Qualitative self-assessment against the CPMI-IOSCO Principles for Financial Market Infrastructures

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1. Executive Summary

This disclosure presents the self-assessment Cboe Clear Europe N.V. (Cboe Clear) has performed against the Principles for Financial Market Infrastructure (PFMI), and related guidance as published by the Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO). The self-assessment which was completed using the PFMI Disclosure Framework and Assessment Methodology as published by the CPMI and IOSCO, does not cover the following principles as they are not applicable as explained below:

Principle 10 (Physical deliveries): Cboe Clear does not clear commodities and does not clear financial instruments that require delivery of an instrument in physical form.

Principle 11 (Central securities depositories): This principle applies to central securities depositories only and therefore is not applicable to Cboe Clear.

Principle 24 (Disclosure of market data by trade repositories): This principle applies to trade repositories only and therefore is not applicable to Cboe Clear.

This self-assessment demonstrates how Cboe Clear complies with the PFMI as a central counterparty (CCP). It is produced using the data available as of 30 September 2025.

In addition to this assessment, Cboe Clear publishes quantitative disclosures on its website, as expected of CCPs under Principle 23 - Key Consideration 5 of the PFMI, and in accordance with the CPMI-IOSCO Public quantitative disclosure standard for CCPs dated February 2015.

Unless otherwise defined herein, capitalised terms used in this document have the same meaning as in the Cboe Clear Clearing Rules.

2. Overview of Cboe Clear

2.1. General

Cboe Clear provides post-trade services for cash equities (and equity-like instruments), ETPs, SFTs, and index futures and options contracts traded on the Cboe Europe platform (CEDX). Cboe Clear centrally manages counterparty risk after an executed trade has been sent to Cboe Clear and accepted for clearing. Cboe Clear delivers securities or makes payment to counterparties to the relevant contract at the price agreed at trade execution, even if the original counterparty to the trade has defaulted on its obligations.

Cboe Clear provides post-trade services to 46 platforms as per 30 September 2025. The list of platforms can be found on the Cboe Clear website.

2.2. Legal and Regulatory Framework

Cboe Clear is a Dutch limited liability company incorporated under the laws of the Netherlands, having its registered office at the Symphony Offices, Gustav Mahlerplein 77, 1082 MS Amsterdam, the Netherlands.

Cboe Clear was formed on 5 December 2013 through the combining of European Multilateral Clearing Facility N.V. and European Central Counterparty Limited, both incorporated in 2007. Cboe Clear maintains a two-tier board structure in accordance with the legal requirements for a Dutch limited liability company and is a wholly owned subsidiary of Cboe Worldwide Holdings Limited.

Cboe Clear is registered in the Dutch commercial register under number 34268194 and has a branch office in London that is registered in the UK as a UK Establishment with Company No. FC031747 and UK Establishment No. BR016817.

Cboe Clear’s Legal Entity Identifier (LEI) is 724500937F740MHCX307.

Cboe Clear’s national competent authorities are De Nederlandsche Bank (DNB, the Dutch Central Bank) and the Autoriteit Financiële Markten (AFM, the Netherlands Authority for the Financial Markets). The European Market Infrastructure Regulation (EMIR)[1] requires all CCPs operating in the European Union to meet common risk management, governance and capital adequacy standards. On 1 April 2014, Cboe Clear obtained authorisation under EMIR to operate as a CCP within the European Union (and EEA). Cboe Clear is also a designated system under the Settlement Finality Directive (SFD) (as amended)[2].

Effective 10 January 2023, the Bank of England granted Cboe Clear permanent recognition as an non-UK CCP under UK EMIR and permanent designation as a system under the UK Settlement Finality Regulations.

Cboe Clear is recognised as a foreign CCP under Swiss law since December 2016.

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[1] Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories.

[2] Directive 98/26/EC of the European Parliament and of the Council of 19 May 1988 on settlement finality in payment and securities settlement systems.

3. Detailed Assessment Report

3.1 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.

Cboe Clear achieves a high degree of certainty for the legal basis of its material activities through assessment by the Cboe Clear legal function, and by use of the services of external counsel. The material aspects requiring a high degree of legal certainty are the contract formation between Cboe Clear and Clearing Participants and interoperable CCPs (Co-CCPs), the collateral arrangements, the arrangements for the settlement of Open Positions in the CSDs and the (enforceability of the) default procedures including close-out netting. As appropriate, Cboe Clear obtains or requests legal opinions on the enforceability in the relevant jurisdiction(s) of its Clearing Rules and the contractual arrangements listed below:

1. Post Trade Services Agreements (PTSA) / Clearing Services Agreements (CSA): these are the agreements between Cboe Clear and platforms;
2. Clearing Participant Agreements (Clearing Participant Agreement): these are the contracts between Cboe Clear and the direct and general Clearing Participants, binding the Clearing Participants to the Clearing Rules;
3. Clearing Rule Book: this sets out the general terms and conditions of the service, including the default provisions;
4. Regulations: these set out additional details, terms and conditions of the service and together with the Clearing Rule Book form the Clearing Rules;
5. Master Clearing Link Agreements with Co-CCPs: these set out the contract formation between Cboe Clear and the Co-CCPs and form the basis for collateral provision and default handling between the relevant CCPs;
6. Pledge and Title Transfer Agreements for collateral provision by Clearing Participants and Co-CCPs;
7. Statements of Authority: these allow Trading Participants to submit transactions for clearing at Cboe Clear on behalf of Clearing Participants;
8. Admission agreements between the CSDs and Cboe Clear for the markets with direct access and contracts with settlement agents; and
9. Contracts and service level agreements between Cboe Clear and its (IT) services providers and vendors.

The relevant jurisdictions for each material aspect of Cboe Clear's activities are Austria, Czech Republic, Denmark, Finland, France, Germany, Hungary, Ireland, Italy, the Netherlands, Poland, Spain, Sweden, Switzerland and the United Kingdom.

The core of the default procedures and in particular the close-out netting is provided for in the Clearing Rules consistent with the way in which netting is foreseen in master netting agreements such as the ISDA Master Agreements or the Global Master Repurchase

Agreement. Cboe Clear has obtained legal opinions from external counsel confirming the soundness and enforceability of its Clearing Rules and the arrangements included therein.

Cboe Clear is a designated system under the SFD. The receipt of trade data, from platforms and Clearing Participants (via service providers) for OTC trades, qualifies as an entry into a settlement finality system and is irrevocable for the purposes of Dutch bankruptcy law.

As mentioned above in section 2.2, Cboe Clear is a designated system under the UK Settlement Finality Regulations.

Key Consideration 2:

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

The Clearing Rules, standard contractual agreements and selected procedures are publicly available on its website and are designed to conform with Dutch law and EMIR. The Clearing Rules outline how rule changes are made, including governance and Clearing Participant notification and consultation. Changes to the Clearing Rules are reviewed and approved by the Cboe Clear Clearing Rules Committee. Cboe Clear publishes proposed changes to the Clearing Rules, either for notification or for a minimum 30-day consultation period as required.

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.

Cboe Clear is organised pursuant to the company laws of the Netherlands. Cboe Clear's articles of association (Articles of Association) govern the functioning of Cboe Clear, including the business of the company, share capital and management structure. Information on the legal basis for Cboe Clear activities is published on its website. This information includes the status of Cboe Clear under Dutch company law, its regulatory authorisation status, management and governance structure, the Clearing Rules, and standard contractual agreements.

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 Clearing Participant Agreement and Clearing Rules governing the relationship between Cboe Clear and its Clearing Participants are governed by Dutch law and have been drafted and maintained by the Cboe Clear legal function, and where necessary assisted by external Dutch legal counsel.

Cboe Clear has obtained confirmation from external counsel that its rules are enforceable under Dutch law. Cboe Clear is not aware of any court in any relevant jurisdiction that has held that the actions under its rules, procedures or contracts could be voided, reversed or be 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.*
The rules of Cboe Clear are governed by Dutch law. Cboe Clear has received confirmation from external counsel that its rules are enforceable under Dutch law. Cboe Clear is not aware of any potential conflict of laws across relevant jurisdictions in respect of its rules.

3.2 Principle 2: Governance

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

Key Consideration 1:

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

The Cboe Clear mission which is published on its website is the provision of outstanding risk management, capital and operational efficiencies, customer experience and innovation for the benefit of Clearing Participants and venues. Cboe Clear's strategy is to collaborate and innovate with its clients and industry partners and strengthen the markets in which it operates. Cboe Clear achieves this by delivering products and services that are designed in partnership with its users to provide best in class service, functionality, and enhance the markets in which it operates.

Cboe Clear promotes safety and efficiency by focusing on settlement efficiency and maximizing netting opportunities for market participants by means of an open access philosophy that is demonstrated by connecting to as many platforms as possible. Offering the ability to net trades sent for clearing from one trade source with those sent for clearing from another trade source is key to aiding market participants to reduce risks and potential costs while increasing efficiency.

Cboe Clear's Management Board (Management Board) monitors progress on business objectives by benchmarking against the annual corporate objectives.

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.

Cboe Clear maintains a two-tier board structure that is in accordance with Dutch company law. Cboe Clear has a clear and transparent governance structure including the Management Board, the Supervisory Board, and committees with delegated authority. In accordance with the Articles of Association of Cboe Clear, the Supervisory Board may consist of a maximum of eight members, with a maximum of three independent supervisory directors.

As of 30 September 2025, the Supervisory Board consisted of five members (three supervisory directors representing the shareholder and two independent supervisory directors), and the Management Board consisted of four members (the President, the Chief Operating Officer, Chief Risk Officer and the Chief Technology Officer).

All governance bodies are subject to written rules or terms of reference, setting out the respective scope and objectives, roles and responsibilities, and where appropriate, their legal and regulatory basis or mandate.

Information on the governance arrangements is available on the Cboe Clear website. The terms of reference of the EMIR Risk Committee are available upon request.

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.*
Pursuant to the Articles of Association, the Management Board represents Cboe Clear and is responsible for managing the company's general affairs and the business connected with it. The Management Board fulfils all duties and powers assigned to it by Dutch law, EU regulations, and the Articles of Association. The Management Board is accountable to the Supervisory Board the General Meeting and is expected to consider the interests of all stakeholders including employees. The General Meeting appoints members of the Management Board based on nominations of the Supervisory Board. Cboe Clear's Rules governing the Management Board and Cboe Clear's Rules governing the Supervisory Board set out the procedures for the functioning of the Management Board and Supervisory Board, respectively. Procedures to identify, address and manage conflicts of interest, whether actual or potential, are set out in the Articles of Association, Cboe Clear's Rules governing the Management Board, Cboe Clear's Rules governing the Supervisory Board, and Cboe Clear's Conflicts of Interest Policy. In accordance with the Articles of Association, the Supervisory Board is charged with overseeing the Management Board's policy and the general course of affairs within the company. This includes advising the Management Board on the company's strategy, monitoring its performance in achieving its financial and social objectives, the design and effectiveness of the internal risk management and control systems, the financial reporting processes, and compliance with applicable legislation. There are four standing committees: the Audit Enterprise Risk and Compliance Committee, the Remuneration Committee, the Nomination Committee and the EMIR Risk Committee. The Audit Enterprise Risk and Compliance Committee is established to assist in the fulfilment of oversight responsibilities for the enterprise risk and financial reporting process, the system of internal control, the audit process, and the company's process for monitoring compliance with laws and regulations. The Remuneration Committee is established to assist in the fulfilment of responsibilities for the remuneration of the members of the Management Board and for the target setting and performance evaluation of the members of the Management Board and of the company as a whole. The Nomination Committee nominates independent members of the Supervisory Board for appointment by the General Meeting. As of September2025, the EMIR Risk Committee comprises three Clearing Participant representatives, three Trading Participant representatives and is chaired by an independent member of the Supervisory Board. The EMIR Risk Committee gives advice to the Supervisory Board and the Management Board on any arrangements that may affect the risk management of the CCP. The terms of reference for this committee comply with the requirements of Article 28 of EMIR.

The terms of reference for each Supervisory Board committee form part of the rules governing the Supervisory Board.
Key Consideration 4: *The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s).*
The members of each the Supervisory Board and the Management Board have been selected on the basis of their expertise and experience. Cboe Clear ensures that the Supervisory Board and the Management Board each have the appropriate skills and incentives to fulfil their multiple roles and duties. The General Meeting appoints the members of the Management Board based on the nominations by the Supervisory Board. When preparing nominations for the Management Board, the Supervisory Board prepares a profile of the scope and composition, taking into account the nature of the business, its activities, and the desired expertise and experience. The profile considers aspects of diversity in the composition of the Management Board that are relevant to the company and states what specific objective is pursued in relation to diversity. The General Meeting appoints the members of the Supervisory Board with the independent members being first nominated by the Nomination Committee of the Supervisory Board. When appointments are made, the Supervisory Board prepares a profile of its desired scope and composition, taking into account the nature of the business, its activities, and the desired expertise, experience and independence of its members. The Management Board members collectively have more than 80 years' experience in financial services and markets, with over 50 years gained from employment at and management of a CCP. The three shareholder directors of the Supervisory Board collectively have more than 85 years' experience in financial services and markets, and the two independent non-executive directors collectively have more than 70 years' experience in financial markets including central bank policy.
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.*
As previously mentioned, Cboe Clear operates a two-tiered board structure in the form of a Management Board and Supervisory Board. The Articles of Association set out the roles and responsibilities of each board, and this is further delineated in internal governance documentation assigning tasks pursuant to the Articles of Association and EMIR. Dutch law and EMIR provisions govern the Management Board, its roles, responsibilities and required skills. The Management Board responsibilities are reflected in the Articles of Association and the Cboe Clear Rules governing the Management Board. Pursuant to the Articles of Association, members of the Management Board can be removed by the General Meeting. In general, the Management Board is responsible for the management of the company and is therefore tasked with developing objectives and strategies for Cboe Clear that are consistent with the company mission and vision, regulatory permissions and applicable laws.

