



CME Clearing Risk Management and Financial Safeguards

CME Group Inc. (“CME Group”) is the parent company of Chicago Mercantile Exchange Inc. (“CME Inc.”). CME Inc. operates a registered Derivatives Clearing Organization (“DCO”). CME Clearing (or “the Clearing House”), a division of CME Inc., is one of the world’s leading central counterparty clearing services. CME Clearing provides clearing and settlement services for exchange-traded and cleared swaps derivatives. CME Clearing applies robust risk management standards and applicable Commodity Futures Trading Commission (“CFTC”) customer protection standards for all products it clears.

CME Group brings buyers and sellers together through numerous venues including the CME Globex electronic trading platform, open outcry trading facility in Chicago, cleared privately negotiated transactions, and through CME ClearPort. CME Clearing serves as the counterparty to every trade, becoming the buyer to each seller and the seller to each buyer, limiting credit risk and therefore mitigating the risk of default.

CME Clearing’s integrated clearing function is designed to ensure the safety and soundness of our markets, serving the risk management needs of customers around the globe by offering clearing services for a wide range of global benchmark products. CME Clearing continues to structure its services, safeguards, and registration status to best serve the evolving markets to which it provides clearing services. This includes business transacted on the Board of Trade of the City of Chicago Inc. (“CBOT”), CME Inc., Commodity Exchange, Inc. (“COMEX”), the New York Mercantile Exchange, Inc. (“NYMEX”), Dubai Mercantile Exchange (“DME”), and Eris Exchange, as well as transactions submitted for clearing through CME ClearPort.

CME Clearing is vitally aware of its role in global markets and is confident that our operational standards paired with our financial safeguards provide an effective set of risk management tools and capabilities that result in industry leading risk management capabilities.

This document is intended to provide an overview of CME Clearing’s financial safeguard system. For additional details and applicable CME Group Exchange Rules, please reference the CME Inc., CBOT, and NYMEX rulebooks published on CME Group’s website (www.cmegroup.com).

CME Clearing Overview

CME Inc. is registered with the U.S. CFTC as a DCO. CME Clearing provides clearing services to four CFTC registered Designated Contract Markets (“DCMs”), including CME Inc., CBOT, NYMEX, and COMEX. CME Inc. additionally, provides clearing services for DME and Eris Exchange. CME Clearing also accepts trades submitted for clearing through CME ClearPort, a flexible clearing service that allows market participants to transact trades on over-the-counter (“OTC”) terms and submit them for clearing, either clearing products as cleared swaps or as futures and options on futures (through an exchange-of-futures-for-swaps or EFS transaction), pursuant to applicable rules. CME Clearing provides clearing services cleared Interest Rate Swaps (“IRS”) and Foreign Exchange (“FX”) swaps.

CME Clearing has two independent financial safeguards waterfalls that support the products for which it provides clearing services, where the contributions to one waterfall cannot be used to cure losses in a different waterfall (as further explained below). CME Clearing has a financial safeguards waterfall for IRS products and one for futures, options on futures and cleared OTC products other than IRS (referenced collectively as “Base products”).

Risk management and financial surveillance are principal functions of CME Clearing’s financial safeguards system. The safeguards are designed to provide the highest level of security and aim to protect and mitigate the consequences to Clearing Members and their customers in the case of a Clearing Member default event.¹ CME Clearing’s financial safeguards system is continually evaluated and updated to reflect the most advanced risk management and financial surveillance techniques. The CME Clearing Risk Management team, in collaboration with the Financial & Regulatory Surveillance (“FRS”) department are responsible for design, development, monitoring, and managing the financial safeguards system.

Governance Structure

CME Clearing’s risk management policies and actions are monitored by several layers of governance designed to align incentives and ensure prudent oversight. Two committees comprised entirely of members of the Board of Directors have oversight of matters relating to the risk management of CME Clearing, which are the Clearing House Oversight Committee (“CHOC”) and Risk Committee. The primary role of CHOC is to provide oversight of the risk management activities and the senior management of CME Clearing, including oversight with respect to the effectiveness of the risk management program. The Risk Committee has the primary remit to review, assess, and provide oversight of the CME Group’s enterprise-wide risk management, which encompasses its oversight of operational risks as they relate to CME Clearing.²

CHOC and the Risk Committee are comprised of members from other Board and functional committees that have risk oversight responsibilities of CME Clearing, including the Market Regulation Oversight Committee, the Clearing House Risk Committee (“CHRC”), and the Interest Rate Swap Risk Committee (“IRSRC”). Cross-representation is designed to ensure appropriate information sharing across the committees. The Risk Committee is also responsible for periodically performing a gap analysis of the division of risk-related responsibilities among the Board and functional committees to ensure the Board has effective oversight of CME Group’s key risks and make recommendations for enhancing such oversight to the Board, as necessary.

The Chairmen of CHOC, the Risk Committee, CHRC and IRSRC make regular oral reports to the Board during meetings of the Board. Additionally, in a continued effort to keep the Board of CME Group apprised of CME Clearing’s activities, the President of the Clearing House makes at least annual reports to the Board.

CHRC and IRSRC (collectively, “the CME Clearing Risk Committees”) have been established to oversee the financial safeguards systems relevant to the major asset class in which

¹ Under CME Group Exchange Rules 802.A.1, 8F006, and 8G802.A.1, as applicable, a Clearing Member is in default when it “fails to promptly discharge any obligation to” CME Clearing.

² A copy of the charter for the Board Risk Committee is available on CME Group’s website here: <http://investor.cmegroup.com/investor-relations/committees.cfm?DocumentID=14475>.

CME Clearing Overview, *continued*

they have primary oversight, Base and IRS, respectively. The primary functions of the CHRC and IRSRC are to advise on risk management policy and practices, approve new Clearing Members, and assess the adequacy of the financial safeguards waterfall for their respective major asset classes. Each CME Clearing Risk Committee represents a balanced constituency of Clearing Members and industry experts and is chaired by a Board member.

Additionally, CHRC, unlike the IRSRC, is charged with providing oversight on major risk management policy issues impacting broader functions of the Clearing House as it pertains to the financial safeguards waterfall. In its function, CHRC oversees the financial surveillance activities of the FRS department.

Financial Integrity of CME Clearing

CME Clearing serves as the counterparty to every cleared transaction, becoming the buyer to each seller and the seller to each buyer, maintaining a matched book and limiting the credit risk by guaranteeing the financial performance of both parties. In a bilateral system, each participant faces the concentrated, individual credit risk of the other party to the transaction. Satisfactory fulfillment of the transacted contract or agreement depends primarily on the creditworthiness and proper behavior of each individual party to each transaction. CME Clearing mitigates counterparty risk through becoming the counterparty to both sides of the transaction, while utilizing risk tools such as: the collection of performance bond (also referred to as initial margin), daily mark-to-market cycles, and the collection of Guaranty Fund contributions, among other tools. By this mechanism, the concentrated credit risk of each transaction is transformed into a well-diversified and regulated risk supported by the financial safeguards system (described below).

Market participants access CME Clearing products through Clearing Members who serve as an integral part of the foundation upon which central clearing is built. All transaction participants must be represented by a Clearing Member who assumes performance and financial responsibility for all transactions it clears, including transactions cleared on behalf of its customers, own account, and affiliates. Additionally, each Clearing Member is accountable to CME Clearing as the guarantor for payment and performance bond obligations arising from the accounts it clears.

CME Clearing utilizes a variety of risk management metrics to evaluate Clearing Members' abilities to withstand changing market dynamics. Under the structure which CME Clearing operates, CME Clearing evaluates the counterparty risk posed by its Clearing Members and ensures that Clearing Members provide prudent oversight and evaluation of the market participants for which they clear. CME Clearing evaluates Clearing Members for the adequacy of their customer level risk monitoring policies and procedures. Additionally, throughout the day CME Clearing monitors the risk exposure of individual customer accounts that are deemed to be "Large Trader" accounts.

