Disclosure Framework for Financial Market Infrastructures

V3.0
November 2019

Nodal Clear Disclosure Framework

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RESPONDING INSTITUTION: NODAL CLEAR, LLC

JURISDICTION: UNITED STATES

AUTHORITY REGULATING, SUPERVISING OR OVERSEEING THE FMI:

UNITED STATES COMMODITY FUTURES TRADING COMMISSION

DISCLOSURE DATE: NOVEMBER 2019

THIS DISCLOSURE CAN ALSO BE FOUND AT www.nodalclear.com.

FOR FURTHER INFORMATION, PLEASE CONTACT NODAL CLEAR AT accountmanagement@nodalexchange.com OR (703) 962-9820.

1. EXECUTIVE SUMMARY

The objective of this document (**"Disclosure Framework for Financial Market Infrastructures"**) is to provide relevant disclosure to market participants on the methods used by Nodal Clear, LLC to manage the risks it faces as a central counterparty (**"CCP"**).[1]

The Disclosure Framework for Financial Market Infrastructures is prepared in accordance with the internationally-recognized "Principles of Financial Market Infrastructure" (**"PFMIs"**) published in February 2012 and developed jointly by the Committee on Payment and Settlement Systems (**"CPSS"**)[2] and the Technical Committee of the International Organization of Securities Commissions (**"IOSCO"**).

The Disclosure Framework contains twenty-four principles designed to ensure a more robust infrastructure for global financial markets, twenty-two of which apply to CCPs. No disclosure is provided with respect to Principles 11 and 24, as they do not apply to CCPs.

Nodal Clear, LLC provides clearing services for futures and options on futures traded on or through Nodal Exchange, LLC. Nodal Clear, LLC is registered with the U.S. Commodity Futures Trading Commission (**"CFTC"**) as a derivatives clearing organization (**"DCO"**); Nodal Exchange, LLC is registered with the CFTC as a designated contract market (**"DCM"**). In this document Nodal Clear, LLC may be referred to as **"Nodal Clear"** or **"Clearing House,"** and Nodal Exchange, LLC may be referred to as **"Nodal Exchange"** or **"Exchange."**

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

The initial version of Nodal Clear's Disclosure Framework was dated September 2015.

Since the last update in November 2017, Nodal Clear has updated this document to reflect various changes such as Nodal Clear's clearing of physically settled environmental futures contracts and movement to a one or two-day holding period for liquidation of Customer Accounts.

3. GENERAL DESCRIPTION OF THE FMI

(A) General description of the FMI and the markets it serves

Nodal Clear is a wholly-owned subsidiary of Nodal Exchange. Nodal Clear's main business objective is to clear Nodal Exchange contracts, including futures and options on futures contracts, initially for electricity and natural gas contracts at various locations in the United States and Canada, and locational and time spreads of the forgoing. As of November 25, 2019, Nodal Exchange's open interest represents approximately 45% of the cleared futures open interest in electricity in the United States and Canada. Nodal Exchange commenced operations as an exempt commercial market in April 2009 and became a DCM in September 2013.

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[1] Capitalized terms not otherwise defined herein shall have the meanings set forth in the Nodal Clear Rulebook.

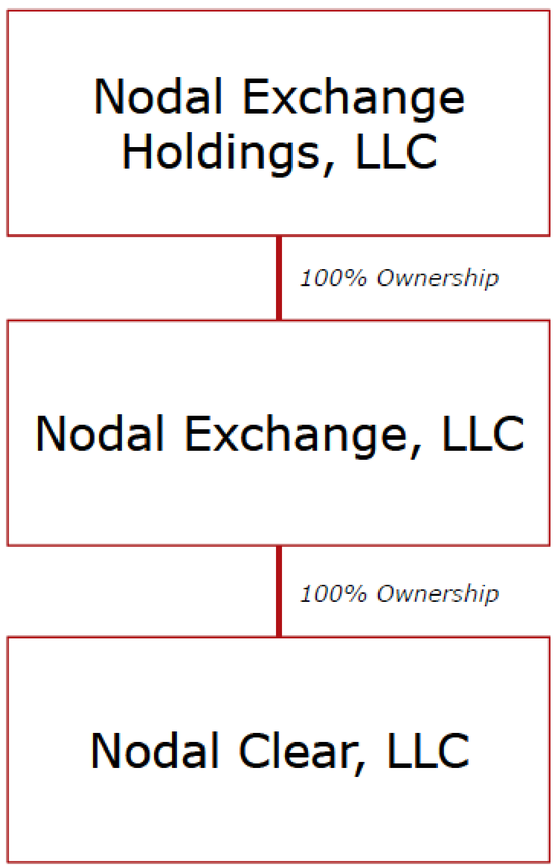
[2] As of September 1, 2014, the Committee on Payment and Settlement Systems changed its name to the Committee on Payments and Market Infrastructures.

On September 24, 2015, Nodal Clear was granted registration as a DCO by the CFTC. Nodal Clear was the first DCO to elect to become a Subpart C DCO at the time of its registration. On October 19, 2015, Nodal Clear commenced clearing Nodal Exchange power and natural gas futures contracts. Nodal Exchange currently lists cash-settled futures contracts and physically settled options contracts for many granular power locations including hubs, zones and nodes. All current power futures and options contracts are for monthly terms for peak or off-peak power and are settled to Day Ahead or Real Time power prices as published by the organized markets in electric power, known as regional transmission organizations/independent system operators (**"RTOs/ISOs"**). The number of power and natural gas contracts is expected to expand over time to meet market needs. Additionally, Nodal Exchange offers contracts on environmental products and trucking freight. Nodal Exchange contract specifications can be found at www.nodalexchange.com.

(B) General organization of the FMI

Nodal Clear, LLC is a wholly-owned subsidiary of Nodal Exchange, LLC, which is wholly owned by Nodal Exchange Holdings, LLC ("**Holdings**").

Organization Structure:



(C) Legal and regulatory framework

Nodal Clear, LLC was organized in October 2014 as a Delaware limited liability company. The company operates in Tysons Corner, Virginia and is duly authorized to conduct business in the Commonwealth of Virginia. Nodal Clear is subject to regulatory oversight by the CFTC. The CFTC reviews, assesses and enforces a DCO's adherence to applicable provisions of the Commodity Exchange Act (**"CEA"**) and the regulations promulgated thereunder on an ongoing basis, including but not limited to, the DCO's compliance with eighteen **"DCO Core Principles,"** including principles relating to financial resources, participant and product eligibility, risk management, settlement procedures, treatment of funds, default rules and procedures, rule enforcement and system safeguards. Nodal Clear is subject to ongoing examination and inspection by the CFTC. Nodal Clear has elected to be subject to, and comply with, Subpart C of Part 39 of the CFTC's regulations, which applies additional requirements on a DCO consistent with the international risk management standards set forth in the PFMIs.

The CFTC has been charged with administering and enforcing the CEA. Accordingly, the CFTC is the US government agency that has direct regulatory and oversight responsibility for DCOs. The CFTC monitors Nodal Clear's operations and receives from Nodal Clear regular, as well as event-specific, reports relating to, among other things, daily volume and open interest, quarterly financial and liquidity resources calculations, significant changes to the risk or financial profiles of Nodal Clear and/or its Clearing Members, default events, and determinations to transfer/liquidate positions. The CFTC conducts periodic on-site examinations of Nodal Clear.

Additionally, Nodal Clear is recognized as a third-country CCP under European Market Infrastructure Regulations ("**EMIR**") by the European Securities and Markets Authority ("**ESMA**") and is exempt from recognition in Ontario and Québec.

(D) System design and operations

Nodal Clear utilizes the Nodal Clearing System (**"NCS"**) to manage the clearing operations and provide a portal for Clearing Members to manage their interactions with Nodal Clear. NCS provides real-time position keeping, trade reporting and margin reporting functionality, as well as banking functionality that processes Nodal Clear's margin calls and allows Clearing Members to view their cash and letters of credit balances and request release of excess collateral.

Nodal Exchange's systems provide key risk management functionality for Clearing Members. Clearing Members place a Trade Risk Limit (**"TRL"**) on each Customer and House Account via the Nodal Exchange interface. Upon receipt of a trade, Nodal Exchange then checks the resulting Customer or House portfolio against the TRL to verify that the portfolio risk is below the TRL specified by the Clearing Member.

All Nodal Clear and Nodal Exchange systems offer Internet-based connectivity and various file and interface options for Clearing Members to integrate into their own systems. Nodal Clear and Nodal Exchange use industry standard protocols, such as FIX for trade reporting and secure file transfer protocol (**"SFTP"**) for key mid-day and end-of-day file delivery.

Nodal Clear operates on a consistent schedule to create a predictable flow of daily activities for Clearing Members. The Nodal Exchange market is open from 9:00 a.m. EPT to 5:00 p.m. EPT, and all trades received between those hours are booked the same day. Files containing pay and collect reports are generally published to the market by 12:45 p.m. EPT for the mid-day margin run, and at 7:30 p.m. EPT for the end-of-day run, followed by the issuing of payment instructions by 1:00 p.m. EPT and 3:00 a.m. EPT the following business day, respectively. Margin calls must be met by Clearing Members at 2:00 p.m. EPT for the mid-day call (or 1 hour from the time payment instructions are sent if there are any delays in the intraday workflow), and at 9:00 a.m. EPT the following day for the end-of-day margin call.

4. Core Principles

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.*

Nodal Clear accepts and clears contracts traded on, or pursuant to the rules of, Nodal Exchange. Upon accepting the trade, Nodal Clear novates the contract by becoming the counterparty to each Clearing Member that has submitted the trade, and thereby releases each Clearing Member from its obligations to the other. Nodal Clear collects and manages margin collateral from each Clearing Member with respect to each of its House and Customer Account positions; collects and disburses funds to mark positions to the settlement price on a daily basis; and manages netting, final settlement, and liquidation of positions.

Each Clearing Member must sign and deliver to Nodal Clear a duly completed Clearing Member Agreement (the **"Clearing Member Agreement"**), pursuant to which the Clearing Member certifies that it will observe and abide by the Nodal Clear Rulebook and any amendments thereto. The Clearing Member Agreement is governed by and, as discussed below, is enforceable under, New York law.

United States law is the governing law that governs the majority of the operations of Nodal Clear. The US legal framework consists primarily of the CEA and the CFTC Regulations, pursuant to which the CFTC exercises regulatory oversight of clearing systems and market participants. The CEA requires that Nodal Clear be registered with the CFTC as a DCO and be subject to the CFTC's regulatory oversight. As relevant here, the purposes of the CEA are to deter and prevent disruptions to market integrity, ensure the financial integrity of transactions within its purview, and the avoidance of systemic risk.[3]

In accordance with the CEA, Nodal Clear is required to operate subject to the DCO Core Principles, including Core Principle R, Legal Risk, which requires each DCO to have a well-

[3] Section 3(b) of the CEA establishes the purposes of the CEA.

founded, transparent and enforceable legal framework for each aspect of its activities as a DCO.[4] CFTC Regulations implementing Core Principle R require that Nodal Clear provide a legal framework for its activities as a central counterparty, netting arrangements, interests in collateral, steps to address a default of a Clearing Member, finality of settlement and funds transfers, operational requirements, and risk management procedures.[5] CFTC Regulations also require that Nodal Clear be duly organized, legally authorized to conduct business, and remain in good standing at all times in any relevant jurisdiction.[6]

Other laws, including the Uniform Commercial Code as adopted in New York (**"NYUCC"**) and the US Bankruptcy Code govern Nodal Clear's rights with regards to defaulting Clearing Members. The NYUCC governs many aspects of the enforceability of Nodal Clear's right to liquidate the positions of a defaulting Clearing Member and to net and set off any amounts that a Clearing Member may owe to Nodal Clear. Relevant provisions of the Bankruptcy Code, in concert with Part 190 of the CFTC's Regulations (the **"Part 190 Regulations"**), authorize Nodal Clear to transfer, net, set off, liquidate, terminate, accelerate and close out the trades and positions of a defaulting Clearing Member.