In addition to the Management Board members, Cboe Clear employs senior managers, who all have considerable experience in financial markets, and in particular, have expertise gained from employment with a CCP.

Similarly, the Supervisory Board roles and responsibilities are reflected in the Articles of Association and the Cboe Clear Rules governing the Supervisory Board. The Supervisory Board provides advice to and oversees the Management Board. Independent members of the Supervisory Board are identified in the Supervisory Board information published on the Cboe Clear website.

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.

Cboe Clear has a control framework in place to measure, monitor and manage the risks it faces. An integral component of the control framework are the policies, procedures and processes that support Cboe Clear's internal control management in relation to a number of areas including operational risk, business continuity, record keeping, information security/cyber-security, governance, finance, treasury, legal, compliance/regulatory, human resources and operations.

The Enterprise Risk Policy outlines all material risks of the company and the approach to the management of these risks. This policy is reviewed on an annual basis, or more frequently as needed, and is approved by the Management Board. The Management Board is responsible for compliance with and execution of the Risk Tolerance Statements, with each risk category delegated to a senior manager and monitored through a Risk Tolerance Dashboard made available to the Supervisory Board, the EMIR Risk Committee and the Management Board on a monthly basis.

Regular monitoring and controlling are integral parts of Cboe Clear's Risk Management Framework. Automated real-time information systems are in place for managing credit and liquidity exposures while other types of exposures are monitored regularly. All exposures are monitored and controlled in line with the relevant policies.

Cboe Clear has a business continuity framework that is a component of the wider CFMS. This framework includes a Crisis Management Plan and Crisis Management Team (CMT). The CMT is responsible for carrying out the plan, which contains all necessary information, including crisis communications, and tools to enable the CMT to function properly. The business continuity framework is ISO 22301 certified.

The Risk Management, Legal and Compliance and Internal Audit functions report to the Supervisory Board, through the Chief Risk Officer, the Chief Compliance Officer, and the Head of Internal Audit, respectively.

The Cboe Clear Model Validation Policy sets the standards for model validations including the required governance steps.

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.

As previously mentioned, the Cboe Clear governance structure is designed to ensure ongoing engagement with its client base, which in turn allows Cboe Clear to remain responsive to users' business needs. Cboe Clear maintains two fora for stakeholder engagement – the Strategic Advisory Board (SAB) and the Market Advisory Council (MAC). Both fora operate under the principle that all information exchanged between its members and Cboe Clear is confidential. Relevant Management Board decisions are disclosed and discussed at the SAB and MAC, as appropriate.

The purpose of the SAB is to provide Clearing Participants with a formal forum in which they can engage with Cboe Clear and provide advice to Cboe Clear on strategic matters. The SAB is comprised of at least five Clearing Participants, and as outlined in its terms of reference shall convene scheduled meetings twice per year. The SAB may also convene extraordinary meetings, if required, in addition to the twice-yearly meetings.

The purpose of the MAC is to provide Clearing Participants with a forum where information relevant to key Cboe Clear business initiatives and operational updates can be shared. As per the MAC Guidance notes, MAC meetings are scheduled four times per year, and there is no minimum or maximum limit on the number of members.

Cboe Clear also conducts regular service reviews with its connected platforms. Pursuant to PTSAs Cboe Clear enters into with its connected platforms, the parties may also establish a Trading and Clearing Committee to discuss operational, legal and commercial matters relating to the market as a whole (such as segments, size and volume) and relating to the terms and conditions of the PTSA.

In accordance with the Clearing Rule Book, Cboe Clear publishes the Clearing Rule Book, Regulations and other decisions of general application to its Clearing Participants or to the relevant category of Clearing Participants by publishing them on its website or by issuing individual notifications as appropriate. Major initiatives are therefore notified to Clearing Participants through a combination of informal soundings, formal communications, Clearing Rule Book consultations and participation in fora such as the EMIR Risk Committee, the MAC and SAB.

3.3 Principle 3: Framework for the Comprehensive Management of Risks

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

Key Consideration 1:

An FMI should have risk-management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMI. Risk-management frameworks should be subject to periodic review.

Cboe Clear measures, monitors and manages a number of risks to its operations in its risk framework, which are categorised into four broad categories: (1) general business risk (risks related to the administration and operation of an FMI): strategic risk, capital risk, financial reporting & control risk, client risk, legal risk, compliance risk, people risk, change management risk and audit risk; (2) core CCP risks (risks related to the functioning as a CCP): credit/market risk, investment risk, liquidity risk, processing risk, systems, IT Infrastructure risk, operational risk and cyber and information security risk; (3) ecosystem risks (risks related to value chain partners, vendors regulatory developments and reputational events): network risk, vendor risk, regulatory risk, reputational risk and climate risk ; and (4) business environment risks (risks related to Cboe Clear's market position, geopolitical climate and innovation development): market position risk, and (geo)political risk. All of these risks are outlined in the Cboe Clear Enterprise Risk Policy.

Cboe Clear has a control framework that measures, monitors and manages the risks the CCP faces. An integral part of this framework are policies, procedures and processes that support Cboe Clear's internal control management in relation to a number of areas including operational risk, business continuity, recordkeeping, information security/cyber-security, governance, finance, treasury, legal, compliance/regulatory, human resources, and operations.

Cboe Clear has various systems in place to help identify, measure, monitor and manage the risks that it faces. For instance, the risk system is key for credit and market risk, the accounting and general ledger system is key for capital and financial reporting, as is the system for the tracking and recording of operational events and the screening tool used for certain compliance risks. Importantly, systems are in place to enable regular back-testing, sensitivity testing, reverse stress testing and daily stress testing.

All policies within the control framework are reviewed and updated at least annually by policy owners and must be approved by the Management Board. In addition, policies, processes and procedures are reviewed and updated whenever significant changes require it. The policies related to risk management (for example Margin Policy, Collateral Policy, Stress Test Policy) require Management Board approval and depending on the policy and the significance of the change, may require review and advice from the EMIR Risk Committee.

Cboe Clear's Risk Governance Board, which includes Management Board members, meets monthly to assess the effectiveness of the company's control framework including risk management tools) and annually to assess whether the control framework is sufficient to identify and manage the risks Cboe Clear faces. In addition, and in accordance with the Cboe Clear Internal Audit Charter, certain processes of Cboe Clear are subject to annual audits as set out periodically in the Internal Audit Programme, such as the business continuity management component of the control framework being audited annually.

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.

Cboe Clear provides its Clearing Participants a full suite of reports, including margin requirement reports, interoperability fund deposit reports, Clearing Fund contribution reports, transactions reports, outstanding settlement reports and fees reports, which are provided at least daily. In addition, Clearing Participants have the option to receive transactions reports on a real-time basis and/or on a batch basis. These reports cover the primary risks (i.e. credit and market risks) that Clearing Participants pose to Cboe Clear, enabling Clearing Participants to manage and contain such risks. Clearing Participants may also use the (risk management) tool TRACE, which enables the Clearing Participant to follow its own positions, P&L and margin requirement and set warning limits based on P&L and margin requirement thresholds.

The credit risk that a Clearing Participant poses to Cboe Clear consists of the net positions resulting from cleared but not yet settled transactions and those transactions that fail to settle on the intended settlement date (ISD). Cboe Clear incentivises Clearing Participants to monitor and manage the risk posed by unsettled net positions by requiring Clearing Participants to transfer collateral to Cboe Clear to cover the margin requirements of such positions or, RQV assets in the case of an SFT transaction. The collateral that Clearing Participants deposit is proportionate to the exposure they bring to Cboe Clear. In addition, Clearing Participants are required to make contributions to the Clearing Fund, which are proportionate to their average margin requirement and the same applies to deposits to the interoperability fund. Cboe Clear's margin and collateral policies are designed to ensure that Cboe Clear has sufficient highly liquid collateral in place to protect the CCP and its members. Lastly, Cboe Clear charges Clearing Participants a fail fee for trades that fail to settle on ISD.

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.

Cboe Clear routinely reviews the parties with which it interacts and whether such interaction results in material risks due to interdependencies. Cboe Clear has identified entities from which it bears or to which it poses material risks including Co-CCPs, CSDs, Central Banks, settlement agents, trading platforms, Clearing Participants, Trading Participants, liquidity providers and vendors.

The risk that Co-CCPs bring to Cboe Clear is comparable to that of a Clearing Participant. The credit risks arising from Co-CCPs are mitigated in the same way as for Clearing Participants, through margin requirements and inclusion of the portfolios of Co-CCPs in the testing of financial resources adequacy. Cboe Clear also collects collateral from those Clearing Participants that make use of Cboe Clear's interoperable links with Co-CCPs, to cover the margin calls issued by such Co-CCPs.

Cboe Clear also faces the risk that service providers may not be able to provide their services either temporarily or for a longer period, which in turn impacts Cboe Clear's own ability to provide its services. For temporary disruptions, business continuity plans are in place but if a service provider experiences an outage for a longer period, Cboe Clear may be subject to substantial risks. For that reason, Cboe Clear engages with various liquidity providers and periodically assesses these parties against both credit risk and operational risk standards. Monitoring of CSDs and central banks is limited to operational risk standards.

Cboe Clear periodically reviews the resilience and risk maturity of its critical vendors and network partners through due diligence questionnaires. Critical vendors are required to demonstrate their planning for disruptions to their services and recovery capabilities to ensure that Cboe Clear services are not impacted. The results of the questionnaire for each critical vendor are reviewed and any remediation actions discussed with vendors. The material risks that Cboe Clear faces are a loss of service from suppliers or network partners that then impact the services of Cboe Clear. The vendor and network partner questionnaires are designed to assess the resilience of providers and gain assurance that suppliers and partners can support the Cboe Clear 2-hour recovery time objective (RTO).

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.

Cboe Clear maintains a risk register where it registers scenarios that may potentially prevent Cboe Clear from providing its critical operations and services. The Management Board, Risk Management and specialists from other departments review the risk register in its entirety on at least an annual basis. During a review, all scenarios are rated for both likelihood and impact, and where the combined likelihood/impact score is deemed too high, additional mitigation actions are planned. The occurrence of specific events may also trigger a review of the risk register.

Where risks in the risk register are linked, further actions may be defined and assigned. For example, the risk that Cboe Clear is exposed to a loss of client volumes that would impact the validity of its business can be linked to other risks such as external events (e.g. geopolitics, market dynamics) but also to Cboe Clear specific risks such as service quality/customer satisfaction.

Cboe Clear has in place a recovery plan and a wind-down plan. The main recovery tools include calls for losses beyond the default waterfall, calls for additional liquidity resources and calls for replenishment of the Clearing Fund. Cboe Clear has a procedure for reinstating the skin in the game and minimum capital. Furthermore, Cboe Clear has access to tools to address non-default losses such as capital and insurance policies, which are recovery tools identified by CPMI-IOSCO in their publications on recovery.

As mandated under EMIR, Cboe Clear has a wind-down plan that describes the expected steps to terminate CCP services. Winding down commences with the external communication of the decision to do so, in the event that Cboe Clear can no longer operate as a going concern, EMIR requirements can no longer be met, or if Cboe Clear's license is revoked. In an orderly wind-down strategy, the aim is to cease the operations and services of the CCP over time while at the same time providing the operations and services at a basic level until they are wound down.

The focus of both the recovery and wind-down plans is to preserve the continuity of Cboe Clear's critical services. The plans highlight that sufficient buffer is to be held to continue the provision of critical services and maintenance of key systems and provide that staff members should be identified and prioritised. In the event of a recovery or wind-down situation, the Management Board has discretion to take decisions to protect the critical services of Cboe Clear. The plans also highlight that Cboe Clear's obligations under EMIR remain in a recovery or wind-down situation. The tools to execute the recovery and wind-down plans are designed to allow critical services to be continued at all times.

The recovery and wind-down plans are required to be reviewed and approved by the Management Board on an annual basis but can also be reviewed ad-hoc, whenever required due to significant changes.

3.4 Principle 4: Credit Risk

An FMI should effectively measure, monitor, and manage its credit exposure to participants and those arising from its payment, clearing, and settlement processes. An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two largest participants and their affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions. All other CCPs should maintain, at a minimum, total financial resources sufficient to cover the default of the one participant and its affiliates that would potentially cause the largest aggregate credit exposures to the CCP in extreme but plausible market conditions.

Key Consideration 1:

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

Cboe Clear is exposed to credit risk predominantly in the event that a Clearing Participant fails to meet a financial or contractual obligation. Cboe Clear mitigates credit risk by having minimum Clearing Participant capital requirements and by monitoring their financial health. In addition, Clearing Participants must transfer collateral in order to cover potential losses to Cboe Clear in the event of a Clearing Participant default. If collateral to cover the margin requirement does not completely cover the loss in a Clearing Participant default, there are additional financial resources available to Cboe Clear, such as Clearing Fund contributions. Co-CCPs pose credit risk to Cboe Clear in the same way as a regular Clearing Participant, and such risk is mitigated in a similar way.

