess Net Capital, as determined from the regulatory reports provided to NSCC.

³⁴ See SEC 1934 Act Releases Nos.34-79598 and 34-79592 (December 19, 2016) available at www.dtcc.com and www.sec.gov. The implementation of these enhancements will be announced via Important Notice.

8. **Backtesting Charge** - NSCC may impose a backtesting charge when a Member's overall margin backtesting coverage over the trailing 12-month period has fallen below the target 99% coverage level and NSCC determines, based on deficiencies observed over that time period, that the VaR margin charge may not fully address the projected liquidation losses estimated from such Member's settlement activity.

In conjunction with accelerating the trade guaranty, NSCC will enhance its Clearing Fund formula to address the risks posed by the expanded trade guaranty. Specifically, the Clearing Fund will, upon implementation, include two new components: the Margin Requirement Differential ("MRD"), and the Coverage Component. The MRD is a component designed to address the risk of unobserved positions (that is, trades captured and guaranteed but not yet margined in NSCC's overnight calculation), and the Coverage Component is a back-test-like component designed to address observed VaR shortfalls on an end-of-day basis. The implementation of these components obviate the need for the Specified Activity Charge, which will be removed at the time the ATG enhancements are implemented.

NSCC may also, on an as-needed basis, impose ad hoc intraday charges. Changes in Member portfolios and security pricing are monitored intraday, and additional Clearing Fund charges may be collected to cover significant exposure in an identified security or net portfolio. These intraday routines are run frequently throughout the day and generate reports identifying Members' then-current positions and the market value of those positions. These reports are reviewed, and if FRM concludes that action is warranted, it may impose an ad hoc charge. As part of NSCC's accelerated trade guaranty proposal, FRM has also enhanced its intra-day margining processes, and will be measuring NSCC's exposures to its Members on a more frequent intra-day basis, using updated intraday trading activity and price information. As a result, NSCC may make intra-day charges to address both market/portfolio changes and potential intra-day backtesting deficiencies.

Clearing Fund charges are calculated overnight and notified to Members early the following morning, for collection by 10:00 a.m. EST, regardless of the time zone the Member operates in. Intraday calls are due within one hour of demand. Failure to submit payment by the deadline may subject the Member to a warning letter or a fine, according to the schedule provided in NSCC's Rules. Such fines are reported to the SEC. Repeated lateness may result in additional penalties or disciplinary action, including termination of membership pursuant to NSCC's Rules.

Pricing and data sources

NSCC utilizes multiple third-party vendors to price its eligible securities, and uses a pricing hierarchy to determine a price for each cleared security; generally, that is the prior day's closing price. FRM monitors each pricing file and performs rigorous exception reporting (large variance, stale, missing, off-the-market reports) to ensure that the prices are accurate, and uses a "default logic" to generate prices for securities when vendor information may not be readily available or reliable. Generally the default is to apply the last previously used, valid price.

Model inputs, assumptions and parameters

As noted above, NSCC calculates margin requirements assuming a three-day liquidation/hedge period for unsettled positions. The Clearing Fund requirement is calculated to achieve a confidence level of at least 99%, and this is evidenced with regular back-testing studies.

The liquidation periods are conservative based on the types of securities to be liquidated and the availability of options to "hedge" the portfolio to be liquidated essentially in "real time." Hedging strategies may be used shortly after the failure of a Member in order to minimize market risk. This allows sufficient time to liquidate the portfolio in an orderly manner and minimize market impact.

Certain attributes of the product type such as liquidity are taken into account, including but not limited to industry research and scenario development. In addition, past insolvencies affecting each product type are reviewed, and “lessons learned” from past events may be incorporated into the model. Simulated closeout exercises are performed to understand the profit and loss of a portfolio under various stressed conditions, including market liquidity, limits on average daily volume, and significant price changes due to stressed conditions.

As regards the historical data used in the VaR model, 152 days is the current sample period for equities. NSCC bases its determination of the sample periods for historical data on mathematically sound principles that result in a stable base for providing projected returns, supported by continual back-testing. The appropriate sample period is also discussed with industry experts and NSCC’s independent model validators.

With respect to portfolio margining, NSCC’s margin formula takes into account the correlation of different equity types NSCC clears and the relationship and correlations among the securities, including those transactions that operate as natural offsets or hedges for other related cleared transactions. Correlation is determined within the parametric equity VaR component, and that correlating benefit is used within the calculation of the VaR component.

NSCC does not “cross-margin” per se, but it maintains an arrangement with OCC for the settlement of exercised and assigned options cleared through OCC. The arrangement, referred to as the “OCC Accord”, is described in more detail in Principle 20 (FMI Links). One of the principal purposes of the OCC Accord is to mitigate duplicative margining requirements on common members, which is achieved through certain cross guaranties. Accordingly, NSCC provides offsets within its mark-to-market Clearing Fund component with respect to exercised and assigned equity options processed by OCC (and where OCC collects the margin) that abide by the rules within the OCC Accord.

Procyclicality and specific wrong-way risk

In times of stress, market volatility may cause the Clearing Fund to increase which is inherent in the risk management process of NSCC. The choice of the VaR look-back period reflects a balance between stability of the VaR calculation, and appropriate responsiveness to changing market conditions. NSCC addresses the procyclicality of the formula through ongoing Member outreach, seeking to increase Member awareness of this impact.

NSCC currently mitigates wrong-way risk (defined as the risk that counterparty exposures will increase when the creditworthiness of a counterparty deteriorates) by limiting eligible Clearing Fund collateral to cash and U.S. government and agency securities; equities and Member-issued debt securities are not eligible collateral. NSCC has identified a possible exposure to wrong way risk when it acts as counterparty to a Member with respect to positions in securities that are issued by that Member or that Member’s affiliate. These positions are referred to as “family issued securities.” In the event that a Member with unsettled long positions in family issued securities defaults, NSCC would close out those positions following a likely drop in the issuer’s valuation. In order to address this risk, NSCC applies a haircut-based margining methodology to the net unsettled long positions in family issued securities of Members on surveillance status, and excludes those securities from the VaR charge. NSCC plans to expand this approach to all Members, regardless of their credit status, subject to regulatory approval.

Back-testing, sensitivity analysis and model validation

NSCC confirms the robustness of its margining methodologies through rigorous back tests, and validation of its risk models by independent third-party experts.

NSCC conducts back-testing on a daily basis on individual Member portfolios to determine: (a) the efficacy of the underlying VaR model, and (b) the sufficiency of the calculated required Clearing Fund deposit (which includes all component charges). Coverage is defined as the number of test events without deficiencies divided by the total number of events in the testing period. The back tests compare the Clearing Fund requirements with actual price changes in a portfolio. The portfolio values are calculated by using the actual positions in an NSCC Member's portfolio and the observed security price changes over the following three days.

NSCC employs daily stress-testing to determine whether there will be adequate coverage levels for potential losses in a portfolio incurred under extreme, but plausible market conditions. As the VaR component of NSCC's Clearing Fund formula is intended to provide coverage at a 99% confidence interval (assuming a three day period to liquidate or hedge the relevant portfolio), it is possible under certain historical or hypothetical stress scenarios, which may be outside of 99% confidence interval, that the VaR based Clearing Fund component requirement could be insufficient to provide complete coverage for losses realized as a result of a Member's failure. Stress-tests facilitate NSCC's determination of the possibility where such clearing fund requirement would be insufficient in this regard.

Back-test results are reviewed by FRM management on a regular basis. Exceptions identified in back-tests are reviewed in order to identify causes and formulate responses, as needed. The results of this review and related metrics are reported to and discussed with the Management Risk Committee monthly, and shared with the Board Risk Committee and NSCC's supervisors in accordance with their regularly scheduled meetings. Members with repeated deficiencies, subject to certain criteria, may be contacted as well.

Additionally, an internal Model Risk Governance Council, comprised primarily of FRM management, is responsible for oversight of all risk models. This group meets regularly and discusses any identified issues that might impact model efficacy. In accordance with the DTCC Model Validation Management Policy, all new models (including material changes to existing models) must be internally reviewed (including by the MRGC) and subject to independent validation prior to their implementation in production. The margin models are also reviewed annually by an independent external validator. The results of these reviews are provided to the Management Risk Committee, the Board Risk Committee and NSCC's supervisors. If a model weakness is detected, deficiencies would be escalated through NSCC's Model Validation team and additional mitigation strategies would be discussed with the MRC and BRC.

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.

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.

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.

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.

[Not applicable, as NSCC is not a payment system or an SSS.]

Key consideration 4: A CCP should maintain sufficient liquid resources in all relevant currencies to settle securities-related payments, make required variation margin payments, and meet other payment obligations on time 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 to the CCP in extreme but plausible market conditions. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should consider maintaining additional liquidity resources sufficient to cover a wider range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions.

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 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.

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.

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.

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.

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.

Liquidity risk management framework

NSCC maintains a liquidity risk management framework for the measurement, monitoring and management of its liquidity needs. Liquidity risk is managed by FRM, and is governed and subject to oversight by the Management Risk Committee and the Board Risk Committee. The program is designed to ensure that NSCC maintains sufficient liquid resources to timely meet its payment (principally settlement) obligations with a high degree of confidence.

As a central counterparty, NSCC's liquidity needs are driven by the requirement to complete end of day money settlement, on an ongoing basis, in the event of a failure of a Member. As a cash market CCP, if a

Member defaults, NSCC will need to complete settlement of guaranteed transactions on the failing Member's behalf from the date of insolvency (referred to as "DOI") through the remainder of the settlement cycle (currently three days for securities that settle on a T+3 basis).³⁵ NSCC measures and manages its liquidity risk by performing daily simulations that measure the amount of liquidity that would be required by NSCC in a number of scenarios, including amounts required over the settlement cycle in the event that the Member or Member family with the largest aggregate liquidity exposure becomes insolvent (that is, on a Cover 1 standard). NSCC then seeks to maintain qualified liquidity resources in an amount sufficient to cover this risk. NSCC's liquidity resources include: (1) the cash in the Clearing Fund; (2) the cash that would be obtained from NSCC's committed 364-day credit facility with a consortium of lenders³⁶; (3) cash proceeds from NSCC's commercial paper and extendable note program (the "CP Program")³⁷ and (4) as discussed more fully below, additional cash deposits ("Supplemental Liquidity Deposits" or "SLD") designed to cover the heightened liquidity exposure arising around monthly option expiry periods, required from those Members whose activity would pose the largest liquidity exposure to NSCC.

As all securities cleared and settled through NSCC settle in U.S. dollars, NSCC has no cross-currency exposure. As noted above under the discussion of Credit Risk (Principle 4), NSCC is not systemically important in multiple jurisdictions, and as a U.S. cash market equity CCP, its activities do not have a complex risk profile. NSCC does not have access to routine credit at the central bank for liquidity; as such, it does not account for this option in its liquidity planning.

Measurement and monitoring of liquidity risk and needs

FRM and NSCC's Settlement Operations groups monitor settlement flows and projected debit obligations on a daily basis. Each Member's incoming credits and debits are reviewed to estimate the size of cash outflow required to satisfy settlement needs. In addition, automated risk systems are utilized to measure and monitor liquidity demands. On a daily basis FRM will contact those Members who have large projected settlement obligations to confirm their settlement capabilities.

FRM performs daily liquidity studies to determine if NSCC's current available liquidity resources are sufficient to satisfy the single-largest family default under stressed but plausible conditions. Sizing of NSCC's committed credit facility is based on observed historical peak liquidity needs and current market trends; however, as a commercial facility, it is subject to market availability.

In the event an NSCC Member defaults on its open obligations, NSCC's liquidity needs are driven by whether the failed Member has paid its settlement obligations DOI, plus the settlement amount of the failed Member's net long (buy) positions for each remaining day of the settlement cycle. NSCC is responsible for the receipt of securities from, and payment of cash to, the contra side Members; thus long (receive) positions create the largest cash settlement needs and, as such, they drive NSCC's potential liquidity risk.

³⁵ In September of 2017, the U.S. securities market is expected to move to settlement of equities, corporate and municipal bonds and UITs to a T+2 basis, thereby eliminating one day's settlement obligations from NSCC's liquidity exposure.

³⁶ At June 30, 2016, the amount of NSCC's committed credit facility was \$10.855 billion.

³⁷ NSCC initiated the CP Program in 2015, and may issue up to \$5 billion of such securities under its terms. As of June 30, 2016 the amount outstanding under CP program was \$2.069 billion.

Accordingly, NSCC calculates its liquidity needs per individual Member at a legal entity level and further aggregates amounts at a family level (that is, including all affiliated entities that are also NSCC Members, under the assumption that all such affiliates fail simultaneously). The total liquidity need is calculated by netting the sum of contract values for all securities on a per CUSIP basis per Member (that is, to determine the Member's net long or short position per CUSIP) for each day of the cycle, and summing the total of the debit (long) positions only. These positions represent the securities that NSCC would have an obligation to receive and pay for from CNS in the event of a Member default.

Based on the results of the calculation, NSCC determines its aggregate financial resources that would be available to satisfy the largest peak aggregate settlement obligation of a Member or Member family on the day of the simulated default. The review includes a number of stress scenario assumptions or conditions, among which are the following:

1. *Jump to default.* The relevant entities within the Member family simultaneously default, without warning, and they fail to satisfy end of day money settlement on date of failure. The defaulting firms trade on the day of default at peak historical trading levels.
2. *Market volatility remains low.* The failure of a systemically important Member family will normally result in a significant upswing in market volatility, which will lead to an increase in Clearing Fund requirements (the funds from which could be used in a liquidity event). However, for purposes of these daily calculations, NSCC assumes no increase in Clearing Fund requirements.
3. *Largest liquidity lender defaults.* NSCC also assumes that the lender with the largest commitment under its committed credit facility is unable to lend, and thus the lender's commitment amount is unavailable as a liquidity resource.
4. *No fails to deliver.* NSCC assumes that all long positions due to be delivered to CNS by Member counterparties, and hence from CNS to the failing firms, are allocated and delivered on their originally scheduled settlement dates; that is, there are no delivery fails. As a result, NSCC pays for the deliveries on the scheduled contractual settlement date and payment is not deferred.

The results of these daily studies and calculations are reviewed by FRM management on a daily basis; the resultant metrics are reported to and discussed with the Management Risk Committee monthly, and reviewed with the Board Risk Committee and NSCC's supervisors at their regularly scheduled meetings.

Size and composition of qualifying liquid resources; reporting

NSCC's Rules specifically permit borrowings from the Clearing Fund to facilitate end of day money settlement; in addition, Clearing Fund amounts and collateral may be pledged for the purpose of securing loans to facilitate settlement.³⁸ Clearing Fund cash is maintained in accounts with creditworthy commercial banks and other overnight investments in accordance with the Investment Policy (as more fully described under Principle 16 (Custody and investment risks)), as are cash proceeds from the CP Program. These amounts can be available to draw to complete settlement as needed.

³⁸ NSCC Rule 4, sections 2 and 12.

NSCC can access its committed credit facility up to the amount of the resources eligible to secure a borrowing. These resources are also available on a same-day basis. If drawn, the line would be collateralized with Eligible Clearing Fund Securities and the securities in the process of settlement which, as a result of the defaulting Member's failure, are received and paid for by NSCC (i.e., unpaid long allocations owned by NSCC), or collateral supporting those long allocations.

In 2014, NSCC implemented the requirement for certain Members to provide additional liquidity in the form of Supplemental Liquidity Deposits to the Clearing Fund to cover the largest exposures arising around option expiry periods where NSCC has, historically, had the largest liquidity exposure. This requirement, provided for in NSCC Rule 4A, requires those Members (whether individually, or as part of an affiliated Member family) whose activity during monthly periods around options expiration generate liquidity needs in excess of NSCC's then available qualifying liquid resources, to fund such additional amounts. The Rule's allocation formula ratably applies the additional amount needed among affected Members based upon Members' peak liquidity exposure during such periods over a look-back period.³⁹ Members may voluntarily prefund their deposit requirements where they project their own activity will increase their liquidity exposure. SLD deposits must be in cash, and are held and maintained in the same manner as other Clearing Fund deposits. They are thus available to fund settlement as needed.

All of these liquidity resources constitute "qualifying liquid resources."

With respect to Member SLD requirements, NSCC provides reporting that includes daily liquidity reports to Members to facilitate their understanding of the risks that their activity presents to NSCC. This reporting dovetails with NSCC's outreach to affected Members of their potential SLD requirements, and enhances Members' ability to make decisions regarding potential or future liquidity obligations and incorporate that impact into their capital planning process (or modify their behavior so as to minimize the liquidity risk they present to NSCC).

Reliability of liquidity providers and others

NSCC's committed line of credit is maintained with a diversified consortium of lenders, all of which are regulated financial institutions, and are introduced to NSCC as regular providers of such facilities. The line of credit is renewed annually, and during the renewal period NSCC, in coordination with the lead facility arranger, conducts presentations and discussions with potential liquidity providers, and provides them with information to enable them to understand the liquidity obligations, and risks, they may face as potential lenders under the facility. This includes the need to be able to provide funding within a short time window on a same-day basis. In addition, NSCC also participates in bespoke meetings with lenders to outline the facility and address lender questions. The lead facility arranger also conducts standard due diligence on all potential counterparties to determine their suitability, and DTCC's Finance department and FRM conduct their own credit analysis of the potential lenders, which includes review of credit ratings assigned by credit rating agencies and reviews of key metrics including (but not limited to) capital

³⁹ The rule provides that if, based on the look-back period, a Member presented liquidity exposure that exceeded NSCC's then-available qualifying liquidity resources, the Member must pay an additional Clearing Fund deposit based on the amount of the liquidity shortfall, which amount is due in advance of the coinciding option expiry period. If an affected Member anticipates that its calculated liquidity exposure during any such monthly period will be greater than NSCC's current available resources, it can make an additional designated cash deposit to the Clearing Fund (in excess of its Required Deposit).

adequacy, liquidity, asset quality, and profitability. These reviews, together with such discussions, are designed to provide NSCC with confidence that the facility lenders have sufficient information and the capacity to perform their obligations should NSCC have a need to draw on the facility's resources.

Test drawdowns for the line of credit are performed periodically (at least annually) to confirm the lenders are operationally capable to perform on their commitment and are familiar with the drawdown process.

