Monetary Authority of Singapore

SECURITIES AND FUTURES ACT
(CAP. 289)

NOTICE ON FINANCIAL MARKET INFRASTRUCTURE STANDARDS

Notice No.: SFA 02A/03-N01

Issue Date: 31 Aug 2015 (last revised on 16 Jun 2016)

NOTICE ON FINANCIAL MARKET INFRASTRUCTURE STANDARDS

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1 Introduction

1.1 This Notice is issued pursuant to sections 46ZK and 81R of the Securities and Futures Act (Cap. 289) ("SFA"), and applies to—

(a) licensed trade repositories; and
(b) approved clearing houses

1.2 MAS administers the SFA in respect of the supervision and oversight of trade repositories, clearing houses and central securities depositories in accordance with the CPMI-IOSCO Principles for Financial Market Infrastructures ("PFMI"), as set out under the Monograph on Supervision of Financial Market Infrastructures. Some of the principles in the PFMI are set out in the SFA and subsidiary legislations issued under the Act. This Notice sets out the remaining principles in the PFMI that an FMI has to comply with.

2 Definitions

2.1 For the purpose of this Notice—

"authorities" include regulatory authorities and central banks;

"central counterparty" or "CCP" means an approved clearing house which is a clearing facility carrying on the activity set out in sub-paragraph (b) of the definition of "clearing or settlement" in Part II of the First Schedule to the SFA;

"FMI" means a multilateral system among participating institutions, including the operator of the system, used for the purposes of clearing, settling, or recording payments, securities, derivatives, or other financial transactions, and includes a Regulated FMI;

"Regulated FMI" means a licensed trade repository or an approved clearing house; and

"securities settlement system" or "SSS" means an approved clearing house which is a clearing facility carrying on the activity set out in sub-paragraph (d) of the definition of "clearing or settlement" in Part II of the First Schedule to the SFA.

2.2 Any expression used in this Notice shall, except where expressly defined in this Notice or where the context requires, have the same meaning as in the SFA.

3 Standards applicable to Regulated FMIs

3.1 Legal risk management

A Regulated FMI shall:

3.1.1 have an enforceable legal basis for each material aspect of its activities, to provide a high degree of legal certainty for such activities.

3.1.2 have rules, procedures, and contracts that are clear, understandable, and consistent with laws and regulations applicable to its activities and operations.

3.1.3 be able to articulate the legal basis for its activities to authorities, participants, and, where relevant, participants' customers, in a clear and understandable way.

3.1.4 have rules, procedures, and contracts that are enforceable in all relevant jurisdictions[1]. The Regulated FMI shall ensure a high degree of certainty that actions taken by the Regulated FMI under such rules and procedures will not be voided, reversed, or subject to stays.

3.1.5 identify and mitigate the risks arising from any potential conflict of laws when conducting business in multiple jurisdictions.

3.2 Governance arrangements

A Regulated FMI shall:

3.2.1 have governance arrangements that place a high priority on the safety and efficiency of the Regulated FMI and support financial stability and other relevant public interest considerations.

3.2.2 document its governance arrangements for its board of directors (or equivalent) ["board"] and such arrangements shall provide clear and direct lines of responsibility and accountability between management and the board. The Regulated FMI shall disclose its arrangements to its owners, authorities, participants, and, at a more general level, the public.

3.2.3 specify the roles and responsibilities of its board clearly in its governance arrangements, and there shall be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest. The Regulated FMI shall ensure that its board reviews the overall performance of the board and the performance of the individual board members regularly.

3.2.4 specify the roles and responsibilities of management clearly in its governance arrangements. The Regulated FMI shall ensure that its management has the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the Regulated FMI.

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[1] These jurisdictions could include (a) those where a Regulated FMI is conducting business (including through linked FMIs); those where its participants are incorporated, located or otherwise conducting business for the purposes of participation; (c) those where collateral is located or held; and (d) those indicated in relevant contracts.