The Nodal Clear Rulebook describes Nodal Clear's clearing and settlement activities, including the regulatory requirements for Nodal Clear, the Clearing Members, and market participants. Nodal Clear relies on legal agreements with its settlement banks (**"Settlement Bank"**) and custodians of Nodal Clear and Clearing Members. New York law governs these agreements, along with the Nodal Clear Rulebook and the agreements with Clearing Members. The NYUCC permits parties to a security agreement to designate events of default that authorize the secured party to exercise its right to liquidate positions. Accordingly, the NYUCC permits the Clearing House to exercise its rights as a secured party to exercise remedies set out in the Nodal Clear Rulebook in respect of amounts payable under the terms of Nodal Exchange contracts and to net those amounts upon their liquidation and termination.

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

The Nodal Clear Rulebook, Nodal Clear's operational procedures as a DCO, and Nodal Clear's agreements with its Clearing Members are clear and understandable and consistent with the CEA and CFTC Regulations. The CEA and CFTC Regulations are publicly available on the CFTC's website. Based on appropriate legal analysis, Nodal Clear has adopted rules and procedures for Nodal Clear and its Clearing Members that comply with its legal requirements. Nodal Clear must submit new rules and rule revisions to the CFTC for approval or, in certain circumstances, Nodal Clear may self-certify the compliance of the rule or rule revision.

On its website, Nodal Clear publishes the Nodal Clear Rulebook, its operational procedures as a DCO, the terms and conditions of each Nodal Contract, fees, the margin-setting methodology, the size of the Guaranty Fund, and Settlement Prices, volume and open interest for each Nodal

[4] CEA Section 5b(c)(2)(R).

[5] CFTC Regulation 39.27(b).

[6] CFTC Regulation 39.27(a).

Contract (collectively referred to herein as **"Nodal Clear Rules"**). Nodal Clear will also publish any new or revised rules, procedures, and contracts.

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.*

The Nodal Clear Rulebook establishes the legal basis for Nodal Clear's activities and provides for Nodal Clear's role as central counterparty. The Nodal Clear Rulebook also sets out Nodal Clear's arrangements relating to netting, interests in collateral, default, settlement finality, funds transfers and operations.

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.*

The CEA and CFTC Regulations and, to the extent not preempted thereby, the law of the State of New York, govern the majority of the activities of Nodal Clear, its Clearing Members, market participants, and the legal relationships between these parties. In addition, the NYUCC, the US Bankruptcy Code and the Federal Deposit Insurance Corporation Improvement Act of 1991 (**"FDICIA"**) govern Nodal Clear's legal rights with regards to defaulting Clearing Members, including the enforceability of Nodal Clear's Rules authorizing the transfer, netting, setoff, liquidation, termination, acceleration, and close-out of trades and positions of a defaulting Clearing Member. In the event of bankruptcy by a futures commission merchant (**"FCM"**) registered with the CFTC, the Part 190 Regulations provide detailed procedures for addressing a collateral shortfall and a system for the transfer of Customer Accounts.

Under US law, state law claims involving trading or operations of a futures market or clearing house are pre-empted by the CEA.[7] Claims involving Nodal Clear's regulated activities must be pursued in US federal courts under the CEA, which limits the risk that a state or local court could undermine the enforceability of Nodal Clear Rules.

Nodal Clear will assess its legal risks of entering into contractual relationships with entities domiciled in foreign jurisdictions. Since all Clearing Members that clear for Customers are required to be registered with the CFTC as FCMs, there is a basis for US jurisdiction over their activities on Nodal Clear.

At this time, Nodal Clear has one Clearing Member that is domiciled outside the United States. Before accepting any foreign Clearing Member, Nodal Clear will assess the legal risks that may arise from such Clearing Member and obtain appropriate legal analysis regarding the enforceability of Nodal Clear Rules against the foreign Clearing Member.

At this time, Nodal Clear has engaged financial institutions for Settlement Bank and custodial services that are domiciled in the United States. Prior to accepting a foreign Settlement Bank or

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[7] *See*, *e.g.*, *American Agriculture Movement, Inc. v. Board of Trade of the City of Chicago*, 977 F.2d 1147, 1154-56 (7th Cir. 1992).

custodian, Nodal Clear will assess the applicable legal and regulatory regime to determine that there is a high degree of certainty that the terms and conditions of the agreement with such foreign entities would be enforceable and not subject to a material risk of being 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.*

Nodal Clear conducts business inside the United States. Prior to entering into any arrangement involving international jurisdictions, Nodal Clear will assess the legal risks that may arise from potential conflict of laws engaging in activities involving foreign entities and make determinations based on the ability to appropriately limit such risks.

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.*

Nodal Exchange, the parent of Nodal Clear, has published the following mission on its public website:

> "To be the most trustworthy and effective commodities exchange in the markets we serve enabling better risk reward management."

Nodal Clear has also published its mission on its public website:

> "To provide a safe, effective, and efficient clearing house that supports financial stability and earns all stakeholders' trust."

In addition, pursuant to its charter, Nodal Clear's Risk Management Committee is responsible, for "recommending changes that would support the broader financial system or other relevant public interest considerations." The full text of the charter is available on Nodal Clear's public website.

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.*

Nodal Clear posts its Limited Liability Company Agreement (**"LLC Agreement"**), the charters of its Board committees and its Rulebook on its website in order to make its governance structure clear and transparent to its members and to the public, as well as to emphasize Nodal Clear's focus on providing a safe and efficient clearing house to the markets it serves. Nodal Exchange, the parent of Nodal Clear, similarly ensures that its governance structure is clear and transparent by posting on its public website its Limited Liability Company Agreement, its Board committee charters, and its Rulebook.

Section II of Nodal Clear's Rulebook explicitly identifies the governance structure. Nodal Clear Rule 2.1 identifies the composition of the Board and its powers, and explicitly requires that at least 35%, and no fewer than two, of Nodal Clear's Board members be comprised of **"Public Directors,"** as that term is defined in the CFTC Rules, to ensure independent, objective contributions to Nodal Clear's governance. Nodal Clear is also accountable to its owners: the majority-in-interest of Nodal Clear's owners has the authority to appoint any Board members and must consent to any removal of Board members.

The Nodal Clear Board is authorized to oversee the day-to-day management and business operations of the Clearing House in accordance with the LLC Agreement.

The Board must have at least two standing committees: the Nominating Committee and the Risk Management Committee (**"RMC"** or **"Risk Management Committee"**). In addition to the standing committees, the Board has the power and authority to create and terminate, in accordance with the LLC Agreement, special committees of the Board and designate their composition, responsibilities and powers.

The Board is authorized to appoint one or more individuals with appropriate experience, skills and integrity to serve as the Chairman, Chief Executive Officer, President, Chief Risk Officer, Chief Compliance Officer, and General Counsel and may further appoint such other officers of the Clearing House or any subsidiary of the Clearing House (each, an **"Officer"**) as deemed necessary or appropriate, with such titles, duties, and authority as the Board approves, to carry out the business of the Clearing House or any subsidiary of the Clearing House, and upon such terms and conditions as the Board determines.

The Chief Risk Officer is responsible for implementing Nodal Clear's risk management policies, procedures and controls and for making recommendations regarding risk management functions to the RMC and the Board. The RMC's responsibilities include supervising the Chief Risk Officer, who reports to the RMC as well as to the Chief Executive Officer.

The Chief Compliance Officer, in consultation with the RMC and the Board, is responsible for developing and enforcing appropriate compliance policies and procedures, to fulfill the duties and obligations of the Clearing House set forth in the CEA and CFTC Regulations. The RMC's responsibilities include supervising the Chief Compliance Officer, who reports to the RMC as well as to the Chief Executive Officer.

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.*

The Board's responsibilities are clearly specified in Nodal Clear's LLC Agreement and in Section II of the Nodal Clear Rulebook.

The Board oversees Nodal Clear's day-to-day management and business operations in accordance with the LLC Agreement. The Board approves new Rules or Rule revisions, although the Board may delegate such authority to a Board committee or one or more Officers of the Clearing House. The Board has the power to call for review, and to affirm, modify, suspend or overrule, any and all decisions and actions of committees or special committees of the Board or one or more Officers of the Clearing House related to the day-to-day business operations of the Clearing House. The Board has established arrangements to permit consideration of the views of Clearing Members in connection with the functioning of the Clearing House and with additions or amendments to the Rules; a description of these arrangements is available to the public and to the CFTC. Major decisions of the Board will be disclosed to Clearing Members and to the CFTC. Major decisions of the Board with a broad market impact will be disclosed to the public.

As noted above, the Nominating Committee and the Risk Management Committee comprise the standing committees of the Board. The Nominating Committee is responsible for: (i) identifying individuals qualified to serve on the Board, consistent with the criteria that the Board may require and any composition requirement(s) promulgated by the CFTC; and (ii) administering a process for the nomination of Board candidates.

The Risk Management Committee oversees Nodal Clear's risk program on behalf of the Board with the authority to: (i) monitor the risk program for sufficiency, effectiveness and independence; and (ii) oversee all facets of the risk program. The RMC's responsibilities include supervising the Chief Risk Officer and the Chief Compliance Officer, both of whom report to the RMC as well as to the Chief Executive Officer. Nodal Clear maintains a Risk Advisory Committee ("**RAC**"). The RAC is composed of individuals representing every Clearing Member (each of whom are market Participants of Nodal Exchange as well as Clearing Members of Nodal Clear) and provides advice to the RMC on risk and risk-related product issues. The RAC is chaired by the Chief Risk Officer.

Conflicts of interest are managed by the Clearing House in accordance with Nodal Clear Rule 2.7.

On a regular basis, the RMC reviews the performance of the Board and its individual members, as provided in the RMC Charter. The Board also reviews and assesses its performance annually.

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).*

Nodal Clear Rule 2.1 sets out the composition of the Board. In accordance with Rule 2.1.4, to serve as a director of Nodal Clear, an individual must possess the ability to contribute to the effective oversight and management of the Clearing House, taking into account the needs of the Clearing House and such factors as the individual's experience, perspective, skills and knowledge of the cleared derivatives industry.

In accordance with Section 7.3 of the LLC Agreement and Nodal Clear Rule 2.1.5, at least 35%, and no fewer than two, of Nodal Clear's Board members must be Public Directors. In accordance with Nodal Clear Rule 2.1.6, to qualify as a Public Director, the Board must find that the individual has no material relationship with the Clearing House. The Board must make such finding upon the nomination or appointment of the Public Director and as often as necessary in light of all circumstances relevant to such Public Director, but in no case less than annually. For these purposes, a "material relationship" is one that reasonably could affect the independent judgment or decision-making of the Public Director.

In accordance with Section 7.4(d) of the LLC Agreement, no member of the Board is entitled to compensation for any services provided to the Clearing House, except as authorized in writing by the majority-in-interest of the members of Nodal Clear. The majority-in-interest of the members have authorized Public Directors to receive a fixed sum and reimbursement of expenses for attendance, if any, at each regular or special meeting of the Board attended by Public Directors.

The other current Board members are either associated with ownership in the Clearing House or executives of the Clearing House or Nodal Exchange and therefore serve on the Board without additional compensation.

Key consideration 5*: The roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI.*

Management roles and responsibilities are clearly specified in the LLC Agreement, the RMC Charter and in Section II of the Nodal Clear Rulebook. All of these documents are publicly available on the Nodal Clear website.

Please see the comments regarding Key Consideration 2 for a description of the responsibilities of the senior management.

In accordance with Section 7.5(h) of the LLC Agreement, the Board may remove any Officer, with or without cause. In addition, the Board may vote to transfer the power and duties of any Officer to any other Officer or individual, notwithstanding the other provisions of the LLC Agreement.