Prospective Clearing Members may apply for clearing membership for all or a subset of cleared products. To maintain clearing membership in any of the CME Clearing offered asset classes, adequate financial resources, including performance bond obligations, contributions to the applicable major asset class' Guaranty Fund, and satisfying capital requirements are required. In addition to maintaining adequate financial resources, Clearing Members are subject to necessary operational and technological requirements associated with the products planned to be cleared, demonstration of adequate knowledge and experience in the desired products, adherence to prudent risk management policies, and participation in default management drills. CME Clearing is committed to providing Clearing Members with fundamental risk management tools to promote and protect the financial integrity of the markets it serves.

Risk Management Controls

With a globally diverse group of Clearing Members and market participants, CME Clearing utilizes a wide range of techniques to assess the level of risks to which it is exposed under both normal and stressed market conditions. CME Group provides pre-trade risk management controls for Clearing Members who provide clearing services for their clients, including those clients that have direct market access (“DMA”). The risk control parameters are determined and set by the Clearing Member. As an additional layer of protection for the marketplace, CME Clearing reviews and monitors the risk control parameters that Clearing Members put in place on their clients. All CME Clearing risk tools are continually assessed to ensure appropriateness and effectiveness, as well as evaluated against prevailing industry best practices to ensure that the tools are properly measuring potential risks facing the Clearing House.

Pursuant to CME Group Exchange Rule 982, Clearing Members are required to have written policies and procedures in place to ensure they are able to perform certain basic risk and operational functions at all times. This rule is set out to ensure Clearing Members maintain appropriate governance for trade submission and account monitoring, but specifically to ensure order entry systems include the ability to set automated credit controls or positions limits.

Trade Execution

CME Globex is the platform that hosts CME Group’s global electronic trading execution for futures and options on futures. On CME Globex, all futures and options markets can be accessed directly through iLink. CME Globex provides access to the broadest array of futures and options products available on any platform, nearly 24 hours a day throughout the trading week, from anywhere in the world. CME Globex offers high-speed execution, transparency, anonymity, and global distribution.

CME SDR

CME Inc. supports a Swap Data Repository (“SDR”) that provides public reporting on cleared and uncleared swap transactions providing an infrastructure that allows for greater transparency into OTC markets. The information is published by asset class in real-time after any applicable regulatory-mandated delays and includes access to the history on all previous publicly reported

swap transactions. CME SDR seamlessly integrates with CME Clearing and simplifies swap transaction reporting, reconciliation, and compliance.

CME SEF

CME Inc. is registered as a swap execution facility (“SEF”) with the CFTC – referenced as “CME SEF”. CME SEF is accessible via CME Direct, which provides enhanced operational flexibility to meet customers’ needs. CME SEF currently supports commodities products.

All OTC derivative trades submitted for clearing executed on a SEF or other third-party execution platforms are subject to all relevant CME Group Exchange Rules, particularly Rule 815. Clearing Members are required to implement appropriate risk controls when a trade is executed on a third-party execution platform. For risk management purposes, all third-party execution platforms that submit trades to CME Clearing are subject to CME Group Exchange Rules and are required to give CME Clearing access to its execution platform. CME Clearing’s authority over third-party execution platforms gives CME Clearing the ability to ensure prudent risk management standards are met for all trades entering into clearing.

Mechanisms to Limit Excessive Price Movements

CME Group employs numerous mechanisms that prevent excessive price movements to preserve market integrity. To protect against market disruptions, Price Banding is employed for all incoming electronic orders, which subjects orders to price verification. Price Banding is designed to prevent the entry of orders at clearly erroneous prices. Additionally, CME Group employs proprietary functionality that assigns a limit price or protection point to each market order entered on the CME Globex platform and to each stop order entered without a limit price. Similar to price banding, protection points prevent orders from being filled at significantly aberrant price levels but due to the absence of sufficient liquidity to satisfy the order. The protection point is a value that is established in connection with a defined non-reviewable range. Another type of risk management tool is Velocity Logic, which is designed to detect significant price moves of futures contracts occurring within a predetermined period. When Velocity Logic triggers, it introduces a momentary

suspension in trade matching by transitioning the futures instrument(s) and related options into the reserved/paused state for a prescribed number of seconds. Several exchange-traded derivatives products have rules that establish daily price limits and/or circuit breakers that allow market participants time to assimilate information and mobilize liquidity during periods of significant and potentially destabilizing price swings. Circuit breakers are calibrated at defined levels and completely halt trading for a defined period of time or for the balance of the day's trading session. Price limits allow trading to continue, but only within the defined limits. Additionally, CME Globex employs matching algorithms to ensure market participants receive fair prices at execution for each product group.

Credit Controls

CME Clearing has pre-trade credit control systems in place to manage credit risk for Clearing Members that clear exchange-traded and cleared swaps derivatives products at CME Group. Through setting credit limits via credit controls, Clearing Members have the ability to limit total exposure to their electronic trading accounts. Further, both CME Clearing and Clearing Members can gain insight into credit exposures at the execution firm level by utilizing the credit control system. Pursuant to CME Group Exchange Rule 949, CME Group requires Clearing Members to place credit controls on their customers. CME Clearing maintains the right to advise a Clearing Member if any credit limits appear to be inappropriate for the Clearing Member's clients for exchange-traded and cleared swaps derivatives products.

Exchange-traded derivatives Clearing Members are required to use CME Globex Credit Controls ("GC2") functionality, which provides Clearing Members access to automated risk controls and protection against risks arising from adverse execution activity. GC2 is intended to complement the risk management tools used by Clearing Members to manage risk at the more granular trader and account level. Clearing Member or partner exchange Clearing Member's risk administrators can set specific credit limits in GC2. GC2 allows Clearing Members to retain the ability to implement risk controls in a manner that is most appropriate for their customers and business profile. Risk administrators are able to select from a set of automated real-time actions to alert them of risk limit breaches, including e-mail notifications, blocking of

non risk-reducing orders, and the cancellation of working orders. The risk administrator can also set levels at which early warning notifications will be automatically generated.

CME Group also offers optional, granular pre-trade risk management capability through In-Line Credit Controls ("ICC") for exchange-traded derivatives. ICC allows Clearing Members and Globex Executing Firms to set daily limits for CME Globex, per product, at the account level through the Account Manager tool. Risk administrators at the Clearing Members or Globex Executing Firms also have the ability for read only view of each other's credit limits. Regardless of whether an account is registered for ICC, there is no latency differential and all Globex orders are subject to the same ICC processing.

ICC functionality features include:

- **Daily Quantity Limits** – set quantity position limits per product, per account level;
- **Good 'til Cancel** – Good 'til Cancel ("GTC") orders remain active in the order book until they are completely executed, canceled, or when the instrument expires;
- **Good 'til Date** – Good 'til Date ("GTD") orders remain active in the order book until they are completely executed, expire at the specified date, are canceled, or when the instrument expires; and
- **E-mail Alerts** – configured at pre-set threshold level breaches.

Due to the different market structure between swaps and exchange-traded derivatives products, IRS Clearing Members have the flexibility to implement client credit controls utilizing either CME Clearing risk control tools or their own internal systems. Further, before an IRS trade can enter into clearing, it must pass the credit controls set by CME Clearing on its IRS customers. IRS credit controls are set at the clearing and trade level. Credit controls are reset at the start of each trading day and monitored by CME Clearing's Risk Management team on a real-time basis.

Risk Management Controls, *continued*

As an IRS Clearing Member approaches its credit limits, the CME Clearing Risk Management team may take any of the following actions:

- Contact the firm to discuss changes to their risk profile and assess next steps;
- Request additional collateral, if appropriate;
- Adjust limit thresholds to reflect the risk profile; and/or
- Permit risk-reducing trades only, for the respective account.