3.2.5 ensure that its board establishes a clear, documented risk-management framework that includes the Regulated FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. The Regulated FMI shall also ensure that the governance arrangements provide for the risk-management and internal control functions to have sufficient authority, independence, resources, and access to the board.

3.2.6 require its board to ensure that the Regulated FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. The Regulated FMI shall clearly disclose major decisions relating to the relevant stakeholders and, where the decision has a broad market impact, the public.

3.3 Framework for the comprehensive management of risks

A Regulated FMI shall:

3.3.1 regularly review its 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 Regulated FMI.

3.3.2 provide incentives[2] to participants and, where relevant, their customers to manage and contain the risks they pose to the Regulated FMI.

3.3.3 shall 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.

3.4 Credit risk management

An SSS or a CCP (as the case may be) shall:

3.4.1 establish a robust framework to manage its credit exposures[3] to its participants and the credit risks arising from its payment, clearing, and settlement processes.

3.4.2 identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk-management tools to control these risks.

An SSS shall:

3.4.3 cover its current exposures and, where they exist, potential future exposures to each participant fully with a high degree of confidence[4] using collateral and other equivalent financial resources. For an SSS – (a) where settlement is on a net basis at the end of a predetermined cycle, (b) which does not provide any settlement guarantee and (c) which participants face credit exposures to other participants arising from the SSS' clearing and

[2] For example, an FMI could apply financial penalties to participants that fail to settle securities transactions in a timely manner or apply loss-sharing arrangements in a manner proportionate to the exposures brought to the FMI.
[3] Credit exposure may arise from current exposures, potential future exposures, or both.
[4] Initial margins, or other prefunded financial resources of equivalent or stronger quality, should meet an established single-tailed confidence level of at least 99 percent of the estimated distribution of future exposure.

settlement processes, the SSS shall maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates[5] that would create the largest aggregate credit exposure in the system.

A CCP shall:

3.4.4 cover its current exposures and potential future exposures to each participant fully with a high degree of confidence[6] using margins and other prefunded financial resources. The CCP shall document its rationale for, and shall have appropriate governance arrangements relating to, the amount of total financial resources it maintains.

3.4.5 determine the total amount of its financial resources available in the event of a default or multiple defaults, in extreme but plausible market conditions and regularly test the sufficiency of such financial resources, through rigorous stress testing. The CCP shall have clear procedures to report the results of its stress tests to appropriate decision makers under its governance arrangements. The CCP shall also have clear procedures to use such results to evaluate the adequacy of its total financial resources, and, where appropriate, to adjust its total financial resources. The CCP shall perform stress tests daily using standard and predetermined parameters and assumptions. The CCP shall, at the minimum on a monthly basis, 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. The CCP shall perform this analysis 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. The CCP shall perform a full validation of its risk-management model at least annually.

3.4.6 consider the effect of a wide range of relevant stress scenarios in terms of both defaulters' positions and possible price changes in liquidation periods in conducting stress testing. 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.

An SSS or a CCP (as the case may be) shall:

3.4.7 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 SSS or CCP (as the case may be). These rules and procedures shall address how potentially uncovered credit losses would be allocated, including the repayment of any funds the SSS or CCP (as the case may be) may borrow from liquidity providers. The SSS or CCP (as the case may be) shall include in such rules and procedures, the process to replenish any financial resources that the SSS or CCP (as the case may be) may employ during a stress event, so that the SSS or CCP (as the case may be) can continue to operate in a safe and sound manner.

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[5] An affiliate is a corporation which controls, is controlled by, or is under the control of another entity which also has control of, the participant. Such control refers to (a) ownership, control, or holding with power to vote 20 percent or more of a class of voting securities of a corporation; or (b) consolidation of the corporation for financial reporting purposes.

[6] Please refer to footnote 3.

3.5 Collateral

An SSS or a CCP (as the case may be):

3.5.1 shall generally limit the assets it accepts as collateral to those with low credit, liquidity and market risks.