The majority-in-interest of the members determines each Officer's compensation as provided in the LLC Agreement. In addition, in accordance with the RMC Charter, the RMC reviews the performance of the Chief Risk Officer and Chief Compliance Officer and makes recommendations with respect to such performance to the Board.

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.*

The RMC must review and approve at least annually a framework for risk management (**"Risk Management Framework")** and related risk policies (**"Risk Policies")** for the Clearing House, which is provided to the Board for comment or edit as appropriate.

Nodal Clear Rule 2.4.3 and the RMC Charter give the RMC overall responsibility for the Risk Management Framework, including the authority to: (i) monitor the Risk Management Framework for sufficiency, effectiveness, and independence; and (ii) oversee all facets of the Risk Management Framework, including:

- assessment and approval of applications of new Clearing Members;
- major risk management policy issues, financial safeguards, and financial surveillance and membership issues;
- surveillance, audits, examinations, and other regulatory responsibilities with respect to Clearing Members (including compliance with, if applicable, financial integrity, financial reporting, recordkeeping, and other requirements); and the conduct of investigations;

- reviewing the size and allocation of the risk and compliance budget and resources, and the number, hiring, termination, and compensation of risk and compliance personnel;
- monitoring Nodal Clear risk management resources and endeavoring to ensure that risk control personnel operate with sufficient independence, authority, resources and access to the Board;
- supervising Nodal Clear's Chief Compliance Officer, who reports directly to the RMC and to the Chief Executive Officer;
- supervising Nodal Clear's Chief Risk Officer, who reports directly to the RMC and to the Chief Executive Officer;
- authorizing the RMC's Chairman and the Chief Risk Officer to establish the Risk Advisory Committee;
- recommending changes that would ensure fair, vigorous, and effective regulation and risk management;
- recommending changes that would support the broader financial system or other relevant public interest considerations;
- reviewing all regulatory proposals prior to implementation and advising the Board as to whether and how such changes may impact regulation;
- approving new products for clearing;
- maintaining minutes and records of its meetings; and
- reviewing such other matters and perform such additional activities, within the scope of its responsibilities, as the Board deems necessary or appropriate

The RMC may take such actions required by the Rules or as otherwise delegated to the RMC by 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.*

The RMC Charter provides that the RMC is responsible for recommending changes that would support the broader financial system or other relevant public interest considerations. In addition, Nodal Clear's mission - "To provide a safe, effective, and efficient clearing house that supports financial stability and earns all stakeholders' trust" – is posted on Nodal Clear's public website.

The RMC Charter also authorizes its Chairman and the Chief Risk Officer to establish a RAC which is charged with providing ad hoc recommendations to the Clearing House and the RMC. The RAC is composed of individuals representing Clearing Members (each of whom are market Participants of Nodal Exchange as well as Clearing Members of Nodal Clear) and provides advice to the RMC on risk and risk-related product issues. The RAC is chaired by the Chief Risk Officer.

Nodal Clear also receives feedback from market Participants via the Board of Nodal Exchange Holdings, the parent company of Nodal Exchange and Nodal Clear. The Board of Nodal Exchange Holdings has at least one member who is a senior executive at a company that is an active participant in electricity and natural gas markets. Market participants may also express their views by submitting questions or comments to the Nodal Clear Board via Nodal's webpage.

Major decisions made by the Board that impact relevant stakeholders and, where appropriate, the public are disclosed to the relevant stakeholders or the public respectively. Public announcements such as press releases, notices, and Rule changes are posted on the Nodal Clear website. Relevant stakeholders may receive certain communications directly in accordance with the confidentiality provisions that may be in place in an agreement with the Clearing House.

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.*

Nodal Clear maintains a Risk Management Framework that is regularly reviewed by the Risk Management Committee. This Framework describes the types of risks faced by Nodal Clear and identifies the policies, processes, and procedures that mitigate these risks. Specifically, the Framework addresses the following types of risk:

- Legal risk
- Credit risk
- Collateral risk
- Settlement risk
- Liquidity risk
- Operational risk
- General business risk

Nodal Clear employs a variety of methods and procedures to manage the above risks.

Legal risk, which is discussed more in Principle 1 above, is managed by carefully reviewing all Nodal Clear activities to make sure they have a well-founded legal basis, as well as through careful monitoring and review of regulatory changes.

Credit risk, which is discussed further under Principle 4 below, is primarily managed by limiting counterparty exposure through collecting variation margin twice per day, holding initial margin and guaranty funds, and reviewing the credit quality of the Clearing Members.

Collateral risk, which is discussed further under Principle 7 below, is primarily managed through Nodal Clear's Collateral Policy, which restricts the non-cash collateral Nodal Clear may hold to high quality and liquid U.S. Treasury securities.

Settlement risk is managed through Nodal Clear's Approved Financial Institution Policy, which requires Nodal Clear to maintain high standards for Settlement Banks and custodians and to continuously monitor its exposure to its Settlement Banks.

Liquidity risk, which also is discussed further under Principle 7 below, is managed through Nodal Clear's Collateral Policy and Liquidity Policy as well as requirements that at least 50% of Clearing Members' Guaranty Fund contributions be in cash. Nodal Clear also manages its liquidity risk through its arrangements for the application of a "liquidity waterfall" set out in the Nodal Clear Rulebook.

Operational risk, which is discussed further under Principle 17 below, is managed through Nodal Clear's Operational Risk Framework and the metrics and processes identified therein.

Lastly, general business risk, which is discussed further under Principle 15 below, is continually monitored by the Nodal Clear management team, which regularly verifies that Nodal Clear has sufficient assets to cover operating costs for the next year.

Nodal Clear uses a variety of systems and processes to identify, measure, monitor, and manage its risks. In particular, Nodal Clear's systems provide for the real-time monitoring of risk exposure to Clearing Members at both the House and Customer level as well as at each Customer level. Nodal Clear's systems also permit Nodal Clear to directly monitor the aggregate exposure to Customers using multiple Clearing Member accounts.

Nodal Clear's Risk Policies and Risk Management Framework are generally developed by Nodal Clear staff, but approved at the RMC or Board level (the Board reviews and may make edits or comments as appropriate). As a result, Nodal Clear staff, Officers, and the Board (including the RMC) are all aware of the risks borne by Nodal Clear and the measures being taken to manage these risks.

The RMC reviews the Risk Management Framework and associated policies and their effectiveness at least once per year. Risk Policies specifically related to the market environment, such as the initial margin policy, provide for more regular review and escalation should measures of their effectiveness, such as backtests, show reduced efficacy.

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.*

Nodal Clear's Clearing Members and their Customers have access to extensive information to enable them to manage and contain their risks.

In particular, the Nodal Exchange trading platform allows Clearing Members and their Customers to input Trade Risk Limits (**"TRLs"**) for their accounts. The TRL describes the maximum initial margin exposure an account is allowed to assume. Clearing Members are required to place a TRL on all Customer and House Accounts, and Customers may set a TRL below that set by their Clearing Member. The Nodal Exchange trading platform also provides Clearing Members and their Customers real time information on their positions, required initial margin, and required variation margin, and access to a margin calculator which allows them to calculate the required initial margin under various scenarios.

The Nodal Clear Rulebook requires that Clearing Members "adopt, adhere to and enforce risk management and other policies and procedures that are designed to address the risks that the Clearing Member poses to the Clearing House." Nodal Clear conducts annual reviews of Clearing Members, which include a review of Clearing Member risk management policies and procedures.

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.*

As part of its Risk Management Framework, Nodal Clear has identified risks from Clearing Members and Approved Financial Institutions as the key institutional risks it faces. In particular, Nodal Clear bears the risk that a Clearing Member may default on its obligations to the market. Nodal Clear measures this risk through routine review and monitoring of the Clearing Member's financial position and its risk exposure at Nodal Clear. Nodal Clear has the power under the Nodal Clear Rulebook to set risk limits on Clearing Members and to decrease the risk limit and/or require more initial margin or guaranty funds as the result of Nodal Clear's review of the Clearing Member's financial status.

Nodal Clear also bears the risk that an Approved Financial Institution could be placed into receivership. To manage this risk, Nodal Clear measures its cash exposure to each of its Settlement Banks daily and seeks to minimize cash balances held through the use of overnight reverse repos. Nodal Clear manages the risk to any remaining cash balances through regular monitoring of each Settlement Bank's financial status as well as by applying limits to the amount of cash assets that may be held at any particular Settlement Bank. Nodal Clear's policies require Nodal Clear to have relationships with more than one Settlement Bank in order to ensure an appropriate level of redundancy for making cash settlements.

Nodal Clear's Clearing Member Policy and Approved Financial Institution Policy are reviewed by the Board annually.

A bankruptcy of Nodal Clear poses risks to Clearing Members. Nodal Clear Rule 3.38 provides that open House and Customer positions are to be closed promptly in the event Nodal Clear were to become the subject of a Bankruptcy Event (as that term is defined in the Rules). The netting and close-out procedures for proprietary and Customer positions set out in the Nodal Clear Rulebook accord with the requirements of the Bankruptcy Code, the CEA, CFTC Regulations, and FDICIA.

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.*

The Risk Management Framework requires Nodal Clear to analyze potential scenarios that could cause a Clearing Member default or defaults. Nodal Clear sizes the resources in the default waterfall based on the potential losses generated in those scenarios. In the event the resources in the default waterfall, including additional Clearing Member assessments, are insufficient to cover the loss from Clearing Member defaults, Nodal Clear would face the possibility of insolvency.

Nodal Clear's Operational Risk Framework identifies scenarios that could prevent or severely restrict Nodal Clear's operations, and provides mitigation strategies for these scenarios. Nodal Clear also maintains a Disaster Recovery and Business Continuity Plan that examines potential disaster scenarios and solutions for quickly restoring operations in those scenarios.

Nodal Clear maintains a Recovery and Wind-Down Plan which identifies scenarios which could threaten Nodal Clear's existence as a "going concern." This plan outlines how Nodal Clear would ensure that it continues to operate its critical functions in either a recovery or wind-down scenario. The Board reviews the Recovery and Wind-Down Plan at least on an annual basis.

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.*

Nodal Clear manages its credit exposures through the Risk Management Framework outlined in the response to Principle 3 and the associated Risk Policies that support the Risk Management Framework. In particular, under the Initial Margin Policy, Nodal Clear must collect sufficient initial margin to cover two-day portfolio losses to a 99.7% confidence level and Nodal Clear's Guaranty Fund Policy requires the Guaranty Fund to be sized to cover losses resulting from a default of the two Clearing Members to which Nodal Clear has the largest combined exposure.

In addition, the Risk Management Framework identifies the credit risk that arises from a Clearing Member not meeting its financial obligations and the settlement risk that arises from the insolvency of a Settlement Bank as two key risk areas. Nodal Clear's senior management reviews this Risk Management Framework on a regular basis and proposes revisions to the Risk Management Framework whenever appropriate based on the market environment. The Board, or the RMC, may also propose changes to the Risk Management Framework at any time, and must review the Risk Management Framework in its entirety no less than once per year.

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.*

As a DCO, Nodal Clear's primary source of credit risk is the possibility that a Clearing Member counterparty may fail to perform on its obligations. Nodal Clear identifies this and other sources of credit risk through its Risk Management Framework.

Nodal Clear monitors credit exposures to Clearing Members in real-time. Nodal Clear systems continuously update Clearing Member positions and related initial margin requirements. Price marks for all contracts are updated twice each day. Nodal Clear collects variation margin based on the current valuation of Clearing Member positions at least once per day to prevent credit exposures from building. Likewise, Nodal Clear collects any initial margin owed at least once per day. Nodal Clear further requires Clearing Members to make Guaranty Fund deposits for additional security.