Overall, credit controls allow for CME Clearing to prudently manage and have oversight into Clearing Members risk exposures and are flexible to account for changing market conditions.

Self-Match Prevention

To further limit risks associated with accounts that share common beneficial ownership, CME Group provides optional self-match prevention (“SMP”) functionality. SMP is designed to prevent matching of buy and sell orders for accounts where a firm has common beneficial ownership. Customers that opt in to the functionality are required to populate FIX tags with a specific SMP ID on all orders sent to CME Globex. Also, customers have flexibility in how to apply SMP functionality based upon their particular business structure, but in all cases registration is required in order to utilize the SMP functionality.

Drop Copy

The Drop Copy service allows customers to receive, via a FIX messaging interface, real-time copies of Globex execution reports, acknowledgement and reject messages. This enables firms to feed the data to their internal risk systems, allowing firms to monitor risk on a real-time basis and provide greater transparency to both risk managers at the Clearing Member and customer levels.

The Drop Copy service also allows for the ability to monitor aggregate activity guaranteed by one or more clearing firms upon approval.

Cancel on Disconnect

CME Globex Cancel On Disconnect (“COD”) functionality is an opt-in free service that allows for automatic cancellation of resting day orders upon the involuntary loss of Globex connectivity. Market makers and liquidity providers have the ability to utilize this tool to control their risk in the market. Upon a session disconnect, the COD functionality checks for resting orders for registered session and trader ID pairs and sends a command to cancel the orders. Through the COD function, a user will receive all cancel acknowledgment messages upon reconnecting.

Risk Management Interface

Risk Management Interface (“RMI”) gives Clearing Members that have access to CME Globex the ability to implement granular pre-trade risk controls. Clearing Members can access the RMI API through their proprietary risk systems given that the proprietary or third-party risk management applications are certified. The RMI API allows Clearing Members (or third-party risk system providers) to programmatically send instructions to block or unblock order entries at execution firm, account, derivative type, side (buy or sell), or product level. Additionally, the RMI API provides Clearing Members the ability to query current blocked or unblocked instructions and cancel working orders, GTC and GTD order types. Specifically the RMI GUI is a web-based user interface that provides the capability to view current blocked orders or block/unblock order entry at the same levels as the API.

FirmSoft

FirmSoft is a browser-based order management tool which provides market participants access to real-time information for working and filled CME Globex orders as well as order modification history. Risk managers at the Clearing Member have greater insight into working and filed orders with FirmSoft. Additionally, FirmSoft provides order visibility and cancellation capabilities. Cancellation functions such as the “Cancel All” or “Kill Button” provide important risk mitigation techniques at all times and during system failures.

Kill Switch

Kill Switch provides Clearing Members the ability to implement a one-step shut-down for all of CME Globex activity at the SenderComp ID (Tag 49) level, allowing Clearing Members to limit total exposure to electronic trading entities. Upon activation of the Kill Switch by the Clearing Member, all order entry capabilities are blocked and all working orders are cancelled for either a selected subset or the entire firm's SenderComp IDs.

Further information on CME Globex can be found on CME Group's website in the CME Globex Reference Guide.³

CME ClearPort and CME Direct

With regards to cleared swaps products, CME Clearing offers services through CME ClearPort. CME ClearPort is a platform that not only hosts CME Clearing's cleared swaps products but it provides a comprehensive set of flexible clearing services for global cleared swaps markets fully backed by CME Clearing. CME ClearPort offers an array of clearing services that vary depending on the nature of the product traded, allowing users to submit bilaterally negotiated trades for clearing. CME ClearPort has the capacity to report transactions in multiple asset classes, provide significant mitigation of counterparty risks, and allows for neutral valuations across asset classes.

Additionally, market participants can access CME Group's exchange-traded and OTC derivatives markets through CME Direct. Integrated with CME ClearPort, CME Direct allows for OTC trades to be submitted for clearing instantaneously. Within CME Direct, Clearing Members can view and control risk settings through applications at either the clearing- or executing firm-level for OTC trades submitted for clearing. All trades submitted for clearing are subject to risk controls prior to acceptance, regardless of how they are transmitted to CME Clearing.

³ <http://www.cmegroup.com/globex/files/GlobexRefGd.pdf>

Financial Safeguards System

CME Clearing has established a financial safeguards system to provide optimal risk management protections. CME Clearing has established separate financial safeguard waterfalls for each major asset class in which it provides clearing services: one for IRS and one for Base products, which includes futures, options on futures and cleared swaps products other than IRS. The financial safeguards waterfalls are designed to ensure that CME Clearing has sufficient resources to cover the potential future exposures of each of its Clearing Members and, without mutualizing losses under extreme but plausible market conditions, has additional resources to cover exposures borne by a Clearing Member default event. Each Clearing Member is required to participate in each applicable waterfall for the product(s) it is eligible to clear.

CME Clearing uses a proactive risk management approach through the tools and methodologies it employs. CME Clearing's risk management approach estimates potential market exposures in real-time and prevents the accumulation of losses by marking-to-market open positions at least once daily. In addition, CME Clearing monitors the financial integrity and operational capabilities of Clearing Members to meet their obligations and the sufficiency of their resources to cover potential future obligations. Additional CME Clearing risk management functions include: daily recalculation of performance bond requirements, monthly recalculation of Guaranty Funds with daily monitoring, setting collateral acceptability and limits, client account identification, stress testing, concentration risk monitoring, credit risk monitoring, liquidity risk management, and other techniques as standard risk management practices. CME Clearing risk management tools also allow for prompt detection of financial and/or operational weaknesses and allows for swift and appropriate action to rectify any financial problems to protect market participants.

Real-Time Monitoring

CME Clearing monitors intraday price movements and trading activity throughout the trading session. To assess the impact of these price and activity changes on Clearing Members, CME Clearing tracks market participants' exposures in real-time. CME Clearing conducts intraday mark-to-market calculations, which are performed on Clearing Member and customer positions and reviewed by CME Clearing throughout the day and overnight. CME

Clearing's Risk Management team continuously tracks profit and loss on real-time positions that are marked to real-time market prices, reducing the accumulation of debt in the marketplace. Through 24 hour, 6 days a week monitoring, CME Clearing is able to reduce risk across time zones, from Europe to Asia with settlement occurring during peak times of activity.

On a daily basis, CME Clearing conducts stress testing of Clearing Member portfolios and for Clearing Members' large individual customer accounts. Numerous stress scenarios have been modeled to reflect a diverse set of possible market events. Stress results are evaluated against performance bond on deposit and Clearing Member adjusted net capital. Results of stress tests may lead CME Clearing to request that a Clearing Member provide additional information about its customer accounts, such as whether offsetting positions for CME Clearing cleared products exist in other markets. In some cases, stress test results may cause CME Clearing to increase a Clearing Member's performance bond requirement, capital requirements, or require a Clearing Member to reduce or transfer positions.

Mark-to-Market

CME Clearing's risk management model uses both performance bond and settlement variation to mitigate the risk of default by a Clearing Member, with performance bond addressing the costs of hedging and liquidation in the case of a default. CME Clearing limits the accumulation of losses through daily settlement variation, known as mark-to-market calculation, which removes debt from the system by settling profits and losses rather than allowing outstanding obligations to accumulate in the system. CME Clearing calculates mark-to-market settlement variation and performance bond twice daily for futures and options, and once daily for cleared swaps products to appropriately limit the build-up of risk exposures. CME Clearing's twice daily mark-to-market cycles limit the risk associated with trading hours in the European and Asian time zones. CME Clearing also reserves the right to perform ad hoc settlement cycles as market conditions warrant or to call for additional performance bond collateral, as necessary.