Cboe Clear maintains a comprehensive framework for managing credit exposures which includes: (i) regular assessment of Clearing Participant and service provider creditworthiness, (ii) approved methodologies for calculating current exposures (variation margin or 'VM'), potential future exposures (initial margin or 'IM' and associated stress testing), and collateral haircuts, (iii) maintenance of a default waterfall that includes a layer of skin-in-the-game in line with regulatory requirements, pre-funded Clearing Fund (Default Fund) and Interoperability Fund (if the defaulter is a Co-CCP), (iv) maintenance of a default handling procedure for managing credit exposure in the event of a default, (v) restrictions on acceptable collateral along with concentration limits, (vi) maintenance of an approved investment policy, and (vi) the maintenance of appropriate clearing rules, regulations, policies and procedures.

Cboe Clear reviews all elements of the framework for the management of credit exposures at least annually, or more frequently where changes in market conditions and market practice require such review. The introduction of a new product could also lead to a review of the framework. Additionally, Cboe Clear performs a test of its default handling procedures on at least an annual basis.

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.*
Cboe Clear identifies sources of credit risk based on the nature of the clearing services it provides to Clearing Participants. These sources of credit risk are set out in Cboe Clear's policies and procedures and cover the credit risk posed by: (i) the potential default of a Clearing Participant or Co-CCP, (ii) the potential default of the issuer of debt instruments provided as collateral, and (iii) the potential default of a counterparty with whom Cboe Clear undertakes investments. Cboe Clear measures and monitors credit exposures arising from the potential default of Clearing Participants and collateral issuers in near real-time using its risk system. Cboe Clear calculates margin requirements in real-time covering current mark-to-market and potential future exposures. Cboe Clear requires all Clearing Participants to lodge margin collateral to meet their margin requirements at all times. Clearing Participants must meet margin calls accordance with the Clearing Rules. The effectiveness of the margin requirements calculation is back-tested daily to ensure sufficiency of collateral held in the event of a Clearing Participant default. Additionally, Cboe Clear requires all Clearing Participants to post contributions to a mutualised Clearing Fund to cover the potential default of the largest two Clearing Participants (and their affiliates) under extreme but plausible market conditions. Cboe Clear sets minimum thresholds for the credit quality of collateral that it accepts from Clearing Participants, as well as concentration limits for particular types of collateral and criteria to select its investment counterparties.
Key Consideration 3: *A payment system or SSS should cover its current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (see Principle 5 on collateral). In the case of a DNS payment system or DNS SSS in which there is no settlement guarantee but where its participants face credit exposures arising from its payment, clearing, and settlement processes, such an FMI should maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.*
Not applicable – Cboe Clear does not operate a payment system or SSS.
Key Consideration 4: *A CCP should cover its current and potential future exposures to each participant fully with a high degree of confidence using margin and other prefunded financial resources (see Principle 5 on collateral and Principle 6 on margin). In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should*

include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. In all cases, a CCP should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount of total financial resources it maintains.
Cboe Clear maintains approved methodologies for calculating current exposures (VM) and potential futures exposures (IM and associated stress testing). The IM model applies a 99% confidence level using an expected shortfall measure. Cboe Clear performs back-testing of its margin model, haircuts, and stress testing of its financial resources on a daily basis and reports the results of such testing to the Management Board and its regulator on a monthly basis. Test results are also shared with the EMIR Risk Committee on a quarterly basis to evaluate the ongoing effectiveness and appropriateness of stress test assumptions and parameters. Cboe Clear's margin model and stress testing framework are independently validated at least on an annual basis. All Clearing Participants are required to lodge margin collateral to cover their current and potential future exposures. Collateral haircuts are applied based on worst-case price moves over the past 30 years. Cboe Clear also maintains a default waterfall including a layer of skin-in-the-game in line with regulatory requirements, and a pre-funded Clearing Fund to cover potential future exposures of Clearing Participants on a Cover-2 basis under extreme but plausible market conditions. Margin collateral and Clearing Fund contributions are provided in the form of pre-funded cash or high-quality liquid assets. The Clearing Rule Book also provides for an amount of additional cash calls to be made in the event that default losses exceed the pre-funded financial resources. Cboe Clear ensures that its financial resources cover the default of the two participants and their affiliates that would create the largest credit exposure for Cboe Clear in extreme but plausible market conditions (irrespective of product(s) cleared). Additional financial resources are excluded from these calculations as they are not pre-funded and are not required for Cboe Clear to meet its coverage minimum. The rationale for the holdings of total financial resources of Cboe Clear is based on the standards set by EMIR. These standards underpin the Cboe Clear risk and finance related policies and procedures. All Cboe Clear policies are subject to approval by the Management Board and additionally risk policies and procedures are subject to review and advice from the EMIR Risk Committee.
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.

Cboe Clear determines the required amount of total financial resources on a daily basis, based on the potential default of the largest two clearing participants (and their affiliates) under extreme but plausible market conditions. Cboe Clear performs stress testing and reverse stress testing of its total financial resources on a daily basis and reports the results of such testing to the Management Board and its regulator on a monthly basis. Test results are also shared with the EMIR Risk Committee on a quarterly basis to evaluate the ongoing effectiveness and appropriateness of stress test assumptions and parameters.

Stress test results are reported to the Chief Risk Officer (CRO) and the second-line Risk team each day. These results show the adequacy of total financial resources. Where there is a resource shortfall, additional resources are called from participants to alleviate the shortfall. Testing results are also shared with the EMIR Risk Committee on a quarterly basis to evaluate the ongoing adequacy of financial resources.

Cboe Clear's stress testing framework and risk management model are independently validated on an annual basis.

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.

Cboe Clear's stress test scenarios cover extreme but plausible market conditions over the past 30 years, in accordance with regulatory requirements. The scenarios include extreme shifts in relevant risk factors (i.e. price moves of equities, bonds, and exchange rates), multiple clearing participant defaults, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions.

Key Consideration 7:

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

The rules relating to application of financial resources in the default waterfall, ordering and allocation of uncovered credit losses, and return of surplus collateral, are described in chapter 1, articles 14.7 to 14.10 of the Clearing Rule Book.

If default losses exceed pre-funded total financial resources in the default waterfall, Cboe Clear's rules provide for additional cash calls to be made, capped at twice the amount of each Clearing Participant's pre-default Clearing Fund contribution. The Clearing Rule Book also provides for the replenishment of the Clearing Fund after the completion of the default handling period and subsequent 30-day cooling-off period. During the cooling-off period, Clearing Participants are required to replenish the Clearing Fund up to their minimum contribution amount.

3.5 Principle 5: Collateral

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

Key Consideration 1:

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

Cboe Clear's Collateral Policy outlines and defines the framework for the assessment of collateral acceptance. In line with EMIR, Cboe Clear only accepts types of collateral that have low credit, liquidity and market risks. The Collateral Policy does not allow for exceptions and does not consider the acceptance of collateral that does not meet the defined criteria.

When a Clearing Participant deposits collateral, the Clearing Participant advises Cboe Clear and requests permission to deposit the collateral. Before permission is granted, Cboe Clear assesses the advised collateral and ensures that it meets the collateral requirements as set by Cboe Clear.

Once agreed, collateral postings are visible to Cboe Clear the moment it is paid in (cash-collateral) or matched in the relevant CSD (collateral in the form of securities). Cboe Clear receives SWIFT (MT910/MT517) messages that are uploaded in its collateral and risk management systems.

Cboe Clear applies a haircut to the collateral value and assesses whether it can liquidate the collateral without losing more than the haircut on the collateral. Concentration limits are in place with respect to individual issuers and per type of asset and are set on an individual Clearing Participant level and on the level of all Clearing Participants in aggregate. Collateral valuations including the application of relevant haircuts take place on a real-time basis.

To mitigate specific wrong-way risk, Cboe Clear does not accept collateral that is issued by a Clearing Participant (or Co-CCP) or a related entity.

Key Consideration 2:

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

Collateral instruments are valued using prices supplied by Refinitiv. Collateral instruments for which a price cannot readily be obtained will not be accepted as collateral at Cboe Clear. On an intraday basis, collateral is priced against the mid-point between bid and ask price. These bid and ask prices are requested from Refinitiv every 5 seconds. Collateral valuation takes place on a near real-time basis, and the applied haircut is recalculated every 5 seconds incorporating the price movement of the collateral instrument.

The determination of haircuts on non-cash instruments takes the following characteristics into account:

- the type of collateral instrument;
- the time required to liquidate collateral instruments;
- the price volatility and price sensitivity to changes in market circumstances of the collateral instrument;

- a minimum price volatility to cover for less volatile market periods and to establish a buffer for stressed market conditions (hereby limiting procyclicality);
- the downside risk;
- the degree of creditworthiness of the issuing institution;
- the residual maturity of the collateral instrument;
- the foreign exchange risk of the collateral instrument in relation to the main denomination of the cleared exposure;
- bid/ask spread.

The determination of haircuts on cash shall incorporate at least the following characteristics:

- the price volatility of the currency against the reporting currency;
- a minimum price volatility to cover for less volatile market periods and to establish a buffer for stressed market conditions (thereby limiting procyclicality).

To test the sufficiency of the haircuts, a daily back-test is performed. For this purpose, haircuts are assessed against the largest price change observed over the previous 30 years.

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.

Procyclicality is specifically taken into account when setting the haircut by using extreme but plausible scenarios when establishing haircut levels. A minimum price volatility is set to cover for less volatile market periods and to establish a buffer for stressed market conditions (limiting procyclicality). This limit is normally set on the type of collateral but may be set on the level of an individual instrument, if deemed necessary.

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.

Concentration limits on collateral are in place, whereby limits are set for individual issuers and per type of asset on an individual Clearing Participant level and on the level of all Clearing Participants combined. The collateral holdings are monitored on a daily basis against the concentration limits, and any breaches are dealt with in accordance with the relevant procedure, which is subject to at least an annual review.

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.

Cboe Clear maintains accounts in its own name for the acceptance of cross-border non-cash collateral in the following Central Securities Depositories (CSD) - Euroclear Bank SA/NV and Clearstream Banking. Cboe Clear has established procedures to minimise operational and market risk, as well as procedures for enforcement events. Market risk is captured through setting appropriate haircuts which include consideration of FX-risk. Further, through its due diligence process and service level agreements, Cboe Clear ensures that the operating hours and cut-off times of each CSD are known to and compatible with the requirements of Cboe Clear.

Key Consideration 6: *An FMI should use a collateral management system that is well-designed and operationally flexible.*
Collateral is administered in the Cboe Clear clearing system, where one or more collateral accounts are maintained for each position account and linked to that position account. On the collateral account, the collateral is recorded at the time it is received. Each movement on a collateral account in the clearing system is mirrored in the risk system. Within the risk system, the collateral is valued and the haircut is updated in near real-time. The clearing and the risk systems are flexible with regard to currencies, collateral locations, type of instruments, instances of types of instruments, pricing of instruments, etc. To ensure smooth functioning of collateral processes during the opening hours of the CCP, the Cboe Clear operations department maintains adequate and sufficiently qualified staffing including during times of market stress.

3.6 Principle 6: Margin

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

Key Consideration 1:

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

Cboe Clear has a margin methodology for securities (equities, ETPs and SFTs) and a margin methodology for the equity derivative products it clears. Both margin methodologies are documented and published on the Cboe Clear website. The total margin called by Cboe Clear is equal to the sum of: (A) the higher of (1) the securities initial margin minus the securities variation margin and (2) the minimum margin requirement and (B) the higher of (1) the derivatives initial margin minus the sum of net option valuation, futures variation margin and premium margin and (2) the minimum margin requirement.

The margin requirement for cash equities covers two components: the current exposure (or variation margin) and the potential future exposure (or initial margin). Variation margin is defined as the (unrealised) profit or loss in the portfolio. The variation margin is not paid out or paid in but rather it is offset against the initial margin. Initial margin is defined as the potential future exposure of the portfolio i.e. the potential maximum loss in the portfolio over the time until close out of the portfolio under ‘normal’ circumstances. ‘Normal’ circumstances are defined by a 99% confidence interval over a three-day holding period.

The margin requirement for equity derivatives covers five components which must be collateralised at all times: initial margin, futures variation margin, options premium margin, unexpired net options value and expired options net options value.

Cboe Clear's margin models for securities and equity derivatives both calculate core initial margin requirements using a Filtered Historical Simulation (FHS) methodology, based on an Expected Shortfall tail measure at a confidence level of 99% and a lookback period of 700 days. The FHS model is supplemented by a Stressed Historical Simulation (StressedHS) model in accordance with anti-procyclicality (APC) requirements under EMIR. An APC-compliant margin is then computed as the weighted sum of the FHS and the StressHS components (floored at the level of FHS), in line with regulatory requirements. Where applicable, initial margin add-ons are calculated in addition to core initial margin to cover exposures related to wrong-way risk, liquidity risk, and large stress loss exposures.

Through daily back-testing Cboe Clear assesses whether margin requirements are sufficient for the portfolios that are cleared and ensures its margin requirements are commensurate with the risks and particular attributes of each product, portfolio and market it serves.

Credit exposure arises from (price) volatility in the contracts in which positions are taken, the size of the positions and the correlation between the positions. Additional exposure may stem from the size of the positions in relation to the overall market liquidity in the contracts in which a position is taken. For individual contracts cleared, the initial margin increases where the product is more volatile. For portfolios, initial margin changes are dependent on the size and directionality of positions in the portfolio and the volatility and correlation of those products. Cboe Clear addresses wrong way risk in a Clearing Participant’s portfolio by margining all long positions in equity securities issued by that Clearing Participant at 100%.