Nodal Clear also monitors the credit quality of its Clearing Members, assigning each Clearing Member a rating based on its credit quality. Clearing Members that may be at risk of substantial financial deterioration are placed on a watch list for closer monitoring. Nodal Clear also has the right to request additional margin from a Clearing Member at any time based on its risk analysis of the Clearing Member.

Nodal Clear establishes a margin-based TRL for each Clearing Member account, and requires Clearing Members to establish a TRL for each of their accounts as well. This mechanism prevents excessive accumulation of position risk by preventing trades that would cause the account to exceed its TRL.

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 their system.*

Nodal Clear is not a payment system or a securities settlement system.

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.*

Nodal Clear maintains a variety of pre-funded financial resources based on models of its current and future financial exposures. Initial margin is one such key financial resource, and is calculated based on an expected shortfall model to provide coverage to a 99.7% confidence level. For the initial margin calculations, Nodal Clear includes both recent price history as well as price histories from select past stress periods to ensure that the coverage is appropriate for periods with some market stress. Nodal Clear's initial margin model incorporates at least a one-day holding period for futures and options contracts in Customer Accounts and a two-day holding period in House

Accounts. The initial margin model also contains a separate estimation of the costs to liquidate a position in the event of a default.

Nodal Clear measures the coverage provided by initial margin on a daily basis based on backtesting and can adjust parameters in the margin model if the coverage declines below the 99.7% level.

Nodal Clear provides coverage for periods of extreme stress through the Guaranty Fund. In accordance with Rule 3.35, Nodal Clear can access the Guaranty Fund resources of non-defaulting Clearing Members once the resources of the defaulting Clearing Member, held as either initial margin or Guaranty Fund deposits, and Nodal Clear's $20 million Clearing House Contribution have been exhausted. The Nodal Clear Risk Team sizes the Guaranty Fund based on the loss of the two Clearing Members to which Nodal Clear has the largest combined financial exposure in stress tests which model extreme but plausible scenarios. The Chief Risk Officer and Risk Team review these stress scenarios on at least a monthly basis, and more frequently during periods of market stress. Should all the prefunded resources of the Guaranty Fund be exhausted, Nodal Clear has the right to assess Clearing Members for additional contributions as described in Nodal Clear Rule 3.35(b)(vi).

Nodal Clear only accepts cash and letters of credit denominated in US Dollars, ensuring that its collateral resources are both very accessible and liquid. Furthermore, Nodal Clear investment policies dictate that any Nodal Clear investments be short term (e.g., one day) to maintain the accessibility of the collateral.

Nodal Clear has not been declared a systemically important DCO, nor does it engage in activities with more complex risk profiles, such as jump-to-default risk. Nodal Clear does not offer contracts that are highly correlated with Clearing Member defaults.

The Risk Management Committee reviews and approves all policies and required updates related to Guaranty Fund resources, including the policies governing the stress tests that determine the size of the Guaranty Fund.

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.*

Nodal Clear conducts daily stress tests to determine the sufficiency of its total financial resources in extreme but plausible market scenarios. Should these stress tests show that total financial resources are not adequate, the Chief Risk Officer is immediately alerted and steps are taken to remediate the deficiency.

The Chief Risk Officer reviews the stress tests, including their assumptions, parameters and results, at least once per month and more frequently during times of market stress. In addition, the Risk Management Committee reviews the stress tests, including their assumptions and parameters, once per quarter.

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.*

Nodal Clear has defined a wide range of stress scenarios designed to test the Clearing House's exposure in extreme but plausible market conditions. These stress tests explicitly apply stress to price levels through replaying peak volatilities, abrupt changes in the forward curve, changes in underlying commodity prices, and changes in correlations between commodities. The stress tests also explicitly address the liquidation costs of a defaulting portfolio during stressed periods.

Nodal Clear examines the results of these stress tests across both Clearing Member House and Customer Accounts, and calculates the greatest potential loss should two Clearing Members suffer simultaneous defaults in House and Customer Accounts.

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.*

Nodal Clear's Rulebook contains rules that explicitly address any losses that Nodal Clear may face as a result of a single or multiple Clearing Member default. Rule 3.35 of the Nodal Clear Rulebook contains the Nodal Clear default waterfall as well as rules for further assessments of Clearing Members.

Nodal Clear's default waterfall provides that the defaulting Clearing Member's resources are first used to cure the default. If the defaulting Clearing Member's resources are exhausted before the default has been cured, then Nodal Clear may next use any surpluses of Nodal Clear that the Board determines are available for such purpose, any lines of credit, and then the Clearing House Contribution of $20 million. Should these resources be exhausted before the default has been cured, Nodal Clear will next apply the Guaranty Fund resources from non-defaulting Clearing Members. Should the resources of the Guaranty Fund be exhausted before the default has been cured, Nodal Clear will assess the surviving Clearing Members for additional contributions. These assessments cannot exceed 200% of a Clearing Member's prior Guaranty Fund contribution for a single default, or 550% of a Clearing Member's prior Guaranty Fund contribution for multiple defaults occurring within a six-month period. These assessments are due and payable at the end-of-day Settlement Time for the day on which the assessment is levied.

To provide additional liquidity upon a Clearing Member default, Nodal Clear may at times make use of a line of credit, as noted above in the default waterfall description.

Nodal Clear's Rule 3.38 provides procedures in the event that Nodal Clear has exhausted all its resources and assessments by determining close-out amounts to be paid to or received from Nodal Clear by each Clearing Member.

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.*

Nodal Clear accepts collateral with minimal credit, liquidity and market risks. Nodal Clear evaluates collateral based on the volatility of its price movements, the likely cost to convert the collateral into cash in a limited timeframe, and its conformance with CFTC Regulation 1.25. Currently, Nodal Clear only accepts collateral in the form of cash and letters of credit denominated in US Dollars. Nodal Clear conducts regular test draws on letters of credit to ensure the letter of credit issuing bank is able to make payment within the 60-minute time-frame prescribed in each letter of credit. In the future, Nodal Clear may accept US Treasury bills, notes, and bonds. The Risk Team and the Risk Management Committee periodically review the collateral policy to make sure Nodal Clear's arrangements conform with the goals of only accepting safe and liquid collateral. There is no wrong-way risk because none of the foregoing collateral is issued by Clearing Members or related to the contracts Nodal Clear clears.

Nodal Clear does not grant exceptions to its collateral policy.

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

In the event that Nodal Clear elects to accept securities as collateral, Nodal Clear will mark collateral to market twice per day, based on prices obtained from third party data services. Should the price obtained from a third party data service show a large price change, the Risk Team will investigate. Should the Risk Team determine the price was in error, they may override the system-generated price with a prior price or other market based price as it deems appropriate.

Nodal Clear will apply haircuts to all accepted securities to ensure that the amount recovered from the collateral in a time of stress would at least equal the value Nodal Clear applied to the collateral. Nodal Clear determines collateral haircuts by applying a Value at Risk (**"VaR"**) methodology to at least five years to past collateral pricing data. The Chief Risk Officer will review the sufficiency of these haircuts monthly, and the Risk Management Committee will review the haircuts quarterly.

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.*

Nodal Clear will use price histories from stressed market conditions in determining the haircuts for its US Treasury collateral, and will seek to establish stable haircut levels that are generally above the current market volatility levels of the collateral prices.

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.*

Nodal Clear avoids concentrated holdings of assets that would impact its ability to quickly liquidate assets without significant adverse price effects. In the future, Nodal Clear may accept US Treasury bills, notes, and bonds, and the US Treasury market is widely recognized as one of the most liquid global markets. As a consequence, Nodal Clear does not plan to impose concentration limits on specific types of US Treasury securities.

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.*

Nodal Clear does not accept cross-border collateral.

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

Nodal Clear will manage collateral through a well-designed collateral system which provides appropriate administrative and Clearing Member functionality for the daily management of any US treasuries posted as collateral. The collateral management system will be able to calculate the balance of collateral held in real-time, compare the balance to the margin required, and permit Clearing Members to view these amounts as well as request substitutions of non-cash for cash collateral or releases of excess cash collateral. The collateral management system will reconcile account balances with the relevant Approved Financial Institution after each daily margining run.

Nodal Clear’s collateral management system is scalable and can meet Nodal Clear’s needs for the foreseeable future. Changes to the collateral management system will be adopted as needed and in coordination with Clearing Members based on the evolving needs of Nodal Clear.

Collateral in the form of securities will be held in Nodal Clear safekeeping accounts, and be immediately available to Nodal Clear. Nodal Clear Rule 3.19 establishes Nodal Clear’s first lien and perfected security interest all cash and non-cash collateral deposits held for Clearing Members in connection with their financial obligations to the Clearing House.

Nodal Clear has sufficient full-time staff to manage the collateral system on a daily basis.

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.*

Nodal Clear collects both initial margin and variation margin to ensure that it holds margin commensurate with the risks of the products it offers. The initial margin manages the price and liquidity risk of forward positions, while the collection of variation margin twice per day ensures that current exposures are covered.

Nodal Clear employs a portfolio-based initial margin methodology, consisting of two primary components: price risk and liquidation risk. The price risk portion of the initial margin methodology uses an expected shortfall calculation based on the average of the top portfolio losses based on an assumed holding period.[8] As all margins are calculated at the portfolio level, they are automatically commensurate with the risk Nodal Clear faces for that portfolio. To calculate the portfolio losses, Nodal Clear uses a specially-selected price series consisting of both recent contract price histories as well as past periods of market stress. The liquidation portion of the margin methodology scales the likely liquidation cost by the percentage of contract open interest held by the participant and the volatility of the contract.

Nodal Clear performs daily back tests to review the calibration of the model's parameters and to verify the margin model is covering the risk to the Clearing House. Furthermore, Nodal Clear's margin models are validated by an independent party regularly and prior to the deployment of significant model design changes.

Nodal Clear publishes its margin methodology at www.nodalclear.com, and also makes available an on-line tool for margin calculation to both participants and Clearing Members. This on-line tool allows participants and Clearing Members to calculate the margin of their current portfolio(s) as well as to understand the impact of adding hypothetical positions to their portfolio.

Nodal Clear conducts its daily settlement process on a defined and published schedule. Clearing Members are required to remit their payments by the published deadlines. Any payment failure by a Clearing Member is considered a potential default event, and may trigger Nodal Clear exercising its rights pursuant to Nodal Clear Rule 3.30.

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.*

[8] Nodal Clear's initial margin model incorporates at least a one-day holding period for futures and options contracts in Customer Accounts and a two-day holding period in House Accounts. The initial margin model also contains a separate estimation of the costs to liquidate a position in the event of a default.

Nodal Clear relies on Nodal Exchange for twice-per-day settlement prices on all contracts and expiries. Nodal Exchange has been producing twice-per-day settlement prices on a timely basis since launching in April 2009. Nodal Exchange's pricing methodology relies on Nodal Exchange market activity, including transactions and bid/ask data, third party marks, and extrapolation to produce a comprehensive view of prices across all locations and for all expiries. Nodal Clear reviews the prices received from Nodal Exchange, focusing on any unusual pricing behavior, such as large price moves. In the event of unusual pricing behavior, Nodal Clear queries Nodal Exchange, at which point the Exchange reviews the prices and either confirms or modifies the price.

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 subportfolio 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.*

Nodal Clear employs an initial margin methodology that produces margin stability for the market, and includes periods of stress in the calculation to limit the pro-cyclical impact of margin increases during periods of market stress.

To meet these goals, Nodal Clear maintains a portfolio-level initial margin model which seeks to cover estimated future exposure to a 99.7% confidence level. As described in the response to Key Consideration 1 of this Principle 6, Nodal Clear's initial margin model focuses on managing the following two key risks:

- risk of price changes between default and closeout; and
- cost of liquidation.