At each settlement cycle, CME Clearing determines the change in market value of all open positions from the prior settlement cycle and communicates this to the respective Clearing Members for settlement. These processes ensure that CME Clearing, at a

minimum holds sufficient collateral to protect against potential losses that may accumulate prior to the next settlement cycle. The settlement process is covered in greater detail under CME Group Exchange Rule 814.

Performance Bond Requirements

Performance bond requirements are good-faith deposits to mitigate non-financial performance on open positions, acting as an ex-ante risk based tool to cover potential future exposures. Through CME CORE, a web-based tool, CME Clearing offers full transparency to market participants by giving them the ability to calculate and evaluate performance bond requirements for all products cleared by CME Clearing.

CME Clearing permits Clearing Members to deposit performance bond sufficient to cover their net exposures for their proprietary positions. CME Clearing calculates performance bond requirements for each customer, collecting gross performance bond for the aggregate cleared swap customer account and customer segregated account, for exchange-traded derivatives.

CME Clearing establishes minimum initial and maintenance performance bond levels for all cleared products. All Clearing Members are required, at a minimum, to post maintenance performance bond levels to CME Clearing, which represents the minimum amount of protection against potential losses for a position or portfolio. Due to the increased risk of loss, initial performance bond is charged only to speculative customer accounts and is calculated as a percentage above the amount of maintenance performance bond level derived by the applicable margin model. Clearing Members and hedge customers are margined at the maintenance performance bond level. The buffer between initial performance bond and maintenance performance bond is currently 10% with CME Clearing having the discretion to increase the buffer, where appropriate. This buffer acts as an anti-procyclical measure, while also maintaining stable, prudent risk management standards.

Pursuant to CFTC Regulation 39.13(g)(8), Clearing Members are required to collect at a minimum from their customers the amount of performance bond required by the DCO. CME Clearing therefore, requires that Clearing Members collect initial performance bond levels from a speculative customer when an account is new or

when the account's equity falls below minimum maintenance performance bond requirements set by CME Clearing, allowing customers to absorb some losses before issuance of another performance bond call. When performance bond collateral on deposit of the speculative customer falls below the maintenance performance bond requirement, the account is topped up to the current initial performance bond level, resulting in a direct debit to the Clearing Members account at its designated settlement bank.

Clearing Members may impose more stringent performance bond requirements on their customers than the minimums established by CME Clearing, due to the greater visibility they have into the credit risk profiles of their customers. This "excess" collateral collected minimizes the potential need for more frequent calls for additional margin calls on customers. Excess customer collateral posted to CME Clearing by a customer's Clearing Member is carefully monitored and protected (see "Customer Protections and Financial Surveillance" below).

Performance bond requirement policy is established to ensure appropriate coverage for all products and portfolios, while allowing flexibility to CME Clearing to adjust settings or model parameters as market conditions change. In compliance with CFTC Regulation 39.13, CME Clearing aims to cover 99% of the potential price moves on an ex post basis for a product or portfolio of products over a minimum of one-day for futures and options on futures; one-day for swaps on agricultural commodities, energy commodities, and metals; and five-days for all other swaps. CME Clearing calibrates performance bond requirements for each asset type to, at a minimum, meet the necessary 99% coverage standard within the defined margin period of risk ("MPOR") and therefore, where appropriate, utilizes confidence levels that exceed 99% in calibrating performance bond requirements.

Performance bond methodologies utilized to calculate portfolio risk give consideration to product specific risk profiles. All of CME Clearing's performance bond methodologies look to balance prudent coverage standards with the potential impact of procyclicality to the market place. Where appropriate, CME Clearing determines performance bond floors for certain products, which ensures targeted performance bond levels are maintained during periods of low volatility. CME Clearing considers seasonal volatility for specific products that are subject to seasonal

Financial Safeguards System, *continued*

behavioral patterns. CME Clearing utilizes both shorter- and longer-term volatility movements to appropriately calibrate stable performance bond requirements.

CME Clearing calibrates performance bond levels against expected liquidity profiles of certain products and portfolios, considering the need to liquidate in times of market stress. In conducting reviews of product or portfolio liquidity profiles, CME Clearing may increase the coverage standards and/or MPOR for particular products directly within the portfolio risk assessment methodology, or alternatively, by addressing liquidity issues through “add-ons” to the basic portfolio risk assessment algorithm calculations. Additionally, pursuant to CME Group Exchange Rule 824, CME Clearing may call for additional performance bond collateral from any Clearing Member when deemed necessary in response to unstable market conditions.

CME Clearing uses rigorous backtesting to validate that performance bond models are performing as they were intended and are meeting the coverage standards defined for each product. Any backtesting violations trigger analysis exercises to assure model parameters are appropriately tuned to existing market conditions. CME Clearing’s senior Risk Management team and the appropriate CME Clearing Risk Committee have insight into backtesting results.

Further information on CME Clearing’s performance bond methodologies and related backtesting is disclosed in CME Clearing’s Principles for Financial Infrastructures Disclosure document on CME Group’s website.⁴

Concentration Performance Bond

CME Clearing maintains concentration performance bond programs for each major asset class. Clearing Members are subject to a concentration performance bond charge if they hold positions that are sufficiently large to trigger the concentration charge in the position’s respective major asset class. Each major asset class maintains a unique trigger for its concentration charge that allows for prudent management of concentration risks. A Clearing Member’s positions relative to the overall market and

adjusted net capital, among other things can trigger concentration performance bond charges. The purpose of concentration performance bond programs is to recognize the potential market exposures due to large positions relative to the overall market.

Guaranty Funds

In addition to the collection of performance bond, each Clearing Member contributes a risk-based (or minimum) amount to the Guaranty Fund(s) associated with its clearing membership(s). CME Clearing maintains two distinct financial safeguards packages with individual Guaranty Funds for each of its major asset classes, Base and IRS. The Guaranty Funds are a mutualized pre-funded pool of resources to cover losses associated with extreme, but plausible, market events that can be utilized to remedy a potential Clearing Member default event. Each Guaranty Fund is sized to cover the default of the two Clearing Members and their affiliates with the largest potential stress shortfalls. The funds of one financial safeguards package cannot be used to cure the losses within a different financial safeguards package. Further information on the financial safeguards packages and the management of a Clearing Member default can be found below in the “Default by a Clearing Member” section.

Acceptable Collateral

CME Clearing determines the acceptability of various collateral types, in accordance with relevant CFTC Regulations and CME Group Exchange Rules, and determines appropriate haircuts and limits, as well as requirement type eligibility – performance bond or Guaranty Fund. CME Clearing’s acceptable collateral types exhibit minimal credit, market, and liquidity risks. CME Clearing offers a comprehensive collateral management program that allows for market participants to meet collateral requirements with a broad set of eligible assets, while reducing concentration risk. CME Clearing’s diverse collateral offering reduces the risk that illiquidity or pricing issues in one type of collateral will have an impact on Clearing Members’ abilities to meet their financial obligations. CME Clearing also has several different collateral management programs, providing efficient and cost-effective

4 <http://www.cmegroup.com/pfmidisclosure>

solutions for Clearing Members' collateral management needs. Acceptable collateral may vary by account class and account type, with further detail disclosed on the CME Group website.⁵

Risks associated with various forms of acceptable collateral are mitigated through ongoing review, daily valuation, prudent haircuts, and limits. Securities are revalued on a daily basis, at a minimum, and are subject to prudent haircuts. Haircuts are set with the intention to account for the potential decline in liquidity and value of collateral during stressed market conditions. CME Clearing ensures that their haircuts are sufficiently conservative and reviewed on a regular basis, while meeting industry regulatory standards for haircuts. Additionally, CME Clearing's sovereign model utilizes numerous factors, which are reflective of the risk of the country and other elements to evaluate the sovereign risk to which CME Clearing is potentially exposed.