3.5.2 shall establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.

3.5.3 shall establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent, in order to reduce the need for pro-cyclical adjustments.

3.5.4 shall avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects.

3.5.5 that accepts cross-border collateral shall mitigate the risks associated with its use and ensure that the collateral can be used in a timely manner.

3.5.6 shall use a collateral management system that is well-designed[7] and operationally flexible.

3.6 Margin

A CCP:

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

3.6.2 shall have a reliable source of timely price data for its margin system. The CCP shall also have procedures and sound valuation models for addressing circumstances in which pricing data are not readily available or reliable.

3.6.3 shall adopt initial margin[8] 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. The CCP shall have an initial margin that meets 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 CCP shall use a model which (a) uses a conservative estimate of the time horizons for the effective hedging or close out of the particular types of

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[7] For example, a well-designed system would be able to accommodate changes in the ongoing monitoring and management of collateral. The system would also have the functionality to accommodate the timely deposit, withdrawal, substitution, and liquidation of collateral.

[8] Initial margin, in relation to a CCP, refers to collateral that is collected by the CCP to cover potential changes in the value of each participant's position (that is, potential future exposure) over the appropriate close-out period in the event the participant defaults.

products cleared by the CCP (including in stressed market conditions), (b) has 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, limits the need for destabilising, procyclical changes.

3.6.4 shall mark participant positions to market and collect variation margin at least daily to limit the build-up of current exposures. The CCP shall have the authority and operational capacity to make intraday margin calls and payments, both scheduled and unscheduled, to participants.

3.6.5 may, in calculating margin requirements, 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[9] they must have appropriate safeguards and harmonised overall risk-management systems.

3.6.6 shall analyse and monitor its model performance and overall margin coverage by conducting rigorous daily backtesting and at least monthly, or more-frequent where appropriate, sensitivity analysis. The CCP shall regularly conduct an assessment of the theoretical and empirical properties of its margin model for all products it clears. In conducting a sensitivity analysis of the model's coverage, the CCP shall 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.

3.6.7 shall regularly review and validate[10] its margin system.

3.7 Liquidity risk

3.7.1 In this section, "Qualifying Liquid Resources" means cash at the central bank and at creditworthy commercial banks, committed liquidity instrument[11] 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 the SSS or CCP (as the case may be) has access to routine credit at the central bank of issue, the SSS or CCP (as the case may be) may count such access as part of the Qualifying Liquid Resources 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.

An SSS or a CCP (as the case may be) shall:

3.7.2 have a robust framework to manage its liquidity risks from its participants, settlement banks, nostro agents, custodian banks, liquidity providers, and any other entity which it has dealings with.

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[9] Cross-margining refers to an arrangement where two or more CCPs agree to consider their positions and supporting collateral as a common portfolio for participants that are members of those two or more CCPs.

[10] For example, a qualified and independent party would be expected to review and validate a CCP's margin methodology, including the basic assumptions of the analytical method selected and the key data inputs.

[11] For example, committed lines of credit, committed foreign exchange swaps and committed repos. Such committed liquidity arrangements are explicit contractual agreements or obligations to draw on funds extended by counterparties at a future date, which are contractually irrevocable or conditionally revocable agreements.

3.7.3 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.

An SSS shall:

3.7.4 maintain sufficient Qualifying Liquid Resources in all relevant currencies to effect same-day settlement, and where appropriate intraday or multiday settlement, of payment obligations under a wide range of potential stress scenarios ("Minimum SSS Liquid Resource Requirement"). Such scenarios shall include the default of the participant and its affiliates[12] that would generate the largest aggregate payment obligation in extreme but plausible market conditions.