The price risk portion of the initial margin methodology uses an expected shortfall calculation based on the average of the top portfolio losses for a one or two-day period for Customer Accounts or a two-day holding period for House Accounts. Portfolio losses are calculated based on the historical performance of the component contracts during both recent periods and during past periods of market stress. These histories are selected to represent a meaningful sample of recent returns as well as returns from periods representing key departures from typical market conditions, such as decreases in correlation or high price volatility. Antithetical returns are also calculated, and then the average of the top losses is calculated. The number of losses included in this calculation is a parameter that may be adjusted from time to time.

The liquidation portion of the margin methodology scales the likely liquidation cost of a given position by the percentage of contract open interest held by the participant and the volatility of the contract. The liquidation portion of the margin methodology produces increased margins for positions with lower demonstrated market liquidity or where a participant holds a concentrated position.

The confidence level and key parameters for the initial margin model are determined through daily backtesting of the margin model. This backtesting is performed at the portfolio level.

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.*

Nodal Clear collects variation margin twice per day to limit the build-up of current exposures. Variation margin is calculated based on the most recent price marks provided by Nodal Exchange and the mid-day or end-of-day position snapshot.

Nodal Clear has the authority and capability to make, and to ensure the payment of, intraday margin calls, including unscheduled calls.

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.*

Nodal Clear calculates all margins on a portfolio basis. As a result, Nodal Clear does not have explicit margin offset policies. Rather, the price histories incorporated into the margin model determine the amount of offsetting, if any, that will occur. As described above, the potential future exposure is likewise calculated at the portfolio level.

Nodal Clear's portfolio margin provides stability in stressed market conditions by including stressed market conditions in the price histories used as a basis for the margin calculation. Nodal Clear confirms the robustness of its approach through backtesting the margin model results for both current and hypothetical portfolios.

Nodal Clear does not have any arrangements with other CCPs to offer cross-margining.

Key consideration 6: *A CCP should analyze 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.*

Nodal Clear conducts daily backtesting at a portfolio level, and reviews the results of backtesting on a monthly basis with the Chief Risk Officer and on a quarterly basis with the Risk Management Committee. Nodal Clear's backtests examine whether the price risk portion of the Nodal Clear margin calculation would be sufficient to cover the actual losses the portfolio would have incurred if held during the two-day backtesting period. Nodal Clear's target confidence level is 99.7%. In addition to testing current Clearing Members' Customer portfolios, Nodal Clear also backtests potential portfolios composed of combinations of products Nodal Clear offers.

Nodal Clear also regularly conducts a sensitivity analysis of the margin methodology This analysis incorporates a range of parameters and assumptions that capture a variety of historical and hypothetical market conditions, including periods of high volatility and changes in correlations between contract prices. This sensitivity analysis is conducted on both current House and Customer portfolios as well as on hypothetical portfolios designed by the Nodal Clear Risk Team.

Any backtesting failure to meet the 99.7% coverage target will trigger an immediate review of the backtest results with the Chief Risk Officer, who will determine the necessary steps to address the failure.

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

Nodal Clear conducts an independent margin model validation regularly, or whenever the initial margin model undergoes any significant changes. The results of the validation are reviewed by the Risk Team and the RMC.

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.*

Nodal Clear's liquidity risks are addressed by the Risk Management Framework. Nodal Clear also complies with CFTC Regulations 39.33 and 39.35, which require it to maintain sufficient liquid resources to meet intra-day, same-day and multi-day obligations with a high degree of confidence under a wide range of stress scenarios, and further require the Clearing House to conduct daily stress testing to measure liquidity exposure. Currently, Nodal Clear only accepts highly liquid collateral in the form of US dollar cash and letters of credit. In the future, Nodal Clear may accept US Treasury bills, notes, and bonds.

Nodal Clear's Risk Management Framework identifies liquidity risks specifically related to Clearing Member failure and Approved Financial Institution failure. Nodal Clear calculates, on a daily basis, the largest combined liquidity exposure to two Clearing Members in stressed market conditions. These tests are used to size Nodal Clear's liquidity resources. Nodal Clear manages exposure to Settlement Banks through strict criteria for the acceptance of Approved Financial Institutions, subsequent annual reviews of each Settlement Bank, and by imposing concentration limits on the assets that can be kept at each Approved Financial Institution. Furthermore, liquidity risk at Approved Financial Institutions is further limited by minimizing cash balances held at such entities through the use of overnight reverse repos that are explicitly structured so as to make cash available when Nodal Clear would need access to the returned cash to manage a default.

Nodal Clear evaluates the inter-linkages between its Clearing Members, liquidity providers, and Settlement Banks. Nodal Clear assesses its counterparty risk to each institution in aggregate, including any affiliates.

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.*

Nodal Clear's systems track and monitor the flow of funds for the twice-per-day margin calls and other collateral related activity, such as the release of excess cash. Members of the Nodal Clear Treasury team monitor funding flows in real time. Nodal Clear also performs daily reconciliations with its Approved Financial Institutions to track account balances.

Nodal Clear gives its Clearing Members notice of a margin call prior to the call being issued. Nodal Clear's systems have automated tools that report unusual calls (e.g., calls that exceed the past monthly average for the Clearing Member) to the Risk Team so that they can confirm the accuracy of the call and, if needed, provide additional notification to the Clearing Member.

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.

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.*

Nodal Clear only accepts collateral in US Dollars and thus only has to manage liquidity in one currency. Nodal Clear complies with CFTC requirements to maintain sufficient liquid resources to meet intra-day, same-day and multi-day obligations with a high degree of confidence under a wide range of stress scenarios.

Nodal Clear has identified a Clearing Member default as its largest liquidity risk. To determine the amount of liquid resources that could be required to manage the simultaneous default of two Clearing Members, Nodal Clear employs stress tests of extreme but plausible scenarios to identify the two Clearing Member to which it has the largest combined liquidity exposure. These stress tests are conducted on a daily basis and reviewed on a monthly basis by the Chief Risk Officer (or more frequently in periods of market stress) and on a quarterly basis by the Risk Management Committee.

Nodal Clear is not a systemically-important DCO and does not engage in activities with a more complex risk profile.

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.*

As noted in the response to Key Consideration 4 above, Nodal Clear determines its liquidity resource requirement through stress testing. In accordance with CFTC Regulation 39.33, Nodal Clear may use:

- Cash in the currency of the obligation held at a creditworthy commercial bank;
- Committed lines of credit;
- Committed repurchase agreements; or
- Highly marketable collateral, including high quality, liquid, general obligations of a sovereign nation, which must be readily available and convertible into cash pursuant to prearranged and highly reliable funding arrangements, even in extreme but plausible market conditions.

Nodal Clear requires that each Clearing Member deposit at least 50% of its Guaranty Fund requirement in the form of cash, and currently only accepts US Dollars for Guaranty Fund deposits.

Nodal Clear's Rule 3.36 provides a structure (**"Liquidity Waterfall"**) that may be employed in the event that Nodal Clear is unable to pay its intraday obligations and declares a Liquidity Event, as defined in the Rulebook. This Liquidity Waterfall provides a mechanism for Nodal Clear to substitute US Treasury securities for cash deposited in the Guaranty Fund, cash deposited as Initial Margin, or to pay variation margin or other obligations arising from the sale of the defaulting Clearing Member's positions. Substitutions of US Treasuries for Guaranty Fund or Initial Margin deposits must be reversed within 29 business days of the substitution. Clearing Members may return any US Treasury securities used to pay Initial Margin on the following business day for cash.

Nodal Clear does not have access to credit at the Federal Reserve and must rely on the funding sources described above.

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.*

Nodal Clear's default resources are US dollar cash and U.S. Treasury securities subject to committed repurchase agreements which enable Nodal Clear to quickly sell such collateral and receive the cash proceeds from the sale on a same day basis. Both U.S. dollar cash and U.S. Treasury securities are classified as highly-liquid resources.

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.*

Nodal Clear performs rigorous due diligence on any liquidity provider on which it relies to meet its minimum liquidity requirements. Liquidity providers must meet Nodal Clear's standards for Approved Financial Institutions, which includes a review of their regulatory supervision and access to the Federal Reserve System. Nodal Clear also annually reviews the liquidity provider's ability to perform as required under the commitment. Nodal Clear will test the procedures for accessing liquidity resources by accessing the liquidity resources from each liquidity provider at least once per year.

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.*

Nodal Clear does not have access to central bank accounts, payment services, or securities services at the Federal Reserve.

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.*

Nodal Clear conducts daily stress testing to determine the amount of liquidity resources required. Members of the Risk Team conduct the daily stress tests, and the results are reviewed on at least a monthly basis with the Chief Risk Officer, and on a quarterly basis with the Risk Management Committee. The governance of liquidity stress testing is detailed in Nodal Clear's Risk Management Framework. Should a liquidity stress test produce a result in excess of the liquidity resources in place, the Nodal Risk Team will immediately escalate the results to the Chief Risk Officer, who, in conjunction with Nodal Clear senior management, will determine what measures to take to remedy the situation.

Nodal Clear's stress test scenarios are designed to calculate the required liquidity resources in the event of a default by two Clearing Members that creates the largest liquidity exposure for the Clearing House in extreme but plausible market conditions. In accordance with CFTC Regulation 39.33, Nodal Clear conducts liquidity stress tests using peak historic price volatilities, simultaneous pressures in funding and asset markets and a variety of extreme but plausible market scenarios. Nodal Clear also examines its exposure to Settlement Banks and liquidity providers, and any links between entities serving multiple roles (Settlement Bank, liquidity provider, or Clearing Member) as part of its liquidity stress testing.

Nodal Clear employs a real-time, gross payment process which minimizes payment risk by requiring payment of variation and initial margin amounts by predetermined deadlines.

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.*

Nodal Clear's daily settlement schedule for both variation and initial margin will continue to apply after a Clearing Member default or defaults. Nodal Clear's default waterfall, detailed in Nodal Clear Rule 3.35, allows Nodal Clear to immediately use a defaulting Clearing Member's initial margin and Guaranty Fund deposits to settle its payment obligations. Should the defaulter's loss exceed its deposited collateral, Nodal Clear will next apply any surplus of the Clearing House that the Board makes available for this purpose, then any loans or purchase agreements and then its Clearing House Contribution. Should all these resources be exhausted, Nodal Clear will next apply the Guaranty Fund deposits of non-defaulting Clearing Members. Should these Guaranty Fund deposits be exhausted without covering the losses generated, Nodal Clear will assess the Clearing Members for additional amounts, per Rule 3.35. These assessments are due and payable no later than the normal end-of-day settlement time for the day on which such assessment is levied.

As described above in the response to Key Consideration 5, should Nodal Clear have an unforeseen liquidity shortfall, it will apply the resources set out in its Liquidity Waterfall to meet its same-day payment obligations. Nodal Clear has the ability to repay any credit extended to Nodal Clear from either a liquidity provider or through the provisions of Rule 3.36 through the liquidation of collateral used to secure the credit.

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.*

Rule 3.25 of the Nodal Clear Rulebook provides for final settlement of all payments to or from the Clearing House for initial margin, variation margin, and Guaranty Fund deposits. Nodal Clear uses the Fedwire Funds Service for all cash transactions, and this payment system enables participants to execute fund transfers that are immediate, final and irrevocable once processed.

Legal certainty of settlement is defined in the agreements Nodal Clear has signed with its Approved Financial Institutions that provide settlement services. Nodal Clear does not have linkages to other clearinghouses or payment systems.

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.*

Nodal Clear conducts scheduled initial and variation margin calls twice per day. Nodal Clear also has the operational capability to conduct ad-hoc margin calls outside of the posted schedule should market conditions warrant. Nodal Clear posts variation and initial margin amounts to Clearing Members prior to calls, and provides reports to Clearing Members confirming the amounts collected or paid through system generated reports.

Nodal Clear has not experienced a deferral of final settlement to the next business day that was not contemplated by its rules or procedures.

Nodal Clear is not a large-value payment system or a securities settlement system.