Secured Credit Facility

CME Clearing maintains a fully secured, committed line of credit with a consortium of domestic and international banks, which supports CME Clearing's diverse collateral offering. Under the terms of the credit agreement, CME Clearing may use the proceeds of the credit line to provide temporary liquidity in the event of a Clearing Member default, in the event of a liquidity constraint or default by a depository institution (custodian of the collateral), or if there is a temporary problem with the domestic payments system that would delay payments of settlement variation between CME Clearing and Clearing Members. The line of credit thus provides CME Clearing with additional capacity to facilitate payments in a default situation and/or in stressed market conditions. As of December 31, 2017, the size of the facility was \$7 billion, expandable to \$10 billion.

⁵ <http://www.cmegroup.com/clearing/financial-and-collateral-management/>

Customer Protections and Financial Surveillance

Customer Positions and Collateral

CME Clearing employs an account structure that distinguishes and segregates customer positions and performance bond from that of the Clearing Members and their affiliates, as required by the Commodity Exchange Act and CFTC Regulations. Consistent with CFTC Regulation 39.13(g)(8)(ii), performance bond for customers is collected on a gross basis – i.e. one customer's exposures cannot offset another customer's exposures to reduce performance bond requirements. Customer performance bond for the futures and options on futures is referenced in relationship to the "customer segregated account" and for cleared swaps is referenced in relationship to the "cleared swap customer account". Regardless of product type, customer performance bond is collected on a gross omnibus basis for each Clearing Member, as the sum of performance bond requirements for each individual customer of the Clearing Member. Customer performance bond is held to protect CME Clearing from the failure of a Clearing Member to make payments associated with a settlement cycle. CME Group Exchange Rules are supported by the collection of customer performance bond on a gross basis and by CFTC Part 190 Bankruptcy regulations, which are designed to protect customers in the event of insolvency or financial instability of their Futures Commission Merchant ("FCM") Clearing Member.

CME Clearing's FRS department routinely inspects Clearing Member records to monitor compliance with segregation and cleared swap customer account requirements. The integrity of segregated customer accounts relies on the accuracy and timeliness of the information provided to CME Clearing by FCM Clearing Members. Violations by a Clearing Member of segregation requirements for customer accounts are considered serious infractions and can result in the imposition of significant penalties.

Customer Protection

Although the regulatory regimes for customer protections are different for futures and options on futures than for cleared swaps, ultimately a high-level of protection is provided in both cases.

Per CFTC Regulation 39.13(g), CME Clearing sets minimum performance bond levels to the sum of requirements calculated for each individual customer account for products that are under the futures regulatory regime and swaps regulatory regime.

The performance bond requirement for futures is referenced in relationship to Customer Gross Margining ("CGM") and the performance bond requirement for cleared swap customer accounts is referenced in relationship to Legal Segregation with Operational Commingling ("LSOC") regulatory requirements. Both CGM and LSOC, as discussed above, ensure each customer account is gross margined rather than offset against other customers at the same Clearing Member. Customer positions and performance bond is required to be segregated from the positions and performance bond of its Clearing Member for customer segregated and cleared swap customer accounts, in line with CFTC Regulation 1.20(a) and CFTC Regulation 22.2(b), respectively. Additionally under CFTC Regulations, no futures customer collateral or cleared swaps customer collateral can be applied to losses stemming from house positions under any circumstances.

LSOC is implemented through Parts 22 and 190 of CFTC Regulations, which establish customer protections for cleared swaps. LSOC additionally prevents a DCO from using the collateral of one customer to cover the obligation of another customer in the event of a Clearing Member default. CME Clearing goes above and beyond the requirements of LSOC to provide additional protections to customers. CME Clearing's LSOC with excess program allows for Clearing Members to post cleared swap customers' "excess" collateral, which is the amount collected that exceeds the margin requirement set by CME Clearing, while allowing for the customers' full collateral value, as reported by the Clearing Member to be protected. Additionally, upon the default of a Clearing Member, CME Clearing will cease netting settlement variation for cleared swap customers of such Clearing Member and will allow the cleared swap customers of the defaulted Clearing Member to settle directly with the Clearing House.

CME Clearing complies with CFTC Regulation 1.25 that sets forth requirements for the reinvestment of customer segregated account funds and cleared swap customer account funds on deposit at a DCO. This ensures a high level of safety of customer funds and ready access to liquidity. CFTC Regulation 1.25 imposes requirements that mitigate credit, liquidity, and market risks, while ensuring the preservation of principal and maintenance of liquidity. CME Clearing only invests customer collateral in highly liquid, low risk instruments that are permitted under CFTC Regulation 1.25. Furthermore, CME Clearing adheres to the permitted investment

categories laid out in CFTC Regulation 1.25 for non-customer collateral and Guaranty Fund deposits, which goes above and beyond the requirements of the CFTC. Additionally, CME Clearing complies with CFTC Regulation 1.29, which requires that a DCO bear all losses related to the investment of customer funds. CME Clearing also applies CFTC Regulation 1.29 protections against investment losses related to the house account funds.

Financial Surveillance

Recognizing the need to monitor the financial condition of Clearing Members and compliance with customer segregation requirements, CME Clearing's FRS department, in conjunction with other self-regulatory organizations, operates a sophisticated financial surveillance program. The FRS department performs CME Inc's Designated Self-Regulatory Organization ("DSRO") function by conducting on-site, risk-based examinations on an impromptu basis every nine to fifteen months. Through the surveillance program, the FRS department monitors Clearing Member's capitalization levels through regular financial statement submissions, ensures Clearing Member adherence to notification, inspection and information sharing requirements, among other things. The program has several important aspects, as outlined below:

Reporting. FCM Clearing Members are required to maintain excess segregated, secured 30.7, and cleared swap funds at all times including on an intraday basis.⁶ FCM Clearing Members must calculate and report customer segregated, secured 30.7, and customer cleared swap statements daily to the FRS department. FCM Clearing Members are also required to ensure their customer segregated, secured 30.7, and customer cleared swap customer funds depositories independently report daily balances to the FRS department. In addition, FCM Clearing Members must submit to the FRS department bi-monthly investments reports.

All Clearing Members must maintain compliance with capital requirements at all times, including on an intraday basis. Clearing

Members must provide full financial statements monthly, provide certified financial statements once a year, and submit more frequent reports (daily or weekly) as directed by CME Clearing. Clearing Members regulated by another regulatory authority (i.e. banks) must submit to CME Clearing annual audited financial statements as well as all unaudited financial statements provided to its primary regulator within five days after such statements are provided to their regulator.

Notification. Clearing Members are required to report any failure to meet customer segregated, customer cleared swap account requirements, foreign futures or foreign options secured amount, or minimum capital requirements. Clearing Members also must notify CME Clearing prior to any significant business transaction, any significant change in operations, or significant declines in net capital. Numerous other notifications are required and Clearing Members should be familiar with such requirements as highlighted in the CME Group Exchange Rulebook.

Inspection. Generally, each Clearing Member is subject to a financial and operational review every year. The reviews are tailored to focus on the specific risks of the Clearing Member with inspections performed on an impromptu basis.

Information Sharing. CME Clearing participates in formal agreements with other domestic and foreign regulatory authorities, as well as clearing and self-regulatory organizations with regard to information sharing. As part of these agreements, CME Clearing regularly exchanges financial and operational information about joint Clearing Members with other participating entities. Recognizing that the financial marketplace spans the globe, CME Clearing was instrumental in developing the International Information Sharing Memorandum of Understanding, which established a framework for participating exchanges and clearing organizations worldwide to share information relevant to managing risk on a global basis. CME Clearing also seeks broader cooperation between clearing organizations through such industry

⁶ Secured 30.7 accounts primarily contain funds of a FCM's U.S. domiciled customers trading futures and options on futures on foreign exchanges.