A CCP shall:

3.7.5 maintain sufficient Qualifying Liquid Resources in all relevant currencies to settle securities-related payments, make required variation margin payments, and meet other payment obligations on time under a wide range of potential stress scenarios ("Minimum CCP Liquid Resource Requirement"). Such scenarios shall include 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 shall consider maintaining additional Qualifying Liquid Resources sufficient to cover a wider range of potential stress scenarios. Such scenarios shall include 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.

An SSS or a CCP (as the case may be):

3.7.6 shall, for the purpose of meeting its Minimum SSS Liquid Resource Requirement and Minimum CCP Liquid Resource Requirement, have its Qualifying Liquid Resources in each currency available when needed.

3.7.7 may supplement its Qualifying Liquid Resources with other forms of financial resources. If the SSS or CCP (as the case may be) does so, then these financial resources shall 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 the SSS or CCP (as the case may be) does not have access to routine central bank credit, it shall 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 market circumstances. The SSS or CCP (as the case may be) shall not consider the availability of emergency central bank credit as a part of its framework to manage its liquidity risks.

3.7.8 shall conduct rigorous due diligence such that each provider of its Qualifying Liquid Resources, whether a participant of the SSS, CCP or an external party, has sufficient information to understand and to manage its associated liquidity risks, and that it has the

[12] Please refer to footnote 4.

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. The SSS or a CCP (as the case may be) shall regularly test its procedures for obtaining its Qualifying Liquid Resources from a liquidity provider.

3.7.9 with access to central bank services[13] shall use these services, where practical, to enhance its management of liquidity risk.

3.7.10 shall determine the amount and regularly test the sufficiency of its Qualifying Liquid Resources through rigorous stress testing. The SSS or CCP (as the case may be) shall have clear procedures to report the results of its stress tests to appropriate decision makers under its governance framework and to use these results to evaluate the adequacy of and adjust its liquidity risk-management framework. In conducting stress testing, the SSS or CCP (as the case may be) shall consider a wide range of relevant scenarios. Scenarios shall 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 shall also take into account the design and operation of the SSS or CCP (as the case may be), include all entities that might pose material liquidity risks to the SSS or CCP (such as settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs), and where appropriate, cover a multiday period. In all cases, the SSS or CCP (as the case may be) shall document its rationale for, and shall have appropriate governance arrangements relating to, the amount and form of total liquid resources it maintains.

3.7.11 shall establish explicit rules and procedures that enable the SSS or CCP (as the case may be) 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 shall address unforeseen and potentially uncovered liquidity shortfalls and shall aim to avoid unwinding, revoking, or delaying the same-day settlement of payment obligations. The SSS or CCP (as the case may be) shall include in such rules and procedures the SSS's and CCP's (as the case may be) 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.

3.8 Settlement finality

An SSS or a CCP (as the case may be) shall:

3.8.1 have rules and procedures which clearly define the point at which settlement is final.

3.8.2 complete final settlement no later than the end of the value date, and preferably intraday or in real time, to reduce settlement risk. An SSS shall consider adopting real-time gross settlement (RTGS) or multiple-batch processing during the settlement day.

3.8.3 clearly define the point after which unsettled payments, transfer instructions or other obligations may not be revoked by a participant.

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[13] These include payment services, securities services or collateral management services.

3.9 Money settlements

An SSS or a CCP (as the case may be):

3.9.1 shall conduct its money settlements in central bank money[14], where practical and available, to avoid credit and liquidity risks.

3.9.2 shall conduct its money settlements using a settlement asset[15] with little or no credit or liquidity risk if central bank money is not used.

3.9.3 that settles in commercial bank money[16] shall monitor, manage, and limit its credit and liquidity risks arising from the commercial settlement banks. In particular, the SSS or CCP (as the case may be) shall 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. The SSS or CCP (as the case may be) shall also monitor and manage the concentration of credit and liquidity exposures to its commercial settlement banks.

3.9.4 that conducts money settlements on its own books shall minimise and strictly control its credit and liquidity risks.