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.*

In accordance with Nodal Clear Rule 3.25, payments to Nodal Clear are irrevocable and unconditional when they are debited from or credited to an account of Nodal Clear at the Approved Financial Institution. Thus, unilateral revocation is not possible. Should Nodal Clear determine that a fund transfer was made in error, it will initiate a new transfer to correct the error.

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 minimize 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.*

Nodal Clear conducts money settlements in commercial bank money denominated only in US dollars. As a Subpart C DCO, Nodal Clear does not have access to the Federal Reserve System.

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.*

Nodal Clear settles all variation and initial margin calls with US dollars. Nodal Clear's Risk Management Framework establishes criteria for assessing the credit and liquidity risks of its Approved Financial Institutions. Approved Financial Institutions must maintain certain objective standards set out in the Approved Financial Institution Policy and meet the requirements assessed during Nodal Clear's annual reviews of its Settlement Banks.

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, capitalization, 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.*

Nodal Clear manages, monitors and limits its credit and liquidity exposure to its Settlement Banks. Nodal Clear's Risk Management Framework establishes criteria for assessing the credit worthiness of its Approved Financial Institutions; these criteria include an assessment of the Settlement Banks' regulation and supervision, creditworthiness, capitalization, access to liquidity and operational reliability. After accepting a Settlement Bank, Nodal Clear continues to monitor the Settlement Bank's capital resources and liquidity, regulatory compliance, credit rating, and stress test results. Nodal Clear also conducts an annual review of its Settlement Banks' conformance with Nodal Clear's Approved Financial Institution criteria.

Nodal Clear manages its credit and liquidity exposures to Settlement Banks through ensuring that it has multiple Settlement Banks. Nodal Clear has concentration limits on the assets that may be kept at any one Approved Financial Institution. Nodal Clear also restricts the percentage that its or its Clearing Members' deposits may be of the Approved Financial Institution's total assets.

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

Nodal Clear does not conduct money settlements on its own books.

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.*

Nodal Clear Rule 3.25 and its legal agreements with its Approved Financial Institutions provide for the finality of settlement and the transfer of funds to and from Nodal Clear. Because Nodal Clear uses Fedwire for funds transfer, all payments are immediate.

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.

Nodal Clear's obligations with respect to physically-settled environmental futures contracts are set forth in Section IX of the Nodal Clear Rulebook. Specifically, Nodal Clear Rule 9.1.1 establishes that Clearing Member's guarantee and assume responsibility for performance of all delivery obligations. Additionally, Nodal Clear clears options contracts that physically settle into the underlying futures. The rules governing options exercise are found in the Nodal Exchange Rulebook, Rule 4.10.4 Options Exercise (Physical Settlement) which can be found on the Nodal Exchange website. Nodal Clear issues tenders and invoices relating to physical settlement via email to relevant participants and clearing members. It also makes the reports and confirmations it issues as part of the delivery process available to clearing members electronically.

Principle 11: Central securities depositories

Nodal Clear is not a central securities depository.

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.

Nodal Clear does not settle transactions that involve the settlement of two linked obligations.

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.*

Nodal Clear's Rulebook and Risk Policies clearly address the definition of default and set out the procedures that Nodal Clear will follow to meet its obligations on a timely basis in the event of a Clearing Member default.

Nodal Clear Rule 3.29 provides both a financial and operational definition of a Clearing Member default. A "default" occurs when: (a) a Clearing Member fails to meet any of its obligations under its Nodal Contracts to the Clearing House, (b) a Clearing Member fails to pay when due any amounts owing to the Clearing House, (c) a Clearing Member fails to make the required deposit to the Guaranty Fund, (d) the Clearing House determines that a Clearing Member is not in compliance with the provisions of Rule 3.2 and that such noncompliance poses an unacceptable risk to the Clearing House, or (e) if the Clearing Member is insolvent. Nodal Clear's emergency rules also permit Nodal Clear's senior management or the Board to suspend a Clearing Member in the event of the insolvency or imposition of any injunction or other restraint on a Clearing Member by any governmental authority, court or arbitrator that may affect the ability of that Clearing Member to satisfy its obligations to the Clearing House. However, the Nodal Clear definition of "insolvent" excludes Clearing Members for whom a government authority has been appointed as receiver for purposes of resolution. Therefore, a Clearing Member that is in receivership and continues to meet its obligations to Nodal Clear is not considered in default and will retain access to Nodal Clear.

Upon declaration of default, Nodal Clear will suspend the defaulting Clearing Member and notify regulatory authorities and non-defaulting Clearing Members. Rule 3.30 provides that all open contracts carried by Nodal Clear for the defaulting Clearing Member will be liquidated as expeditiously as practicable, unless the contracts are transferred to a non-defaulting Clearing Member or Nodal Clear's senior management determines that it is in Nodal Clear's best interests to refrain from liquidating the defaulter's positions. Nodal Clear Rule 3.31 provides the Clearing House discretion in the methods it may use to close out a defaulting Clearing Member's positions.

Following a default, Nodal Clear will conduct normal settlement cycles (unless a Liquidity Event is declared pursuant to Rule 3.36). In the event of a Clearing Member default, Nodal Clear will first use the initial margin deposits, guaranty fund deposits, and positions of the defaulter to satisfy its obligations to the Clearing House. In no event will Nodal Clear use funds deposited for Customer Accounts to satisfy obligations arising from a default in the House Account. Customer funds will, however, be used in the event of a default in the Customer Account.

Nodal Clear Rule 3.35 provides a clear order for resource use in the event of a Clearing Member default. Should the resources of the defaulter be exhausted, Nodal Clear will apply, in order:

- such portion, if any, of the surplus of the Clearing House as the Board determines to be available for such purpose;
- if the President, with the concurrence of the Chairman, or in the absence of the Chairman, any Director, or in the absence of the President any two Directors, so determines a loan or repurchase agreement or similar transaction on such terms and conditions as they may determine to be necessary or appropriate (including without limitation granting an assignment, pledge or other lien on or security interest in the Guaranty Fund or the cash and securities held in the Guaranty Fund or applying such cash and securities as provided in Rule 3.34.6);
- the Clearing House Contribution;
- subject to Rule 3.34.6 and the last paragraph of Rule 3.35(b), the Guaranty Fund;
- insurance proceeds, if any; and
- further assessments against Clearing Members.

The second line item above permits the Clearing House to maintain a line of credit against the Guaranty Fund that may be drawn down to manage liquidity requirements. Further, in the event of liquidity pressures, Nodal Clear may declare a Liquidity Event and execute the provisions of Rule 3.36 as described in the response to Principle 7, above, to ensure timely settlement of Nodal Clear's obligations.

Nodal Clear also has assessment powers under Rule 3.35(b)(vi) should replenishments of the Guaranty Fund be required. Clearing Members are required to replenish their Guaranty Fund resources no later than the normal end-of-day settlement time for the Business Day on which such an assessment is levied. These assessments will be allocated in accordance with the Nodal Clear Rules and the amount that can be called from a Clearing Member is capped in respect of any single Clearing Member default or multiple Clearing Member defaults in a six-month period.

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.*

Nodal Clear maintains a Default Management Plan (**"DMP"**) that clearly delineates the roles and responsibilities for addressing a default. The Nodal Clear Risk Team, Treasury Team, Chief Risk Officer, Chief Executive Officer, Chief Compliance Officer and Risk Management Committee all have responsibilities in the event of a default. Nodal Clear conducts default management drills at least once[9] per year to test these procedures. The RMC reviews the DMP on an annual basis and also reviews the results of all Nodal Clear default drills.

[9] In practice, Nodal Clear seeks to run two drills per year.

The DMP contains procedures for contacting all relevant stakeholders in a timely manner, and Nodal Clear maintains a contact database of key personnel at Clearing Members and other stakeholders to ensure rapid communication in the event of a default.

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

Nodal Clear's Rulebook, which contains all rules relating to Clearing Member default and designates who may carry out the actions related to default, is publicly posted on the Nodal Clear website. Circulars and notices to Clearing Members are also publicly posted on the website.

Upon a Clearing Member default, Nodal Clear will first assess whether hedges could reduce portfolio risk and will then seek to liquidate all House and affiliate positions as soon as practicable. Nodal Clear will seek to transfer Customer positions to surviving Clearing Members. Because Nodal Exchange is not an intermediated market, Nodal Clear is able to track all positions at an individual Customer level and can move Customers and their collateral individually to new Clearing Members, rather than requiring a single Clearing Member acquire all Customer positions of a defaulting Clearing Member.

Nodal Clear will only apply Customer funds to cover losses in the Customer Account as a result of a Customer default. Should the Customer Account be involved in the default, Nodal Clear maintains the right to apply segregated Customer collateral to losses associated with the default.

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.*

Nodal Clear regularly tests the DMP through default drills. In addition, Nodal Clear draws any lines of credit once per year to confirm the drawdown procedures. Results of this testing are shared with the Risk Management Committee.

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.*

Nodal Clear complies with the segregation and portability provisions of Section 4d(a) of the CEA, which require Customer positions and margin deposits be segregated from the positions and margin deposits of the House and affiliated accounts of the Clearing Member. Nodal Clear maintains positions at the individual Customer level, and can execute position transfers and associated collateral transfers in accordance with Nodal Clear Rule 3.17(a) in non-default situations and Rule 3.17(b) in situations involving a Clearing Member default.

The Nodal Clear Rulebook requires that all Customer funds received by the Clearing House be segregated in accordance with the CEA and CFTC Regulations.

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.*

Nodal Clear can readily identify positions of Clearing Members' Customers, and track all positions at the individual Customer level. Nodal Clear maintains segregated House and Customer Accounts for both cash and non-cash collateral for initial margin. In compliance with CFTC Regulation 39.13(g)(8), Nodal Clear establishes initial margin requirements for each Clearing Member's Customer Account on a gross basis.

Nodal Clear's rules and CFTC Regulations prohibit Nodal Clear from using Customer collateral to meet obligations generated by the Clearing Member's House Account. However, in the event that a Customer defaults and causes a Clearing Member default, then Customers will be exposed to fellow-customer risk.

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.*

Nodal Clear has adopted rules governing the portability of positions and associated collateral of the Customers of a defaulting Clearing Member in accordance with CFTC Regulations.

Nodal Clear therefore has both the authority and the information to conduct position and collateral transfers for the Customers of a defaulting Clearing Member. Prior to making any such position transfer, Nodal Clear obtains the consent of the Customer and the receiving Clearing Member.

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.*

Nodal Clear discloses its segregation and portability arrangements in its Rulebook. Customer collateral is segregated in an omnibus basis in accordance with the requirements of Section 4d(a) of the CEA and CFTC Regulation 1.20(g).

Nodal Clear is not aware of any legal or operational constraints that could impair its ability to segregate and port the positions and collateral of a defaulting Clearing Member's Customers, provided the default is solely in the House Account. Non-defaulting Customers would be exposed to "fellow customer risk" only if the default was in the Customer Account carried by Nodal Clear for the defaulting Clearing Member and that Clearing Member's excess House Account margin and Guaranty Fund deposit were not sufficient to cover the shortfall.

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

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.*

The Risk Management Framework sets out Nodal Clear's approach to identifying and managing general business risks. Nodal Clear has identified the following sources of general business risk:

- competitive risks;
- risks from a decline in market demand for Nodal Clear's products;
- risks from poor execution of business strategy;
- reputational risks; and
- risk from other liabilities.

Nodal Clear management monitors and manages its general business risks through on-going monitoring of key metrics for the Nodal Clear business. Management also conducts thorough reviews of new product opportunities and submits plans and financial projections for significant new products to the Board for approval. Nodal Clear reviews its cash flows on a monthly basis and performs a detailed review of its financial resources, including projections of its ability to fund one year of operations with its current financial resources, on a quarterly basis.

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.*

Nodal Clear complies with CFTC Regulation 39.11, which requires it to maintain adequate financial, operational and managerial resources to meet its projected financial obligations and to be able to fund operating costs for a twelve-month period, with highly liquid assets available to cover operating costs over a six-month period. Nodal Clear submits its financial resources report to the CFTC on a quarterly basis.