Customer Protections and Financial Surveillance, *continued*

forums as the Unified Clearing Group⁷, CCP12⁸, the Joint Audit Committee⁹, and the Intermarket Surveillance Group¹⁰.

CME Clearing has continually been a supporter of implementing prudent financial surveillance over its Clearing Members and its FRS department proactively adopted enhanced customer protection reporting requirements and monitoring practices of FCM Clearing Members. Various CFTC enhanced customer protection requirements were in place and being enforced by CME Clearing prior to their adoption by the CFTC. Further CME Clearing has adopted several customer enhancements which go beyond those required by the CFTC to provide an even stronger customer protection regime.

Capital Requirements for Clearing Members

CME Clearing monitors the financial health of its Clearing Members to ensure they are capable of meeting their obligations to customers and to the Clearing House. CME Clearing requires Clearing Members comply with CFTC capital requirements and also sets its own minimum requirements. Capital requirements vary to reflect the risk of each Clearing Member's house and customer exposures. In addition, capital requirements may vary after CME Clearing's assessment of each Clearing Member's internal controls, risk management policies, and back office operations. Minimum capital (Adjust Net Capital for non-Banks and Tier 1 Capital for Banks) is the greatest of the CFTC (8% of all foreign and domestic domiciled customers and non-customers [excluding proprietary] risk maintenance performance bond requirements for all domestic, foreign futures and options on futures contracts and cleared swaps) or the SEC capital requirement or:

For non-Banks:

- \$5,000,000 if clearing only exchange-traded futures/options or agricultural cleared swaps products;
- \$50,000,000 if clearing swaps derivative products (including but not limited to FX swaps and IRS); or
- 20% of aggregate performance bond requirements for its customer and house accounts for CME cleared IRS positions.

For Banks:

- \$5,000,000,000 if clearing exchange-traded futures/options; or
- \$50,000,000 if clearing only swaps derivative products; or
- 20% of aggregate performance bond requirements for its customer and house accounts for CME cleared IRS positions.

The CHRC and IRSRC, or the Clearing House may prescribe additional capital requirements or grant exemptions for Clearing Members. Capital requirements are monitored by CME Clearing's FRS department.

⁷ The Unified Clearing Group promotes the cooperation of securities and futures clearing agencies on common interest topics.

⁸ CCP 12 is an industry group with clearing house representatives from Asia, the Americas, and Europe.

⁹ The Joint Audit Committee is a voluntary, cooperative organization comprised of representatives from U.S. futures exchanges and regulatory organizations.

¹⁰ The Intermarket Surveillance Group is comprised of an international group of exchanges, market centers, and market regulators that perform market surveillance in their respective jurisdictions.

ANC is computed based on the following formula:

Current Assets

– Adjusted Liabilities

– Capital Charges

Adjusted Net Capital

Current Assets: Cash and other assets that are reasonably expected to be realized as cash, or sold, during the next twelve months. However, certain assets such as prepaid expenses, deferred charges, and unsecured receivables from customers, non-customers, subsidiaries, and affiliates, which would be classified as current under generally accepted accounting principles are deemed non-current. Exchange memberships are also reflected as non-current assets.

Adjusted Liabilities: The Clearing Member's total liabilities less the liabilities which have been subordinated to the claims of general creditors.

Capital Charges: Regulatory capital charges primarily encompass percentage deductions ("haircuts") on the following:

- Speculative proprietary futures and options positions
- Proprietary inventories, fixed price commitments, and forward contracts
- Under margined customer, non-customer, and omnibus accounts
- Marketable securities

Non-bank Clearing Members which are members of all CME Group Exchanges (CME Inc., CBOT, NYMEX, and COMEX) must assign to CME Clearing two CME Group memberships, two IMM memberships, two IOM memberships, one GEM membership, one full CBOT membership (two if a registered FCM), two full NYMEX memberships, and two full COMEX memberships. To obtain clearing privileges for a single CME Group Exchange, a Clearing Member must meet the membership requirements of that particular Exchange. To obtain clearing privileges for multiple CME Group Exchanges, Clearing Members need to meet the membership requirements of each of those particular Exchanges.

Additionally, CME Group Exchange Rules generally require if any person owns 10% or more of the profits of two or more Clearing Members, then each such clearing member shall guarantee the obligations of the others to the Clearing House.

Market Regulation

Through CME Group's Market Regulation department, CME Clearing's Risk Management team has access to specific account position information for Clearing Members' large individual customer accounts. Such position information, which is maintained on a highly confidential basis, allows the identification of concentrated positions as they arise and the aggregation of positions that may be owned by common principals through several different Clearing Members. Knowledge of concentrated or high-risk positions, coupled with information routinely gathered on the cash and/or related derivative markets, enables CME Clearing to respond rapidly to market situations that might adversely affect the financial integrity of CME Clearing or the financial stability of a Clearing Member.

Clearing Member Risk Reviews

The FRS department's risk-based examinations are supplemented by separate on-site risk reviews conducted by CME Clearing's Risk Management team about every other year. The Risk Management team focuses on Clearing Members' holistic risk management program, including Clearing Members' approach to market risk, credit risk and liquidity management, including in relationship to their customers. During the on-site review, CME Clearing evaluates various financial metrics such as liquidity, capital adequacy, asset quality, and earnings/profitability. In addition, reviews are conducted to review policies for new and existing account monitoring, risk management procedures for customer and proprietary exposures, default management capabilities, monitoring of liquidity risk, and operational risk management. These reviews cover credit, market, and liquidity risks through a series of topics:

- Customer and proprietary trading risk monitoring and control;
- Risk management, monitoring, and stress test reports;
- Demonstration of risk management systems;
- Demonstration of credit control functionality;

Customer Protections and Financial Surveillance, *continued*

- Counterparty credit risk management;
- Internal funding process;
- Internal risk system for pays/collects;
- Collateral policy;
- Settlement bank relationships; and
- Liquidity/capital plans in case of assessment to CME Clearing.

Results of each review are provided to CME Clearing Senior Management. If a review indicates a potential weakness or area of concern, the CME Clearing Risk Management team will submit recommendations to CME Clearing Senior Management and the appropriate CME Clearing Risk Committee. Recommendations may include, among other things, issuing a formal request to the Clearing Member to address the matter within a specified period to alleviate the need for more significant action to be taken.

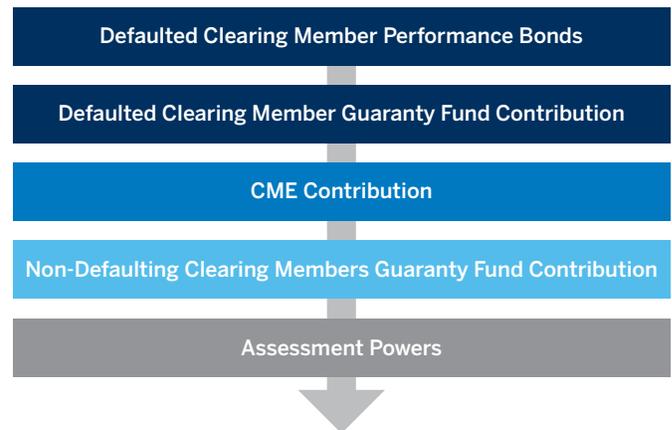
Information from Clearing Member reviews is also supplemented by CME Clearing's ongoing monitoring of counterparty exposures, which encompasses the monitoring of Clearing Members. On a daily basis, CME Clearing monitors counterparty market data which includes share pricing, CDS spreads, and external credit ratings, among other items. Each Clearing Member is subject to an internal credit risk rating determined by CME Clearing, based on quantitative and qualitative metrics. In assessing a Clearing Member, public and private information is considered. Internal credit ratings are in part utilized to determine tolerance thresholds for Clearing Members that highlight when Clearing Member settlement variation and/or initial margin payment obligation amounts to CME Clearing exceed the designated threshold, which then requires the Risk Management team to investigate the matter further. Clearing Members with strong ratings are given higher tolerance thresholds, while those with weaker ratings are assigned more conservative thresholds and are subject to more frequent review schedules.