Cboe Clear cut-off times for margin collections and payments are set out in Cboe Clear's Regulation Margin. Regulation Margin requires Clearing Participants to ensure collateral has been provided within one hour of a margin call having been issued. Cboe Clear has in place authorisations from its Clearing Participants in order to directly debit amounts from Clearing Participant accounts. Cboe Clear may also, in accordance with its Clearing Rules, place a Clearing Participant into default in the event of failure to pay margin and impose any of the measures listed in chapter 1, article 14.4 of the Clearing Rule Book.

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.

Price data is sourced from platforms and approved vendors and updated in the Cboe Clear system in real-time and at end-of-day. Margin requirements are updated continuously based on live positions. Approved vendors provide intraday prices without delay, as well as end-of-day prices, and relevant interest rate data.

Cboe Clear's margin system monitors the timeliness and availability of intraday prices. Cboe Clear also performs a check that compares preceding same-day transaction prices with the closing price of the previous trading day. Continuous delivery of prices is monitored, and large price deviations are checked for accuracy.

Cboe Clear does not use models to estimate prices where market prices are not available. If a price is not available due to malfunction of the approved vendor or platform, the most recent trading price of a cleared transaction is taken and if no such transaction is available, the margin system will use the previous trading day closing 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 sub portfolio level or by product, the requirement must be met for the corresponding distributions of future exposure. The model should (a) use a conservative estimate of the time horizons for the effective hedging or close out of the particular types of products cleared by the CCP (including in stressed market conditions), (b) have an appropriate method for measuring credit exposure that accounts for relevant product risk factors and portfolio effects across products, and (c) to the extent practicable and prudent, limit the need for destabilising, procyclical changes.

The initial margin models are designed to capture the theoretical loss in the portfolio, based on a coverage level of 99% and a liquidation period of two days for securities and three days for equity derivatives.

To calculate the initial margin of a portfolio, Cboe Clear uses a filtered historical simulation (FHS) methodology, which simulates the distribution of future returns (scenarios) by sampling realised past returns, scaled by the ratio of past and most recent volatility estimates. The FHS methodology directly models the volatility dynamics without assuming that returns are independent and identically distributed (as is the case in a standard historical simulation approach). This allows the model to capture non-trivial statistical properties of return distributions, such as asymmetry, fat-tails, volatility clustering and tail dependence. Cboe Clear first calculates daily price and FX rate historical returns based on the closing prices of the past 700 business days and 50 stress scenarios in order to capture a full range of market conditions including periods of stress. Volatility is estimated from historical returns using an Exponentially Weighted Moving Average (EWMA) model. Such calculations allow Cboe Clear to produce a set of hypothetical future return scenarios for a defined number of scenarios that are consistent with the present level of volatility and which in turn allow Cboe Clear to calculate simulated P&L scenarios. Margin requirements are obtained by calculating an Expected Shortfall risk measure for the portfolio based on the simulated P&L scenarios and the application of the portfolio margin limit rule in accordance with EMIR RTS Article 27(4), which Cboe Clear applies at all times by using the weighted sum of the gross and net portfolio margin, with the net portfolio margin having a weight of 80% in line with regulatory requirements. Key margin model assumptions are: confidence level, lookback window, liquidation period and portfolio margin limit rule, which are all discussed above.

Cboe Clear applies an anti-procyclicality (APC) measure in the form of a stressed historical simulation (StressHS) margin, which aims at reducing the procyclicality of the standalone FHS methodology. StressHS margin is based on a historical simulation combining a set of 650 of the recent past returns with a set of 50 returns that correspond to defined historical dates of exceptional market stress, which yield the potential expected loss for a given portfolio in stressed market conditions. The incorporation of a less-variable margin component provides for a conservative margin estimate that is less sensitive to the current dynamics of market volatility. The APC-compliant margin is calculated as the weighted sum of the FHS and StressHS margins. As a result, margin requirements are more conservative during low volatility periods and more stable during high volatility periods.

Cboe Clear assumes a close-out period of two days for securities and three days for equity derivatives for the purposes of calculating margin requirements. This period is determined based on the following considerations:

(a) the period that may elapse from the last collection of margins up to the declaration of default or activation of the default management process – although in general this period may only be a few hours, Cboe Clear allows for the possibility that it may take up to 24 hours;

(b) the period needed to design and execute the default management strategy – Cboe Clear maintains a playbook that describes the various strategies for the handling of a default. The adopted default management strategy will depend on the circumstances and complexity/size of the default portfolio, although in all cases, the complete close-out of a defaulting Clearing Participant’s positions is estimated to take no more than two business days following the declaration of a default;

(c) the period needed to cover the counterparty risk to which Cboe Clear is exposed – since (b) above incorporates the full execution of liquidation strategy required to bring Cboe Clear back to a matched book, no further liquidation activities are required to cover counterparty risk. Therefore, no additional time is required.

In addition to underlying price volatility risk, Cboe Clear is exposed to other specific risks that require separate treatment in the form of margin add-ons:

- Wrong-way risk add-on: this reflects the risk due to a Clearing Participant holding long positions on their own stock. This risk originates from the correlation between the default risk and the credit exposure of the Clearing Participant.
- Liquidity risk add-on: this reflects the risk of concentration and/or illiquid positions in a Clearing Participant portfolio. The add-on captures the potential price impact of liquidating such positions in the event of default.
- Large position add-on: this reflects the potential excess stress loss in a Clearing Participant portfolio over and above available financial resources. This add-on captures the excess loss exposure taking into consideration available mutualised Clearing Fund resources under a Cover-2 standard and the defaulting Clearing Participant's individual margin collateral posted.

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.

Cboe Clear does not collect variation margin separately as it is one of the components of the overall margin that it collects each morning (and intraday). Variation margin is defined as the (unrealised) profit or loss in the portfolio or the current exposure, and is calculated using the position, trade prices and the current or closing prices as inputs.

Trade details are provided to Cboe Clear as part of the platform trade feed and are therefore available at all times. The current price / closing price of products and currencies are available through a platform or data vendor (see above). During the day, variation margin is continuously updated upon arrival of new price information and/or position information.

Cboe Clear makes a single margin call that covers both initial and variation margins. The authority to make intraday margin calls is provided in the Clearing Rule Book under chapter 1, article 6.3.2 and is further detailed in Regulation Margin section 3. Cboe Clear has the operational capacity to make and complete intraday margin 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.

Cboe Clear calculates the margin at the portfolio level and allows margin offsets based on historical price co-movements observable during the lookback period. The margin methodology is not dependent on statistical correlation or dependence assumptions since it seeks to model a diverse range of historical correlation scenarios and considers only the worst-case losses (i.e., using an expected shortfall tail measure). Cboe Clear does not have permission to offer cross-margining between CCPs.

Key Consideration 6:

A CCP should analyse and monitor its model performance and overall margin coverage by conducting rigorous daily back testing – 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.
Cboe Clear's Back-Testing Policy and Back-Testing Procedure describe the back-testing process. Cboe Clear applies a confidence level of 99%. On a daily basis, Cboe Clear performs back-testing at a portfolio level and therefore takes into account portfolio netting effects. Cboe Clear's Sensitivity Testing Policy and Sensitivity Testing Procedure form the basis of the sensitivity testing. On a daily basis, Cboe Clear performs sensitivity testing on all key parameters of the risk model, as well as sensitivity testing using both historical and hypothetical stressed market conditions. Cboe Clear addresses any shortcomings identified by back-testing and sensitivity analysis. Cboe Clear reports back-testing and sensitivity testing results to its Management Board, EMIR Risk Committee and Supervisory Board. Cboe Clear reports the results on a monthly basis to its regulators and (if requested) to Clearing Participants. A high-level report on the back-test results is available on the website of Cboe Clear.
Key Consideration 7: *A CCP should regularly review and validate its margin system.*
Cboe Clear regularly reviews its margin model through its daily back-testing and sensitivity testing. As mentioned under Key Consideration 6, back-testing and sensitivity analysis reports are shared with the Management Board, EMIR Risk Committee and Supervisory Board. Additionally, a qualified and independent party performs an annual model validation, and this report is shared and reviewed by various governance fora.

3.7 Principle 7: Liquidity Risk

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

Key Consideration 1:

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

Cboe Clear maintains a Liquidity Risk Management Framework which is designed to ensure that liquidity resources are available to cover liquidity requirements in all relevant currencies, both intra-day and overnight in business-as-usual and extreme but plausible situations. The Liquidity Risk Management Framework is part of the overall Risk Management Framework of Cboe Clear and includes a range of tools to monitor liquidity needs and ensure fulfilment of liquidity needs, at all times and pursuant to the Cboe Clear Liquidity Plan. The Liquidity Plan is approved by the Management Board subject to review and advice from the EMIR Risk Committee.

Cboe Clear's Liquidity Plan describes the procedures for managing and monitoring, on a daily basis, its liquidity needs for the settlements in various markets against its liquidity resources. The Liquidity Plan considers a range of market scenarios that influence its liquidity needs, and the timescales over which its liquid financial resources should be available. The Liquidity Plan distinguishes the use of different types of liquidity resources and includes a description of sources of liquidity risk.

The main sources of liquidity stress would be failure to have sufficient liquidity available to start the settlement process (including in stressed circumstances), failure to monitor settlement cycles, which could cause overnight long positions that require funding, and the default of a Clearing Participant or Co-CCP. The Liquidity Plan sets out the solutions in place for each settlement venue/currency.

In line with EMIR, Cboe Clear monitors all entities towards which it has a liquidity exposure. As set out in Cboe Clear's Liquidity Plan, settlement banks, payment systems, securities settlement systems, nostro agents, custodian banks, liquidity providers, Co-CCPs, service providers and Clearing Participants may generate a liquidity exposure for Cboe Clear. Additionally, Clearing Participants can act as settlement agents and/or liquidity providers. Cboe Clear manages this risk by monitoring concentration limits with respect to credit lines (or similar arrangements), so that no single Clearing Participant can provide more than 25% of the total liquidity requirements of Cboe Clear, as prescribed by EMIR. In liquidity stress tests, Cboe Clear also considers as unavailable any unused amounts under credit lines that are in place with a defaulting Clearing Participant.

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.

Cboe Clear uses an internal monitoring system and the facilities provided by CSD systems to identify, measure and monitor settlement and funding flows. The CRO, Chief Financial Officer (CFO) and Chief Operating Officer (COO) are informed in the event a liquidity shortfall is identified. Cboe Clear monitors the progress of settlements and associated liquidity needs continuously during the day on the basis of settlement confirmations received from the CSDs. An automatically generated intraday and overnight liquidity overview allows Cboe Clear to assess whether actual liquidity needs per currency are covered by available liquidity sources. The monitoring of intraday funding includes controls to ensure that intraday funding never exceeds the overnight funding capacity.
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 – Cboe Clear does not operate a payment system or SSS.
Key Consideration 4: *A CCP should maintain sufficient liquid resources in all relevant currencies to settle securities-related payments, make required variation margin payments, and meet other payment obligations on time with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should consider maintaining additional liquidity resources sufficient to cover a wider range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions.*
Cboe Clear conducts liquidity stress tests to determine whether available liquidity resources under stress conditions are sufficient to cover liquidity needs. The tests are done per currency and on an intraday and overnight basis. Stress scenarios tested include the largest two Clearing Participants (measured by liquidity needs) defaulting, default of the single largest Co-CCP, settlement system failure, largest two liquidity providers not being operational, funding peaks, increased haircuts on collateral provided to liquidity providers and FX-rates moving against Cboe Clear. Stress scenarios account for counterparties with multiple roles (for example, a Clearing Participant may also be a liquidity provider) and anticipate that Clearing Participants and liquidity providers belonging to the same group could default at the same time. Cboe Clear assumes the non-availability of all the unused liquid resources provided by a defaulting Clearing Participant that has multiple roles. All Cboe Clear liquidity stress tests consider a multi-day period of at least five business days. The outcomes of the liquidity stress tests determine the need for and size of liquidity arrangements, including those required to convert one currency into another or bonds into cash. Cboe Clear ensures that its financial resources cover the default of the two Clearing

Participants (and their affiliates) irrespective of products cleared, that would create the largest exposure for Cboe Clear in extreme by plausible conditions.

Key Consideration 5:

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

Liquid resources available to Cboe Clear include collateral from Clearing Participants, Default Fund contributions, credit lines and Cboe Clear's capital. The largest contribution to liquidity resources comes in the form of collateral posted to Cboe Clear by its Clearing Participants. Collateral in the form of cash may be used by Cboe Clear to fund the settlement process or may be invested in accordance with its Investment Policy. Non-cash collateral received from Clearing Participants or received as a result of cash collateral investments are available to Cboe Clear as liquidity resources. The liquidity resources are normally available on a same day basis.

Cboe Clear has a number of pre-arranged, secured and unsecured funding arrangements in place, including intraday credit lines with central banks and a committed € 1.2 billion multi-currency syndicated loan that enables Cboe Clear to generate additional liquidity using, among other things, cash equity financial instruments that have been received but can no longer be delivered (to the defaulting Clearing Participant). In such a scenario, the loan provides same-day liquidity as long as the relevant cut-off times are met. Cboe Clear performs assessments in order to determine whether its liquidity counterparties can reliably provide a particular currency that is in scope for Cboe Clear as well as their ability to perform under stressed circumstances. Cboe Clear also validates the liquidity availability timescales by performing 'live tests' or by timing the drawing-down of a test amount.