NSCC monitors the resiliency of the CP markets. It is possible in stressed markets that access to CP funding could be reduced. NSCC's objective is to (i) maintain sufficient additional liquidity resources to achieve diversity in our qualified resources; and (ii) manage the CP Program to a weighted average life in excess of 30 days, so that in a stressed market limited impact on NSCC's liquidity resources during the closeout of defaulting Member if maturing CP securities cannot be rolled over.

NSCC also seeks to manage its liquidity and operational risks arising from settling banks and investment counterparties through a framework that includes: as to settling banks, minimum requirements that are effectuated through the membership application and ongoing review process and, for its investment counterparties, through the Investment Policy which includes counterparty credit and concentration standards. NSCC has established strict eligibility requirements for entities seeking to act as settling banks, which include minimum financial, credit and operational standards. Entities that act as such and that are not otherwise NSCC Members (and thus subject to ongoing financial reporting requirements and surveillance review) are required to be "Settling Bank Only Members" and agree to abide by the requirements applicable to that class of membership; this includes timely adherence to daily settlement protocols. In evaluating its exposure to a settling bank, NSCC takes into account, among other factors, the banks' regulation and supervision, its operational reliability (which is monitored daily), its suitability for the settling bank services it performs, along with other services it may provide to NSCC, its creditworthiness, and its capitalization and access to liquidity (including access to central bank liquidity).

Stress scenarios, review and validation

As discussed above, the daily liquidity study that FRM performs includes a number of stress scenarios and assumptions so as to evaluate NSCC's liquidity needs on a conservative basis and ensure the maintenance of sufficient liquid resources to timely meet its settlement obligations with a high degree of confidence.

As part of the liquidity risk framework, FRM also runs additional scenarios that take into account more severe market price variation and resource constraints. Stresses applied during these tests may include (1) substantial price swings of the defaulting Member's portfolio, (2) multiple default scenarios, and (3) haircut increases or resource stresses. Results are reviewed daily and selected scenarios are provided to the Management Risk Committee on a monthly basis and escalated to the Board Risk Committee as necessary. The results of these studies are used, for informational purposes, to evaluate the impact of extreme market moves and the potential changes in resource availability that may follow. To the extent that stress tests indicate a potential impact on the sufficiency of NSCC's liquidity resources, management may consider options available to supplement resources. FRM continually evaluates additional stresses that may be appropriate for inclusion in future testing, and reviews potential market developments that could lead to increased strain on its liquidity resources, evaluating those developments in conjunction with the stress-testing results.

Replenishment of liquidity resources; uncovered liquidity shortfalls

As the liquidation of a defaulting Member's portfolio completes (including the sale of collateral used to secure a borrowing), the proceeds from the closeout would be used to repay liquidity borrowings, thus

replenishing NSCC's liquidity resources. Should closeout proceeds be insufficient to fully repay a liquidity borrowing, then NSCC would look to its loss waterfall (described under Principles 4 (Credit risk) and 13 (Participant-default rules and procedures) to repay any outstanding borrowings.

NSCC continues to evaluate additional options for liquidity, particularly to address unforeseen and potentially uncovered liquidity shortfalls in extreme scenarios. DTCC has established a standing member-based advisory group, the Clearing Agency Liquidity Council ("CALC") to provide a forum for the discussion of liquidity and liquidity-related financing issues and trends, along with developing approaches to address such scenarios. The CALC is comprised of a diverse cross section of NSCC and FICC participants, including: (a) custodian banks; (b) investment banks; (c) retail broker-dealers; (d) clearing firms; (e) government securities dealers; and (f) mortgage-backed securities dealers. As NSCC develops additional liquidity alternatives, the CALC will be a forum through which these alternatives can be discussed and evaluated, to the extent applicable, including the potential funding obligations any such liquidity solutions may pose on Members.

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.

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

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.

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.

NSCC provides end-of-day final settlement on the value date of transactions settled. As described in the General Background of NSCC, CNS relies on an interface with DTC for the book-entry movement of securities to settle transactions. The CNS deliveries made through DTC are made free of payment, using a Model 2 delivery versus payment mechanism or deferred net settlement approach, in which securities deliveries settle gross, and related funds obligations settle (on the books of NSCC) net, through end-of-day settlement. As described in Principle 9 (Money settlements), NSCC's end-of-day money settlement is consolidated with DTC. Upon completion of funds settlement, securities and funds transfers are final.

NSCCs Rules define the point at which settlement is final

Under NSCC's Rules governing CNS, NSCC becomes the contra-party for settlement purposes at the point NSCC's trade guaranty attaches, assuming the obligation and obtaining the right, by assignment and assumption, to pay for and receive securities delivered from the delivering (short) Member, and to deliver securities and receive payment from the receiving (long) Member. Within its Balance Order accounting system, which provides netted and allotted Balance Orders, NSCC does not act as a CCP, but does guarantee settlement through the close of business on the originally scheduled settlement date. The timing of NSCC's assumption of liability for CNS transactions and its guaranty of Balance Order transactions is clearly set forth in NSCC's Rules.⁴⁰

The actual settlement of Balance Orders occurs outside of NSCC, either at DTC or otherwise, or through NSCC's Envelope Settlement Service. As such, the finality of the settlement of Balance Orders is determined under the rules of the applicable settlement location.

For CNS securities, NSCC uses a modified delivery versus payment mechanism in that when a Member delivers securities to CNS the Member receives a credit, and when NSCC delivers securities to the long

⁴⁰ The Rules generally provide that CNS and Balance Order transactions are guaranteed as of the later of midnight of T+1 and midnight of the day the transaction is reported to Members as compared or recorded. For Balance Order transactions, this guarantee remains effective through the close of business on the scheduled settlement date. At year-end 2016 NSCC received approval to move the trade guaranty forward to the point of trade validation (for locked-in trades) and comparison (for trades compared through NSCC). This initiative is referred to as the "Accelerated Trade Guaranty" or "ATG." See SEC 1934 Act Rels. Nos. 34-79598 and 34-79592 (December 19, 2016), available at www.sec.gov and at www.dtcc.com. The implementation of these changes, and the related Clearing Fund formula enhancements, will be announced via Important Notice. For more information, go to www.dtcc.com.

receiving Member (a long allocation), the securities deliveries/movements are not final until the “effective time.” Under NSCC’s rules, a CNS delivery is complete and final as to the delivering Member once the securities are debited from the delivering Member’s DTC securities account and credited to NSCC’s CNS account at DTC. The delivering Member (providing it is not in default at settlement) will be paid through net settlement, regardless of any failure to settle of the receiving Member.⁴¹

A CNS delivery transaction is final as to the receiving “long” Member at the “effective time”. Pursuant to NSCC Rule 12 (Settlement), the “effective time” generally occurs when it is clear that NSCC has either been paid, or is in a credit position with respect to a Member or its settling bank, and NSCC has no Clearing Agency Cross-Guaranty obligation due with respect to a Member.⁴² Until the effective time occurs, NSCC retains ownership rights in the long allocations.

NSCC processes CNS delivery and receive transactions on settlement date in two cycles: a night cycle that commences in the prior evening (of S-1), and a day cycle that runs until approximately 3:10 PM each business day. The end-of-day net money settlement process (see Principle 9 (Money settlements)) typically concludes between approximately 4 p.m. and 4:30 p.m. (New York time). End-of-day net funds payments are made through the NSS, as described in Principle 9 (Money settlements), and are final immediately when effected, in accordance with FRB rules.⁴³

With respect to the non-guaranteed services provided to participants by NSCC (such as Mutual Fund Services, Insurance & Retirement Services, Alternative Investment Product Services, and the ESS⁴⁴), NSCC does not act as central counterparty to its participants. In accordance with NSCC’s Rules, NSCC explicitly reserves the right, if at any time it fails to receive payment from a participant with respect to transactions or charges in those services, which payment was to be used to make payment to the respective contra side(s), to reverse (in whole or in part) any credit provided to the contra side participant(s).⁴⁵ NSCC has systems and/or processes designed to enable reversals to be effected prior to completion of settlement on the value date. Should that not occur, NSCC may debit the contra side(s) for payment on the next settlement day.

⁴¹ While the credit is effective when made, such credits will be net and offset against other obligations that the Member owes to NSCC as part of end-of-day net money settlement. *See* NSCC Rule 12, sections 5 and 6, and Procedure VIII (Money Settlement Service).

⁴² DTC Rule 6 gives effect to NSCC’s determination of the “effective time.” Accordingly, CNS securities transfers made through the NSCC/DTC CNS interface are final on DTC’s books when the effective time has occurred in accordance with NSCC’s Rules.

⁴³ FRB OC 12.

⁴⁴ Described under Principle 10—Physical deliveries.

⁴⁵ Addendum D - Statement of Policy - Envelope Settlement Service, Mutual Fund Services, Insurance and Retirement Processing Services and Other Services Offered by the Corporation. For Alternative Investment Product Services (which has a separate settlement process), the reversal of credits is required.

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.

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

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

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.

Introduction

NSCC uses a Model 2 DVP deferred net settlement (DNS) system, with funds settlement occurring at the end of day.⁴⁶ From an operational perspective, money settlement is centralized with its affiliate, DTC's end-of-day money settlement, so as to provide common participants with consolidated reporting and a single point of access for all settlement information. End-of-day money settlement is conducted in U.S. central bank funds through a tiered structure and netting process designed to minimize and strictly control credit and liquidity risks. Funds transfers are effected via NSS⁴⁷ and are final when effected on the books of the FRBNY. Commercial banks, acting as settling banks for NSCC Members, must have Federal Reserve Bank accounts and satisfy criteria, including regulatory status, creditworthiness, capitalization, access to liquidity and operational reliability.

⁴⁶ See Annex D of the FMI Principles, where the various types of settlement systems are described.

⁴⁷ NSS is a multilateral settlement service owned and operated by the Federal Reserve Banks (FRBs). The service is offered to depository institutions that settle for participants in clearinghouses, financial exchanges and other clearing and settlement groups. Settlement agents, acting on behalf of those depository institutions in a settlement arrangement, electronically submit settlement files to the FRBs. Files are processed on receipt, and entries are automatically posted to the depository institutions' Federal Reserve Bank accounts. DTC maintains an account at the FRB and acts as agent for NSCC.

Tiered and netted settlement arrangements

Members⁴⁸ are obligated to designate a settling bank to effect daily money settlement on their behalf. Members may designate a settling bank of their own choosing (and NSCC does not intervene in that relationship), provided the bank meets certain financial and operational criteria, is a Federal Reserve member, and agrees to settle through use of NSS. Entities that act as such and that are not otherwise NSCC Members (and thus subject to ongoing financial reporting requirements and surveillance review) are required to be “Settling Bank Only Members” and agree to abide by the requirements applicable to that class of membership; this includes timely adherence to daily settlement protocols. The settling bank may or may not have a credit relationship with the Member – it is not expected or required to guarantee the obligations of the Member or to advance funds on the Member’s behalf.⁴⁹ If a settling bank does not settle on behalf of one or more Members, each of those Members nevertheless remains obligated to pay its net settlement obligation in central bank money through alternative funding arrangements.

Throughout the day, money debit and credit data generated by participant activities are recorded in the settlement system. At the end of the processing day, the data is summarized by NSCC product category (i.e., CNS, mutual funds, insurance services, envelope services, etc.) and netted to produce an aggregate money debit or credit for each Member. This final net debit or net credit balance determines whether the Member has an obligation to pay or to be paid in the process of NSCC completing end-of-day settlement. A Member with an end-of-day net debit balance has an obligation to pay NSCC that amount; a Member with an end-of-day net credit balance is entitled to receive a payment from NSCC.⁵⁰

To protect NSCC and its membership and minimize systemic risk, money settlement amounts are subject to netting to reduce funding transfers due through the commercial banking and central bank systems. As noted above, from an operational perspective, NSCC end-of-day money settlement is centralized with DTC’s end-of-day settlement. In addition to providing common participants with a centralized point for consolidated reporting, it provides the benefit of netting money settlements. Under this process, following the determination of final net numbers for each NSCC Member and DTC Participant, these amounts are further netted or combined to produce a consolidated net money settlement obligation for common participants. For example, a Member with a settlement debit at NSCC and a settlement credit at DTC, will have that debit netted against the DTC credit.

Settling banks may settle on behalf of multiple DTC Participants and/or NSCC Members. So, following determination of the consolidated net money settlement obligations of common participants, the net-net debit or credit amounts for each customer participant on whose behalf the settling bank settles is further netted to produce a single net-net debit or credit balance for each settling bank. At this stage, each settling bank must acknowledge the net amount due to it or from it, in order for settlement to proceed (or, a settling bank may refuse to settle for one or more identified Members or Participants). Settlement of these net-net balances occurs through use of the NSS, whereby DTC, for itself and as NSCC’s settlement agent, submits instructions to have the Federal Reserve accounts of the settling banks charged for their net-net debit balances and credited with their net-net credit balances, with offsetting entries to the DTC

⁴⁸ Participants who may access services involving money settlement are subject to the same requirements.

⁴⁹ NSCC’s Rules include protections such as allowing the Settling Bank to refuse to settle for a Member.

⁵⁰ NSCC participants using Alternative Investment Product Services (AIP) settle money payments with respect to AIP Services outside of NSCC’s end-of-day net money settlement. All AIP money settlement is effected on a gross basis, where on the applicable settlement date, AIP debits are collected first, and in the afternoon all contra-side credits, where the corresponding debits have been collected, are paid.

account at FRBNY.⁵¹ NSS funds transfers are final immediately when effected, in accordance with the FRB rules and procedures governing NSS.⁵² Once funds transfers are complete, DTC then confirms to Participants, Members and settling banks that system-wide settlement is complete.

NSCC Members and settling banks must adhere to the timeframes set forth for DTC (consolidated) settlement in the DTC Settlement Service Guide.⁵³

DTC acts as settlement agent for NSCC

As described above, NSCC has a settlement interface with its affiliate, DTC that is integral to the settlement of each clearing agency. DTC acts as settlement agent for NSCC. In submitting the end-of-day NSS file, DTC, on its own behalf and as NSCC's settlement agent, submits instructions to cause the Federal Reserve accounts of the settling banks to be charged for their net-net debit balances and credited with their net-net credit balances. This cross-clearing agency netting and settlement arrangement is reflected both in the Rules of each of DTC and NSCC, as well as in a netting agreement between them.⁵⁴ When NSS processing and DTC system-wide settlement is completed, NSCC settlement for the business day is likewise completed.

Settling Bank requirements and monitoring

Settling banks for NSCC Members are required to be either Members or Settling Bank Only Members, maintain accounts at the Federal Reserve, and meet minimum financial and operational criteria, including minimum capital requirements and a minimum Tier 1 Risk-Based Capital Ratio for regulatory purposes. Settling banks are subject to supervision and regulation by their federal and state regulators, depending on their form of organization.

FRM monitors the settling banks for their compliance with NSCC Rules (in their capacity as Members or as Settling Bank Only Members). In this regard, FRM obtains information from Settlement Operations regarding settlement exposures, and any operational problems experienced by these banks. Settling bank operational capabilities are monitored on an ongoing basis; banks may be subject to fines for failure to timely acknowledge settlement balances.

FRM reviews the financial condition of settling banks, at least quarterly. Financial statements filed with regulatory agencies (CALL reports), and information gathered from various financial publications are analyzed to confirm that each settling bank continues to be financially stable.

⁵¹ Pursuant to DTC's Rules, and in its capacity as NSCC's settlement agent, DTC treats any Settling Bank that settles for other Participants that does not (i) affirmatively acknowledge its end-of-day net-net settlement balance or, alternatively (ii) notify DTC of its refusal to settle for one or more Participants for which it is the designated Settling Bank, as deemed to have acknowledged its end-of-day net-net settlement balance. The Settling Bank's net-net settlement balance would then, in the ordinary course of settlement processing, be debited from or credited to its FRB Account through the NSS process.

⁵² Federal Reserve Circular OC 12.

⁵³ The DTC Settlement Service Guide is publicly available on the DTCC website.

⁵⁴ The Second Amended and Restated Netting Contract and Limited Cross-Guaranty Agreement, dated as of October 1, 2002, between NSCC and DTC.

Principle 10: Physical deliveries

An FMI should clearly state its obligations with respect to the delivery of physical instruments or commodities and should identify, monitor, and manage the risks associated with such physical deliveries.

Key consideration 1: An FMI's rules should clearly state its obligations with respect to the delivery of physical instruments or commodities.

Key consideration 2: An FMI should identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities.

Envelope Settlement

As previously described, CNS transactions settle via book entry movements through an interface that NSCC maintains with its affiliate, DTC. They do not settle using delivery of a physical certificate. NSCC does, however, provide a non-guaranteed service facilitating physical deliveries. NSCC Rule 9 (Envelope Settlement Service) sets forth the rules for NSCC's Envelope Settlement Service ("ESS") (including intercity envelope deliveries between New York and Toronto). This service facilitates the processing and settlement of physical security deliveries and associated charges through the use of envelope deliveries. Under this service, physical certificates may be processed for delivery at specified NSCC locations through use of sealed envelopes accompanied by appropriate documentation (which, among other items, identifies the security, the receiving Member and the money value (if any) associated with the delivery), in accordance with the Rules and procedures applicable to the service. NSCC's Rule 9 specifies Members' rights and obligations with respect to envelopes. As a non-guaranteed service, the Rule explicitly provides for NSCC's right to reverse credits and debits in certain events; these include failure to pay, delivery of impermissible items, or in the event NSCC has ceased to act for either the delivering or receiving Member. These provisions have been provided in NSCC's Rules to reduce NSCC's exposure to potential losses from Member defaults, insolvencies, mistakes, and fraud by appropriately shifting the risk outside of NSCC to the contracting Members in an ESS transaction.

Risk controls

With respect to ESS, NSCC has comprehensive security systems (e.g., staffed security guard presence, camera surveillance, bio-metric/badge access, etc.) in place at its facilities, as well as a bar code tracking system that tracks all envelope receipts and deliveries. DTCC also maintains comprehensive insurance covering its subsidiaries, including NSCC. Insurance coverage includes blanket bond coverage and all risk excess coverage for securities on premises and in transit. Finally, in addition to the loss risk rules set forth in NSCC Rule 9, NSCC Rule 58 (Limitations on Liability) sets forth NSCC's general standard of care and provides limits on NSCC's liability.

Principle 11: Central securities depositories

A CSD should have appropriate rules and procedures to help ensure the integrity of securities issues and minimise and manage the risks associated with the safekeeping and transfer of securities. A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry.