Default by a Clearing Member

The failure of a customer to meet its financial obligations to its Clearing Member, which does not cause the failure of the Clearing Member to meet its financial obligations to the Clearing House, is managed by the Clearing Member and therefore, outside the scope of this document.

CME Clearing's financial safeguards system includes processes related to managing defaults for both exchange-traded and cleared swaps markets. CME Clearing's risk management and financial surveillance techniques are designed to minimize the possibility that a Clearing Member will default on its obligations to CME Clearing. CME Clearing, by Rule and by operational practice, has prepared contingencies to expeditiously deal with the unlikely event of a Clearing Member default. A Clearing Member may be declared to be in default when it fails to promptly discharge any obligation to CME Clearing,¹¹ including but not limited to failure to satisfy its financial obligations to CME Clearing. Upon the default of a Clearing Member, CME will attempt to port all non-defaulting customers as quickly as practicable to a non-defaulting Clearing Member. CME Clearing will work to identify stable Clearing Members with similar or complimentary customer profiles who may be well placed to absorb solvent customers prior to the default of the distressed Clearing Member, minimizing the amount of time necessary to port customers once the default has been declared. Under Chapter 8 of CME Group Exchange Rulebook, CME Clearing has the right to immediately transfer customer positions and associated performance bond value to a non-defaulting Clearing Member, when the default did not occur in such customer account. In managing past Clearing Member default events, performance bond funds collected from the defaulted Clearing Members were sufficient to cover the associated losses and CME Clearing was able to quickly transfer all customer positions and collateral to non-defaulting Clearing Members, preserving customers' access to CME Clearing's services.

In the event of a default of a Clearing Member, depending upon the products cleared by the particular Clearing Member, CME Clearing may utilize the appropriate Guaranty Fund(s) and financial safeguards waterfall(s), in which the Clearing Member participates, but may not use those in which the defaulted Clearing



Member does not participate. As previously mentioned, CME Clearing maintains two waterfall structures, one for Base product and one for IRS products. The layers of the financial safeguards waterfalls create a pre-defined and transparent structure of protections that give Clearing Members the information needed to assess potential liabilities in the event of a Clearing Member default. Each financial safeguards waterfall is structured in the same way, where the default of a Clearing Member will result in the utilization of the performance bonds and Guaranty Fund contributions of the defaulted Clearing Member first, and then in the unlikely event those funds are insufficient the CME Clearing contribution would be utilized, followed by the non-defaulting Clearing Members' Guaranty Fund contributions, and lastly funds collected through the assessment of non-defaulting Clearing Members – with the waterfall(s) associated with the defaulted Clearing Member's membership(s) only being utilized.

In the event CME Inc. is facing severe stress, unrelated to a Clearing Member default, Clearing Member and customer assets are bankruptcy remote from CME Inc.'s estate.

¹¹ CME Rule 802.A.1 (Default by Clearing Member).

Default by a Clearing Member, *continued*

Guaranty Funds

CME Clearing's rules are designed to maximize the safety of the mutualized pool of Guaranty Funds. CME Clearing's Guaranty Fund practices are consistent with regulatory requirements and industry standards and subject to review and approval by the appropriate CME Clearing Risk Committee. The Guaranty Funds are designed to cover the tail risk of potential losses in excess of performance bond (considered stress shortfall) under extreme but plausible scenarios, as measured by stress tests. Consistent with CFTC Regulation 39.33(a), the Guaranty Funds for each waterfall are sized to cover the potential loss caused by the simultaneous default of the two Clearing Members and their affiliates with the largest potential shortfalls, within the individual major asset class. This is commonly referred to as "Cover Two". For all major asset classes, the largest potential losses from hypothetically defaulting Clearing Members are identified through a series of stress tests simulating extreme but plausible market fluctuations based on historical data for individual products as well as hypothetical stresses. The stress test results are reviewed by the CME Clearing Stress Testing Committee at least on a monthly basis, in addition to daily reviews of the results to ensure adequacy of the Base and IRS Guaranty Funds. Results are also shared with the appropriate CME Clearing Risk Committees.

Each Clearing Member is required to contribute a risk-based, or minimum amount, to the Guaranty Fund of the waterfall for each major asset class it clears. The minimum contributions are defined in CME Group Exchange Rules 816 and 8G07 for the Base and IRS waterfalls, respectively.

Individual Clearing Member contributions to the Base Guaranty Fund¹² are computed as the greater of \$500,000 or the results of a formula under which 95% of the total requirement is based on the Clearing Member's proportionate contribution to aggregate risk performance bond requirements over the prior three months and the remaining 5% is based on the Clearing Member's contribution to risk-weighted transaction activity over the prior three months.

Individual Clearing Member contributions to the IRS Guaranty Fund are computed as the greater of the \$15 million or the Clearing Member's proportional share of the IRS Guaranty Fund

based on (a) a 30-day trailing average of their Portfolio Residual Loss, which is the tail risk the IRS Clearing Member brings to the Clearing House (90%) and (b) a 30-day trailing average of its gross notional (10%).

CME Clearing recalculates the Base and IRS Guaranty Funds requirements on at least a monthly basis, but may resize the Guaranty Funds more frequently as market conditions warrant. This is to ensure the Guaranty Funds for each waterfall are sized to cover the defaults of the two largest Clearing Members and their affiliates. The aggregate size of the Guaranty Fund contributions for each major asset class are disclosed on the CME Group website and updated regularly.¹³

CME Clearing Contribution

CME Clearing believes it's critical that a clearing house commit a meaningful first-loss contribution to the waterfall structure, in advance of a mutualized Clearing Member Guaranty Fund, to further align the incentives of the Clearing House and market participants. The size of the designated CME Clearing Contribution for each asset classes' waterfall structures are also covered under CME Group Exchange Rules 802 and 8G802 for Base and IRS, respectively.

Assessment Powers

The final layer of the financial safeguards waterfall is CME Clearing's assessment powers against non-defaulting Clearing Members. Assessment powers are determined independently for the Base and IRS financial safeguards waterfalls to ensure coverage of extreme tail events in each specific major asset class. For the Base financial safeguards waterfall, assessment powers cannot exceed 2.75 times each non-defaulting Base Clearing Member's Base Guaranty Fund requirement for a single default. For the IRS financial safeguard waterfall, assessment powers are sized to cover the default of the third and fourth largest IRS Clearing Member stress shortfalls.

In the event that the Guaranty Fund is drawn on to cover losses caused by a Clearing Member default, each non-defaulting Clearing Member is required to replenish its Guaranty Fund contributions by

¹² Clearing members that clear OTC products covered in the Base Guaranty Fund must maintain a minimum Guaranty Fund deposit of \$2.5 million.

¹³ <http://www.cmegroup.com/clearing/cme-clearing-overview/safeguards.html>

close of business the business day following the utilization of the Guaranty Fund, subject to any applicable cooling off periods – 5 business days for the Base financial safeguards waterfall and 25 business days for the IRS financial safeguards waterfalls under CME Group Exchange Rule 802.H and 8G802.H, respectively.

Default Management

Default management practices are designed to ensure the continuity of CME Clearing's services. CME Clearing has established practices and procedures that allow the clearing house to operationally manage a Clearing Member default while simultaneously maintaining continuity of clearing services to non-defaulting Clearing Members. CME Clearing acts in the event of either a Clearing Member house account or Clearing Member customer account default are described in detail below.