3.9.5 shall, in order to enable the SSS or CCP (as the case may be) and its participants to manage credit and liquidity risks, ensure that its legal agreements with any settlement bank state clearly when transfers on the books of the settlement bank are expected to occur, that transfers are to be final when effected, and that funds received shall be transferable as soon as possible, at a minimum by the end of the day and ideally intraday.

3.10 Physical deliveries

An SSS or a CCP (as the case may be) shall:

3.10.1 have rules which clearly state its obligations with respect to the delivery of physical instruments or commodities.

3.10.2 identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities.

3.11 *[This section is intentionally left blank]*

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[14] "Central bank money" refers to liabilities of a central bank, in the form of deposits held at the central bank, which can be used for settlement purposes.

[15] This refers to an asset used for the discharge of settlement obligations as specified by the rules, regulations or customary practices of a payment system.

[16] "Commercial bank money" refers to liabilities of a commercial bank.

3.12 Exchange-of-value settlement systems

An SSS or a CCP (as the case may be):

3.12.1 that is an exchange-of-value settlement system shall 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 SSS or CCP (as the case may be) settles on a gross or net basis and when finality occurs.

3.13 Participant-default rules and procedures

An SSS or a CCP (as the case may be) shall:

3.13.1 have default rules and procedures that enable the SSS or CCP (as the case may be) to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.

3.13.2 be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in its rules. The SSS or CCP (as the case may be) shall design its rules and procedures to ensure that the SSS or CCP (as the case may be) can take timely action to contain losses and liquidity pressures and continue to meet its obligations.

3.13.3 publicly disclose key aspects of its default rules and procedures.

3.13.4 involve its participants and other stakeholders in the testing and review of the SSS or CCP (as the case may be) default procedures, including any close-out procedures. Such testing and review shall be conducted at least annually or following material changes to the rules and procedures to ensure that they are practical and effective.

3.14 Segregation and portability

A CCP shall:

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

3.14.2 employ an account structure that enables it readily to identify positions of a participant's customers. A CCP shall maintain customer positions in individual customer accounts or in omnibus customer accounts.

3.14.3 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.

3.14.4 publicly 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 shall disclose whether customer collateral is protected on an individual or omnibus basis. In addition, the CCP shall 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.

3.15 General business risk

A Regulated FMI shall:

3.15.1 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.

3.15.2 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 a Regulated FMI shall hold shall 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.

3.15.3 maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed. The Regulated FMI shall ensure that this plan is approved by the board and updated regularly.

3.16 Custody and investment risks

An SSS or a CCP (as the case may be) shall:

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

3.16.2 have prompt access to its assets and the assets provided by participants, when required.

3.16.3 evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.

3.16.4 ensure that its investment strategy is consistent with its overall risk-management strategy and fully disclosed to its participants, and investments shall be secured by, or be claims on, high-quality obligors. These investments shall allow for quick liquidation with little, if any, adverse price effect.

3.17 Operational risks

A Regulated FMI shall:

3.17.1 require its board to clearly define the roles and responsibilities for addressing operational risk and endorse the Regulated FMI's systems, operational policies, procedures, and controls to identify, monitor and manage operational risks ("operational risk management framework"). The Regulated FMI shall, periodically and after significant changes, review, audit and periodically test its operational risk management framework.

3.17.2 have clearly defined objectives on the reliability of its operations and shall have policies in place that are designed to achieve those objectives.

3.17.3 ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.

3.17.4 have comprehensive policies on physical and information security that address all potential vulnerabilities and threats.

3.17.5 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 shall incorporate the use of a secondary site and shall be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The Regulated FMI shall design a plan to enable it to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The Regulated FMI shall regularly test these plans.

3.17.6 identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In addition, the Regulated FMI shall identify, monitor, and manage the risks its operations might pose to other FMIs.