NSCC is not a CSD. Accordingly, Principle 11 does not apply to NSCC.

Principle 12: Exchange-of-value settlement systems

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.

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.

NSCC operates an exchange-of-value settlement system involving the settlement of two linked obligations -- securities and cash -- using an external securities settlement system for the securities and an external payment system for the cash. As described above in “General Background of NSCC and Key Metrics”, NSCC relies on (i) an interface with the securities settlement system operated by DTC for the book-entry movement of CNS securities and (ii) participation in the NSS payment system operated by the FRS to effect payment for these securities. In the DTC securities settlement system, securities are transferred on a gross basis intraday. In the NSS payment system, payments are made on a net basis at the end of the day. Pursuant to the NSCC Rules, a delivery of CNS securities is not final until the obligation to pay for these securities is satisfied. This settlement mechanism -- where securities transfers are settled on a gross basis intraday (through DTC), funds transfers are settled on a net basis at the end of the day (through NSS) and the two obligations are linked (by the NSCC Rules) -- most closely fits the description of a delivery versus payment model 2 design for securities settlement systems, as set forth in Annex D of the FMI Principles.

Under NSCC’s Rules governing CNS, NSCC becomes the contra-party for settlement purposes at the point NSCC’s trade guarantee attaches, assuming the obligation and obtaining the right, by assignment and assumption, to pay for and receive securities delivered from the delivering (short) Member, and to deliver securities and receive payment from the receiving (long) Member.⁵⁵

When a short Member delivers securities to CNS, the Member receives an NSCC settlement credit for that delivery and ownership in the securities delivered to NSCC is transferred to NSCC (through its CNS account at DTC).⁵⁶ Deliveries of securities by a delivering Member are final as to the delivering Member when they are delivered to NSCC’s CNS account at DTC, and CNS credits the delivering Member with the settlement amount due with respect thereto. The delivering Member (providing it is not in default at settlement) will be paid through net settlement, regardless of any failure to settle of the receiving Member.⁵⁷

NSCC is not obligated to make deliveries until it receives deliveries of such securities from Members with delivery obligations. Deliveries that come into CNS are redelivered to Members that are entitled to

⁵⁵ NSCC does not act as CCP for Balance Order transactions. The actual settlement of Balance Orders occurs outside of NSCC, either at DTC or otherwise, or through NSCC’s Envelope Settlement Service. ESS, described under Principle 10 (Physical deliveries), is a non-guaranteed service designed to facilitate physical deliveries.

⁵⁶ As provided in NSCC Rules 11 and 12.

⁵⁷ While the credit is effective when made, such credits will be net and offset against other obligations that the Member owes to NSCC as part of net money settlement. See NSCC Rule 12 and Procedure VIII.

receive them through an allocation algorithm. Members are obligated to accept and pay for securities allocated to them in the CNS process.⁵⁸

When NSCC delivers to the receiving long Member (a long allocation), the transfer is not final until the “effective time,” as defined in NSCC Rule 12 (Settlement). Pursuant to NSCC Rule 12, the “effective time” generally occurs when it is clear that NSCC has either been paid, or is in a credit position with respect to a Member or its settling bank, and NSCC has no Clearing Agency Cross-Guaranty obligation due with respect to a Member. In this way, finality of transfer to the long Member will be linked to receipt of payment. End-of-day net funds payment is made through a net-net consolidated settlement with DTC and over the FRB’s NSS system, in central bank money, as further described in Principle 9 (Money settlements). Upon completion of funds settlement, securities and funds transfers are final.

Given that NSCC is the CCP in these transactions, any principal risk faced by a delivering Member will be to NSCC, and not to any onward receiving Member. The protection provided to the delivering Member against principal risk is in NSCC’s risk management controls (which are discussed in greater detail in the response to Principles 3, 4, 5, 6 and 7), including, for example, the collection of risk-based margin to NSCC’s Clearing Fund, maintenance of liquidity resources, and the ongoing credit risk monitoring of Members.

With respect to NSCC’s delivery of CNS securities to the receiving long Member, until the effective time, NSCC maintains an ownership interest in the long allocations. Such long allocations are, as part of the DTC/NSCC interface, tracked at DTC on NSCC’s behalf and subject to controls so that the long allocations (or replacement securities of approximate value) are available for NSCC in the event the long Member fails to complete settlement (that is, the effective time does not occur with respect to that Member on the settlement day).⁵⁹ Final settlement – of both CNS securities and funds transfers – occurs by the end of the settlement day.

⁵⁸ NSCC’s Rules also provide mechanisms allowing a receiving Member a right to receive high priority in the allocation of deliveries, and also permit a Member to buy-in long positions that have not been delivered to it by the close of business on the scheduled settlement date.

⁵⁹ As provided for in the DTC/NSCC Netting Contract and Limited Cross-Guaranty, and the DTC Settlement Service Guide. This is described in Principles 13 (Participant-default rules and procedures) and 20 (FMI links).

Principle 13: Participant-default rules and procedures

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.

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.

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.

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

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.

Rules and procedures relating to default management

NSCC's Rules allow NSCC to take timely action to continue to meet its obligations and contain losses in the event of a participant default.

NSCC's Rules clearly state what constitutes a participant default. Under Rule 46 (Restrictions on Access to Services), the Board of Directors may suspend a participant or prohibit or limit a participant's access to NSCC's services in enumerated circumstances. These circumstances include a participant's expulsion or suspension from a regulatory or self-regulatory organization, default in delivering funds or securities to NSCC, and a participant's experiencing such financial or operational difficulties that NSCC determines, in its discretion, that restriction on access to its services is necessary for its protection and for the protection of its membership. NSCC's Rules provide NSCC with some discretion in determining what constitutes adequate cause to cease to act for a participant. Rule 20 (Insolvency) enumerates the circumstances under which a participant will be treated as insolvent.

If any of the enumerated circumstances arise, depending upon the facts and situation, NSCC may suspend a participant from any service provided by NSCC either with respect to a particular transaction or transactions, or with respect to transactions generally, or it may prohibit or limit such participant's access to services offered by NSCC. When NSCC restricts a participant's access to services generally, NSCC is said to have "ceased to act" for the participant.

The determination as to whether or not to cease to act for a participant is not automatic; rather under Rule 46, an affirmative determination to do so must be made. The Board of Directors has delegated authority to make such determinations to the BRC.⁶⁰ To ensure that timely action may be taken, the BRC Charter also provide for delegated authority to the Chair or, if the Chair is unavailable, the Vice Chair of the BRC

⁶⁰ NSCC Rules 23 and 46, Section 3. This authority is reflected in the Charter of the BRC, which is available on DTCC's website.

if it is impractical to convene the BRC. Action taken would then be ratified by the BRC at a subsequent meeting.⁶¹

When NSCC ceases to act for a participant, or suspends or limits its access to services, NSCC notifies the participant and furnishes it with a written statement, pursuant to Rule 46, of the grounds for the decision, and of the participant's right to request a hearing with respect to that determination.⁶² NSCC will issue an Important Notice to all participants informing them of the decision to cease to act.⁶³ NSCC will also notify the defaulter's regulator and NSCC's own supervisors of such decision.

Close-out process

Once NSCC has ceased to act for a participant, its Rules provide it with the authority to promptly close out and manage the positions of a defaulter and to apply the defaulter's collateral. Rule 18 (Procedures for When the Corporation Declines or Ceases to Act) describes the procedures, including actions NSCC may take, when it ceases to act for a participant; this includes provisions for the treatment of core services where Members may have transactions pending with a defaulting Member. The Rule identifies which actions are automatic and which are discretionary, and details how the unsettled transactions of the defaulting Member are to be processed. In this regard, unless the BRC has determined otherwise, NSCC will exclude from further processing any CNS trade or Balance Order trade which, at the time NSCC declined or ceased to act for the Member, had not yet reached the stage where the trade guaranty had attached. Similarly, pending transactions in non-guaranteed services will also be exited from NSCC's systems.⁶⁴ Any transactions so excluded are to be settled between the parties and not through NSCC.

NSCC communicates all such actions and determinations to its membership (including participants' responsibilities with respect thereto) via Important Notices, which are posted on the DTCC website. Participants are responsible for retrieving Important Notices daily.

As discussed in Principle 14 (Segregation and portability), as a cash market CCP in the U.S., the legal regime provides for protection of customer securities at the broker/dealer level. As a result, NSCC does not maintain separate "house" and "client" accounts for its Members, nor is it able to distinguish between proprietary and customer activity. Accordingly, the close-out of pending transactions will include all of the defaulter's pending transactions that are not otherwise exited from NSCC's systems.⁶⁵

⁶¹ In addition, NSCC Rule 23 also permits action to be taken by Senior Corporate Officers, if so designated.

⁶² Notices are provided for in NSCC Rule 45; hearing procedures are provided pursuant to NSCC Rule 37. As provided in Rule 46, in certain cases NSCC may summarily suspend a participant, with the participant having a right to a hearing after the fact; in other cases, the action is subject to the participant's prior right to request a hearing.

⁶³ NSCC Rule 18, Section 1.

⁶⁴ See NSCC Rule 18. This includes transactions settling on a trade-for-trade basis, transactions processed in NSCC's Obligation Warehouse service and uncompleted ACATS transactions. For the treatment of transactions in NSCC's non-guaranteed wealth management and insurance services, those transactions are handled as provided in NSCC's Rules providing for those services, NSCC Addendum D (Statement of Policy: Envelope Settlement Service, Mutual Fund Services, Insurance and Retirement Processing Services and Other Services Offered by the Corporation) and Rule 46, Section 4.

⁶⁵ For certain limited activity, NSCC does maintain separate accounting for pending long (receive) transactions where the defaulter had previously moved the position to its "long free account" and been debited the receive amount in anticipation of a CNS long allocation. These positions are maintained in a separate "fully paid-for" CNS subaccount and completion of those transactions would be effected and accounted for separately to the SIPC trustee.

As a cash market CCP, the process of closing out open CNS positions typically involves effecting market purchases and sales; that is, buying in securities the defaulter was obligated to deliver to NSCC, and selling out securities the defaulter was obligated to receive from NSCC and pay for, or otherwise liquidating the position. NSCC utilizes the services of investment advisors and executing brokers to facilitate such transactions promptly following its determination to cease to act. NSCC may engage in hedging transactions or otherwise take action to minimize market disruption as a result of such purchases and sales.

With respect to pending guaranteed Balance Order transactions, NSCC does not become a counterparty to such transactions, but does provide a trade guaranty to the receive and deliver parties which remains effective through the close of business on the scheduled settlement date. The settlement of Balance Order transactions generally occurs outside of NSCC. As a result, NSCC's guaranty for these transactions is effectuated as follows: When NSCC ceases to act for a Member, Members are required to close out the open guaranteed Balance Order transactions they had with the defaulter and report gains or losses to NSCC. Any gains must be paid to NSCC, and NSCC will cover the losses on such closed-out transactions. NSCC provides explicit instructions to Members on the procedures for closing out pending Balance Order transactions, including the timing of reporting any resulting profits and losses, via Important Notice.

Use of financial resources to contain liquidity pressures and losses

As described more fully in Principle 7 (Liquidity risk), NSCC maintains liquidity resources to enable it to complete settlement in the ordinary course notwithstanding the default of a Member. This includes the cash deposits to the Clearing Fund, cash proceeds from the CP Program and a committed secured credit facility. NSCC's Rules empower it to draw promptly on these resources as needed, while it proceeds to complete the close-out and liquidation of the defaulter's positions.

NSCC's Rules specifically permit borrowings from the Clearing Fund to facilitate end-of-day money settlement; in addition, Clearing Fund collateral may be pledged for the purpose of securing loans to facilitate settlement.⁶⁶ NSCC can access its committed credit facility up to the amount of the resources eligible to secure a borrowing. If drawn, the line would be collateralized with Eligible Clearing Fund Securities and the securities in the process of settlement which, as a result of the defaulting Member's failure, are received and paid for by NSCC (i.e., unpaid long allocations owned by NSCC), or collateral supporting those long allocations.

As the liquidation of a defaulting Member's portfolio completes (including the sale of collateral used to secure a borrowing), the proceeds from the close-out would be used to repay liquidity borrowings, thus replenishing NSCC's liquidity resources. Should close-out proceeds be insufficient to fully repay a liquidity borrowing, then NSCC would look to its loss waterfall to repay any outstanding borrowings.

Loss waterfall

To address potential tail losses, NSCC maintains additional prefunded resources. These consist of (i) the Clearing Fund which, in the aggregate, currently serves as NSCC's default fund and (ii) a portion of NSCC's retained earnings.

⁶⁶ NSCC Rule 4, sections 2 and 12.

NSCC's Rules address how uncovered credit losses—including any amounts remaining due to liquidity providers—are to be covered. Rule 4 (Clearing Fund) addresses the use of NSCC's Clearing Fund amounts to satisfy losses that may be incurred as a result of a Member default. Addendum E (Statement of Policy: Application of Retained Earnings – Member Impairments) and Addendum K (Interpretation of the Board of Directors Application of Clearing Fund) of NSCC's Rules provide additional detail.

If, after closing out and liquidating a defaulting Member's positions, NSCC were to suffer a loss, such loss would be satisfied as follows:

- (1) First, apply defaulter's resources, including any amounts available under Clearing Agency Cross Guaranty Agreements.

In the event of a Member default, the amounts on deposit to the Clearing Fund and Eligible Clearing Fund Securities pledged from the defaulting Member (along with any other resources of, or attributable to, the defaulting Member that NSCC may access under its Rules), is the first source of funds and collateral that NSCC would use to cover any losses that may result from the close-out and liquidation of the defaulting Member's positions. This includes any amounts that may be available to NSCC under applicable "Clearing Agency Cross Guaranty Agreements" (that is, agreements with other registered clearing agencies that relate to the guaranty by one or more clearing agency parties of certain obligations of a defaulting Member to other clearing agency parties). This may include certain amounts under (i) the netting contract and limited cross-guaranty between DTC and NSCC relating to collateralization across the DTC-NSCC interface (referred to as the DTC/NSCC Netting Contract and Limited Cross-Guaranty),⁶⁷ and (ii) the OCC Accord between OCC and NSCC, providing for payments to each other relating to the settlement of certain option exercises and assignments in the event of a mutual participant's failure.⁶⁸

NSCC has also entered into a multilateral netting contract and limited cross-guaranty agreement with DTC, FICC and OCC, under which these clearing agencies have agreed to make payments to each other for any remaining unsatisfied obligations of a common defaulting participant to the extent that these clearing agencies have excess resources belonging to the defaulting participant. Under this arrangement, no party ever needs to pay "out of pocket" and no party can receive more than its loss.

- (2) Next, use of retained earnings.

Under Addendum E of NSCC's Rules (Statement of Policy: Application of Retained Earnings — Member Impairments), NSCC has adopted the policy that, in the event of a Member impairment, before applying the Clearing Fund deposits of non-defaulting Members to cover any resulting loss, it will apply at least 25 percent of its retained earnings existing at the time of the Member impairment (or such greater amount as the Board of Directors may determine).

⁶⁷ The agreement contains certain cross-guaranty arrangements designed to permit transactions to flow smoothly between DTC's system and the CNS system in a collateralized environment. Under this arrangement, DTC provides a guarantee to NSCC of CNS long allocations (deliveries from CNS), and NSCC provides a guarantee to DTC for CNS short covers (i.e., deliveries from the broker to CNS to satisfy a CNS delivery obligation). These guaranties ensure, among other things, that debits created in DTC's system continue to be collateralized when the securities serving as collateral are delivered into the CNS system as short covers, and reduce risk at NSCC by ensuring that long allocations, or the approximate value of long allocations, will be made available to NSCC in a default situation.

⁶⁸ Described in more detail in Principle 20 (FMI links).

(3) Finally, access and replenish Clearing Fund (i.e., participant loss allocation).

If a deficiency still remains, NSCC would satisfy the deficiency by utilizing the Clearing Fund and assessing its non-defaulting Members as provided for in its Rules. The process, in general, allocates any remaining liabilities pro rata among the Members of NSCC who were non-defaulting Members on the date of default, based upon the Member's usage of the service to which the loss relates.

If, as a result of applying the Clearing Fund, a Member's actual Clearing Fund deposit is less than its required deposit, it will be required to top up such shortfall. In addition, iterative allocations relating to the same loss event may be made, if necessary, to fully eliminate any remaining credit loss. Members may withdraw from membership within specified timeframes after receipt of a loss allocation charge and limit their obligation for future assessments, but they will remain obligated for the charge that triggers their withdrawal and any other prior charge for which a withdrawal election was not timely made.

To date, NSCC has never invoked its participant loss allocation process.

Implementation of default rules and procedures

NSCC maintains internal plans outlining the roles and responsibilities for addressing a Member default. These include internal procedures of the involved departments (for example, Settlement Operations, FRM and the General Counsel's Office) that outline the actions that may be taken in the event of a default of a Member and the various roles and responsibilities associated with these actions. Each instance where NSCC would determine to cease to act is unique, and the internal procedures take this into consideration. NSCC also maintains arrangements with one or more investment advisors and executing brokers to facilitate an actual close-out and liquidation.

As noted above, NSCC will notify the defaulting Member, as well as the Member's regulator, of any decision to cease to act promptly after such decision is made. NSCC will also issue an important notice to all participants informing them of the cease to act. If a trustee (or other insolvency official) is appointed for the defaulting Member, NSCC will notify them as well. Finally, NSCC will also notify other FMIs that are party to clearing agency cross-guaranty or other link arrangements, as applicable.

The NSCC close-out procedures are subject to ongoing review and development, including incorporating knowledge gained from actual close-outs and internal tests, which occur at least once per year. Material changes to NSCC's internal plans are presented to the MRC and the BRC for approval.

NSCC Rules are publicly available

The key aspects of the close-out procedures are in NSCC's Rules, which are available to Members and to the public generally on DTCC's website. In addition, if NSCC were to make a determination to cease to act on behalf of a Member, NSCC would provide notice of the action to Members via Important Notice and also communicate relevant details as to the resolution of open transactions to Members in the same manner. Important Notices are posted by NSCC on the DTCC website and are available to the public. Members are responsible for retrieving notices daily from the website.⁶⁹

⁶⁹ NSCC Rule 45, section 7.