Nodal Clear's liquid assets to meet these requirements are funded by equity, and are primarily held in US dollar cash. Nodal Clear believes a six-month period is adequate for execution of its wind down or recovery plan.

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.*

Nodal Clear has adopted Recovery and Wind-Down Plans, which take into consideration the operational, technological and legal requirements of the various alternatives in assessing the length of time necessary for execution. Nodal Clear believes six months of resources are adequate for execution of the recovery or wind-down plan.

Financial resources designated to cover business risks are held separately from financial resources held to cover Clearing Member defaults. Clearing Member financial resources are held in accounts at a Nodal Clear approved Settlement Bank or custodian, and this infrastructure is separate from the accounts used for Nodal Clear's financial resources.

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.*

Nodal Clear's liquid assets funded by equity are held exclusively in US dollar cash or cash equivalents, and thus are immediately available to allow Nodal Clear to meet its current and projected operating expenses.

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.*

The Board will determine if any additional equity needs to be raised. At each quarterly meeting of the Board there is an update on the financial status of Nodal Clear and management will recommend a special Board meeting should an urgent issue arise prior to the regular quarterly meetings. Nodal Clear assesses its financial resources at least monthly on a rolling twelve-month basis consistent with CFTC Regulations.

Should there be a need to inject more equity into Nodal Clear, then Nodal Exchange will be informed and Nodal Exchange will in turn notify Holdings. The members of Holdings approve the contribution of capital or the raising of equity.

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

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.*

Nodal Clear will use commercial banks as custodians for non-cash collateral posted by Clearing Members. The Nodal Clear Rulebook requires that Nodal Clear approve any bank acting as a custodian as an Approved Financial Institution. Nodal Clear's Risk Policies establish uniform criteria for Approved Financial Institutions whether they are holding cash or non-cash collateral, or both. These criteria include that the bank be supervised by the Federal Reserve, FDIC, OCC, or the New York Superintendent of Financial Services, and establish eligibility criteria relating to the bank's total assets, Tier I capital ratio, credit rating, and operational capabilities and experience. Through assessing these criteria, Nodal Clear verifies that its Approved Financial Institutions have robust accounting practices, safekeeping procedures, and internal controls.

Nodal Clear periodically reviews the financial statements and regulatory compliance of its Approved Financial Institutions to verify that they continue to meet Nodal Clear's eligibility criteria. Nodal Clear also conducts an annual review of the soundness of its Settlement Banks.

Nodal Clear requires all Settlement Banks to provide segregation letters verifying that the Settlement Bank complies with the CEA and CFTC Regulations regarding the segregation of House and Customer Accounts.

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

Any non-cash collateral held by Nodal Clear will be held in Nodal Clear accounts in accordance with Nodal Clear's agreements with the custodian. Nodal Clear Rule 3.19 establishes that Nodal Clear has a first lien and perfected security interest in all cash and non-cash collateral held in its accounts on behalf of a Clearing Member. In addition, Nodal Clear Rule 3.20 clarifies that the Clearing House may only invest cash deposited as initial margin in accordance with the investment limitations set out in Nodal Clear's Investment Policy and CFTC Regulation 1.25.

Nodal Clear requires its Settlement Banks and custodians to be located in the United States in order to minimize operational and legal risks related to differences in jurisdiction and time zones.

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.*

Nodal Clear includes custodian banks in its annual review of Approved Financial Institution soundness. As part of this review, Nodal Clear examines each custodian bank's total assets, financial condition and any changes to the financial condition, and operating and compliance record. Nodal Clear also monitors its exposure to custodian banks.

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.*

Nodal Clear includes its Investment Policy as part of its Risk Management Framework and associated Risk Policies. The Investment Policy applies to all Nodal Clear investments, and all modifications to the Investment Policy must be approved by the Risk Management Committee. Further, the RMC reviews the Risk Management Framework and the associated Risk Policies at least once per year to ensure their continued appropriateness to address Nodal Clear's risks. Counterparty risks and liquidity concerns are key issues addressed in Nodal Clear's Investment Policy, and Nodal Clear may only invest in short-term high quality securities that present minimal counterparty and liquidity risk.

Special conditions apply to the investment of collateral. Nodal Clear only invests cash deposits; securities posted to Nodal Clear cannot be re-invested. In addition, any investment of Customer funds must comply with CFTC Regulation 1.25, which sets out the types of high–quality, low-risk instruments permitted, as well as concentration limits on the use of some instruments. Currently, Nodal Clear's Investment Policy only permits investment in overnight reverse repurchase agreements backed by US government securities.

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

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.

Nodal Clear maintains a comprehensive Operational Risk Framework that includes identification of operational risks (including those created by a third party) and mitigation strategies, as well as metrics for measurement of operational performance and a process for regular review and audit of these metrics. The Risk Management Committee reviews Nodal Clear's Operational Risk Framework on an annual basis.

This Operational Risk Framework is accompanied by a catalog of key technology risks maintained by the Nodal Clear technology team. This catalog is periodically reviewed by Nodal Clear senior management, which may at times accept input from outside experts as appropriate. Nodal Clear also maintains a Business Continuity Plan and Disaster Recovery process to support the continued performance of Nodal Clear in the event of a disruption to Nodal Clear's primary production site or to its headquarters location. Nodal Clear tests these plans at least once every six months.

Nodal Clear identifies operational risks by exploring a variety of potential scenarios and their impact on Nodal Clear's ability to operate. Nodal Clear has found that its operational risks can be categorized into the following three categories:

- failure of Nodal Clear processes or controls;
- failure of Nodal Clear systems or technology; and
- failure of third party systems on which Nodal Clear relies.

Where possible, Nodal Clear identifies key metrics that can be tracked to monitor sources of operational risk. Nodal Clear's technology risk catalog uses international standards on technology management best practices as baseline recommendations for technology risk management, and explicitly reviews any Nodal Clear departures from these recommendations.

Nodal Clear's staff are crucial to mitigating operational risk. Nodal Clear hires well-qualified individuals with applicable educational and work backgrounds, and provides detailed on the job training to ensure that all Nodal Clear staff are proficient in their operational role. Nodal Clear uses appropriate controls, such as restricting information access to those who need to know and using "four-eyes" approvals for key steps to mitigate the risk of employee malfeasance.

Nodal Clear employs extensive testing to ensure that major changes to the system will not affect on-going operations. The Software Development Lifecycle at Nodal Clear requires that the following steps be followed before a system is declared functional and released from the Quality Assurance process for deployment to production:

- collection of input on system development from both business and technical operations teams;
- definition of clear requirements that encourage robust scenario planning before development begins;
- new feature demonstrations between development and testing phases that allow end operational users to see exactly what will be added to the system; and
- execution of an appropriate test plan that may include automated unit and integration tests, manual functional tests, and automated and manual regression tests.

Once the development and business technology teams declare that a new build has been functionally tested, the build can then pass through three broader test phases (depending on the size or impact of the release):

- Operational Day Testing in which the system is run over one or more simulated days to look for any issues that only appear in full operation. This is typically used when changes are not clearly isolated to a single feature or function.
- Internal User Acceptance in which the system is run over multiple days, and in which teams responsible for production operations participate to provide another level of validation to ensure consistency in the operational schedule and outcomes. This is typically used when the changes are significant enough that Nodal operational users may need rehearsals with new functionality to ensure everything runs smoothly upon go-live.
- Market User Acceptance Testing in which Nodal invites the full community of stakeholders to validate the entire operational life cycle of system inputs and outputs over multiple days. This is typically used when there are very large changes to the platform that affect a broad group of stakeholders.

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.*

Nodal Clear's Board has overall responsibility for governance and provides proper oversight of senior management. The Board reviews Nodal Clear's key strategic decisions, receives regular updates of Nodal Clear's financial and operating performance, and conducts annual reviews of the Risk Management Framework, including the Operational Risk Framework. The Board has delegated responsibility for the management of operational risk to Nodal Clear's senior management.

Nodal Clear employs an independent, external audit team annually which results in an audited financial statement and footnote disclosures. Nodal Clear also engages external specialists to perform certain audits of key technology risks, such as information systems security. Results from the non-financial control and technology audits are reviewed by senior management.

Nodal Clear participates in the industry wide Business Continuity/Disaster Recovery testing process of the Futures Industry Association (**"FIA"**). The FIA testing process involves testing key failover procedures with its Clearing Members.[10]

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.*

Nodal Clear's system and operations teams target an availability of 99% for all critical capabilities. This availability is evaluated through a monthly review of incidents to see which, if any, contributed to an outage of critical capabilities.

Nodal Clear achieves these objectives through a set of practices organized according to the ITIL service delivery framework. The key ITIL areas that support Nodal's availability objectives are:

- Architecture management: Nodal designs infrastructure and applications to limit single points of failure

- Monitoring and event management: Nodal triages and analyzes events that come in from applications and infrastructure to identify possible issues

- Incident management: Nodal reviews all major incidents in detail to identify root causes and ways to prevent related issues in the future

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.*

Nodal Clear conducts testing of its system capacity as needed to ensure that it has scalable capacity adequate to handle higher than expected volumes without a disruptive deterioration in system performance. Nodal Clear continuously monitors the performance and utilization of its technology infrastructure and can quickly react to decreases in performance by adding additional resources (e.g., additional servers, bandwidth).

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

Nodal Clear's security program is driven by a dedicated Manager of Cybersecurity who drives security documentation, training, testing, architecture, and development. Nodal security practices are currently organized in the following categories:

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[10] In 2018 Nodal did not participate in the FIA testing process due to the timing of migration to Nodal's new data center configuration.

- Data management and retention: ensuring Nodal can recover uncorrupted versions of data that is attacked or changed

- Employee and staff vetting: ensuring Nodal hires trustworthy staff members

- Identity and access management: ensuring systems users and operators are who they say they are

- Patch management: keeping key third-party systems up to date with security-related patches

- Penetration testing: conducting ethical hacking engagements to improve external and internal defenses as well as staff responses to security issues

- Personal technology: recognizing staff laptops and phones as particularly vulnerability vectors for malicious activity and securing them appropriately

- Physical security: controlling access to Nodal physical sites

- Secure application development and design: through application testing and code review, ensure software engineers use security best practices

- Security incident management: documenting and practicing appropriate responses to security events

- Staff cybersecurity awareness program: using explicit training and testing to build a culture of good habits and critical thinking about potential security threats

- Vulnerability scanning: using an automated tool to guide hardening of OS, network, firmware, and third-party systems

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.*

Nodal Clear maintains Business Continuity and Failover and Disaster Recovery plans that contain procedures to support its objective of recovering from a wide-scale or major disruption within two hours. A two-hour recovery time is sufficient for Nodal Clear to complete its end-of-day processing. These plans contain provisions for communication to key market stakeholders, such as Clearing Members and participants.

Nodal Clear replicates transaction data to backup systems at its primary site and to its secondary site systems. While most failover scenarios should not generate any need to reconcile trade information with Clearing Members, the Failover and Disaster Recovery Plan documents the requirement to communicate with Clearing Members to confirm recent transactions and to reconcile trade information.

Nodal Clear's Business Continuity Plan covers scenarios in which an entire geographical region is disrupted, preventing Nodal Clear's personnel from working or its systems from operating. To ensure coverage in these scenarios, Nodal Clear maintains a secondary site located in a geographic region with a distinct risk profile from that of its primary site. Further, Nodal Clear employs staff that work remotely from its headquarters location and who can continue operations in the event of a disaster at the headquarters location.

Nodal Clear runs Business Continuity Procedures and Failover/Disaster Recovery testing twice per year. These testing activities include failover from the primary to the secondary site, as well as ensuring that remote staff are able to run the systems. Nodal Clear participates in the FIA's industry disaster recovery test, which incorporates Clearing Members and participants.