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.

Cboe Clear has not supplemented its qualifying liquid resources described above with other forms of liquid resources. Even though Cboe Clear does not assume the availability of

emergency central bank credit as part of its Liquidity Plan, Cboe Clear regards the collateral it accepts as collateral that is typically accepted by central banks.
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.*
Cboe Clear has established a number of secured and unsecured liquidity arrangements with commercial banks and central banks. These liquidity arrangements are used primarily to convert one currency into another, or to convert securities into cash. Cboe Clear has due diligence processes and ongoing relationship management in place for eligible banks – these include an assessment of the liquidity providers' credit worthiness. The assessment enables Cboe Clear to establish that each liquidity provider has the capacity to enter into and perform the activities as agreed under the contractual arrangements.
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.*
Cboe Clear, designated as an Ancillary System under T2 rules, has access to the Real-time Gross Settlement system (RTGS) payment services and intraday central bank liquidity that is provided by the Dutch Central Bank. As a direct participant in the RTGS of Denmark, Sweden and Norway, Cboe Clear makes use of its accounts at such central banks to conduct settlements in central bank money. Intraday credit lines with the aforementioned central banks are used on a day-to-day basis.
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.*

Cboe Clear conducts liquidity stress tests to determine whether available liquidity resources under stressed conditions are sufficient to cover liquidity needs under stressed circumstances. These tests are done per currency on an intraday and overnight basis.

Cboe Clear stress scenarios tests include the largest two Clearing Participants (measured by liquidity needs) defaulting, default of a single largest Co-CCP, settlement system failure, largest two liquidity providers not being operational, funding peaks, increased haircuts on collateral provided to liquidity providers and FX-rates moving against Cboe Clear. Stress scenarios account for counterparties with multiple roles in the liquidity framework (for example some Clearing Participants may also be liquidity providers) and anticipate that Clearing Participants and liquidity providers belonging to the same group could default at the same time. Where a Clearing Participant has multiple roles, Cboe Clear assumes these roles are not available following the default of the Clearing Participant. These scenarios have been created to test the specific risks that Cboe Clear faces as a CCP.

Results of liquidity stress tests are reported daily to relevant management and escalated to the Management Board when required. In accordance with Cboe Clear's liquidity stress testing procedure, a (theoretical) shortfall is reported to the CFO and COO. Theoretical shortfalls lead to a review of liquidity arrangements and may lead to resizing of such arrangements. Cboe Clear performs a thorough analysis of the liquidity stress test outcomes on a monthly and annual basis. A monthly report that consists of a detailed analysis of liquidity stress testing results is distributed to the CFO, COO, CRO and the Management Board, as well as being shared with the EMIR Risk Committee on a quarterly basis. In addition, Cboe Clear reviews its stress testing policy framework and the historical and hypothetical scenarios used to identify extreme but plausible market conditions on an annual basis (or more frequently if adjustments are required as a result of market developments or material changes to the set of contracts cleared by Cboe Clear). Cboe Clear undertakes an independent validation of its liquidity risk model and liquidity risk management framework on an annual basis.

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.

Cboe Clear has established rules and regulations that require Clearing Participants (and Cboe Clear) to settle payment obligations when due. These rules and regulations also apply during stress events and situations where one or more Clearing Participants have defaulted. To ensure that sufficient liquidity resources are available, the Clearing Rules and in particular Cboe Clear's Regulation Liquidity Measures, describe measures that ensure that Cboe Clear is prepared for unforeseen and potentially uncovered liquidity shortfalls. Cboe Clear's Liquidity Plan addresses the replenishment of liquidity resources, and it sets out procedures for handling potential liquidity shortfalls. In addition, chapter 1, article 17.1 of the Clearing Rule Book allows for liquidity cash calls in extreme and implausible situations (activation of the Cboe Clear Recovery Plan is required). Furthermore, Cboe Clear's Recovery Plan, if activated, does consider delayed settlement.

3.8 Principle 8: Settlement Finality *An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.*
Key Consideration 1: *An FMI's rules and procedures should clearing define the point at which settlement if final.*
Cboe Clear is a designated system under Dutch law and the SFD as evidenced by publication on the ESMA[3] website. chapter 1, article3.7.3 of the Clearing Rule Book defines the moment of entry into the finality system and irrevocability of a transfer order ("Posting" as defined in the Clearing Rule Book). Acceptance of Postings relating to Trades leads to the creation of trade legs, which in turn create or change Positions leading to settlement obligations. Finality of Postings takes place in the system operated by Cboe Clear in accordance with the Clearing Rules of Cboe Clear. For physical settlements involving securities, this is followed by finality of settlement instructions, which takes place in accordance with the relevant CSD. Cboe Clear's Clearing Rules and its relationship with its Clearing Participants are governed by Dutch law which, in accordance with the SFD, sets out that in the event of insolvency proceedings being opened against a participant in a system, the rights and obligations arising from, or in connection with, the participation of that participant shall be determined by the law governing that system (*Fw* Article 212e).
Key Consideration 2: *An FMI should complete final settlement no later than the end of the value date, and preferable 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.*
For securities settlements, the finality rules and cut-off times of the CSD concerned will apply in respect of final settlement. Settlements occur throughout the business day and Clearing Participants receive SWIFT confirmations intraday and overnight SWIFT statements from the CSDs concerned confirming that a debit or credit has occurred. For equity derivatives, Cboe Clear calculates a single net amount payable or receivable per currency, per Clearing Participant, per day, and final settlement takes place via cash settlement on the next business day.
Key Consideration 3: *An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.*
Clearing Participants may not modify or revoke Postings.

[3] European Securities and Markets Authority

Cboe Clear may amend a Trade Leg in accordance with a correction that Cboe Clear receives from the applicable Trading Venue not later than 30 minutes after close of business on that Trading Venue on the Trade Date of the Trade to which that Trade Leg relates.

The moment of irrevocability for Postings arising from an interoperability arrangement falls generally at the same time as the entry of such Posting into the system and, in any event, not later than at the end of the Clearing Day (Co-CCPs may revoke inter-CCP contracts by mutual consent if required by the rules of the relevant exchange or a competent authority). Inter-CCP contracts can only be revoked before the end of the Clearing Day, as set out in Cboe Clear's Regulation Clearing Days. While Co-CCPs may also unilaterally cancel inter-CCP contracts during a relevant time, such cancellation renders inter-CCP contracts and the underlying trade legs legally void (ab initio) and therefore are not 'revocations'.

Once Cboe Clear establishes the final position for settlement and enters settlement instructions into the SWIFT network or sends payment or credit instructions to the relevant Clearing Participants, the clearing process is completed.

Cboe Clear's opening hours are defined in the Regulation Clearing Days, published on its website.

3.9 Principle 9: Money Settlements

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

Key Consideration 1:

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

Cboe Clear conducts its money settlements in central bank money, where practical and available. Consequently, money settlements that occur in respect of the settlements of cash legs of Open Positions are conducted in central bank money, where such settlement takes place in T2S or for those settlements which take place in the Danish, Swedish and Norwegian markets. This also applies to payments due to Cboe Clear in respect of Open Position settlements in DKK, CHF, EUR, NOK and SEK.

Cboe Clear makes use of a commercial settlement agent in the Polish, Czech and Hungarian markets, and a commercial payment agent in the UK and Ireland. All such settlements are based upon Delivery-versus-Payment/Receipt-versus-Payment (DvP/RvP) settlement instructions using SWIFT.

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.

Liquidity providers and settlement banks are subject to initial and ongoing due diligence which includes assessment of credit risk. Additionally, scenarios used in the liquidity stress testing performed by Cboe Clear take into account liquidity providers and settlement banks, as well as settlement agents.

The designation of a liquidity provider and/or settlement bank depends on various factors captured in the 'Request for a Proposal' process conducted to start the Cboe Clear selection process.

Key Consideration 3:

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

Cboe Clear carefully selects its settlement banks and liquidity providers and at least annually performs due diligence by issuing a due diligence questionnaire. The questionnaire covers (among others) organisational information, financial performance, sources of liquidity, regulatory status, compliance and financial crime aspects, business continuity procedures and cyber security measures.

Cboe Clear measures and monitors concentration risk on a daily basis, and in accordance with the requirements of EMIR. All settlement banks and liquidity providers are included in the liquidity stress testing performed daily.
Key Consideration 4: *If an FMI conducts money settlements on its own books, it should minimise and strictly control its credit and liquidity risks.*
Cboe Clear does not conduct money settlements on its own books. All money settlements take place on the books of CSDs, commercial banks and central banks where Cboe Clear and its Clearing Participants maintain accounts for this purpose (directly or indirectly).
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.*
Cboe Clear uses settlement agents in three small markets that represent 0.0002% of Cboe Clear's total volumes. The agreements and SLAs with these settlement agents define the service levels.

3.10 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.

Cboe Clear does not prepare a self-assessment for this Principle because all cleared products are transferable securities which settle in electronic form, and which are dematerialised / uncertificated and settle through links to CSDs.

3.11 Principle 11: Central Securities Depositories

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

Not applicable – Cboe Clear is not a CSD.

3.12 Principle 12: Exchange-of-value Settlement Systems

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

Key Consideration 1:

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

While Cboe Clear itself is not an exchange-of-value system, it relies on the DvP mechanisms provided by the 19 CSDs through which it settles across 21 settlement locations as a direct member. CSDs offer DvP services for securities settlement, which ensure that final settlement of one obligation occurs only when the final settlement of a linked obligation occurs. Cboe Clear has a contractual agreement with each CSD that it relies on for settlement of securities and communicates with each CSD via the relevant SWIFT messages for the type of settlement instruction.

3.13 Principle 13: Participant-default Rules and Procedures

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

Key Consideration 1:

An FMI should have default rules and precures 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.

Cboe Clear has detailed rules and procedures in place enabling it to continue to meet its obligations in the event of a Clearing Participant default and address the replenishment of resources following a default. These rules and procedures can be found in the Clearing Rules, and Breach of Rule Book and Default Handling procedures.

Chapter 1, article 13 of the Clearing Rule Book sets out the events that may be declared by Cboe Clear to constitute a Breach of the Clearing Rules by a Clearing Participant. The triggers include (i) failure to effect timely fulfilment of any payment or delivery obligation under the Clearing Participant Agreement or failing to perform, or being in breach of, any of the terms of the Clearing Participant Agreement, (ii) appearing to Cboe Clear (in its reasonable discretion) to be unable, or likely to become unable, to meet its obligations under the Clearing Participant Agreement, (iii) winding up, and bankruptcy or similar proceedings. The Legal & Compliance and Risk Management departments provide advice to the Management Board on whether to declare an event of default, which Cboe Clear may do acting reasonably and proportionately in its sole discretion. Immediately after serving a Notice of Default, Cboe Clear can take a number of measures which are laid down in the Clearing Rules. These measures, which are discretionary, include suspension or termination of the Clearing Participant relationship, cessation of clearing of new trades, trigger of procedures for portability, buying, borrowing, or selling securities for the account of the defaulter, enforcement of collateral provided by the defaulting Clearing Participant (the issuance of a Notice of Default is an enforcement event under the title transfer agreements) and finally close out netting.

In particular, the actions that Cboe Clear can take in managing the settlement obligations of defaulting (or failing) Clearing Participants are set out in Regulation Buy-in Procedure and chapter 1, article 5.7, chapter 2, article 8.4 and chapter 3, article 10.2 of the Clearing Rule Book. The general purpose and principle of a buy-in is to honour the original rights or entitlements resulting from trades cleared by Cboe Clear, when one of the parties involved fails to meet its settlement obligations. Cboe Clear may appoint a broker to facilitate a buy-in or sell-out procedure and in the event of a default, if portion of positions is not an option, it may organise an auction in order to hedge or replace positions.

In the event of a Clearing Participant default (and a subsequent enforcement of collateral), Cboe Clear will close out proprietary house positions and all client positions that are unable to be ported. Omnibus client positions are closed out at an aggregate level and not per underlying client. Cboe Clear will not be able to attribute the collateral held against these positions to any particular client within the omnibus account, as collateral held will cover the net result of the close-out netting process. Any unused collateral remaining after the completion of the default management procedures shall be returned to one or more trustee(s) acting on behalf of those clients when known to Cboe Clear, if any, or to the (insolvency practitioner of the) defaulting Clearing Participant for the account of its clients. If individually segregated client positions are recorded on the books of Cboe Clear, EMIR requires that collateral balances owed by Cboe Clear after completion of default procedures, i.e. unused collateral, shall be readily returned to the client if known to Cboe Clear.

Chapter 1, articles 14.6 to 14.10 of the Clearing Rule Book provides that financial resources may be applied by Cboe Clear to make good all losses suffered by Cboe Clear as a result of a Breach that triggers a Notice of Default by any Clearing Participant and/or as a result of a Default Event of any Co-CCP in a specific order. Cboe Clear maintains a Liquidity Plan as part of its Liquidity Risk Management Framework as required under EMIR. The Liquidity Plan and the Liquidity Risk Management Framework are discussed further under Principle 7. Chapter 1, article 7.8 of the Clearing Rule Book addresses the replenishment of the Clearing Fund following a default and Cboe Clear a procedure describing the process for replenishing Cboe Clear's dedicated own resources if required.

The Cboe Clear Breach and Default Management Team (BDMT) is responsible for the execution of the default handling process. The role of the BDMT is described in Cboe Clear's Breach of Rule Book and Default Handling Procedures, and the BDMT includes members of all relevant departments and functions (including the Management Board). As required by EMIR, Cboe Clear's regulators are notified ahead of the issue of a Notice of Default.