Testing and engagement with participants and other stakeholders

NSCC conducts a simulated close-out at least annually, where members of the Board, NSCC's supervisors and certain other stakeholders (such as representatives from SIPC and the FDIC) are invited to attend. The close-out simulations cover a wide-range of hypothetical fact patterns that may represent extreme, but plausible, situations, and include testing arrangements with NSCC's investment advisor(s). In addition, FRM conducts internal "table-top" close-out exercises to enable relevant staff across the DTCC enterprise to become familiar with processes and procedures that would be utilized in the event of an actual cease to act. Both the simulation results and the table-top reviews are used to review—and, where appropriate, improve—default management processes and procedures. Results are shared with the Board of Directors, the BRC, NSCC's supervisors and, as appropriate, relevant stakeholders. In addition, NSCC periodically tests the mechanics for borrowing under its committed credit facility with the agents and lenders under that facility, so that the lenders and NSCC staff may be prepared for an actual borrowing in the event of a settlement default.

In addition, NSCC also periodically tests the mechanics for borrowing under its line of credit facility with the agents and lenders under that facility (which may include participants) so that NSCC staff and the lender may be prepared for an actual borrowing under stress conditions.

As noted above, as a cash market CCP, the process by which NSCC liquidates and closes out Member positions is typically through purchases and sales into the market; accordingly, the successful implementation of NSCC's default management processes does not generally require the active participation of Members (through, for example, an auction process). As such, Members are not generally included as part of NSCC's testing processes. However, NSCC does provide Members with information—including instructions—as to how transactions will be handled in the event of an actual close-out via Important Notices. It also makes available training materials, which provide a description of the close-out process and other relevant information.

Principle 14: Segregation and portability

A CCP should have rules and procedures that enable the segregation and portability of positions of a participant's customers and the collateral provided to the CCP with respect to those positions.

Key Consideration 1: A CCP should, at a minimum, have segregation and portability arrangements that effectively protect a participant's customers' positions and related collateral from the default or insolvency of that participant. If the CCP additionally offers protection of such customer positions and collateral against the concurrent default of the participant and a fellow customer, the CCP should take steps to ensure that such protection is effective.

Key Consideration 2: A CCP should employ an account structure that enables it readily to identify positions of a participant's customers and to segregate related collateral. A CCP should maintain customer positions and collateral in individual customer accounts or in omnibus customer accounts.

Key Consideration 3: A CCP should structure its portability arrangements in a way that makes it highly likely that the positions and collateral of a defaulting participant's customers will be transferred to one or more other participants.

Key Consideration 4: A CCP should disclose its rules, policies, and procedures relating to the segregation and portability of a participant's customers' positions and related collateral. In particular, the CCP should disclose whether customer collateral is protected on an individual or omnibus basis. In addition, a CCP should disclose any constraints, such as legal or operational constraints, that may impair its ability to segregate or port a participant's customers' positions and related collateral.

As explained in the explanatory notes and footnotes to this Principle⁷⁰ in the FMI Principles report, certain cash market CCPs, like NSCC, operate in legal regimes that facilitate segregation and portability in order to achieve the protection of customer assets by alternate means that offer the same degree of protection as the approach recommended by this Principle. In the case of NSCC, as an SEC-registered cash market clearing agency, the applicable customer protection regime is the SEC's customer protection rules, promulgated by the SEC under the Exchange Act in 1972.⁷¹ This regulation applies to broker-dealers, and provides for customer segregation requirements with respect to transactions processed through NSCC to be accounted for on the books and records of the broker-dealer, and not at the clearing agency level.

Under this regime, customer ownership generally occurs upon or after settlement, and "in flight" transactions and Clearing Fund deposited by Members do not belong to the customer. As such, there is no customer trade or position entered into NSCC. As a result, Members provide Clearing Fund deposits with respect to pending transactions regardless of whether the Member is acting in a principal or agent basis, and NSCC is not able to identify positions or possess the assets of its Members' customers. Accordingly, NSCC does not maintain separate "house" and "client" accounts for Members.

⁷⁰ FMI Principles report, Principle 14, explanatory notes 3.14.5, 3.14.6 and footnote 122.

⁷¹ Exchange Act Rule 15c3-3.

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

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.

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.

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.

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.

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.

General business risk and capital planning overview

The capital management strategy of NSCC's parent company, DTCC, as well as its approach to financial planning and management, allow DTCC to effectively identify, monitor, and manage the general business risks for each of its subsidiaries, including NSCC, as well as for the DTCC group as a whole.

DTCC considers those general business risks to include potential impairment to NSCC's financial position that could result in a loss that consequently would be charged against capital. The potential for financial impairment could be affected by a variety of factors, including, but not limited to, an unexpected downturn in business volumes or in the economic cycle; external market events with adverse systemic consequences; competitive forces, such as new market participants in the clearance and settlement space; changes in regulatory requirements that may adversely impact NSCC and/or NSCC's participants; unexpectedly large operating expenses; and operational risk events.

In order to identify, monitor, and manage these risks, the capital management strategy for NSCC focuses on the following key objectives:

- Provide financial resources that are sufficient to support NSCC's business, in terms of both current and forecasted needs;
- Allow NSCC to maintain adequate capital to protect against risks that may arise under adverse scenarios;
- Satisfy current and anticipated regulatory capital requirements in light of evolving global risk management standards for financial market utilities in markets in which NSCC operates;
- Support a strong credit rating for NSCC; and
- Maintain access to financial resources to be able to take advantage of strategic/growth opportunities, as well as for business continuity purposes.

DTCC maintains a disciplined approach to financial planning and management, which it views as a critical element to ensuring sustainability of the operations of NSCC and its other subsidiaries, and to its overall capital planning process. Key aspects of this approach include the annual budget process, through which comprehensive and detailed operating plans are developed for each business line and functional area. These business plans, which are updated periodically throughout the year, include an assessment of the relevant market/operating environment, a business assessment, a strategic plan, and a financial plan. Additionally, business performance reviews are conducted regularly, tracking month-to-month volume data, trends and financial performance, thereby facilitating ongoing assessment and monitoring of business risk. DTCC's financial planning approach also includes development of a three-year long-range financial plan for the overall enterprise and each operating subsidiary, including NSCC; monthly cash flow projections based on earnings estimates and financial forecasting; and regular review of estimated capital requirements at the individual subsidiary level, as well as for DTCC in the aggregate.

The detailed and comprehensive nature of the annual budget process and related business plans, coupled with the monthly frequency of the ongoing business reviews and other tools as mentioned above, allow NSCC to quickly identify relevant events and emerging trends, and to assess their potential financial impact. Based on this information, management is able to take appropriate tactical and strategic measures in order to minimize business risk. These measures may include, among other actions, making changes to existing products and services; introducing new products or services; reprioritizing planned or ongoing projects and reallocating resources accordingly; taking cost-reduction measures; modifying fee structures; and adjusting the level of capital and liquid net assets that DTCC maintains at NSCC. These elements are brought together to create a comprehensive financial plan that projects NSCC's ability to generate the required level of earnings and cash flows to manage and protect against business risks and to support overall business strategies.

This robust framework for assessing capital needs occurs under the oversight of the Finance/Capital Committee of the Board of Directors, which was established to facilitate the oversight of NSCC's financial strategy and assess performance against that strategy. The Committee is authorized by the Board to oversee all capital and finance matters. NSCC's capital management strategy and financial plan are reviewed and updated on an ongoing basis by DTCC's Finance group, and are reviewed at each meeting of the Finance/Capital Committee, or approximately six times a year. Proposed changes to DTCC's capital structure or decisions regarding funding in general must be reviewed and approved by the Finance/Capital Committee and, as appropriate, the Board.

Liquid Net Assets funded by Equity

In identifying and quantifying its capital needs,⁷² NSCC determines its capital requirement as the sum of three comprehensive components:

(i) a general business risk component equivalent to six months of NSCC's projected cash operating expenses, taking into account both retrospective and prospective operating expense requirements in this determination;

(ii) a credit risk component equivalent to an amount that would allow NSCC to be in a position to make available at least 25% of its retained earnings existing at the time of a Member default to cover any losses that may result from the closeout of a defaulting Member, as required by Addendum E to NSCC's Rules. Such amount would be used only if the resulting loss is not otherwise covered by the amounts on deposit to the Clearing Fund from the defaulting Member, along with any other resources of, or attributable to, the defaulting Member that NSCC may access under its Rules, including resources available under applicable Clearing Agency Cross Guaranty arrangements (see Principle 13, Participant-default rules and procedures); and

(iii) a buffer component, representing an additional amount of capital held to protect resources available for recovery and wind-down. The amount of buffer that NSCC expects to hold is a function of the analysis of various factors, including the volatility of NSCC's net income and liquid cash resources or liquid net assets; a potential amount related to an extended time horizon stress scenario review of NSCC's financial results under adverse business and economic conditions; and an anticipated incremental requirement associated with the inclusion of an early warning threshold that would exceed the six months of cash operating expenses determined under the general business risk component described in (i) above.

In addition to the capital calculation described above, DTCC has also developed its own internal economic capital framework, which estimates capital requirements for each major business and on a consolidated basis across core risk categories, specifically, business risk, market risk, credit risk, and operational risk. Management believes that an economic risk-based capital view of DTCC's total business portfolio is an important assessment tool to complement regulatory mandates. This methodology enables DTCC to more fully assess its risk-based capital requirements, and the requirements of NSCC, in terms of economic realities during potential periods of market downturns and contraction.

In the second quarter of 2015, DTCC raised, as planned, additional capital through the issuance of common shares to its existing shareholders, who are participants of DTCC's clearing agency subsidiaries, as well as through the issuance of new preferred shares to qualified institutional investors (the Series C Preferred Shares). A portion of the funds raised has been contributed to NSCC to satisfy anticipated regulatory capital requirements. This includes maintaining liquid net assets to cover at least 6 months of

⁷² The SEC has approved amendments to the Clearing Agency Standards, including a new Rule 17Ad-22(e)(15) which will require NSCC to hold "sufficient liquid net assets funded by equity" to cover potential general business losses so that it can continue to provide operations and services as a going concern. The minimum amount of liquid net assets funded by equity to be held by NSCC has to equal the greater of: (i) six months current operating expenses, or (ii) the amount determined by its board to be sufficient to ensure a recovery or orderly wind-down of critical operations as contemplated by its recovery and wind-down plan. *See* Release 34-78961; File No. S7-03-14 (September 28, 2016). NSCC's recovery and wind-down plans are discussed in Principle 3 (Framework for the comprehensive management of risk).

operating expenses. Pursuant to the Investment Policy (described in Principle 16, Custody and investment risks), NSCC's liquid assets are invested conservatively in order to maximize liquidity and mitigate both credit and market risk. As such, liquid assets, which are represented by cash and cash equivalents, are typically invested in collateralized tri-party reverse repurchase agreements; AAA- rated money market mutual funds; NSCC's FRBNY account ; commercial bank deposits; and direct obligations of the U.S. Government. Additionally, the Investment Policy is reviewed with the Finance/Capital Committee of DTCC's Board of Directors and requires annual approval by the full Board.

Plans to raise additional capital

NSCC's comprehensive financial plan, as described above, is designed, in part, to project NSCC's ability to generate and maintain the required level of capital to manage and protect against business risks. NSCC has in place further strategies to bolster its capital in the event its equity falls close to or below the amount needed. DTCC, the parent company of NSCC, should prove a source of strength to raise and contribute additional capital, as may be approved by the Board. NSCC has developed a plan to raise and replenish its capital through various mechanisms that enable NSCC to replenish liquidity and equity when needed. In such a circumstance, NSCC could engage a phased approach that includes the following potential actions:

Immediate: DTCC provides intercompany funding to NSCC for operations to continue until sufficient additional equity capital is raised.

Near term: NSCC could reduce expenses, raise fees or access the capital markets via DTCC.

Longer term: NSCC could receive proceeds from recovery insurance claims or from the issuance of an equity capital call on Members or a subset of Members.

In addition, as part of its recovery and resolution planning process, NSCC is evaluating additional strategies to replenish regulatory capital in a resolution and wind-down scenario, in the remote event that recovery strategies prove unsuccessful.

Principle 16: Custody and investment risks

An FMI should safeguard its own and its participants' assets and minimise 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.

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.

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

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.

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.

Introduction

NSCC safeguards its own assets (cash, cash equivalents, and marketable investment securities), and Clearing Fund Securities and cash, in a well-established structure designed to minimize the risk of loss on and delay in access to these assets. NSCC investments are subject to NSCC's Rules and the Investment Policy, as it applies to NSCC. Under these requirements, NSCC may only invest in instruments with minimal credit, market and liquidity risks, as further described below. Eligible Clearing Fund Securities that Members deposit as collateral for their Clearing Fund obligations are held at DTC and pledged to NSCC pursuant to DTC's Rules and Procedures. Clearing Fund Securities and cash, and proprietary assets are maintained and accounted for separately, so there is no commingling.

Maintenance of Eligible Clearing Fund Securities

As described under Principle 5 (Collateral), Members may satisfy a portion of their required Clearing Fund deposit through the pledge of Eligible Clearing Fund Securities. Members pledge these securities to NSCC from their DTC accounts, through use of DTC's pledge system. Those pledged securities are thus held subject to the rights and protections afforded DTC Participants by the DTC Rules and Procedures.

NSCC invests cash safely under its Rules and the Investment Policy

NSCC holds proprietary general operating funds cash, Clearing Fund cash and cash proceeds from its CP Program (as described in Principle 7 (Liquidity Risk)). Both the Clearing Fund cash and CP cash proceeds are maintained as liquidity resources to facilitate settlement in the event of a Member default, and Clearing Fund Cash and Collateral is available to cover potential losses due to such an event. (Eligible Clearing Fund Securities may also be used to collateralize borrowings by NSCC to fund daily settlement, pursuant to its committed credit facility).

As a key liquidity resource, Clearing Fund cash must be available to complete daily settlement as needed, but it may be invested in readily available liquid investments. As NSCC's Rules provide, investments of Clearing Fund cash are generally limited to "securities issued or guaranteed as to principal and interest by

the United States or agencies or instrumentalities of the United States, repurchase agreements relating to such securities, or certificates of deposit or deposit accounts or otherwise pursuant to the investment policy adopted by the Corporation.” Deposits with commercial financial institutions are subject to their agreement that any funds so received and assets in which such funds are invested shall not be subject to set-off or lien of these financial institutions. In addition to Clearing Fund cash, cash proceeds from the CP Program and NSCC’s proprietary general operating funds are invested in accordance with the Investment Policy.

Investment criteria and monitoring

The Investment Policy outlines the parameters for NSCC’s investments including, among other things, permitted investments and limitations on investments. The Investment Policy is reviewed with the Finance/Capital Committee of DTCC’s Board of Directors and requires annual approval by the full Board. DTCC’s Treasury group is responsible for the investment of available firm-wide funds, including NSCC funds.

Pursuant to the Investment Policy, Clearing Fund cash, cash proceeds from the CP Program and NSCC proprietary funds are invested conservatively in order to maximize liquidity and mitigate both credit and market risk. Under the Investment Policy, assets are held by regulated and creditworthy financial institution counterparties and may be invested in the following types of financial instruments:

- Reverse repurchase agreements;
- Money market mutual funds;
- Commercial bank deposits;
- NSCC’s FRBNY account; and
- Direct obligations of the U.S. Government

Investments in reverse repurchase agreements are generally secured by debt obligations of the U.S. Government or those U.S. Government Agencies guaranteed by the U.S. Government and collateral must have a market value greater than or equal to 102% of the cash invested. Money market mutual funds must be regulated under Rule 2a-7 of the Investment Company Act of 1940, have a stable Net Asset Value, and a AAA/Aaa credit rating from recognized rating agencies. NSCC’s investments are short term and can be readily accessed for liquidity, should the need arise; as such, market risk is minimal.

As part of its risk management process, evaluations are performed at least quarterly on the relative credit standing of the financial institutions with which NSCC places funds. Investments are generally placed with financial institutions having a credit rating of BBB+/Baa1 or better from recognized rating agencies, as set forth in the Investment Policy. In addition, approved custodial banks, including custodial banks named in tri-party reverse repurchase agreements, must be members of the Federal Reserve System, subject to oversight of the Board of Governors of the Federal Reserve.

Approved financial institutions are monitored by CCR within DTCC’s FRM group on a quarterly basis for review of their financial condition, and approved counterparties and counterparty credit limits may be revised based on these periodic reviews. Additionally, and based on its ongoing monitoring process, to the extent that CCR determines that a change in a counterparty’s financial condition warrants a change in NSCC’s investment limits with the counterparty, CCR would notify Treasury promptly as to any change, so that Treasury can implement any required adjustment to the investment strategy.

An element of CCR's ongoing custody/investment counterparty monitoring process includes the review of audited financial statements, including audit opinions verifying that the counterparty's financial statements were prepared in accordance with generally accepted accounting principles. Beyond the scope of its internal review practices, NSCC takes additional comfort from the regulatory framework that governs its investment counterparties (which includes oversight and examination by U.S. banking regulators and the SEC), in evaluating the safety and accessibility of its investments. This includes regulation regarding the protection of customer securities from theft, loss, or misuse, and in the event of insolvency.

Exposure and concentration risk

The acceptable levels of exposure to financial institution counterparties are governed by the Investment Policy, which establishes the overall framework for the investment of funds, as well as CCR's criteria for determining credit limits to appropriately facilitate diversification and mitigate concentration across counterparties. On a daily basis, DTCC's Treasury group adheres to the policy guidelines and reports investment activity compared to established credit limits for each of the respective counterparties. This reporting is distributed to management, CCR, and Finance.

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

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.

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.

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.

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.

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

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.

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.

Operational risk management framework and identification of risks

The Operational Risk Management Policy and DTCC Corporate Risk Framework Policy describe the framework employed by ORM to identify, analyze, mitigate, report and escalate operational risks. This is done through internal incident data collection, operational risk profile risk assessments, scenario analysis, testing by internal and external parties, metrics and key risk indicators, issue tracking and reporting.

ORM is responsible for the aggregation, analysis, escalation, and reporting of operational risk to the management of business units, senior management and Board of Directors. ORM maintains an operational risk management program that enables the identification, assessment, management, monitoring and reporting of the risks encountered during the course of the day-to-day business of DTCC's clearing agency subsidiaries, including NSCC. The program establishes DTCC's overall strategy for identifying internal and external sources of risks, assessing the implications, prioritizing and

developing plans to address such risks and working, jointly with the relevant business units, for the remediation of such risks, to the extent practicable.