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.*

Nodal Clear has identified risks to its operations from its Clearing Members, Approved Financial Institutions, the Society for Worldwide Interbank Financial Telecommunications (**"SWIFT"**) network, and disruption to its headquarters facilities. Nodal Clear has taken the following steps to mitigate these risks:

Clearing Members. Nodal Clear's Risk Management Framework and Default Management Plan provide robust resources and procedures in the event of a Clearing Member default. Nodal Clear participates in the FIA Disaster Recovery testing to ensure that Clearing Members can connect to Nodal Clear in the event it is operating from its secondary site.

Approved Financial Institutions. Nodal Clear uses Approved Financial Institutions for purposes of settlement and other payment flows with Clearing Members. In the event that an Approved Financial Institution is unavailable, Nodal Clear will route transactions through a different Approved Financial Institution. Nodal Clear tests these backup procedures on an annual basis. Nodal Clear also reviews Approved Financial Institution disaster recovery plans on an annual basis.

SWIFT. Nodal Clear uses SWIFT messages for settlement instructions. Nodal Clear has backup procedures with each Approved Financial Institution that do not rely on SWIFT, and which can be used in the event the SWIFT network is unavailable.

Headquarters Disruption. Nodal Clear enables all staff to work remotely from the office and access key systems through virtual private networks (**"VPNs"**) so that staff may work away from the headquarters location in the event telecommunications or other headquarters utilities are unavailable. Nodal Clear's primary and secondary sites are remote from the headquarters location in Tier I data centers with multiple connectivity providers and backup power systems.

Nodal Clear mitigates the risks it poses to other FMIs through careful monitoring of its operational risk, as described in elsewhere in this response. Further, Nodal Clear has designed business continuity and disaster recovery processes that enable it to return to operations in two hours even in the event of a regional catastrophe. Nodal Clear's participation in the FIA Disaster Recovery test allows Clearing Members to test their ability to connect to Nodal Clear's secondary site.

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.*

Nodal Clear has established objective eligibility requirements for becoming a Clearing Member, which are disclosed publicly in the Nodal Clear Rulebook.

Certain of these eligibility requirements are risk-based, including a demonstration of:

- such fiscal integrity as would justify the Clearing House's assumption of the risks inherent in clearing contracts listed for trading on Nodal Exchange;
- financial capitalization commensurate with Clearing House requirements as set by the RMC from time to time, provided that the minimum capital requirement shall not be more than $50,000,000;
- registration as an FCM, if it is clearing on behalf of Customers;
- back-office facilities staffed with experienced and competent personnel or have entered into a facilities management agreement in form and substance acceptable to the Clearing House; and
- adequate operational capacity, including the ability to process expected peak volumes and values within required time frames, fulfill Collateral payment and delivery obligations imposed by the Clearing House and participate in any default management activities.

Clearing Members must also comply with Nodal Clear's financial reporting policies set out in Nodal Clear Rule 3.11, which are intended to provide Nodal Clear with an accurate and current picture of each Clearing Member's financial position.

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.*

Nodal Clear seeks to achieve fair and open access to prospective Clearing Members. The criteria for eligibility of Clearing Members of Nodal Clear are based on the least restrictive requirements that will not materially increase risk to Nodal Clear or its Clearing Members. These criteria are set out in Nodal Clear Rule 3.2.1. The participation requirements are designed to encourage an open marketplace for the industry.

There are two categories of Clearing Members: (1) members entitled to clear contracts through the Nodal Clear for their proprietary and Customer Accounts (FCM Clearing Members), and (2) members entitled to only clear their own proprietary accounts (House-Only Clearing Members).

All Clearing Members are monitored in a consistent manner and there are no differences in Nodal Clear's enforcement of the Clearing Members' obligations in accordance with the Rules of Nodal Clear.

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.*

Nodal Clear's Compliance and Risk Departments monitor its Clearing Members' ongoing compliance with access criteria.

Specifically, the Nodal Clear Risk Team monitors market information, including reports in the news, credit rating changes, and changes in the credit default swap (**"CDS"**) market to ensure that Nodal Clear has access to timely information about Clearing Members' financial condition. The Risk Team also monitors financial reports submitted from the Clearing Members pursuant to Nodal Clear Rule 3.11. Should a Clearing Member's risk profile deteriorate, the Clearing Member will be placed on "Watch" status, which requires more in-depth reviews of the Clearing Member's financial condition. The Compliance Department reviews Clearing Members for timely submission of information required by Nodal Clear. On an annual basis, the Compliance and Risk Teams perform an in-depth review of Clearing Member's compliance with key Risk Policies.

The Nodal Clear Rulebook sets out procedures for managing the suspension and orderly exit of a Clearing Member that no longer meets Nodal Clear's membership requirements.

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.*

Clearing Members are direct participants of Nodal Clear. A Clearing Member's Customers are indirect participants of Nodal Clear, as are affiliated entities whose trades and positions are cleared by a Clearing Member in its House Account. These indirect participants could pose a risk to Nodal Clear if their losses were so large that they cause their Clearing Member to fail. Nodal Clear directly maintains information about the identity of indirect participants, their positions, and margin requirements. Nodal Clear establishes risk limits for each House and Customer Account based on its assessment of its Clearing Member's capacity to assume the account risks. Should Nodal Clear believe an indirect participant poses a risk to the Clearing House, it has the right to impose additional margin requirements to ensure the safety of the Clearing House.

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

The material dependency between direct and indirect participants that would affect Nodal Clear is that the Clearing Member (the direct participant) acts as the guarantor of the indirect participant (the Customer or affiliated entity). Hence, should a Customer generate large losses and not meet its obligations, the financial solvency of the Clearing Member will be at risk. Nodal Clear and the CFTC Regulations require Clearing Members that are FCMs to have sound risk management policies to mitigate this risk exposure. Nodal Clear further requires that all Clearing Members place a Trade Risk Limit governing position risk for each of the Clearing Member's House and Customer Accounts. Nodal Clear also monitors the financial risk that Customers assume, and places limits on the size of this risk relative to the Clearing Member's capitalization.

***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.*

Nodal Clear monitors indirect participant volumes and risk exposure, and can identify indirect participants that are responsible for volumes or risk assumption that are large relative to the capacity of the Clearing Member. Nodal Clear imposes limits on the amount of risk a Customer can assume relative to Clearing Member capitalization.

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

As noted above, the risk arising to Nodal Clear from indirect participants is the risk that an indirect participant default could precipitate a Clearing Member default. Nodal Clear includes risk from

Customers in its Risk Management Framework and associated procedures. The Risk Management Committee reviews the Risk Management Framework on an annual basis and adopts changes on an as-needed basis whenever a deficiency is identified.

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

Nodal Clear does not maintain links with other CCPs.

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.*

Nodal Clear and its parent, Nodal Exchange, were created to bring the opportunity to trade futures products to underserved areas of the energy markets, and Nodal Clear regularly communicates with its stakeholder communities to understand how it can offer products to best meet their needs.

Nodal Clear has dedicated staff to support Clearing Members. Nodal Clear regularly communicates with its Clearing Members, solicits their input on key system and product changes, and responds to feedback from Clearing Members. Nodal Clear staff who support Clearing Members participate in the company-wide prioritization process for system development to ensure that Nodal Clear is responsive to Clearing Member needs. Also, Nodal Clear's Risk Advisory Committee is largely composed of Clearing Members and provides advice to the Risk Management Committee on risk and risk-related product issues.

Nodal Clear and Nodal Exchange are also members of the FIA, and actively participate in its conferences and meetings to learn about and respond to industry developments.

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.*

Nodal Clear has clearly defined goals and objectives for its operations. Nodal Clear establishes operational metrics and goals through its Operational Risk Framework process and risk management goals through its Risk Management Framework process.

Nodal Clear establishes operational goals around meeting key daily processing times, and measures the times for key information, such as when position files, pricing files, and margin reports are posted to the market. Nodal Clear also sets operational goals for the completion of each of its two daily margin run processes.

Nodal Clear's Risk Management Framework establishes goals for initial margin performance, and measures these goals based on backtests of actual and model product portfolios.

Nodal Clear management reviews performance against operational goals on a quarterly basis, and has more frequent reviews of risk performance. The Board reviews performance against operational targets on an annual basis, and reviews performance versus key risk goals on a quarterly basis.

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

As stated above, Nodal Clear measures its performance against key operational metrics and routinely reviews this performance. During these reviews, Nodal Clear identifies additional ways to create effective and efficient operations, and then implements these improvements so that it is always improving the efficiency and effectiveness of its operations. Nodal Clear also has staff dedicated to supporting Clearing Members, and these staff suggest improvements to Nodal Clear's services based on Clearing Member feedback.

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.*

Nodal Clear routinely publishes a variety of information to its Clearing Members, using internationally accepted communication procedures and standards, including the following:

- FIX for trade reporting;
- SWIFT for settlement instructions;
- SFTP for delivery of files with price, position, end-of-day trade summary, and banking information; and
- PDF for documents such as circulars.

Nodal Clear does not engage in cross-border operations.

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.*

Nodal Clear's rules are published in its Rulebook, which is publicly available on its website. The provisions of the Nodal Clear Rulebook comprehensively govern all aspects of the Clearing House's activities, including Clearing Member eligibility requirements; on-going Clearing Member recordkeeping, reporting, and other requirements; default procedures; liquidity procedures; emergency procedures; and disciplinary procedures.

Changes to the Nodal Clear Rulebook may be prompted by Clearing Member or participant feedback consistent with regulatory requirements, changes in the regulatory environment, or operational changes. The Board or its designee must approve all changes to the Rulebook. Before updating its Rulebook, Nodal Clear provides notice of the proposed change, including a redline comparison of the affected text, on its website, and also notifies the CFTC of the proposed change. Both notifications are provided 10 business days before any Rule change goes into effect.

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.*

Nodal Clear provides its Clearing Members documentation on its system design and operations through both detailed interface specifications and training materials. These materials are made available to all Clearing Members and their independent software vendors.

The Nodal Clear Rulebook contains information about key decisions, including the relevant personnel or committee authorized to make them and whether discretion is permitted. The Nodal Clear Rulebook also provides information about participants' rights, obligations and risks incurred through participation on Nodal Clear. Existing and potential Clearing Members are able to assess their potential risks by reviewing the provisions of the Nodal Clear's Rulebook, which is publicly available on its website.

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.*

Nodal Clear maintains training materials and dedicated staff to facilitate its Clearing Members' understanding of Nodal Clear's Rules and procedures. These training materials include written systems manuals, videos demonstrating system functionality, and customized training sessions at a Clearing Member's request. Nodal Clear has staff dedicated to supporting Clearing Member questions, and this staff work to identify issues and inform Clearing Members on how to best use Nodal Clear's systems and comply with Nodal Clear rules and procedures.

Nodal Clear's Chief Compliance Officer is responsible for monitoring Clearing Members' compliance with rules. To this end, the Chief Compliance Officer conducts audits of Clearing Member financial and reporting obligations. The Nodal Clear Rulebook contains processes for disciplining Clearing Members to enforce compliance with applicable requirements.

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.*

Nodal Clear posts fee information at the level of its individual services in a fee schedule that is available on the Nodal Clear website. Nodal Clear will either issue a directed memo or a public announcement when it changes the fee schedule. The only connectivity required for Nodal Clear is Internet connectivity; therefore, Nodal Clear has no disclosures related to technology costs.

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.*

Nodal Clear provides complete responses to the CPSS-IOSCO disclosure framework for registration as a DCO with the CFTC. This disclosure will be publicly available and updated following any material changes or every two years.

Nodal Clear makes price, volume, and open interest information available to the public on its website. This information is updated every trading day. Nodal Clear makes certain aggregate metrics on the business available through this disclosure. All Nodal Exchange disclosures are in English.

Principle 24: Disclosure of market data by trade repositories

Nodal Clear is not a trade repository.