Key Consideration 2:

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

Cboe Clear's Default Handling Procedure describes the roles, obligations, and responsibilities of and the steps to be taken by the BDMT. The BDMT includes the Management Board, the Risk Management function and Legal & Compliance. The Default Handling procedure sets out the steps in respect of stakeholder communications (including to regulators) during the default management process and the various communication channels that can be used.

Cboe Clear's Default Handling procedure is owned by the CRO and is reviewed quarterly and approved annually by the Management Board further to advice from the EMIR Risk Committee. The Default Handling Procedure is tested at least annually, where a default is simulated, and all the key steps to manage a default are carried out. A report of the simulated exercise is presented to management who are responsible for ensuring that any actions and lessons learnt are addressed.

Key Consideration 3:

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

The Clearing Rules and, the Breach of Rule Book and Default Handling Procedures, are publicly available on Cboe Clear's website. Default rules and procedures are described in chapter 1, articles 13 and 14 of the Clearing Rule Book, which defines a Breach (chapter 1, article 13) and specifies that Clearing Participants may be declared in default upon the occurrence of a Breach. The Clearing Rules also provide for the measures Cboe Clear may take in case of a declaration of a default (chapter 1, article 14 of the Clearing Rule Book.

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.
Cboe Clear tests and reviews its default procedures to ensure that procedures remain up to date and the involved parties are aware of their roles in the default process. As part of the testing, a simulation exercise is performed at least annually in order to test the procedures in a controlled but live environment. The simulation exercises are designed to cover various Clearing Participant default scenarios. The Breach of Rule Book Procedure is reviewed every two years or in case of a major change, and the Default Handling Procedure are reviewed on a quarterly basis by the first-line Risk team. Simulation results are presented to the Management Board, together with proposals to amend the procedures, where relevant. If proposed amendments are deemed to be material, the Management Board will request advice from the EMIR Risk Committee. The Clearing Rule Book (chapter 1, article 5.8) permits Cboe clear to organise an auction to hedge or replace positions of a Clearing Participant that has been declared in Default. Participation in auctions is mandatory for each Clearing Participant (other than any Special Clearing Participant) in relation to the Clearing Services in which a Clearing Participant is active. Each Clearing Participant (other than any Special Clearing Participant) shall participate in, and make available sufficient staff for, any fire drill or default simulation exercises.

3.14 Principle 14: Segregation and Portability

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

Key Consideration 1:

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

Cboe Clear keeps distinct and separate accounts for each Clearing Participant. Each account has a specific Bank Identifier Code (BIC) registered in the Cboe Clear systems ensuring that trades are routed to the right account. Cboe Clear offers the accounts set out in Article 5.2 of the Clearing Rule Book in accordance with its obligations under Article 39 of EMIR. A Clearing Participant can make use of a combination of such accounts. Cboe Clear maintains a principal-to-principal relationship with its Clearing Participants as is customary for CCPs in both common law and civil law jurisdictions. Furthermore, Cboe Clear considers that a Trading Participant for which a General Clearing Participant has issued one or more Statements of Authority qualifies as a client under EMIR.

Consequently, from a Dutch legal perspective which is the law governing the Clearing Rules, the designation of Position Accounts and Collateral Accounts in the books of Cboe Clear as Client Accounts is a segregation of administrative nature, does not identify or record ownership and will not protect the positions and collateral of clients of a Clearing Participant from losses which may occur as a result of insolvency or default of that Clearing Participant. Upon request, Cboe Clear can facilitate a security arrangement with a trustee acting on behalf of joint clients of a Clearing Participant or provide a template pledge agreement to be entered into between a client and a Clearing Participant that is intended to protect collateral that remains in an omnibus or individual client account, respectively, after completion of the default handling processes by Cboe Clear.

Cboe Clear allows clients to request porting, subject to the conditions in Cboe Clear's Regulation Portability (Regulation Portability) being met. Portability is possible in respect of position accounts and cash collateral accounts in the books of Cboe Clear, as well as for securities designated as covering client positions and transferred to Cboe Clear security collateral accounts under a title transfer financial collateral arrangement.

Regulation Portability requires a legal opinion on file on the ongoing validity of authority to port granted by the defaulting Clearing Participant and the (non) applicability of anti-depravation and/or voidance rules, or the written consent of the insolvency practitioner appointed for the defaulting Clearing Participant.

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.

Cboe Clear's account structure (Account Structure), which offers house accounts and individual client accounts in addition to net/gross omnibus client accounts, enables it – if an individual client account is selected by the Clearing Participant in respect of a specific client – to identify the positions of the client and the related collateral, that covers (both initial and variation) margin. Accounts are maintained and margin is recorded in accordance with Clearing Participant instructions. The Account Structure allows Clearing Participants to opt for net or gross omnibus client accounts, which means that margin is calculated and collateral is collected on a net or gross basis, respectively. Cboe Clear registers Trade Legs in the position accounts in accordance with the information provided in electronic postings, i.e. the information received in the trade feed details. The content of the electronic posting is determined at the level of trade matching, again in accordance with the instructions of the Clearing Participant.
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.*
The portability arrangements offered at Cboe Clear are structured to offer the best possible likelihood of porting. Please refer to Key Consideration 1 for further information.
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.*
Cboe Clear has published on its website the Clearing Rule Book, the Regulation Portability and a risk disclosure document on segregation and portability. The risk disclosure document on segregation and portability sets out the risks Cboe Clear has identified with respect to each of the account segregation types Cboe Clear offers.

3.15 Principle 15: General Business Risk

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

Key Consideration 1:

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

Cboe Clear's risk management framework identifies general business risk as one of four broad categories of risk for Cboe Clear business activities. General business risk is the risk Cboe Clear assumes due to potential changes in general business conditions which can impair its financial position as a consequence of, among others, decline in its revenues or an increase in its expenses. Cboe Clear has identified the following risks as falling under this category: strategic risk, capital risk, financial reporting and control risk, client risk, legal risk, compliance risk, people risk, change management risk and audit risk.

Cboe Clear measures and monitors general business risk by adopting and tracking business strategy and annual goals and by tracking the net operating result against the annual budget. Furthermore, Cboe Clear monitors actual calculated capital versus capital requirements applicable to Cboe Clear. Where necessary, the Management Board will consider additional measures and actions.

Cboe Clear sets its goals and priorities annually and submits them for approval by the Supervisory Board. The Management Board tracks Cboe Clear's performance against the corporate goals, discusses progress on projects on a monthly basis and takes measures, as appropriate. Corporate risk assessments are performed on a yearly 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.

The amount of capital earmarked to cover general business risk and allow Cboe Clear to continue operations and services as a going concern if it incurs general business losses, forms part of the required regulatory capital maintained by Cboe Clear. This amount of capital is calculated (in accordance with EMIR) by taking at a minimum 25% of Cboe Clear's annual gross operational expenses, which based on an internal assessment, should cover expected general business losses in a number of scenarios.

Cboe Clear maintains a plan for orderly wind-down . The time span for winding-down or restructuring commences with the external communication of the decision to do so. Such a decision would likely be prompted by economic considerations, because Cboe Clear can no longer operate as a going concern, or regulatory considerations. Open Positions of Clearing

Participants can largely be settled within days given the products accepted for clearing. As such, the main issue for the CCP wind-down would be termination of the operational relationship with the trading platforms. The winding-down scenario assumes that terminating the agreements with the trading platforms will take the most time. The notice period for termination of the contracts with the platforms varies between platforms, with the longest term being 6 months. This requires Cboe Clear to take into account a maximum time span of 7 months for an orderly wind down and to maintain a capital allocation for wind down equal to seven months of expenses.
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.*
The high- level plan of approach for an orderly wind-down is described above. Cboe Clear maintains 7 months of annual gross operational expenses as capital for an orderly wind-down in its regulatory capital calculations. Resources designated to cover Clearing Participant defaults are separately identifiable in Cboe Clear's balance sheet from other resources designated to cover, among others, business risk losses, and wind-down or restructuring costs.
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.*
The cash held as part of Cboe Clear's own capital is invested in accordance with its Investment Policy, which requires that investments should be made on assets of high quality and sufficiently liquid in order to allow Cboe Clear to meet its current and projected operating expenses under a range of scenarios. Additional information on Cboe Clear's Investment Policy is included in the assessment of Principle 16.
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.*
Cboe Worldwide Holdings Ltd, sole shareholder of Cboe Clear, fully supports the plans of Cboe Clear. Cboe Clear closely monitors levels of capital in conjunction with its shareholder. The Finance department of Cboe Clear maintains a policy that is approved by the Management Board and updated at least annually, which sets out a plan for raising additional equity.

3.16 Principle 16: Custody and Investment Risks

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

Key Consideration 1:

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

In accordance with EMIR, Cboe Clear uses and in general directly connects to central securities depositories for the purposes of holding its own and its participants assets. Cboe Clear has procedures in place that require a Request for Information (RFI) or Request for a Proposal (RFP) be conducted when selecting CSDs/custodians. Cboe Clear uses CSD/custodian services to:

1. hold securities transferred to it as collateral pursuant to the title transfer security agreements;
2. hold securities transferred to it as collateral pursuant to investments of cash collateral in accordance with its Investment Policy; and
3. hold long positions resulting from failed settlements in the daily settlement process of Open Positions.

Custodians that may be used under (1) and (2) are regulated Central Securities Depositories (CSDs) domiciled in one of the European Economic Area countries, UK and Switzerland; the International CSDs (ICSDs) Euroclear Bank Brussels and Clearstream Banking Luxembourg; central banks in the countries belonging to the European Economic Area and Switzerland or credit institutions and authorised financial institutions. Cboe Clear performs due diligence on the above stated credit institutions and authorised financial institutions which includes among others, consideration of the long-term credit rating issued by Credit Reference Agencies for the institution under review.

The CSD and agent network referred to in the assessment of Principle 9 is used to hold long positions resulting from failed settlements. Cboe Clear has a procedure for selecting, contracting, and monitoring these service providers as mentioned in the assessment of Principle 9.

Key Consideration 2:

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

As a general rule, Clearing Participants provide assets to Cboe Clear under title transfer arrangements. In this manner, assets transferred by Clearing Participants under title transfer and held in Cboe Clear accounts give Cboe Clear the legal right to such assets in the event of a Clearing Participant default or insolvency. For SFT transactions the same is true other than where a Lender is a Special Clearing Participant acting as a pledge-back Lender. In such case, title to the RQV assets is transferred to such Lender, and security is granted over such assets in favour of Cboe Clear. These secured assets must remain in a triparty collateral account where such assets have restrictions on use – thereby granting Cboe Clear prompt access to such assets as required. Enforcement of the pledge allows Cboe Clear to appropriate or sell the assets.

Cboe Clear holds assets at central banks, commercial banks and CSDs in accounts in its name. Cboe Clear has prompt access to such assets, subject to the hours of operations of the relevant eentity. In the event of custodian insolvency, assets held at commercial banks are generally protected by regulation both at national and European levels that were introduced to effectuate the safeguarding of client assets against the insolvency of commercial banks. For assets held at the ICSDs Euroclear Bank Brussels and Clearstream Banking Luxembourg, Belgian and Luxembourg law, respectively, grant security holders an intangible co-ownership right over the pool of securities of the relevant category that the ICSD holds on behalf of all participants holding securities in that category. Such right gives security holders a pro rata right to recover the securities in the event of insolvency of the ICSD.

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.

As set out in Key Consideration 1 above, Cboe Clear holds cash at central banks or, at commercial banks on a collateralised basis while non-cash collateral is held at approved CSD, custodians or commercial banks, where such commercial banks provide custody services. Cboe Clear's Network Management function performs ongoing due diligence to confirm the standing of CSDs and approved commercial banks used for custody and investment purposes.

To manage its exposure to its custodian banks, and CSDs Cboe Clear uses multiple entities for the safekeeping of its assets, and has established concentration limits. The CCP also takes into account the potential multiple roles that an entity may have with regards to Cboe Clear in its stress testing.

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.

Cboe Clear's investment strategy is defined under the stewardship of the CRO, and is reviewed and presented to the Management Board at least annually to ensures its coherence with the CCP's overall risk-management strategy.

Investments made by Cboe Clear in accordance with its Investment Policy are strictly monitored and controlled. Cboe Clear has in place daily procedures for valuation of collateral obtained through investment activities, and reconciliation processes for operational routine activities that ensure such monitoring and control. The first-line Risk Management team is responsible for compliance with the investment policy. The EMIR Risk Committee as part of the annual review process is requested to provide advice on Cboe Clear's Investment Policy.

In accordance with its Investment Policy, Cboe Clear outright investments with a maximum remaining tenor of 12 months, are in government securities issued by countries that have been assessed by Cboe Clear as being high-quality obligors, . Furthermore, reverse repurchase transactions and secured deposits with commercial banks must be collateralised with the same government securities as those permitted for outright purchases of securities, but with a much shorter tenor. As previously mentioned, concentration limits per counterparty and a minimum collateral haircut are applied.

3.17 Principle 17: Operational Risk

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

Key Consideration 1:

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

Cboe Clear has a control framework and its objectives are detailed in various control framework documentation. The control framework includes policies, processes and procedures which are established to manage and mitigate amongst other things, operational risk (inadequate or failed internal processes, people and systems or external events), business continuity risk, cyber and information security risk, and regulatory and compliance risk. Control framework policies, processes and procedures are based upon international standards and laws applicable to Cboe Clear, and Cboe Clear holds ISO 22301 certification for its business continuity framework. All control framework documentation is subject to periodic review and the Management Board must approve all policies within this framework.