ORM policies and procedures serve as the guiding principles to support the business units to monitor operational control effectiveness through: (1) identification and assessment of operational risks, (2) management and mitigation of operational risks, (3) monitoring of operational risk, and (4) reporting and escalation of operational risk.

Each business unit implements an operational risk management program and related elements in accordance with the standards established by the ORM as set forth in the ORM Policy and the related supporting procedure documents. At least annually, the policies and procedures are reviewed by ORM management and updated as needed; the updated Policies are then reviewed and approved by the MRC and the BRC.

The operational risks that DTCC has identified in its Corporate Risk Framework are:

- *Human Capital/People Risk*
- *Processing and Operations Risk*
- *Cyber and Information Protection Risk*
- *Information Technology Risk*
- *Financial Risk*
- *Legal & Regulatory Compliance Risk*
- *Business Continuity Risk*

To determine how to address these risks, ORM regularly conducts operational risk profile assessments, which includes a thorough analysis of NSCC's business functions and how each of these risk categories may be implicated in the business operations. The data collected informs the organization's business planning and helps guide decision-making with respect to the need for additional investments that may further reduce risk or the readjustment of risk tolerance. Furthermore, to enhance the current risk framework, ORM has developed a scenario analysis program as a forward-looking risk management tool to enable the enterprise to identify and consider scenarios that may materially impact a business to an extent that threatens everyday viability of the business/organization. This framework allows the organization to identify possible vulnerabilities in critical functions and critical external dependencies across the enterprise, and understand more fully the risks and the potential impact of stressful events and circumstances on NSCC's financial condition.

Management of operational risk

DTCC has several ways in which it identifies and manages its operational risks, each underscored by the "three lines of defense" strategy:

- The first line of defense is the businesses and functional units, including Product Management, Operations Management, Information Technology and other areas critical to daily operation and functioning. Their mandate is to manage risk proactively.

- The second line of defense is comprised of the risk and control functions. This includes those areas that fall under the Group Chief Risk Officer’s purview (including Technology Risk Management (“TRM”)), Legal, Privacy and Compliance. Their mandate is to provide advice and guidance to the first line of defense in adhering to established risk standards and to monitor compliance with those standards.
- The third line of defense is Internal Audit. Internal Audit’s mission is to provide independent, objective assurance and advisory services to assist DTCC in maintaining effective risk management and control practices.

ORM is an independent risk management function that operates as part of the “second line of defense.” It is primarily responsible for:

- the company-wide establishment and implementation of the operational risk framework;
- ongoing monitoring of company-wide adherence to the operational risk framework by the business units;
- analysis and reporting to senior management and the Board of Directors, on a company-wide basis, the operational risk exposures, including the timely escalation of risk exposures identified under the framework; and
- supporting the business units with respect to the ongoing roll-out and application of the framework.

Policies, processes and controls

DTCC’s operational risk framework is, in part, designed in accordance with industry standards and best practices, including the operational risk measurement rules under Basel II,⁷³ and has evolved based on the changing needs of DTCC’s businesses and regulatory guidance. These standards are incorporated into the methodology and tools used by ORM to identify, assess, manage and report on operational risks. ORM’s systems, policies, procedures and controls are reflected within the ORM policies and procedures, including those relating to risk incident collection and reporting.

NSCC also complies with the requirements of Regulation Systems Compliance and Integrity (“Reg SCI”), adopted by the SEC under the Exchange Act. These requirements include establishing, maintaining and enforcing written policies and procedures reasonably designed to ensure that critical systems have levels of capacity, integrity, resiliency, availability and security adequate to maintain NSCC’s operational capability and promote the maintenance of fair and orderly markets.

With respect to human capital and people risk, DTCC defines job responsibilities in order to recruit qualified talent into the organization and compensates them competitively based on market data and internal equity. Employees have access to a range of in-house, online and external learning offerings and programs to support risk management capabilities, professional/leadership development, and business/functional knowledge. DTCC regularly tracks voluntary attrition, conducts exit interviews to identify trends and takes appropriate action to mitigate the impact of turnover. Succession and replacement plans are in place to address key-person risk for Managing Directors and other key jobs.

⁷³ <http://www.bis.org/publ/bcbs195.htm>.

Additionally, DTCC's Employee Code of Conduct sets the parameters of acceptable employee conduct that includes, but is not limited to, fraud prevention.

The New Initiative Approval Policy and the related Framework provide the basis on which management proposes, evaluates and approves initiatives; criteria for involving NSCC's supervisors and other stakeholders in the review of initiatives; and escalation and other standards for review and approval of initiatives by the Board of Directors or Board committees. The policy and related framework also provide the necessary governance and oversight structure to enable NSCC to bring initiatives to market in a timely and efficient manner, while helping to ensure, where relevant, that these initiatives are designed in a way that appropriately mitigates risk to NSCC, its membership and the financial markets.

The New Initiatives Office oversees adherence to the New Initiatives Approval Process, which is the process for proposing, evaluating and approving initiatives. This process is DTCC's product development and enhancement methodology, based on the Stage-Gate®⁷⁴ process and product development best practices.⁷⁵ It provides a framework to manage initiatives including defined stages, milestones, gate approval criteria and governance process. The New Initiatives Approval Process is used for all initiatives, including those without technology development. The methodology is designed to integrate with DTCC's IT development processes as well as external software development providers and alternative software implementation methodologies.

The New Initiatives Committee, as an internal management committee comprised of officer-level SMEs, has responsibility for reviewing and approving initiatives that meet designated risk and materiality thresholds. These reviews occur from initial identification and concept development through product launch and post-implementation. Given that initiatives can vary significantly in complexity, risk profile, and internal and external impact, initiatives are categorized in three ways: (1) materiality, (2) business driver and (3) risk rating. These categories determine the level of governance, including documentation, required for an initiative.

The New Initiatives Office tracks initiative exceptions and reports them to the Operating Committee on a monthly basis. Policy conformance for material initiatives is also reflected on the Quarterly Risk Tolerance Dashboard for New Initiatives Risk, a strategic risk that is a component of the Corporate Risk Framework.

Roles, responsibilities and framework; review and audit

As described under Principle 3 (Framework for the comprehensive management of risks), the Board has delegated to management the responsibility for the day-to-day management of risk, as articulated through individual risk tolerance statements. The risk tolerance statements are provided to the Board Risk Committee for its approval at least annually. The Board requires management to distribute regular risk tolerance reporting to the Board and the appropriate Board Committees to provide assurance of management's effective oversight of such risks.

⁷⁴ Created by Stage-Gate® International.

⁷⁵ Robert G. Cooper, *Winning at New Products – Accelerating the Process from Idea to Launch*; Paige Leavitt, Marisa Brown, Steve Wright, *New Product Development: A Guide for Your Journey to Best-Practice Processes*.

To fulfill the Board and management’s risk oversight responsibilities, the Corporate Risk Framework has been designed to provide information on DTCC’s key risks (including those applicable to NSCC) and the processes used to identify, assess, measure, monitor, mitigate and report those risks. The Corporate Risk Framework utilizes two primary risk management processes to consolidate reporting: (1) operational risk profiles created for each business and functional area, and (2) the risk tolerance reporting for each risk family. In addition, ORM reports, on a quarterly basis, on the status of operational risk across the enterprise, providing an overview of the key risks and associated mitigation plans, if applicable.

The operational risk management framework is contained in the ORM Policy which is reviewed and approved by the Board Risk Committee at least annually.

Internal Audit performs independent testing and reviews the effective implementation of the operational risk framework by both ORM and the business units. The audit frequencies range from 12 months to every five years, based on periodic assessments of inherent risk and control environments. In addition, as a regulated entity and designated SIFMU, NSCC is subject to continuous monitoring by the SEC and the FRB, which includes review and monitoring of the effectiveness of NSCC’s operational risk management policies and procedures.

Operational reliability

NSCC monitors operational reliability through multiple processes, including an Annual Risk Assessment, a Risk Controls Self-Assessment, incident reporting, monitoring for lifecycle processing, system availability and data reporting; a metrics review of incidents-related key risk indicators that have been identified for event processing, settlement processing, data reporting, system availability and other key processes. These monitoring activities are performed regularly and evaluated by management as required, with appropriate procedures and controls applied as needed.

To continuously maintain high levels of quality, DTCC uses several concurrent improvement methodologies that, when integrated, provide the company with a powerful quality management toolkit. These tools, which help to streamline processes and develop new business practices using a customer-centric, metrics-driven approach, include:

- *Six Sigma*: a data-driven methodology that strives for near-perfection to deliver world-class performance, reliability and value to NSCC’s customers;
- *Kaizen*: a set of principles to facilitate rapid improvement in all aspects of the organization;
- *Capability Maturity Model Integration*: an internationally recognized collection of best practices and standardized processes that companies follow to gain better control over their software development process; and
- *The Information Technology Infrastructure Library*: a customizable framework of best practices that offers guidance and techniques to align technology services with business requirements.

DTCC utilizes a formalized internal Service Level Agreement (“SLA”) process across the enterprise; this provides a more precise measurement of system performance against specified benchmarks. Within DTCC, SLAs are agreements between the service provider (IT) and their customers (Product Management) that identify the critical business services and underlying Information Technology services provided to fulfill them, their service performance targets, the metrics associated with these services, a definition of acceptable and unacceptable levels of performance and actions to be taken when service levels are breached. These measures and metrics are re-evaluated on an annual basis as part of DTCC’s

continuous improvement process. Any SLA breaches are noted, and timely reports, with appropriate detail, are distributed to various levels within the organization including senior management. The reports are used to track performance against service levels. In addition, a “post mortem” analysis is performed for any service delivery issues that impact an SLA to identify root cause for the avoidance of future issues.

In addition, DTCC produces balanced business scorecards and SLA measurement scorecards that are utilized to drive performance and highlight (and address) any emerging concerns.

Capacity planning

DTCC’s Corporate Capacity Planning and Performance Management Framework provides a governance structure for meeting the requirements of ordinary course business, and for responding to events that may arise as a result of extraordinary market events.

The Corporate Capacity Planning and Performance Management Framework utilizes trend analysis, augmented by annual reviews of business application changes, to forecast the upcoming year’s capacity demand for both processor and storage capacity for all data centers. The Framework incorporates business forecasts, application throughput, current capacity and scalability, SLAs, performance management, capacity utilization, and capacity modeling and forecasts. The annual reviews encompass business defined factors (i.e., growth, new product lines and new applications, etc.) to adjust the trend projection. Furthermore, the Framework’s scope gives priority to and addresses the largest business areas and the associated production processing environments.

DTCC has dedicated capacity planning staff. The Capacity and Performance group is specifically responsible for forecasting and monitoring infrastructure capacity and utilization. Among the area’s responsibilities are:

- supporting performance testing in the quality assurance environment in collaboration with the Test Support Group;
- reporting defects found during performance testing;
- researching and recommending tools to improve the efficiency, quality, and accuracy of capacity and performance reporting, monitoring, and testing;
- reviewing incidents and problems that have a direct impact on capacity or performance;
- measuring and reporting monthly on DTCC mainframe and distributed systems’ usage trends for computer processing unit utilization, memory utilization, persistent storage utilization and traffic; and
- recording and reporting available capacity information for mainframe and distributed systems.

The Capacity and Performance group monitors capacity resulting in daily, weekly and monthly usage reports for review by IT Management, and utilizes several real-time performance monitoring tools to identify anomalies and opportunities for efficiency improvements. New systems are stress tested prior to being placed into production. Capacity management information and metrics are provided to the Operating Committee on a quarterly basis, with management presenting capacity planning to the Committee for discussion no less than two times per year. The clearing systems, including NSCC’s CNS system, have a maximum processing capacity validated at a multiple of historical peak volume. NSCC

performs stress tests periodically to affirm the ability to process at least two times historical peak volumes. This includes testing prior to implementation of significant application changes and in other circumstances where significant volume increases may be anticipated.

Physical security

Global Security Management utilizes a comprehensive security assessment tool as part of an overall program aimed at developing and maintaining a consistent, structured and integrated methodology for identifying, monitoring, managing and reporting on security risks across physical sites and locations throughout the organization.

The process consists of several components, which include: (a) a Security Vulnerability Assessment checklist that is “risk-specific” and facilitates the analysis and reporting of risk information using a common language and (b) quantitative information, including internal theft events and security breaches, area threat analysis (from a Federal and local perspective) and local area crime statistics to ascertain the effectiveness of current security control structures.

Because of the vast differences in the types of federal and non-public facilities and the variety of risks associated with each of them, there is no single relevant international, national, or industry-level standard for physical security by which guidance can be solely taken. Accordingly, select guidance is taken from a number of applicable resources, including:

- GSA Physical Security Handbook 440-2-H, Chap 3,⁷⁶ and
- American Society for Industrial Security international⁷⁷
 - Business Continuity Guideline - A Practical Approach for Emergency Preparedness Crisis Management and Disaster Recovery-BC01,
 - Chief Security Officer Guideline-CSO04, Facilities Physical Security Measures Guideline-FPSM,
 - General Security Risk Assessment Guideline-GSRA,
 - Information Asset Protection Guideline-IAP05,
 - Pre-employment Background Screening Guideline-PBS,
 - Private Security Officer Selection and Training Guideline-PSO,
 - Threat Advisory System Response Guideline-TASR04,
 - Workplace Violence Prevention and Response Guideline-WPV 09,

⁷⁶ [U.S. Department of the Interior, U.S. Geological Survey, Reston, VA, USA - URL: http://www.usgs.gov/usgs-manual/handbook/hb/440-7-h/440-7-h-ch3.html](http://www.usgs.gov/usgs-manual/handbook/hb/440-7-h/440-7-h-ch3.html).

⁷⁷ <http://www.ihs.com/products/industry-standards/org/asis/list/index.aspx>.

- Organizational Resilience: Security Preparedness and Continuity Management Systems-Requirements with Guidance for Use-SPC.1),
- FEMA 452 (A How-To Guide to Mitigate Potential Terrorist Attacks Against Buildings)⁷⁸ and
- FEMA Publication No. 386-7 (Integrating Man-Made Hazards into Mitigation Planning).⁷⁹

From these and other similarly applied standards, basic risk management steps are employed to fundamentally determine security priorities and implement appropriate solutions.

Information security

TRM manages information security within DTCC, including the clearing agency subsidiaries. This includes responsibility to:

- establish and maintain an information security management framework and an organization with the resources, expertise and training to support DTCC's security strategy;
- define roles, responsibilities and accountabilities for information security strategically plan and coordinate information security efforts throughout the enterprise;
- establish, maintain, communicate and periodically reassess information security policies and a comprehensive information security program that are approved by the Technology Risk Management Steering Committee, MRC and the Board of Directors, and that (1) incorporates relevant industry information security standards and (2) is published and communicated to all DTCC employees and relevant external parties;
- review security policy and security control standard exception requests and approve (or reject) them based on a risk assessment that includes a review of the secondary controls;
- coordinate and periodically assess the implementation of information security controls across DTCC;
- be the source of information security advice for new implementations of, and changes to existing, information technology and assets;
- provide annual mandatory and periodic information security awareness, education, training and communication for DTCC employees and relevant external parties;
- identify current and potential legal and regulatory issues affecting information security;
- perform enterprise-wide threat/vulnerability assessments to facilitate the determination of TRM's investment and remediation priorities;

⁷⁸ <http://www.fema.gov/media-library/assets/documents/4608?id=1938>

⁷⁹ <http://www.fema.gov/media-library/assets/documents/4528?id=1915>

- establish and maintain contacts with external security specialists or groups, including relevant authorities, to keep up with industry trends, monitor standards and assessment methods and provide suitable liaison points when handling information security incidents; and
- establish metrics to evaluate the effectiveness of the security program and alignment to risk tolerance statements, and report overall status to the MRC and the DTCC Board.

The objective of DTCC Information Security Policy is to provide management direction and support for information security in accordance with business requirements and relevant laws and regulations. As there is no single relevant international, national, or industry-level standard by which guidance can be solely taken, select guidance is taken, as applicable, from a number of recognized information security standards, including:

- the internationally recognized standard “ISO/IEC 27001:2013 – Information technology – Security techniques – Information security management systems – requirements”,⁸⁰
- the FFIEC Information Technology (IT) Examination Handbook, which is comprised of several booklets covering a variety of technology and technology-related risk management guidance for financial institutions and examiners,⁸¹ and
- the NIST cyber security framework consisting of standards, guidelines, and practices to promote the protection of critical infrastructure.⁸²

Business continuity

Business Continuity Management (BCM) is concerned with the governance and implementation of proactive and reactive measures that help ensure that enterprise and business functions have resilience and recovery capabilities to continue, should a serious event occur. This is done through the: (1) integration and alignment with the various risk functions throughout the organization and sector, (2) development of guidance and standards relating to business continuity and environmental risk, (3) monitoring of compliance and (4) promotion of awareness and education. DTCC’s Global Business Continuity Management Policy establishes requirements for how DTCC as a whole, including NSCC, will effect and maintain controls that address defined threats that, if not otherwise implemented, could result in a high level of risk to the continuity of enterprise operations. This policy defines the governance structure, high-level roles and responsibilities and framework for DTCC’s BCM process.

Given the nature and breadth of significant business disruptive events, BCM aligns its controls to the regional, enterprise, business, and support levels, including alignment with each of DTCC’s clearing agency subsidiaries. DTCC provides a set of core business processes for each clearing agency subsidiary, including NSCC. The business processes have a relative importance based on the service they provide. NSCC falls into the Tier 1 ranking. The ability to deploy sensible and balanced controls, as well as to triage recovery efforts, is based on this relative importance.

⁸⁰ <http://www.iso.org/iso/home/standards/management-standards/iso27001.htm>.

⁸¹ <http://ithandbook.ffiec.gov/>.

⁸² <http://www.nist.gov/cyberframework/upload/cybersecurity-framework-021214-final.pdf>.