House Account Default

If a Clearing Member fails to meet its financial obligations to CME Clearing, related to its house account (sometimes referred to as proprietary or non-customer) account, CME Clearing may act immediately to:

- Transfer customer segregated and cleared swap customer account customer positions and collateral to a non-defaulting Clearing Member;
- Take control of and/or liquidate positions in the Clearing Member's house account;
- Apply the Clearing Member's house performance bond deposits and, if necessary, the Clearing Member's Guaranty Fund contributions to satisfy the Clearing Member's obligations to CME Clearing with regard to its house account; and/or
- Utilize all other assets of the Clearing Member that are available to CME Clearing (e.g., exchange memberships).

Customer segregated and cleared swap customer account assets (positions and/or collateral) on deposit with or in the control of CME Clearing may not be used or impaired by CME Clearing in the case of a Clearing Member default related to the house account.

Customer Segregated Account or Cleared Swap Customer Account Default

If a Clearing Member fails to meet its financial obligations resulting in a failure to make payment within its customer segregated or cleared swap customer account, CME Clearing may act immediately to:

- Transfer non-defaulting customer segregated or cleared swap customer account positions and collateral to a non-defaulting Clearing Member;
- Take control of and/or liquidate defaulting customer segregated or cleared swap customer account positions and house positions;
- Apply the Clearing Member's house performance bond deposits and, if necessary, the Clearing Member's Guaranty Fund contribution to the failed obligation to CME Clearing; and/or
- Utilize all other assets of the Clearing Member that are available to CME Clearing (e.g. Exchange memberships).

Although CME Clearing separates customer segregated performance bond deposits and positions from the Clearing Member's proprietary performance bond deposits and positions, the customer performance bond deposits and positions for each Clearing Member are held in omnibus accounts. Holding customer performance bond deposits in aggregate allows for CME Clearing to quickly port non-defaulted customers' collateral and positions to solvent Clearing Member(s), reducing the likelihood that customers would not be able to access CME Clearing's services during market stress. Gross margining greatly improves the timeliness and likelihood of porting given all positions are fully collateralized.

In case a Clearing Member's default stems from a customer segregated account for exchange-traded derivatives, CME Clearing has the right to apply toward the default all performance bond deposits and positions within the respective customer segregated account at CME Clearing. More specifically, a Clearing Member's customer segregated account is held in aggregate without specific customer ownership identification, which potentially subjects positions and performance bonds deposited by customers not causing a default to liquidation risk. For cleared swaps, LSOC rules require daily reporting of individual customer deposits

Default by a Clearing Member, *continued*

and positions, which works to help safeguard collateral from one customer to another customer. Further, under LSOC, CME Clearing is prohibited from using the value contributed by one customer to satisfy losses of another customer.

Default Management Default Drills

In addition to performing various default management exercises throughout the year, CME Clearing conducts semi-annual default management drills with its Clearing Members and market participants across each financial safeguards waterfall. Default management drills test the operational systems and processes in place and are designed to ensure both the Clearing House and Clearing Members are operationally prepared to manage a potential Clearing Member default. The drills are structured consistent with existing Clearing Member exposures and contain large and complex portfolios representative of the risks held by existing Clearing Members. Each drill consists of a hedging phase, where appropriate, and an auction and/or liquidation of the hypothetically defaulting Clearing Member's positions. The results of each drill are reviewed by the relevant CME Clearing Risk Committee and changes to default management processes are implemented as warranted.

Auction Process

With regard to a default in the Base waterfall, CME Clearing may conduct an auction for selected market participants and Clearing Members to bid on the defaulted Clearing Member's portfolio. Base auction participation is voluntary and participants are selected at the discretion of the Clearing House. Alternatively, CME Clearing may liquidate the defaulted positions using an electronic trading venue (i.e. CME Globex).

As part of CME Clearing's membership requirements, IRS Clearing Members must participate in the auction process of a defaulted IRS Clearing Member's portfolio, which entails the construction of a competitive bid and potential participation on the IRS Active Default Management Committee. The IRS Active Default Management Committee is comprised of seconded traders who are charged with advising CME Clearing in the hedging and/or liquidation process of a defaulted IRS Clearing Member's portfolio in order to facilitate an orderly auction.

Recovery Plan

As a Systemically Important Derivatives Clearing Organization ("SIDCO"), CME Inc. maintains a Recovery Plan in compliance with CFTC Regulation 39.39, which additionally targets to align with the guidance issued by CPMI-IOSCO's report on Recovery of Financial Market Infrastructures. The Recovery Plan includes analysis of stressed market scenarios, which are supposed to threaten CME Inc. from a "going concern" perspective, while taking into account independent and related risk. The recovery tools laid out in the Recovery Plan have the goal of preserving CME Clearing's critical services and operations and allows for continuity of services. The Recovery Plan lays out actions that allows CME Inc. to manage uncovered credit and liquidity shortfalls, as well as general business and operational risks that threaten its viability. Additionally, CME Inc.'s Recovery Plan presents a number of financial tools available to CME Clearing to address both Clearing Member defaults and non-Clearing Member default events.

Disaster Recovery and Business Continuity

CME Group's Business Continuity Management ("BCM") program reflects objectives, policies and procedures that allow for the rapid recovery and timely resumption of critical operations following a wide-scale or major disruption. The BCM program is designed to mitigate potential impacts to the markets and customers CME Clearing serves. The BCM program defines procedures which safeguard the interests of key market stakeholders, and establishes steps necessary to protect the Clearing House's reputation and brand, following a disruption. The BCM program helps to ensure CME Group's resiliency, including CME Clearing's through:

- Aligning with U.S. and international standards for business continuity management;
- Implementing incident response, information technology/ disaster recovery and business recovery strategies that are both flexible and agile;
- Building effective partnerships across the company to effectively manage risk;
- Employing tested exercise models that evolve with the environment and architecture;
- Identifying opportunities for enhanced resilience;
- Establishing collaborative relationships with external entities, partnerships and agencies; and
- Continually monitoring and adjusting program components to meet both domestic and international regulatory requirements, and that reflect any material changes to the business.

CME Clearing ensures it can continually meet its recovery time objectives of two-hours, as further described below by conducting disaster recovery exercises at least twice annually, and participates in the annual Futures Industry Association industry-wide drills. Further, CME Clearing staff located outside of the U.S. region are cross trained to cover and manage critical processes to help ensure the Clearing House can complete processing and settlements in the event where personnel in the production location are not able to do so.

CME Group has implemented a streamlined data center approach, which includes housing all production systems within one data center and all backup systems in a second, out-of-region data

center; both data centers rely on separate infrastructure. CME Clearing transaction data is replicated in near real-time to both primary and secondary sites. In the event CME Group were to experience a regional outage impacting its production data center, it would failover to its out-of-region, secondary data center.

Additionally, at least twice a year, all critical applications are failed over from production to disaster recovery; the results of the failover tests are documented in after-action reports. CME Group also conducts additional incremental testing, outside of the two tests mentioned above, to further validate the recovery strategy.

The BCM program also utilizes incident response teams to ensure CME Group, including CME Clearing continuity meets its defined operational objectives after a disruption within its defined recovery time objective.

Given the developed disaster recovery and business continuity planning CME Clearing has in place, CME Clearing is confident that it would be able to meet its recovery time objective upon a disruption. CME Clearing's clearing and settlement processes are recoverable, upon a disruption in no more than two-hours, in line with CFTC Regulation 39.34(a). The remaining systems are recoverable, upon disruption in no more than four hours.



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All matters pertaining to rules and specifications herein are made subject to and are superseded by official CME Group rules.

Current CME Group rules should be consulted in all cases concerning contract specifications.