3.18 Access and participation requirements

A Regulated FMI shall:

3.18.1 when imposing participation requirements be able to justify such requirements in terms of the safety and efficiency of the Regulated FMI and the markets it serves, and have requirements which are tailored to and commensurate with the Regulated FMI's specific risk. The Regulated FMI shall publicly disclose its participation requirements. Subject to maintaining acceptable risk control standards, a Regulated FMI shall endeavor to set requirements that have the least-restrictive impact on access that circumstances permit.

A licensed trade repository shall:

3.18.2 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 long meets, the participation requirements.

3.19 Tiered participation arrangements[17]

A Regulated FMI shall:

3.19.1 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 Regulated FMI arising from such tiered participation arrangements.

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[17] "Tiered participation arrangements" in relation to an FMI, means arrangements where indirect participants rely on the services provided by direct participants to use the FMI's clearing, settlement or recording facilities for transactions.

3.19.2 identify material dependencies between direct and indirect participants that might affect the Regulated FMI.

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

3.19.4 regularly review risks arising from tiered participation arrangements and shall take mitigating action when appropriate.

3.20 FMI links

A Regulated FMI shall:

3.20.1 have link arrangements which are designed such that each FMI participating in the arrangement is able to comply with the other principles in the PFMI.

3.20.2 ensure that the link has a well-founded legal basis that supports its design and provides adequate protection to the FMIs involved in the link.[18]

A CCP:

3.20.3 before entering into a link with another clearing facility carrying on the activity set out in sub-paragraph (b) of the definition of "clearing and settlement" in Part II of the First Schedule of the SFA ("Clearing Facility"), whether located in Singapore or outside Singapore, shall identify and manage the potential spill-over effects from the default of the linked Clearing Facility. If a link has three or more Clearing Facilities, the CCP, with other Clearing Facilities, shall identify, assess, and manage the risks of the collective link arrangement.

3.20.4 in a CCP link arrangement shall be able to cover, at least on a daily basis, its current and potential future exposures to the linked Clearing Facility and its participants, if any, fully with a high degree of confidence[19] without reducing its ability to fulfil its obligations to its own participants at any time.

A licensed trade repository shall:

3.20.5 carefully assess the additional operational risks related to its links to ensure the scalability and reliability of IT and related resources.

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[18] Legal risk from cross-border links may arise from differences between the laws and contractual rules governing the linked FMIs and their participants, including those relating to rights and interest, collateral arrangements, settlement finality, and netting arrangements.

[19] Please see footnote 3.

3.21 Efficiency and effectiveness

A Regulated FMI shall:

3.21.1 design its operations 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, where appropriate.

3.21.2 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.

3.21.3 have established mechanisms for the regular review of its efficiency and effectiveness.

3.22 Communication procedures and standards

A Regulated FMI shall:

3.22.1 use, or at a minimum accommodate, internationally accepted communication procedures and standards.

3.23 Disclosure of rules, key procedures, and market data

A Regulated FMI shall:

3.23.1 adopt clear and comprehensive rules and procedures that are fully disclosed to participants. The Regulated FMI shall also publicly disclose rules and key procedures that govern its activities and operations.

3.23.2 disclose, to its participants and authorities, clear descriptions of the system's design and operations, as well as the Regulated FMI's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the Regulated FMI.

3.23.3 provide all necessary and appropriate documentation and training to facilitate participants' understanding of the Regulated FMI's rules and procedures and the risks they face from participating in the Regulated FMI.

3.23.4 publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The Regulated FMI shall provide clear descriptions of priced services for comparability purposes.

3.23.5 complete regularly and publicly disclose responses to the CPSS-IOSCO Disclosure framework for FMIs. The Regulated FMI also shall, at a minimum, disclose basic data on transaction volumes and values.

3.24 Disclosure of market data by trade repositories

A licensed trade repository shall:

3.24.1 have robust information systems that provide accurate current and historical data. Where the data is disclosed publicly, the licensed trade repository shall provide the data in a timely manner and in a format that permits it to be easily analysed.

4 Effective Date

4.1 This Notice shall take effect on 16 June 2016.