On an annual basis Business Continuity Plans are updated and include a Business Impact Analysis (BIA). The BIA validates the criticality of business areas to ensure the appropriate level of controls. The key elements of an effective BIA are:

- Assessment of product line criticality to the enterprise and clearing agency subsidiary based on a potential impact
- Assessment and prioritization of product line functions and processes, including their internal and external dependencies
- Estimation of maximum allowable downtime associated with the institution's business functions and processes
- Estimation of recovery time objectives, recovery point objectives, and recovery of the critical path
- Identifying dependencies that a product line has and ranking them to align with the process criticality for recovery
- Product lines are ranked based on their criticality to the enterprise:
 - Tier 0 High Availability - require an infrastructure with virtually no downtime.
 - Tier 1 Severe – has a goal of two hours for resumption, with a maximum allowable downtime of four hours and fifteen minutes.
 - Tier 2 High – has a goal of four hours for resumption with a maximum allowable downtime of four hours and fifteen minutes.
 - Tier 3 Moderate - required resumption of operations is next day.
 - Tier 4 Low - required resumption of operations is three days.
 - Tier 5 Immaterial - reserved for support functions that have non-essential recovery time frames greater than five days.

In support of NSCC's business, DTCC has multiple data centers, including in-region and out-of-region sites. In-region sites utilize synchronous data replication between them, maintaining multiple exact copies of core production data in separate locations. Production processing is spread across the in-region data centers. Specifically, primary and secondary sites are within 10 miles of each other, and the tertiary site is approximately 1,500 miles from primary/secondary sites. The out-of-region site contains additional asynchronously replicated copies of production data. The asynchronous nature of the replication to this site is due to the limits inherent in current-day technology. The technology currently permits asynchronous replication sufficiently timed to ensure that there is no more than a two-minute variance in the data stored at the in-region sites and the data stored out-of-region.

All data centers have emergency monitoring and backup systems including: fire detection and suppression systems, uninterruptable power supply, standby generators, and dual path telecommunications. All sites are operational and have sufficient capacity to process the entire core production workload so any data center can function as the sole production site within two hours in case one or more data centers experience an outage.

Operating centers are deployed in three geographic regions throughout the U.S. DTCC uses these sites to deploy various work area recovery (“WAR”) strategies to mitigate the loss of primary workspace and/or associated desktop technology as well as for social distancing. It provides a means by which DTCC is able to recover its most critical functions in the most efficient and cost effective manner. The allocation of WAR solutions is based on the relative criticality of the product line to the enterprise as defined by the BIA. Support and business functions regarded as Tier 0 or Tier 1 will have a need for more stringent controls than those with a less critical offering. The more critical the offering, the more diverse the staff leading to a greater ability to sustain operations through a disruptive event.

In order to provide continuous operation from multiple sites, DTCC decentralized its information technology and key business operations staff among in-region and out-of-region sites. Daily data processing operations and monitoring of emergency systems is conducted continuously from both in-region and out-of-region data “Command Centers.” During a disaster where data center operations are forced out of region, this process is augmented with steps outlined in a recovery guide issued to participants and managed by the operations staff.

In addition, all critical clearance and settlement transactions utilize private non-Internet networks such as the Securely Managed and Reliable Technology (“SMART”), BT Radianz, and the NYSE Secure Financial Transaction Infrastructure (“SFTI”) networks. SMART is the primary network that provides connectivity between DTCC and its customers. SMART is a seamless, end-to-end, securely managed private communications system encompassing a geographically dispersed complex of processing centers, communications networks and control facilities. Each element of SMART is highly secure, engineered with multiple independent levels of redundancy. External traffic is split between these connections, which are always active with each having sufficient capacity for the entire traffic volume.

The BCM plans enable DTCC to effectively and efficiently assess the impact of the disruption, organize communication and decision-making and coordinate the company’s response effort. The BCM Policy includes definitions of the types of communications necessary, the methodology and some template text to execute the plans. Moreover, BCM is typically responsible for the actual management of a crisis event, and its duties internally are to implement the crisis management procedures.

In addition, individual product line and support units are responsible for working with BCM and include a cross section of individuals from various departments throughout the organization, including senior management (decision making), facilities management (locations and safety), human resources (personnel issues and travel), marketing (media contact), finance/accounting (funds disbursement and financial decisions), Operations (Settlement) and Risk Management (Collection of Clearing Fund), among others. In a crisis, BCM will immediately disseminate a message to internal and external audiences to ensure consistent communication to key audiences.

Review and testing

Contingency arrangements are reviewed throughout the year but at a minimum once per product line or support unit. DTCC also conducts facility specific work area recovery exercises throughout the year, but at a minimum once annually.

DTCC works with its customers and other industry infrastructure organizations to discuss the industry’s business continuity preparations and DTCC’s expectations regarding customers’ own business continuity capabilities. Furthermore, DTCC conducts regular “tabletop” exercises to validate how its command teams would respond in the event of a catastrophic loss of the company’s headquarters or other locations. As with real events, these various exercises involve debriefing sessions and checklists that are used to identify weaknesses or opportunities for improvement.

DTCC also engages in the following:

- *Ensuring connectivity* – DTCC has telecommunication networks with major participants to ensure continued connectivity for all of DTCC’s data processing. This includes the participant’s primary locations as well as the participant’s backup locations. DTCC has met with several of its larger participants to review geographic diversity of their telecommunications and will continue to meet with others.
- *Connectivity testing* – Each year, DTCC’s clearing agency subsidiaries issue Important Notices that establish telecommunications connectivity requirements for major participants and customers. NSCC requires its larger-volume Members to test their connectivity with NSCC at least once a year. This includes testing of connectivity from the Member’s primary and backup locations to several of the DTCC data processing locations.
- *Reg SCI testing* – As a designated Reg SCI entity, NSCC performs functional and operational testing with clients that are, taken as a whole, the minimum necessary for the maintenance of fair and orderly markets in the event of the activation of NSCC’s business continuity and disaster recovery plans.
- *Industry testing* – DTCC participates in industry-wide testing with the Securities Industry and Financial Markets Association, as well as tests conducted by SWIFT, the FRB’s Fedwire® Securities Service, and other critical vendors. In addition, DTCC representatives participate in several industry committees that focus on business continuity issues at the industry level.

Risks to the FMI’s operations and risks posed to other FMIs

As discussed more fully in Principle 3 (Framework for the comprehensive management of risks), given its central role in the U.S. securities markets, NSCC potentially poses a number of risks to other entities, while it is also exposed to risks that may originate from other entities.

NSCC’s material service providers are subject to a comprehensive vendor review and vetting process that include both credit and operations risk reviews and controls. Mitigants may take the form of contractual protections, or additional or backup providers where deemed appropriate and feasible. For example, NSCC utilizes price feeds from multiple vendors as an additional risk mitigant, and further employs price review and data scrubbing procedures to minimize the risk of using inaccurate prices.

As described in Principle 20 (FMI links), NSCC relies on an interface with DTC for the book-entry movement of securities to settle CNS transactions. The operational risks of the interface are monitored on an ongoing basis through DTCC Operations and Settlement areas, and are subject to DTCC’s Operational Risk Management framework. DTC also acts as NSCC’s settlement agent, to effectuate daily money settlement through use of the FRB’s NSS system. As a result, NSCC is indirectly dependent on the availability of NSS to complete daily settlement, as well as on Fedwire®, to effectuate Clearing Fund payments.

NSCC has established credit standards for entities providing settling bank services, and investment and custody services. While settling banks are selected by, and act on behalf of, participants, entities providing such services are held to strict operational standards, and are subject to fines and other disciplinary measures (in their capacity as Members or Settling Bank Only Members) should they fail to abide by such requirements.

With regard to its trade capture processes, where on a daily basis NSCC receives trade data feeds from more than 50 trading venues in the United States, NSCC employs several monitoring and control tools, including the systematic monitoring of networking communications and data transfers to confirm data receipt and which generate alerts during failures, establishing clear lines of communication and escalation, and coordinating system changes or upgrades.

As regards to risks that NSCC might pose to other FMIs, including Participants and linked FMIs, NSCC has communication and escalation processes in the event of system issues to facilitate resolution. As appropriate, NSCC also provides an opportunity for relevant FMIs to participate in default management and/or disaster recovery tests.

Along with other financial industry organizations, DTCC is an active participant in the Financial Services Sector Coordinating Council for Critical Infrastructure Protection and Homeland Security, a private sector group that interfaces with the U.S. Department of Treasury and the Financial Banking Information Infrastructure Committee on infrastructure protection issues. The FSSCC works to coordinate the financial services industry's initiatives to protect critical financial services infrastructure. The goal is to ensure that these efforts focus on complementary objectives and contribute to achieving the highest possible level of overall industry resiliency.

As noted above, DTCC staff actively participate in SIFMA industry-wide business continuity testing. Some of these tests include FEMA pandemic, cyber security, and backup site testing.

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.

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.

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 endeavor to set requirements that have the least-restrictive impact on access that circumstances permit.

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.

NSCC's access and participation requirements

NSCC has established participation criteria and requirements relating to financial resources, creditworthiness, and operational capability. These requirements are designed to limit the risks a participant may present to NSCC or to its membership, while facilitating fair and open access by market participants; they are objective, risk-based, and are set forth in NSCC's Rules, which are publicly available on DTCC's website at www.dtcc.com.

In general, NSCC participation requirements are set forth in Rule 2A (Initial Membership Requirements) and Rule 2B (Ongoing Membership Requirements and Monitoring). As indicated in the General Background of NSCC in part III of this Disclosure Framework, NSCC has several categories of membership with different access levels to services. Addendum B to NSCC's Rules provides that an applicant for each level of membership must either be a specified type of legal (regulated) entity, or must otherwise demonstrate to the Board of Directors that its business and capabilities are such that it could reasonably expect material benefit from direct access to NSCC's services.

Participants within the same membership category are subject to the same requirements, and NSCC membership types differ in terms of their access to NSCC services, level of reporting requirements, admission and continuance standards and their Clearing Fund requirements.

For example, in order to effect settlement of CNS securities movements, NSCC Members must also be Participants of DTC, which has its own set of participation requirements. Additional requirements applicable to non-U.S. entities are set forth in Addendum O to NSCC's Rules which are designed, as may be necessary, to address legal risk and differences in accounting standards. Under Rule 15 (Assurances of Financial Responsibility and Operational Capability), NSCC may also require additional reporting or other requirements it deems necessary or appropriate to demonstrate the Member, or applicant's, financial responsibility or operational capability. Ultimately, an applicant for membership must conform to any

condition and requirement that NSCC reasonably deems necessary for its, and the membership's protection.⁸³

NSCC reviews its risk-based membership criteria regularly, and changes to these criteria would be subject to the Proposed Rule Change Process,⁸⁴ which is subject to public comment. NSCC is currently in the process of proposing adjustments to its participation requirements, particularly Member capital requirements, to more closely reflect the current risk environment. The proposal is currently being developed internally and socialized with NSCC's Members. Once finalized, it will be the subject of a Proposed Rule Change before it becomes effective as part of NSCC's Rules.

Membership application requirements

All applicants for membership must provide NSCC with certain information, depending on the level of services sought by the applicant; this information is reviewed to confirm eligibility. All applicants to become Members must provide information which is reviewed by FRM to ensure that the applicant has (1) sufficient financial ability to make anticipated contributions to the Clearing Fund and to meet obligations to NSCC; (2) either an established business history of a minimum of six months, or personnel with sufficient operational background and experience to ensure the ability of the firm to conduct its business with NSCC; and (3) appropriate settling bank arrangements.

1. *Type of Legal Entity.* As set forth in Addendum B to NSCC's Rules, an applicant for each level of membership must either be a specified type of legal entity (such as a broker-dealer, bank or other specified entity that, under its regulatory regime, may engage in the transactions that will be processed through NSCC), or must otherwise demonstrate to the Board of Directors that its business and capabilities are such that it could reasonably expect material benefit from direct access to NSCC's services. For example, an applicant to be a Member of NSCC must either be (i) a registered broker-dealer, (ii) a bank or trust company that is a member of the Federal Reserve System or is supervised and examined by state or federal authorities having supervision over banks; (iii) a registered clearing agency; (iv) an insurance company or an insurance entity; or (v) an investment company registered under Section 8 of the Investment Company Act of 1940, as amended. If an applicant does not fall within these specified types of entities, it must demonstrate its ability to utilize, and benefit from, direct access to NSCC.
2. *Financial Responsibility.* NSCC sets financial requirements for establishing and continuing membership that are based on the type of legal entity, the types of services that the entity will use at NSCC (that is, whether or not it will seek access to all NSCC services, or limit its access to specified non-guaranteed services), and whether the entity intends to clear transactions for others through NSCC. Currently, among other requirements, Members, which have access to all NSCC services, including CCP services, must have excess net capital over the minimum net capital requirement imposed by the SEC or, if the Member is a broker/dealer, such higher minimum capital requirement imposed by the broker/dealer's designated examining authority, in the amount of (i) US\$500,000; or (ii) US\$100,000, if the applicant is a Municipal Securities Brokers' Broker (as defined in Rule 15c3-1(a)(8) of the Exchange Act); or (iii) US\$1,000,000, if the applicant intends to clear and settle

⁸³ Rule 2A also sets out membership disqualification criteria, such as certain criminal or fraud convictions, regulatory suspensions or other "statutory disqualifications" that may impact an applicant's suitability for membership in NSCC.

⁸⁴ Described in detail under Principle 1 (Legal Risk).

transactions for other broker/dealers (broker-dealers who are not NSCC Members, but clear and settle their transactions through NSCC Members are referred to as “correspondent firms”).

In addition, NSCC’s Rule 4 (Clearing Fund) provides that all NSCC Members are required to make a deposit to NSCC’s Clearing Fund, with the amount of each Member’s required deposit being fixed by NSCC in accordance with one or more formulas (which is detailed in Procedure XV of NSCC’s Rules).

3. *Operational Capability.* NSCC will assess its participants’ operational capability both in connection with the application process as well as during periodic reviews. NSCC’s Operations group, in conjunction with the Relationship Management group, confirms that the applicant will be able to satisfactorily communicate with NSCC and to fulfill anticipated commitments to and to meet the operational requirements of NSCC with necessary promptness and accuracy, and is able to establish appropriate arrangements to effect payment obligations to NSCC. This includes designating a Settling Bank that meets NSCC’s Settling Bank requirements. Prior to activating membership, NSCC applicants are required to conduct testing with NSCC (i.e., connectivity testing) to confirm that they are able to transmit files to, and receive files from, NSCC.

Finally, all applicants must execute a Membership Agreement, and submit other required membership application documents, under which they agree, among other things, to be bound by NSCC’s Rules and meet all anticipated financial obligations to NSCC.

Before denying a membership application, NSCC must provide the applicant with a concise written statement setting forth the specific grounds under consideration upon which any such denial may be based, and notify the applicant of its right to request a hearing to determine whether the application should be denied.

Ongoing compliance with membership requirements

NSCC monitors its participants’ ongoing compliance with access criteria through review and analysis of financial and operational information and through regular market, news, and regulatory monitoring. Pursuant to Rule 2B (Ongoing Membership Requirements and Monitoring), Members are required to provide NSCC with regulatory reports and other required financial information on a timely basis. This includes annual audited financial statements and monthly or quarterly regulatory reports (i.e., FOCUS or CALL reports), depending on the reporting frequency of the Member, and notification of changes in condition. Members are informed by Important Notice as to the due dates for providing this information.

Pursuant to its Rules, NSCC may fine Members that fail to timely provide such information and those fines are reported to the SEC, as required by Rule 19h-1 under the Exchange Act.

Through FRM, NSCC reviews this information to confirm that applicants and Members meet their applicable minimum financial requirements. FRM monitors Clearing Fund requirements throughout the day and Operations staff monitors the operational capability of NSCC Members, as applicable.

As described in Principle 4 (Credit Risk), FRM utilizes an internal credit risk rating matrix (referred to as the “CRRM”) to risk rate U.S. bank and broker/dealer Members as part of the ongoing monitoring of Member firms.⁸⁵ The CRRM is produced systemically from data contained in the Members’ regulatory reports. A rating scale of 1 to 7 is utilized, with 1 being the strongest and 7 being the weakest. The key financial elements used to set a Member’s credit rating focus on that firm’s capital, leverage, liquidity and profitability. Once this rating is generated, it is reviewed by an assigned analyst within the Counterparty Credit Risk (“CCR”) group of FRM. The analyst considers whether qualitative factors (e.g., regulatory history, type of audit opinion issued and material management changes) warrant a manual downgrade to the model-generated rating. The resulting rating determines the level of financial review that will be performed on that Member and may impact the Member’s Clearing Fund requirement.

Members with a weaker internal credit rating (rated a 5, 6, or 7 on the CRRM) are automatically placed on NSCC’s Watch List. Members on this Watch List may be subject to enhanced surveillance and monitored more closely than those with a stronger credit rating.

CCR also maintains an enhanced surveillance list, which consists of Members for which CCR conducts additional surveillance or requires additional information in order to more closely monitor their risk profile. Members can be added to enhanced surveillance for a variety of reasons, including concerns about legal and/or regulatory issues, changes to organizational structure, Member’s liquidity arrangements, available news reports relating to the Member, concern regarding Member’s ability to maintain membership standards, etc. A Member can be added to enhanced surveillance regardless of the rating generated for the firm by the CRRM. In addition, Member types not subject to the CRRM may also be subject to enhanced surveillance and be monitored for financial condition and/or operational capability, as NSCC deems necessary to protect itself and its Members.

Suspension and orderly exit of Members

NSCC’s Rules contain provisions that facilitate the suspension and orderly exit of participants that no longer meet the participation requirements:

- A participant may voluntarily retire from membership by notifying NSCC in writing, as provided in Rule 2B, Section 5 of the Rules. Notwithstanding any such notification, the participant remains obligated to satisfy any open obligations and liabilities arising out of its membership existing at the time of its notification. A retiring participant will typically designate a retirement date, by which all open activity will be closed out and new activity will no longer be submitted or accepted. NSCC issues an Important Notice when a participant voluntarily retires from membership.
- Under Rule 42 (Wind-Down of a Member, Fund Member or Insurance Carrier/Retirement Services Member), NSCC can facilitate the orderly wind-down of a participant’s business when NSCC is notified by the participant that it intends to wind-down its business. Under this Rule, NSCC may impose conditions on, or take actions with respect to, the “Wind-Down Member” in order to mitigate risk, including (but not limited to) permitting the Wind-Down Member to submit only transactions that serve to support the wind-down, restricting or modifying the Wind-Down Member’s use of any or all of NSCC’s services, and requiring the Wind-Down Member to post increased Clearing Fund deposits.

⁸⁵ The CRRM is utilized to rate banks and broker/dealer Members. An enhanced CRRM model, subject to regulatory approval, will also rate foreign bank Members in addition to domestic bank and broker/dealer Members. The enhanced model will also rely on both quantitative and qualitative factors.