Cboe Clear operates a three-lines of defence model, in which the first line of defence identifies, owns and manages risk (business departments/functions), the second line oversees risk management and compliance (Risk Management and Legal & Compliance), and the third line provides independent assurance (Internal Audit). The first-Line ERM team execute and implement risk-reducing controls and mitigants, whereas second-line Enterprise Risk teams provide advice on the implementation of risk-reducing operational controls and mitigants and monitors operational risk against the Risk Tolerance Statements using key risk indicators. The output of Enterprise Risk monitoring is reported to the Management Board. The Risk Tolerance Statements are subject to annual review and approval by the Management Board upon advice from the EMIR Risk Committee.Cboe Clear has a change management and project initiation process, which includes preparation of a business case and a project definition assessment estimating the impact, overall company risk, effort and governance. Cboe Clear also has IT change procedures requiring an assessment of risks, impact and systems involved and software review procedures, which include quality assurance tests and user acceptance tests.

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, CPSS-IOSCO – Disclosure framework and assessment methodology – December 2012 59 and controls should be reviewed, audited, and tested periodically and after significant changes.

The Management Board is responsible for the management and oversight of operational risk and has delegated these duties to Enterprise Risk led by the CRO. The Management Board proposes risk tolerance levels by developing Risk Tolerance Statements which further to advice from the EMIR Risk Committee are adopted. Each risk category identified in the Risk Tolerance Statements is assigned to a member of senior management. Risk tolerance metrics are used to check that monitoring outcomes fall within acceptable risk tolerance levels, which are reported if they do not. The Risk Tolerance Statements are reviewed for content, coherence and coverage on an annual basis. The reporting of risk tolerance metrics is prepared by Risk Management and reviewed monthly by the Management Board and the Risk Governance Board and quarterly by the EMIR Risk Committee. The report is also shared with the Supervisory Board and the Audit, Enterprise Risk & Compliance Committee. As appropriate, certain operational risk management topics may be discussed at stakeholder forum (SAB). The overall operational risk management framework is subject to internal and external audits.

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.

Cboe Clear's Enterprise Risk Policy defines and is designed to achieve the company's operational reliability objectives. The Enterprise Risk Policy defines Cboe Clear's risk culture and its three lines of defence model, sets out roles and responsibilities for the Supervisory Board, the EMIR Risk Committee, the Management Board, Enterprise Risk and risk owners. The Enterprise Risk Policy further identifies sources of risks and the framework around setting risk appetite and tolerance and the use of Key Risk Indicators and Risk Registers.

Business continuity objectives ensure a high degree of operational reliability by setting minimum standards for day-to-day processing, with sufficient control, monitoring and oversight as well as escalation as needed. Cboe Clear's business continuity policy requires the company to conduct a Business Impact Analysis on an annual basis or upon a major change in one of the company's critical activities.

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Operational reliability is further safeguarded by having two datacentres that are fully redundant; this enables the fail-over from one datacentre to another for all critical business processes. Furthermore, monitoring software is installed on key components in the datacentres which provides alerting of performance issues and outages. The maintenance of an RTO of two hours which is periodically tested provides further support for operational reliability.

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.

Cboe Clear ensures that sufficient information technology capacity is available and that Cboe Clear business applications are built to process extreme market volumes while meeting target service levels. Cboe Clear applications must support an application throughput of at least 1.5 times the historical peak volumes and at least 3 times the average daily volume. Cboe Clear's IT systems are subject to regular internal audits.

Cboe Clear completes system capacity tests periodically and runs new capacity tests if a new production peak is experienced. If such test cannot be completed successfully, Cboe Clear will identify the necessary measures to re-create the capacity headroom, which can

include adding technical processing capability (hardware), updating or changing software or job scheduling (IT operations). Cboe Clear's highest peak in processing occurred with around 17 million trade sides in one day during March 2022 System capacity tests have shown that 40 million trade sides can be processed daily.
Key Consideration 5: *An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.*
Cboe Clear has a cyber and information security strategy and framework in place, which includes threats and vulnerability management and security assurance of outsourced services. Its strategy and framework are based on the NIST Cybersecurity framework, the CPMI-IOSCO Guidance on cyber resilience for financial market infrastructures, the DNB Good Practice Guide for Cyber Security and ISO 27001/2. The cyber and information security management system is fully integrated into Cboe Clear's corporate risk management, governance and management system. Cboe Clear equipment is sited, protected and used in geographically distant locations. Cboe Clear production equipment is located in secured datacentres and Cboe Clear makes use of fully outsourced services for office automation running on dedicated terminal servers in two datacentres. The controls in place for ensuring security and restricted access, uninterrupted power, temperature management and fire extinguishing are an integral part of the services delivered to Cboe Clear and of the agreements that are in place with its providers. Cboe Clear has the necessary ICT arrangements to allow for remote working for an indefinite period and therefore it does not maintain a secondary business site on an ongoing basis.
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.*
Cboe Clear has implemented its BCMS in accordance with ISO 22301 and holds the ISO 22301 certification. The business continuity plan forms a part of the BCMS and consists of the Crisis Management and Crisis Communications Plan, the Incident Management and Business Recovery Plan, the Cyber Incident Response and Recovery Plan, and the Incident Management and IT Recovery Plan. Cboe Clear's Crisis Management Methodology has been set up to be scenario independent and covers the management of any possible incident including and not limited to wide-scale or major disruptions. For a number of scenarios including evacuation, and power outage, Cboe Clear has created detailed runbooks. As part of the BCMS, Cboe Clear has defined its Training and Exercising Methodology and Requirements for the Business as well as IT Disaster Recovery Testing Methodology and

Requirements. IT DR Testing (role swapping of IT clusters in different data centres) takes place on a quarterly basis.

Cboe Clear's business continuity plan has been designed to manage any kind of disruption, including and not limited to wide-scale or major disruptions. Cboe Clear's Business Recovery Plans focus on timely resumption of the critical operations. These have been designed to enable IT to recover all critical IT systems to resume operations within two hours following disruptive events and to enable complete settlement by end of day even in extreme circumstances. For example, the Incident Management and IT Recovery Plan contains a recovery timeline that foresees Cboe Clear being capable of switching from its primary datacentre to its secondary datacentre within two hours of a disruption.

Cboe Clear sends all transaction data to both of its datacentres, minimizing the chance of data loss. It also backs up end of day files in case the intraday trade feed is disrupted in both datacentres. As a further control, Cboe Clear reconciliation of the trade count takes place between Cboe Clear and each platform that provides trade feeds on a daily basis.

The functionality of the secondary site is validated through quarterly role swap tests of the IT clusters. Through role swapping of the primary and the secondary site, the secondary site becomes the production site for the duration of the test period (i.e. one week). Cboe Clear is therefore able to prove the proper functioning of the secondary site and the related resources, capabilities, functionalities and staffing arrangements.

The secondary datacentre is located more than 30 kilometres away from the primary datacentre. The location of the secondary site is chosen to create different risk profiles between the datacentres (i.e. different vendors, different parts of the electricity grid, different flooding risks).

Senior management discusses the completeness, accuracy and effectiveness of the BCMS on a monthly basis and reviews it. Cboe Clear performs annual testing and training including a calendar for the Business Recovery related tests and the IT recovery related tests. Business Recovery Plans consider the involvement of Cboe Clear's Value Chain Partners and Suppliers.

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.

Cboe Clear is exposed to operational, cyber security, financial, credit, market, and legal risks arising from its Clearing Participants, other FMIs and service and utility providers. In respect of Clearing Participants, the Risk Management Framework is addressed under Principle 4. Details on how Cboe Clear addresses its risks in relation to other FMIs can be found in the assessment under Principle 20.

In respect of service and market utility providers, Cboe Clear ensures that the contractual and legal arrangements with suppliers protect its interests and reduce the risk of doing business to an acceptable level. Such measures are described in the assessment under Principle 9 in respect of the settlement venues.

Cboe Clear has an Outsourcing Policy setting out stringent requirements for outsourcing which include strict demands in respect of continuity, online access, business continuity, cyber security and onsite access. The policy also requires that all outsourcing must be governed by a formal written agreement.

3.18 Principle 18: Access and Participation Requirements

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

Key Consideration 1:

An FMI should allow for fair and open access to its services, including by direct and, where relevant, indirect participants and other FMIs. Based on reasonable risk-related participation requirements.

The Cboe Clear participation criteria in Regulation Clearing Participants demonstrates its open access philosophy. Clearing Participants may be a Direct Clearing Participant (DCP), clearing trades for its own account or for the account of its clients, in relation to SFT clearing, a Standard Clearing Participant or a Special Clearing Participant clearing trades for its own account, or a General Clearing Participant (GCP), which in addition allows for clearing of trades by Trading Participants. Provided the participation criteria are met, there are no barriers to accessing the services of Cboe Clear directly or indirectly. Section 3 of the Cboe Clear Regulation Clearing Participants details the conditions and criteria, among others, the eligible entity types, the financial requirements, settlement and IT connections requirements and legal documentation requirements.

An applicant (Applicant) must at all times satisfy a number of conditions, including being validly incorporated, and accepting the Clearing Rules by executing and continuing to be a party to a Clearing Participant Agreement

Furthermore, where an Applicant is incorporated outside the EEA or incorporated in the EEA and if requested by Cboe Clear, it is required to deliver to Cboe Clear a legal opinion in form and substance satisfactory to Cboe Clear and capable of being relied on by Cboe Clear from a local counsel (acceptable to Cboe Clear) opining that its domestic law system will not inhibit the ability of Cboe Clear to act effectively under the Clearing Rules. Cboe Clear can request an update of such legal opinion at any time throughout the relationship.

The financial requirements in order to become and remain a DCP are: the higher of EUR 5 million Capital or 20% of 30-day average aggregate Initial Margin requirement or 20% of 250-day average aggregate Initial Margin requirement.

The financial requirements in order to become and remain a GCP are: the higher of EUR 25 million Capital or 20% of 30-day average aggregate Initial Margin requirement or 20% of 250-day average aggregate Initial Margin requirement.

Documentation and information to be provided as part of the application process include a certificate of incorporation and the articles of association, a certificate of incumbency or a trade register extract, a group organisational chart, a recent audited annual report, proof of regulatory status, a list of key management, a list of authorised signatures, and a list of staff and managers engaged in the clearing business. The due diligence process can include onsite visits, and all prospective Clearing Participants must demonstrate their operational capability during a test phase which takes place prior to being allowed to become an active Clearing Participant.

Key Consideration 2:

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

As a CCP, Cboe Clear is obliged to only allow participation that does not jeopardise its safety and soundness. As such, Cboe Clear only accepts as Clearing Participants, legal entities who are recognised or authorised by financial regulators, and who are of sufficiently good standing, as evidenced by the due diligence performed. The due diligence performed on Applicants includes an assessment of creditworthiness and validation that minimum capital requirements are met. The Cboe Clear participation conditions are designed to promote appropriate risk management by the Clearing Participants and establish that each Clearing Participant remains in sufficiently good standing and is able to fulfil its obligations to Cboe Clear. The requirement for a legal opinion in certain circumstances is intended to provide legal certainty as to the enforceability of the Clearing Rules in the particular jurisdiction where the Clearing Participant is domiciled.

The operational criteria are necessary for the performance of the Clearing Participants' obligations under the Clearing Rules, such as timely settlement and expedient provision of collateral, thereby reducing the risk of default.

Cboe Clear makes a distinction between Direct and General Clearing Participants. GCPs are permitted to clear trades dealt for own account or that have been concluded for the account of clients or for Trading Participants. DCPs are only permitted to clear trades dealt for own account or that have been concluded for the account of clients. In accordance with the requirements of EMIR and in recognition of the divergent risk profile, the minimum capital requirements for a GCP differ from that required for a DCP. Otherwise, participation criteria are exactly the same.

The admission criteria are publicly disclosed on the Cboe Clear website. The criteria are reviewed yearly by the EMIR Risk Committee and the Management Board.

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.

Ongoing compliance is monitored through the daily operational interaction in respect of settlements and risk management, including collateral movements. In addition, Clearing Participants must disclose any events that may affect their adherence to the rules and their ability to perform under the rules. There is a yearly monitoring of compliance by Clearing Participants with the participation requirements through Clearing Participant file reviews.

Enhanced surveillance of, or imposing additional controls on, a Clearing Participant whose risk profile deteriorates will be organised on an ad-hoc basis. The exit of a Clearing Participant no longer meeting the participation criteria and ongoing obligations set out in the Clearing Rules will follow the Breach of Rule Book procedure and/or the default handling procedure. Both are elaborated upon in the assessment under Principle 13.

3.19 Principle 19: Tiered Participation Arrangements

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

Key Consideration 1:

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

Cboe Clear offers its Clearing Participants the option to open and maintain Position Accounts and Collateral Accounts on its own behalf and on behalf of Clients. All Account Structures are operated under a principal-to-principal relationship between Cboe Clear and the Clearing Participant.