NSCC will notify the participant, all other participants (via Important Notice) and the SEC when it implements this Rule and determines that the affected participant is a “Wind-Down Member.”

- Under Rule 46 (Restrictions on Access to Services), NSCC has the right to restrict a participant’s access to services, by limiting or excluding the participant’s participation in one or more classes of transactions or services, or by ceasing to act for the participant generally. The circumstances under which NSCC may do so are clearly set forth in the Rule, and include a determination by Board of Directors or appropriate Board Committee that the participant is no longer in compliance with the membership requirements. If NSCC ceases to act for a participant, the Rules provide that NSCC must notify the affected participant, other participants (via Important Notice) and the SEC of NSCC’s action. The participant may request a hearing to consider the decision which, depending upon the circumstances on which the action was based (such as insolvency or settlement default), may be after the cease to act or suspension takes effect.

Principle 19: Tiered participation arrangements

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

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.

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

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.

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

NSCC Members are direct participants of NSCC. Indirect participants are firms that rely on the services provided by Members in order to have their activity cleared and settled through NSCC's facilities. NSCC has enhanced its risk management process to better identify, monitor and manage the risks that indirect participants may pose to NSCC utilizing the Rules-based tools described below.

Identification and monitoring of indirect participant risk

The risks that indirect participants pose to NSCC are identified and monitored as part of the application and on-boarding process for NSCC Members, and as part of NSCC's ongoing Member due diligence process. Applicants for Membership must indicate whether they intend to self-clear only, or also clear activity on behalf of correspondent firms. Among the aims of these review processes is for NSCC to understand the material dependencies between Members and the indirect participants that rely on them for the clearance and settlement of their transactions, as well as significant Member-indirect participant relationships and the various risk controls and mitigants that Members employ to manage their risks with respect to such relationships.⁸⁶

During the membership on-boarding process, NSCC requests and reviews, pursuant to its authority under Rule 2A (Initial Membership Requirements) and Rule 15 (Assurances of Financial Responsibility and Operational Capability), information from Member applicants regarding the types of businesses they conduct, including the anticipated activity to be introduced to NSCC by such applicants on behalf of indirect participants.

⁸⁶ In order to aid NSCC Members in the management of their risks with respect to indirect participants, in the spring of 2014, NSCC introduced a trade monitoring tool called the "DTCC Limit Monitoring Risk Management Tool", which is designed to enable Members to monitor their firm's and/or their correspondents' trading activity on an intraday basis, through review of post-trade data. See NSCC Rule 54.

Thereafter, as part of its ongoing Member due diligence process, NSCC collects information on a periodic basis, pursuant to its authority under Rule 2B (On-Going Membership Requirements and Monitoring) and Rule 15 (Assurances of Financial Responsibility and Operational Capability), from Members in order to understand their overall business condition, risk management practices and financial standing, including information related to the indirect participants that rely on them.

In particular, NSCC requires that Members submit information regarding the amount of revenue and settlement activity that significant indirect participants represent to the Members, the criteria and procedures used by the Members for on-boarding indirect participants, as well as the risk management policies and procedures employed by the Members for ongoing monitoring and controlling of indirect participant trading activity, including limits, acceptable levels of concentration and required levels of liquidity in securities traded.

Management of indirect participant risk

NSCC employs the Rules-based tools described below applicable to its Members in order to manage the risks that indirect participants may pose to NSCC.

Credit Risk Rating. NSCC's review of the information received on indirect participants through its Member on-boarding and periodic Member due diligence processes described above may factor into the qualitative factors that affect NSCC's credit risk rating of a Member. As described in further detail in response to Principles 4 (Credit risk) and 18 (Access and participation requirements), the resulting credit risk rating of a Member determines the level of financial review that will be performed on that Member and may impact the Member's Clearing Fund requirement. If NSCC believes the CRRM model-generated ranking insufficiently accounts for qualitative factors deemed relevant by FRM, or deems such action necessary to protect itself and its Members, NSCC may opt to lower the Member's credit risk rating,⁸⁷ and/or subject the Member to enhanced surveillance.⁸⁸

Monitoring and Margin Collection. As described in further detail in response to Principle 6 (Margin), NSCC collects Clearing Fund Required Deposits from its Members on a daily basis in accordance with the methodology set forth in Procedure XV of NSCC's Rules. Clearing Fund Required Deposits are calculated based on the trading activity submitted to NSCC on Members' own behalf and on behalf of any executing brokers that clear through them. Among the Clearing Fund component charges, NSCC may charge Members amounts for concentrations of trades of such Members and/or the executing brokers that clear through them in certain markets, through NSCC's Market Maker Domination system (described in Principle 6 (Margin)). NSCC may also require additional intraday margin should NSCC deem it necessary or appropriate based on intraday market moves and intraday trading activity (whether the activity is that of the Member, or the executing brokers who clear through the Member).

Adequate Assurances. NSCC also has the authority under Rule 15 (Assurances of Financial Responsibility and Operational Capability) to seek adequate assurances from a Member if NSCC determines that such adequate assurances are warranted based on its review of such Member's indirect participant relationships.

⁸⁷ This may have the effect of placing the Member on the Watch List if, as a result of the downgrade, the final rating is 5, 6 or 7.

⁸⁸ The CRRM is utilized to risk rate banks and broker/dealer Members. An enhanced CRRM model, subject to regulatory approval, will also rate foreign bank Members in addition to domestic banks and broker/dealer Members. The enhanced model will also rely on both quantitative and qualitative factors.

Principle 20: FMI links

An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks.

Key Consideration 1: Before entering into a link arrangement and on an ongoing basis once the link is established, an FMI should identify, monitor, and manage all potential sources of risk arising from the link arrangement. Link arrangements should be designed such that each FMI is able to observe the other principles in this report.

Key Consideration 2: A link should have a well-founded legal basis, in all relevant jurisdictions, that supports its design and provides adequate protection to the FMIs involved in the link.

Key Consideration 3: Linked CSDs should measure, monitor, and manage the credit and liquidity risks arising from each other. Any credit extensions between CSDs should be covered fully with high-quality collateral and be subject to limits.

Key Consideration 4: Provisional transfers of securities between linked CSDs should be prohibited or, at a minimum, the retransfer of provisionally transferred securities should be prohibited prior to the transfer becoming final.

Key Consideration 5: An investor CSD should only establish a link with an issuer CSD if the arrangement provides a high level of protection for the rights of the investor CSD's participants.

Key Consideration 6: An investor CSD that uses an intermediary to operate a link with an issuer CSD should measure, monitor, and manage the additional risks (including custody, credit, legal, and operational risks) arising from the use of the intermediary.

Key Consideration 7: Before entering into a link with another CCP, a CCP should identify and manage the potential spill-over effects from the default of the linked CCP. If a link has three or more CCPs, each CCP should identify, assess, and manage the risks of the collective link arrangement.

Key Consideration 8: Each CCP in a CCP link arrangement should be able to cover, at least on a daily basis, its current and potential future exposures to the linked CCP and its participants, if any, fully with a high degree of confidence without reducing the CCP's ability to fulfil its obligations to its own participants at any time.

Key Consideration 9: A TR should carefully assess the additional operational risks related to its links to ensure the scalability and reliability of IT and related resources.

NSCC Maintains, Monitors and Manages Links with other FMIs

NSCC maintains a risk review framework that sets forth procedures for both the review and approval of prospective link arrangements, and for the monitoring and management of risks related to established links on an ongoing basis. Prospective links are subject to management and regulatory review and approval, as well as a formal risk assessment process designed to identify the risks inherent in the link and the controls and processes designed to mitigate those risks. Link arrangements are subject to NSCC's Rules and relevant agreements between the link parties.

A central element of the risk review framework is input from a cross-functional group of NSCC businesses, functional units and control functions with the requisite subject matter expertise relevant to the particular link. The framework addresses the relevant risk categories including, but not limited to, operational, market, credit, liquidity and legal risks.

NSCC reviews changes to relevant laws and regulations as they arise, and makes such changes to its link arrangements (including filing any Proposed Rule Changes or Advance Notices) as may be necessary or appropriate.

NSCC has established links with each of The Options Clearing Corporation (“OCC”) and CDS Clearing and Depository Services Inc. (“CDS”). NSCC also maintains an interface link with its affiliate DTC. These are described below.

Arrangements with OCC

As described in response to Principle 3 (Framework for the comprehensive management of risks), NSCC has an arrangement with OCC providing for the settlement of exercises and assignments of options on securities (“E&A”), which are cleared and settled through NSCC. The arrangement is reflected in an agreement between the parties referred to as the “OCC Accord.” The OCC Accord is designed to facilitate the settlement of the securities underlying options upon the exercise or assignment of such options by mitigating, to the extent practicable, duplicative margin requirements. It provides for a two-way guaranty between OCC and NSCC of the mark-to-market amounts for options transactions for which NSCC has guaranteed completion in the event of a mutual participant’s failure. OCC can make this guaranty to NSCC because it continues to margin E&A activity through the exercise settlement date, including collecting mark-to-market amounts. As a result, NSCC does not mark E&A positions to the market in its Clearing Fund formula calculations. NSCC can make its guaranty to OCC because it collects risk-based margin on the Member’s entire portfolio of E&A activity, including VaR margin.⁸⁹

The Accord and amendments thereto have been reviewed and approved by the SEC, following a public comment period. The Accord is a comprehensive document that describes the operational and risk management arrangements between OCC and NSCC regarding effecting settlement with respect to the exercise and assignment of options by delivery and receipt of securities through the facilities of NSCC. It has been periodically restated or amended to reflect changes in risk management as analyzed and agreed to by OCC and NSCC.

In order to monitor and manage the risks associated with the Accord, Financial Risk Management staff: (a) conducts joint default management exercises quarterly with OCC, and holds quarterly meetings with them to share information regarding risk management and operational matters; (b) provides margin data and surveillance information with respect to common Members, as well as prospective applicant information for those firms that would be applying to use NSCC services to clear and settle their option activity; (c) subscribes to reports and information from a third party analysts/rating organization regarding OCC; and (d) reviews OCC’s financial condition at least annually.

Arrangements with CDS

As also described in response to Principle 3, CDS, the Canadian CSD and CCP, is a full service Member of NSCC, as well as a participant of DTC. The relationship between NSCC and CDS, established after review and approval by the SEC, has been in place and operated successfully for approximately three decades. This relationship enables CDS participants to clear and settle OTC trades with U.S. broker-dealers through sub-accounts maintained by CDS with DTC and NSCC. CDS is the Member of NSCC (and DTC Participant). CDS’s participants are not Members, and NSCC looks to CDS as principal for

⁸⁹ NSCC and OCC are in the process of developing a proposal for a new arrangement that will replace the current OCC Accord. The proposal is in the development stage and will be subject to the Rule Filing Process.

satisfaction of clearance and settlement obligations. NSCC mitigates its exposure to CDS as a result of CDS participants' activities by calculating and collecting CDS's Clearing Fund requirements at the level of each sub-account maintained by CDS for its participants. For its own protection, CDS maintains collateral based on contributions from its participants that use NSCC services.

As a full service Member, CDS is bound by NSCC's Rules; this includes all the obligations applicable to Members, and the rights available with respect thereto to NSCC, including the right to obtain information and request adequate assurances. In order to monitor and manage the risks associated with CDS's membership, in addition to collecting daily risk-based Clearing Fund, Financial Risk Management staff (a) conducts discussions with their CDS counterparts regarding the methods that CDS utilizes to collateralize risk from transactions of its participants, so as to understand CDS's risk mitigation procedures and default management; (b) subscribes to reports and information from a third party analysts/rating organization; and (c) reviews CDS's financial condition at least annually. Additionally, there are Memoranda of Understanding between the United States and Canadian securities supervisors covering Enforcement (1988) as well as Consultation, Cooperation and Exchange of Information Related to Cross-Border Regulated Entities (2010), which provide a supervisory framework between NSCC's and CDS's respective supervisors for this link arrangement.

NSCC/DTC interface

As previously described in this Disclosure Framework, NSCC relies on an interface with DTC for the book-entry movement of securities to settle CNS transactions. DTC also acts as NSCC's settlement agent, for purposes of effecting end-of-day money settlement.

As provided for in both NSCC's Rules and DTC's Rules and Procedures, CNS settlements are effected through transmission of instructions to DTC, on behalf of the DTC Participant/NSCC Member.⁹⁰ CNS short positions (i.e., obligations to deliver) are compared against Members' DTC accounts to determine security availability. If securities are available, they are transferred from the NSCC Member's account at DTC to NSCC's account at DTC, to cover the NSCC Member's short obligations to CNS. CNS long positions are transferred from the NSCC account at DTC to the accounts of NSCC Members at DTC, in accordance with the applicable algorithm built into the system. CNS deliveries made through DTC are made free of payment on a gross basis intra-day on settlement date, with funds settlement occurring on a net basis (on the books of NSCC) at the end of the settlement day.

NSCC end-of-day money settlement is centralized with DTC, as described in detail in Principle 9 (Money settlements), to obtain the benefit of funds netting and thus reduce funds transfers for common participants. As part of this process, the net settlement debits or credits of common participants of NSCC and DTC are netted and combined to produce a single net amount for each such participant, which amounts are then further netted at the settling bank level to produce a single net-net debit or credit amount for each settling bank. Settlement is effected, with DTC acting as NSCC's settlement agent, in central bank funds through use of the FRB's NSS system. These arrangements are also reflected in DTC's Rules and Procedures and in NSCC's Rules,⁹¹ and in the DTC/NSCC Netting Contract and Limited Cross-Guaranty (which is structured as a netting contract under FDICIA).

⁹⁰ These provisions are contained chiefly in the DTC Settlement Service Guide and DTC Rule 6 (Services), and NSCC Rule 11 (CNS System) and NSCC Procedure VII (CNS Accounting Operation).

⁹¹ See the DTC Settlement Service Guide, and NSCC Procedure VIII (Money Settlement Service).

The DTC/NSCC Netting Contract and Limited Cross-Guaranty includes special cross-guaranties and related arrangements designed to permit transactions to flow smoothly between DTC's system and the CNS system in a collateralized environment. These guaranties ensure, among other things, that debits created in DTC's system continue to be collateralized when the securities serving as collateral are delivered into the CNS system as short covers, and reduce risk at NSCC by ensuring that long allocations, or the approximate value of long allocations, will be made available to NSCC in a default situation.⁹²

The operational risks of the DTC/NSCC Cross-Guaranty arrangement are monitored on an ongoing basis through DTCC Operations and Settlement areas, and are subject to DTCC's Operational Risk Management framework. Processes and procedures to implement these arrangements are monitored and managed through DTC's automated Collateral Monitor risk management controls and Failure-to-Settle system, which are reviewed and tested on a regular basis.

⁹² See discussion of default management process in Principle 13.

Principle 21: Efficiency and effectiveness

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

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.

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.

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

Efficiency and effectiveness in the low cost provision of needed services

NSCC is efficient and effective in meeting the requirements of its participants and the markets it serves; it provides clearance and settlement services to a variety of market participants, including as a central counterparty through its core CNS system, to promote the prompt and accurate clearance and settlement of securities transactions in U.S. markets. Operating as a low-cost financial market utility, NSCC strives for maximum efficiency in its operations and technology, and responsiveness to the needs of its membership in the scope of services it provides.

Scope of services responsive to market needs

NSCC provides clearance and settlement services that are part of its fundamental directive as a registered clearing agency under the Exchange Act. In providing these services, NSCC seeks to enhance and expand the scope of services it offers to support an evolving market, often in response to initiatives requested by its membership and other industry parties. One example of this approach is the modernization of NSCC's trade capture functionality several years ago with the adoption of its universal trade capture ("UTC") system. This effort standardized the trade capture formats and processes across all the equity trading venues supplying trade data to NSCC, moving from a batch process to real-time trade capture. In addition to enhancing efficiency, this effort – and particularly the ability to capture trade data in real time – facilitates a number of ongoing initiatives. They include the creation and roll out of the DTCC Limit Monitoring Risk Management Tool, developed to facilitate Members' monitoring of their trades and that of their correspondents on an intraday basis,⁹³ and the industry-wide initiative to move to a shortened (T+2) settlement cycle in 2017.

These are just a few examples of NSCC's continuing commitment to the evolving needs of the markets it serves.

⁹³ As described in NSCC Rule 54.

NSCC engages with the industry and evaluates new initiatives, enhancements, strategic thinking, and its performance through the following mechanisms:

- NSCC employs a structured approach for the implementation of new initiatives. The New Initiatives Approval Policy and Framework defines the process for proposing, evaluating and approving all initiatives. Among other things, the framework includes a comprehensive risk assessment process.
- NSCC and its parent company, DTCC, lead strategic thinking across the industry through their development of various White Papers, which are designed to provoke discussions on relevant topics of note in an effort to continually improve the overall market infrastructure. The White Papers are available at www.dtcc.com.
- NSCC actively evaluates whether it is meeting and will continue to meet the requirements and needs of its membership through periodic customer satisfaction surveys conducted by DTCC for all of its business lines, including NSCC. Customer Account Representatives are product-aligned to better support the membership.

NSCC participants have the opportunity to participate in product development through their involvement in advisory boards and/or ad hoc working groups. Advisory boards are sometimes established to provide guidance, expertise and feedback on various initiatives. NSCC also establishes ad hoc working groups, as necessary, in order to assist with more discrete programs, products or processes.

NSCC's management team additionally interacts with the industry through (a) industry associations and committees such as SIFMA and Asset Managers' Forum, (b) the annual Executive Forum, providing presentations by prominent industry experts for NSCC participants' executive staff, and (c) Regional Forums organized by NSCC to inform participants of current and new products and services.

Low cost pricing for accessibility of services

NSCC's efficiency is ultimately reflected through its pricing. NSCC operates a "low cost" pricing model, continually striving to drive down cost in the industry by providing efficient services. In addition to driving down cost, NSCC also strives to drive down risk.

NSCC has in place procedures to control costs and to regularly review pricing levels against costs of operation. NSCC uses a formal budgeting process to control its expenditures. It reviews pricing levels against its costs of operation typically during the annual budget process, providing guidance to the BTOC and to the full Board of the price impact. The budget is reviewed by several Board committees and approved annually by the Board, as is any change in service fees. NSCC's fees are cost-based plus a markup, as approved by the Board. This markup or "low margin" is applied to recover development costs and operating expenses, and to accumulate capital sufficient to meet regulatory and economic requirements. Furthermore, to help promote ongoing efficiency, DTCC maintains a Business Transformation Office ("BTO"), which, for example, employs Quality Reengineering, Six Sigma and Lean techniques, among others, to analyze workflows and make appropriate recommendations for further efficiency improvements.

Membership representation in governance

NSCC is a wholly owned subsidiary of DTCC, which, as described in Principle 2 (Governance), is owned and governed by the users of DTCC's three clearing agency subsidiaries. The majority of Directors on the Board are representatives of financial institutions that are significant users of NSCC's services. As further described in Principle 2, in addition to management representatives, the Board also includes non-participant directors with industry, regulatory or academic backgrounds important to shaping institutional goals of DTCC and the clearing agency subsidiaries. The Board and its committees, such as the BTOC, Finance/Capital Committee, Audit Committee and BRC, are structured so that NSCC's operations, delivery systems and technologies, services and products meet the needs of NSCC's membership and the markets that NSCC serves.

Goals and objectives

NSCC senior management sets corporate goals annually, which are approved by the Board. The overarching DTCC corporate goals are used as the framework for the annual goals for each business line and/or control function area. Corporate goals encompass a range of benchmarks, such as service level goals, financial goals and overall business priorities.

To ensure that the goals are clearly defined, measurable and achievable, corporate goals are reviewed by several levels of management, including the Management Committee; they are then reviewed and approved by the Board. Historical results may be used as guidelines to set future targets, as appropriate. Results are tracked monthly by the Management Committee and the Board, with specific attention given to those metrics that might be performing below target.

A Corporate Balanced Business Scorecard holistically measures corporate performance addressing the strategic direction and health of DTCC and its wholly owned subsidiaries; a distinct Core Balanced Business Scorecard is a management tool focused on DTCC's clearing agency subsidiaries. It aims to assure continued focus on risk management and execution excellence for NSCC, DTC and FICC. The BBSs are drafted annually by management and approved by the Board, and include various metrics across the customer experience, operational execution, financial performance and human capital performance.

In addition, there are supporting score cards for Operations and Information Technology that focus on additional metrics in those areas.

Processes and metrics

DTCC uses a variety of metrics to measure NSCC's efficiency and effectiveness. In addition to the BBS's and monitoring against goals, DTCC employs the following:

- DTCC's BTO works with each area of the company to evaluate process efficiency and identify improvement opportunities based on the Lean and Six Sigma methodologies, and reports results to the Management Committee and the Board.
- DTCC also measures the effectiveness of NSCC's technology process through industry standard methodologies, such as Capability Maturity Model Integration and ITIL.
- DTCC's ADM group has been assessed by an independent party on process maturity.
- DTCC's Enterprise Infrastructure organization uses the ITIL framework for continued improvement with respect to IT service management.

NSCC evaluates its efficiency and effectiveness at least monthly. This information is communicated to senior management monthly (via the BBSs and other score cards) and provided to the Board and/or Board Committees as a standing item during their regularly scheduled meetings.

Principle 22: Communication 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.

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

Communication procedures and standards

NSCC uses separate communication standards and data formats for its trade capture and reporting processes, and for its clearance and settlement reporting processes. With respect to equity trade capture, NSCC's UTC system utilizes the Financial Information eXchange ("FIX") electronic communication protocol and record formats, which are internationally recognized and widely used in the financial services industry. FIX is a widely recognized and accepted messaging standard for pre-trade and trade communication in the global equity markets, and is expanding into the post-trade space to support straight-through processing. With respect to NSCC eligible fixed income trade comparison, NSCC utilizes ISO 15022 message formats, as well as online interfaces. With respect to clearance and settlement reporting processes, NSCC, as a mature FMI, has developed and uses proprietary communication standards and data formats that, by virtue of their wide acceptance and long-standing usage by its participants, are an accepted industry standard for domestic transactions processed through NSCC. NSCC also uses and accommodates internationally accepted communication standards and data formats for clearance and settlement.

NSCC supports industry-standard communication interfaces, for example, through the Internet, and through a direct interface (direct end-to-end line) via DTCC's SMART network and through the SFTI® network. These communication interfaces are available for all entities that interface with NSCC systems, including any linked FMIs. Participants are eligible to use any one or a combination of the communication interfaces supported by NSCC. Participants identify their communication interface(s) during the on-boarding process and may modify these elections at any time subsequently, as needed.

NSCC's clearance and settlement systems use internationally accepted file transfer and message queuing standards as well as online interfaces for communication. NSCC uses multiple communication formats in its systems, including proprietary messages and ISO 15022 messaging formats for interacting with its participants and trade sources. NSCC uses ISINs in a number of applications to identify securities, particularly in global applications and newer U.S.-based applications; older applications use CUSIPs (and tickers, etc.). In addition, NSCC's non-guaranteed services support CSV and XML data formats.

When necessary, NSCC is able to translate incoming data to its proprietary format and reply back in multiple formats. Conversion is performed by an internal utility within NSCC that supports various formats and standards.

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.

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.

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.

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.

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.

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.

Introduction

NSCC provides its participants with comprehensive rules and procedures, including its fees. These are readily available on DTCC’s website to NSCC’s participants, supervisors and to the public. Through other publications (including this Disclosure Framework) and participant outreach, NSCC also provides sufficient information to enable participants to understand the risks, fees and other material costs they incur through membership at NSCC.

NSCC’s Rules

NSCC’s Rules are filed with the SEC prior to or concurrent with their effectiveness. As discussed under Principle 1 (Legal basis), all Proposed Rule Changes and Advance Notices are posted on DTCC’s website, and also published by the SEC on the SEC’s website, www.sec.gov, and in the Federal Register (which is published online by the U.S. Government Printing Office). Participants are also notified of all Proposed Rule Changes and Advance Notices via Important Notices published on DTCC’s website.

Except when filed for immediate effectiveness, publication of Proposed Rule Changes (and of Advance Notices) allows participants and other interested parties the opportunity to comment on proposals, and to understand what such proposals provide and how stakeholders may be affected.⁹⁴ Rules filed for immediate effectiveness are typically administrative and not controversial. Fee filings may be made

⁹⁴ Proposed Rule Changes and Advance Notices follow a format prescribed by the SEC. This includes a narrative description of the relevant proposal, with background information, including the statutory basis for the proposal, and discussion of its impact on participants and stakeholders.

immediately effective, but are objective and transparent to participants. NSCC's Rules as in effect, as well as Proposed Rule Changes and Advance Notices, are available to the public via DTCC's website, www.dtcc.com.

All rule changes are subject to internal review and governance before they are submitted to the SEC. Changes to NSCC's Rules may be initiated from a number of sources, including internal review and lessons learned from actual events or simulations, process or product enhancements, participant feedback, and evolving regulatory requirements.

In addition to its Rules, NSCC also provides supplementary information on its services through Important Notices and a series of other documents that are made publicly available on www.dtcc.com.

Design and operations

As part of NSCC's on-boarding process, participants are provided with information about the design and operations of NSCC's systems, including record layouts, if applicable, as well as other technical information necessary for participants to establish connectivity with NSCC and interact with NSCC's systems.

Information about the design and operations of NSCC's systems is also included in service descriptions and other forms of user documentation that are available on www.dtcc.com.

Participant rights, obligations and risks

Participants rights, obligations and risks are reflected in NSCC's Rules and include, but are not limited to: (i) initial and ongoing membership requirements; (ii) NSCC's ability to temporarily suspend, or definitively cease to act on a participant's behalf, with respect to some or all services in enumerated circumstances; (iii) the obligation of participants to make deposits to the Clearing Fund; (iv) the requirement for participants to provide additional assurances of financial responsibility and operational capability, as NSCC deems necessary; (v) participant rights and obligations under the loss allocation process; (vi) participant obligations in their use of NSCC's services, including with respect to certain indemnifications of NSCC; (vii) participant obligation for compliance with applicable law; (viii) settlement and payment obligations; (ix) settling bank requirements and (x) disciplinary sanctions (including fines) and a participant's right to appeal a decision adverse to it. A number of these provisions refer to non-routine, though foreseeable, events, including use of the Clearing Fund for liquidity to complete settlement, and potentially to address uncovered credit losses through the loss allocation process, in the event of a participant failure. The Rules also provide for authority and reporting of waivers and/or suspension of the Rules, in the event of such a contingency. These provisions recognize, and provide for, a degree of discretion to management, to enable NSCC to address situations as facts and circumstances may require.

Training and other resources

NSCC offers training to new participants prior to membership activation, which facilitates their understanding of their obligations under the NSCC's Rules, as well as the risks that they may face from joining NSCC. Additional training tools to help participants learn how to more effectively use NSCC's products and services are made available on www.dtcclearning.com. NSCC also provides formal training on an ad-hoc basis to existing participants, upon request.

The initial and ongoing membership requirements serve to demonstrate that NSCC's participants are able to: (i) satisfactorily communicate with NSCC, (ii) fulfill their anticipated commitments, (iii) meet the operational requirements with necessary promptness and accuracy and (iv) establish appropriate

arrangements to effect payment obligations to NSCC. Participants must demonstrate operational readiness, both during the membership on-boarding process before being provided with access to NSCC's systems, as well as on an ongoing basis as part of their continuing membership requirements. Each NSCC participant is assigned a dedicated Relationship Manager or Account Manager who is able to provide a number of resources or one-on-one education as needed to ensure participants understand NSCC's Rules, procedures and the risks they face from membership in NSCC.

If a participant is observed to be lacking appropriate understanding of NSCC's Rules or NSCC's operations or other requirements, the concerned DTCC employee or department will reach out to Relationship Management staff to discuss remedies with the relevant firm's management. Remedial actions to address an apparent lack of understanding of NSCC's Rules and the obligations and risks of membership may include one-on-one coaching, webinars or other forms of additional training and/or telephone support. NSCC also maintains the right to institute disciplinary proceedings, including fines, for a participant's violation of NSCC's Rules.

Fees

NSCC publicly discloses its fees for services. This information is included in NSCC's Rules and is available on DTCC's website, www.dtcc.com.

Generally, a forecast of fee changes is provided to participants during the third quarter of the year. The fee changes are then finalized, approved by the Board of Directors and filed with the SEC during the fourth quarter of the year with an effective date of the following January 1. NSCC notifies participants of all fee and service changes via Important Notices that are available on DTCC's website. Mid-year fee changes (if applicable) are also filed with the SEC, and participants are provided notice of the changes via Important Notice.

In addition, DTCC discloses information on fees charged for operating and maintaining the SMART communications infrastructure that provides access to DTCC's (including NSCC's) services. These fees are disclosed in the "Guide to SMART Charges" which is available on DTCC's website, www.dtcc.com.

Disclosure Framework

This NSCC Disclosure Framework under the FMI Principles is available on DTCC's website, www.dtcc.com. NSCC intends to update the Disclosure Framework every two years, at a minimum. In addition, NSCC discloses quantitative information specified by CPMI-IOSCO for CCPs. This information is also available on DTCC's website, www.dtcc.com, and is updated quarterly.

DTCC discloses other quantitative information regarding NSCC in the DTCC Annual Report, which is published annually, and in the NSCC financial statements, which are published quarterly. This information, as well as basic data on transaction volumes and values, is available to the public on the DTCC website.

In addition to the information described above, NSCC's public disclosures include the following:

1. Important Notices,
2. Proposed Rule Changes and Advance Notices filed with the SEC, and
3. Management's Statements Regarding Internal Controls and Reports of Independent Accountants

Section VI of this Disclosure Framework includes a listing of publicly available resources, including information available on www.dtcc.com, on other public websites, or available to participants on www.dtcclearning.com or upon request. All such information is available in English.

Principle 24: Disclosure of market data by trade repositories

A TR should provide timely and accurate data to relevant authorities and the public in line with their respective needs.

Key consideration 1: A TR should provide data in line with regulatory and industry expectations to relevant authorities and the public, respectively, that is comprehensive and at a level of detail sufficient to enhance market transparency and support other public policy objectives.

Key consideration 2: A TR should have effective processes and procedures to provide data to relevant authorities in a timely and appropriate manner to enable them to meet their respective regulatory mandates and legal responsibilities.

Key consideration 3: A TR should have robust information systems that provide accurate current and historical data. Data should be provided in a timely manner and in a format that permits it to be easily analysed.

NSCC is not a TR. Accordingly, Principle 24 does not apply to NSCC.

V. Definitions of Key Terms and Abbreviations

AD	Application Development Group
ATG	Accelerated Trade Guaranty
Bankruptcy Code	The U.S. Bankruptcy Code
BBS	Balanced Business Scorecard; a component of DTCC's performance management framework used to assess DTCC's contributions to the financial industry and markets throughout the year and measured against corporate priorities
BCM	Business Continuity Management
BRC	Risk Committee of the Board of Directors
CALC	DTCC's Clearing Agency Liquidity Council
CCP	Central counterparty
CDS	CDS Clearing and Depository Services Inc., the Canadian central securities depository and provider of CCP services for securities
CFM	Clearing Fund Management system, NSCC's collateral management system
Clearing Agency	A self-regulatory organization that operates either as a clearing corporation, or a central securities depository. A clearing corporation compares and/or records securities transactions, and reports to members the resulting activity; and clears and prepares instructions for the automated settlement of those transactions, often acting as intermediaries or CCPs, in effecting settlement of the transactions. Entities acting as clearing agencies are required to register with the SEC
Clearing Agency Standards	The minimum requirements for registered clearing agencies pursuant to the Exchange Act Rule 17Ad-22
CNS	NSCC's Continuous Net Settlement system
Correspondent firm	A broker/dealer that is not a Member of NSCC, but clears and settles its transactions through arrangements with an entity that is a Member of NSCC
CSD	Central securities depository
DNS	Deferred net settlement
Dodd-Frank	The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010
DOI	Date of insolvency

DTC	The Depository Trust Company
DTCC	The Depository Trust & Clearing Corporation
DVP/RVP	Delivery versus payment/Receive versus payment
E&A	Exercise and assignment of options
Eligible Clearing Fund Securities	Certain eligible securities accepted by NSCC as Clearing Fund collateral
ESS	Envelope Settlement Services
ETF	Exchange-traded fund
Exchange Act	The Securities Exchange Act of 1934
FDIA	The Federal Deposit Insurance Act
FDIC	Federal Deposit Insurance Corporation
FDICIA	The Federal Deposit Insurance Corporation Improvement Act of 1991
FICC	Fixed Income Clearing Corporation
FIX	The Financial Information eXchange electronic communication protocol
FMI	Financial Market Infrastructure
FOCUS Report	Financial and Operational Combined Uniform Single Report
FORM	Financial and Operational Risk Management
FRB	The Board of Governors of the Federal Reserve System
FRBNY	The Federal Reserve Bank of New York
FRM	Financial Risk Management
IAD	Internal Audit Department
ITIL	Information Technology Infrastructure Library
MQ	Message Queuing
MRC	Management Risk Committee
NIC	New Initiatives Committee
NSS	The FRB's National Settlement System

OCC	The Options Clearing Corporation
OCC Accord	An arrangement with OCC providing for the settlement of exercises and assignments of options on securities that are cleared and settled through NSCC.
OFAC	Office of Foreign Assets Control
OLA	Orderly liquidation authority from Title II of Dodd-Frank
ORM	Operational Risk Management
RTO	Recovery time objective
Rules	NSCC's Rules & Procedures
SEC	U.S. Securities and Exchange Commission
Securities Act	Securities Act of 1933
SFTI	NYSE's Secure Financial Transaction Infrastructure network
Shareholders Agreement	DTCC's Shareholders Agreement
SIFMU	Systemically Important Financial Market Utility
SIPA	Securities Investor Protection Act of 1970
SIPC	Securities Investor Protection Corporation
SLD	Supplemental liquidity deposit
SMART	DTCC's Securely Managed and Reliable Technology network
SWIFT	A secure messaging service provided by the Society for Worldwide Interbank Financial Telecommunications
TRM	Technology Risk Management
UCC	Uniform Commercial Code; the version of the UCC as adopted in the State of New York is sometimes referred to as the NYUCC
UIT	Unit investment trust
UTC	NSCC's Universal Trade Capture system
VaR	Value-at-Risk
WAR	Work area recovery

VI. Additional Publicly Available Resources

Unless otherwise noted, all documents in the table below are available at www.dtcc.com.

Publicly Available Resources
Statutes, Laws, Regulations and Reports
CPMI-IOSCO Principles for financial market Infrastructures, available at http://www.bis.org , and http://www.iosco.org/
Federal Deposit Insurance Act, available on the Federal Deposit Insurance Corporation website at http://www.fdic.gov
Federal Deposit Insurance Corporation Improvement Act, available on the Federal Deposit Insurance Corporation website at http://www.fdic.gov
New York Business Corporation Law, available on at http://public.leginfo.state.ny.us
New York Uniform Commercial Code, particularly Articles 8 and 9, available at http://public.leginfo.state.ny.us
Regulation J and Operating Circulars 6 and 12, available on the Board of Governors of the Federal Reserve System website at http://www.federalreserve.gov
Securities Exchange Act of 1934, as amended, available on the SEC website at http://www.sec.gov
Securities Exchange Act Rules, available on the SEC website at http://www.sec.gov
Securities Investor Protection Act of 1970, available on the U.S. Securities and Exchange Commission website at http://www.sec.gov
The Dodd–Frank Wall Street Reform and Consumer Protection Act, available at http://www.gpo.gov/ , especially Title II regarding orderly liquidation authority, and Title VIII regarding Clearing and Settlement
Title 11 of the United States (The Bankruptcy Code), available at http://uscode.house.gov/
NSCC and DTCC Documents
Board Code of Ethics
Board of Directors Committee Charters
Board of Directors Mission Statement and Charter
DTCC By-Laws
FICC and NSCC Quantitative Disclosures for Central Counterparties

Identification of Board of Directors
Identification of Senior Management Team
Important Notices
NSCC Important Notice with Nominations Solicitations Letter and Procedures for the Annual Nomination and Election of Directors
NSCC Rules & Procedures
Principles of DTCC Governance
Procedures for the Annual Nomination and Election of the Board of Directors
Rule Filings, Advance Notices, and related Regulatory Approval Orders
White Papers and Industry Reports
Financial Statements and Reports
DTCC Annual Reports, including Consolidated Audited Financial Statements
NSCC Audited Financial Statements
NSCC Interim (Unaudited) Financial Statements