Under the Clearing Rules, specifically Clearing Rule Book chapter 1, articles 4.3 and 10.1, Cboe Clear may request that a Clearing Participant provide information on its (Indirect) Clients and Trading Participants and the criteria and arrangements it adopts to allow its Clients and Trading Participants to access the services of Cboe Clear. In addition, under Clearing Rule Book chapter 1, article 4.8, a Clearing Participant must retain data regarding its clearing activities for five years or such longer period as necessary to ensure compliance with the Clearing Rules and the laws and regulations that apply to Clearing Participant. Pursuant to Clearing Rule Book chapter 1, article 10.1, Clearing Participant will provide such information about itself and its provision of clearing services to Clients of Clearing Participants as may reasonably be requested by Cboe Clear. Further, for each Trading participant that will access the clearing services of Cboe Clear through a Clearing Participant, that Clearing Participant must complete and submit for each Trading Participant (and per Exchange) a Cboe Clear Statement of Authority form prior to the Trading Participant being able to submit trades for the account(s) of the Clearing Participant.

Clearing Participants (General Clearing Participants) that wish to provide client clearing (direct and/or indirect) and provide Trading Participants with access, are subject to a higher minimum capital requirement.

Cboe Clear calculates, calls and collects Margin and other financial resources such as Clearing Fund Contributions against every Position Account within the Account Structure(s) registered on the books of Cboe Clear to that Clearing Participant.

Key Consideration 2:

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

A key risk for Cboe Clear is trade flow i.e. the receipt of trades being submitted for clearing. However, as Trade Legs of Clients and Trading Participants are sent for clearing directly from the platform, Cboe Clear has not identified any operational or technical interdependencies between a Clearing Participant and its Clients or Trading Participants that might impact Cboe Clear.

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.*

Cboe Clear maintains volume statistics at the Trading Participant level as part of its monitoring of its Clearing Participants' activity, given that the relationship between Clearing Participants and Trading Participants typically creates credit and liquidity exposures between these parties.

A Clearing Participant may provide clearing access for more markets and products than the platforms and products cleared by Cboe Clear. Management of exposures between Trading and Clearing Participants remains the responsibility of Clearing Participants. As Cboe Clear does not have a full view of such exposures and only sees the exposures in relation to the Open Positions held in the accounts on the books of Cboe Clear that are registered in the name of the Clearing Participant(s), Cboe Clear may request information from the Clearing Participant(s) to facilitate the management of risks arising from such Open Positions.

Key Consideration 4:

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

Cboe Clear aims at ensuring that it understands the business conducted by key Trading Participants. To this end, communications with or visits to such Trading Participants may take place, to gain insight into the business drivers of the Trading Participants. Discussing the possibility of direct participation forms part of this interaction.

3.20 Principle 20: FMI Links

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

Key Consideration 1:

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

Cboe Clear has links with multiple and varied FMIs, in particular CSDs and ICSDs, other CCPs, payment systems and securities settlement systems (SSSs). Currently Cboe Clear has links with two CCPs and more than 15 CSDs/ICSDs/SSSs, as well as domestic and EU payment systems. Onboarding of new FMIs is done in accordance with the Cboe Clear control framework and governance processes. Establishing a new FMI link involves signoff from applicable risk owners as part of vendor or network management review, as applicable. In addition to internal governance processes, the establishment of a link with other CCPs would be subject to regulatory approval under EMIR.

As described under Principles 9 and 16, the Cboe Clear Network Management team lead the due diligence efforts as part of the establishment of an FMI relationship. Cboe Clear requires each prospective provider to respond to a questionnaire that Cboe Clear uses to identify potential sources of risk arising from the link arrangement. The Network Management team reviews the responses and defines follow-up actions as needed. During the relationship, the Network Management team conducts at least an annual due diligence exercise updating the relationship's information, including ownership and management, financial performance, operational risk, business continuity and cyber security.

Key Consideration 2:

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

Cboe Clear has established FMI links in EU Member States, Norway, UK, and Switzerland. Access conditions and the rights and obligation of Cboe Clear and each FMI concerned are laid down in the admission agreements and the rules and terms of the respective FMI which may be governed by the laws of the jurisdiction of incorporation of the FMI.

Each agreement entered into in respect of a link-arrangement has been subject to review by Cboe Clear in-house counsel and/or review and advice from external counsel. For instance, the Master Clearing Link Agreements (MCLAs) entered into with linked-CCPs, which set out the contract formation between the CCPs, the basis for collateral provision and default handling have been through this process to ensure there is a well-founded legal basis.

The pledge agreements creating the rights of pledge over accounts held by the linked-CCPs for the provision of inter-CCP collateral have been opined on by external counsel, commissioned by the Co- CCPs.

Key Consideration 3: *Linked CSDs should measure, monitor, and manage the credit and liquidity risks arising from each other. Any credit extensions between CSDs should be covered fully with high-quality collateral and be subject to limits.*
Not applicable to CCPs.
Key Consideration 4: *Provisional transfers of securities between linked CSDs should be prohibited or, at a minimum, the retransfer of provisionally transferred securities should be prohibited prior to the transfer becoming final.*
Not applicable to CCPs.
Key Consideration 5: *An investor CSD should only establish a link with an issuer CSD if the arrangement provides a high level of protection for the rights of the investor CSD's participants.*
Not applicable to CCPs.
Key Consideration 6: *An investor CSD that uses an intermediary to operate a link with an issuer CSD should measure, monitor, and manage the additional risks (including custody, credit, legal, and operational risks) arising from the use of the intermediary.*
Not applicable to CCPs.
Key Consideration 7: *Before entering into a link with another CCP, a CCP should identify and manage the potential spill-over effects from the default of the linked CCP. If a link has three or more CCPs, each CCP should identify, assess, and manage the risks of the collective link arrangement.*
In accordance with Title V of EMIR, Cboe Clear only has CCP link arrangements for which it has obtained regulatory approval. In order to obtain regulatory approval, Cboe Clear conducted assessments to analyse the risks, including potential spillover effects presented by each of the link arrangements. Cboe Clear has interoperable arrangements in place with two CCPs, and each of these arrangements is supported by a bilateral agreement between that link-CCP and Cboe Clear. Each interoperability agreement contains provisions that set out how the default of a clearing participant utilising the interoperable arrangements will be managed (i.e., in accordance with the default rules of the respective CCP).
Key Consideration 8: *Each CCP in a CCP link arrangement should be able to cover, at least on a daily basis, its current and potential future exposures to the linked CCP and its participants, if any, fully with a high degree of confidence without reducing the CCP's ability to fulfil its obligations to its own participants at any time.*
Cboe Clear applies the same risk management methodology and tools used for the margining of positions of its Clearing Participants for the margin calculation for Co-CCPs.

These processes are described in the assessment under Principles 4, 5 and 6. Additionally, in accordance with the ESMA Guidance on Interoperability, Cboe Clear does not collect default fund contributions from the Co-CCPs nor provide default fund contributions to Co-CCPs. Cboe Clear maintains an Interoperability Fund, which is described under section 9 of the Clearing Rule Book.
Key Consideration 9: *A TR should carefully assess the additional operational risks related to its links to ensure the scalability and reliability of IT and related resources.*
Not applicable to CCPs.

3.21 Principle 21: Efficiency and Effectiveness

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

Key Consideration 1:

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

Cboe Clear works closely together with its Clearing Participants and connected trading platforms through the governance arrangements elaborated upon in the assessment under key consideration 7 of Principle 2. The key features of Cboe Clear's clearing arrangements, the stock universe and markets cleared, expansion of interoperability arrangements, any potential product expansion and the use of technology are discussed with the stakeholders in an open dialogue. In addition, the Cboe Clear Relationship Management team engages bilaterally with Clearing Participants.

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.

Cboe Clear has defined corporate goals, which include protecting and growing its core cash equities business, enhancing its resilience and strengthening its control framework. These goals are supported by objectives as documented in the control framework (described in detail in the assessments against Principle 3 and Principle 17 above).

Key Consideration 3:

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

Cboe Clear uses Key Risk Indicators (KRIs) to review risks on a monthly basis. Reports on these metrics are discussed as an agenda item at governance meetings including with the Audit, Enterprise Risk & Compliance Committee.

3.22 Principle 22: Communication Procedures and Standards

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

Key Consideration 1:

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

Cboe Clear's information technology communications are based on internationally recognised standards and industry best practice and include:

- SWIFT for communication with CSDs and settlement agents;
- WebSphere MQ. This is a messaging solution, which allows independent and potentially non- concurrent applications on a distributed system to securely communicate with each other using messages (M) and queues (Q). MQ is used for communication with Euroclear Sweden and SIX SIS;
- Secure File Transfer Protocol (SFTP) is a network protocol that provides file access, file transfer, and file management over the internet or over a dedicated line. Cboe Clear communicates with the smaller trading platforms via SFTP;
- Financial Information eXchange, FIX. The FIX Protocol language is comprised of a series of messaging specifications used in trade communications. Cboe Clear uses FIX and FIXML for communication with trading platforms and members (and their service providers) for trade feeds and post-trade messaging.

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

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

Key Consideration 1:

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

The rules of Cboe Clear comprise the Clearing Rule Book and the Regulations, together the "Clearing Rules". The Regulations implement and give interpretation to the Clearing Rule Book. There are 25 such Regulations. The Clearing Rule Book and the Regulations are published on Cboe Clear's website, alongside various other documents including the Standard Settlement Instructions (SSIs) of Cboe Clear, Service Overviews and Descriptions, by market where appropriate, technical, and operational specifications, the Default Handling Procedure, the Breach of Rule Book Procedure, the Margin Model Descriptions, a risk management overview, other disclosures as required by EMIR, and the Cboe Clear ISO certification for its BCMS. The Cboe Clear QCCP hypothetical capital disclosure is also available on the Cboe Clear website.

The published Cboe Clear Service overviews include sections which provide details on business continuity management and cyber and information security management arrangements.

Cboe Clear consults its Clearing Participants on Clearing Rules development and/or changes. The Clearing Rule Book sets out the change management process, including the obligation for Cboe Clear to describe the changes and their effects, to organise consultations and to consider Clearing Participant feedback.

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.

Cboe Clear's system design and operations are described in its Service Overview documents published on its website. The Clearing Rules (also published on the Cboe Clear website) set out the rights and obligations of Cboe Clear and those of its Clearing Participants. The general principles underlying the Cboe Clear risk models, and their methodologies can be found in the documents published under the "Risk Management" section of the website. The key aspects of the default procedures can be found in the Default Handling Procedure.

Cboe Clear reserves the right in certain circumstances to act at its discretion. Those instances are provided for in the Clearing Rules and include, for example, discretion to not accept an application from a prospective Clearing Participant on the basis of compelling reasons (chapter 1, article 2.4), discretion to cash settle delivery obligations where Cboe Clear determines that Cboe Clear or a Clearing Participant is unable to deliver or take delivery of certain securities due to market conditions (chapter 1, article 5.7), discretion to calculate intra-day Margin requirement and call such requirement (chapter 1, article 6.3.2),

reasonable discretion to declare a Breach where Clearing Participant appears to be unable, or to be likely to become unable, to meet its obligations under the Clearing Participant Agreement (chapter 1, article 13.1), upon the occurrence of a Breach, act reasonably and proportionately in its sole discretion to declare a Clearing Participant in Default (chapter 1, article 14.1), discretion to apply one or more recovery measures upon having served a Notice of Default and having activated its Recovery Plan (chapter 1, article 17.1).The Clearing Participant Agreement, published on the Cboe Clear website, states the rights and obligations of the (applying) Clearing Participant, along with the Clearing Rule Book. The main document that sets out the risks of using the Cboe Clear clearing service is the Cboe Clear Disclosure Statement published on the Cboe Clear website. This Disclosure Statement is made in accordance with Article 38 of EMIR and is supported by a further disclosure on the risks of the account types available at Cboe Clear, which is also made and published in accordance with EMIR.
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.*
On its website, in addition to the Clearing Rules and standard contractual agreements, Cboe Clear publishes documentation and information detailing the risks of using the service, the risks associated with the types of available Account Structures, and the technical and operational specifications, which must be met by Clearing Participants. Cboe Clear supports new Clearing Participants during the onboarding process, in particular so that Clearing Participants are able to complete mandatory testing. The appropriate Cboe Clear teams also support new Clearing Participants with completing the Cboe Clear documentation as required at onboarding and on an ongoing basis. Cboe Clear regularly communicates and engages with its Clearing Participants through newsflashes, rule change consultations and client visits. Also as mentioned under the assessment of Principle 2, Cboe Clear has two stakeholder forums which are convened periodically throughout the year. Proposed changes to the Clearing Rules and key procedures may be discussed with connected platforms, in Clearing Participant forums of Cboe Clear and in client visits. Cboe Clear membership includes the key Clearing Participants in the European securities industry. Regular and ongoing interaction with Clearing Participants supports the view that there is understanding of the rules, procedures and risks of Cboe Clear.
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.*
All information on fees and discounts is published in the Cboe Clear's Regulation Fees and Penalties, which is publicly available on the Cboe Clear website, and pursuant to section 8.1 of the Clearing Rule Book. Changes to Regulation Fees and Penalties are implemented in accordance with Cboe Clear procedures and the Clearing Participant Agreement provides that Cboe Clear may adjust

the Fees from time to time with at least thirty Clearing Days prior notice of each such change to the Fees.
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.*
This self-assessment on compliance with the CPMI-IOSCO PFMI Principles is reviewed at least every other year and the outcome is published on the Cboe Clear website. Additionally, Cboe Clear discloses quantitative data - in conformity with the CPMI-IOSCO Public quantitative disclosure standards for CCPs on its website. Cboe Clear publishes its cleared volumes on its website, as per the requirements of EMIR. This information is published each month and is shown as an aggregate monthly total.