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# **STANDARDS FOR MAS-OPERATED FINANCIAL MARKET INFRASTRUCTURES**

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**Monetary Authority of Singapore**

**January 2015**

**(Updated in November 2017)**



# STANDARDS FOR MAS-OPERATED FINANCIAL MARKET INFRASTRUCTURES

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MONETARY AUTHORITY OF SINGAPORE

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## 1 Introduction

1.1 The Monetary Authority of Singapore (“MAS”) issued a Monograph on the Supervision of Financial Market Infrastructures (“FMIs”) in Singapore (“the Monograph”) in January 2013 (revised in January 2015). The Monograph describes MAS’ approach to supervising FMIs in Singapore, including its adoption of the Principles for Financial Market Infrastructures (“PFMI”), issued by the Committee on Payments and Market Infrastructures<sup>1</sup> (“CPMI”) and the International Organisation of Securities Commissions (“IOSCO”) in April 2012. This document supplements the Monograph by setting out minimum standards adopted from the PFMI that are applicable to MAS-operated FMIs<sup>2</sup>.

## 2 Standards

2.1 This section sets out the standards adopted from the PFMI principles and key considerations that are applicable to MAS-operated FMIs. Table 1 below summarises these principles.

**Table 1: Applicability of PFMI Principles to MAS-operated FMIs**

PFMI Principles	MAS-operated FMIs
1. Legal basis	•
2. Governance	•
3. Framework for the comprehensive management of risks	•
4. Credit risk	•
5. Collateral	•
6. Margin	
7. Liquidity risk	•
8. Settlement finality	•
9. Money settlements	•
10. Physical deliveries	•
11. Central securities depositories (“CSDs”)	•
12. Exchange-of-value settlement systems	•
13. Participant-default rules and procedures	•
14. Segregation and portability	
15. General business risk	•
16. Custody and investment risks	•

<sup>1</sup> Formerly known as the Committee on Payment and Settlement Systems (“CPSS”). The renaming became effective as of 1 September 2014.

<sup>2</sup> This document excludes standards for central counterparties and trade repositories. Currently, MAS owns and operates MEPS+, which is a real time gross settlement system for large-value SGD interbank funds transfers. It also holds and processes the settlement of scripless Singapore Government Securities (“SGS”) and MAS Bills.

17. Operational risk	•
18. Access and participation requirements	•
19. Tiered participation arrangements	•
20. FMI links	•
21. Efficiency and effectiveness	•
22. Communication procedures and standards	•
23. Disclosure of rules, key procedures, and market data	•
24. Disclosure of market data by trade repositories	

### Legal Basis

2.2 The legal basis of MAS-operated FMIs must provide a high degree of certainty for each material aspect of the FMI's activities in all relevant jurisdictions. *[PFMI P1; KC1]*

2.3 MAS-operated FMIs must have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations. *[PFMI P1; KC2]*

2.4 MAS-operated FMIs must be able to articulate the legal basis for their activities to relevant authorities, participants, and, where relevant, participants' customers, in a clear and understandable way. *[PFMI P1; KC3]*

2.5 MAS-operated FMIs must have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There must be a high degree of certainty that actions taken by the FMIs under such rules and procedures will not be voided, reversed, or subject to stays. *[PFMI P1; KC4]*

2.6 If any MAS-operated FMI conducts business in multiple jurisdictions, the FMI must identify and mitigate the risks arising from any potential conflict of laws across jurisdictions. *[PFMI P1; KC5]*

### Governance

2.7 MAS-operated FMIs must have objectives that place a high priority on the safety and efficiency of the FMIs and explicitly support financial stability and other relevant public interest considerations. *[PFMI P2; KC1]*

2.8 MAS-operated FMIs must have documented governance arrangements that provide clear and direct lines of responsibility and accountability. These arrangements must be disclosed to owners, relevant authorities, participants, and, at a more general level, the public. *[PFMI P2; KC2]*

2.9 The roles and responsibilities of MAS board of directors (or equivalent) in relation to MAS-operated FMIs must be clearly specified, and there must be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest. The board must review both its overall performance and the performance of its individual board members regularly. *[PFMI P2; KC3]*

2.10 The board must contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s). *[PFMI P2; KC4]*

2.11 The roles and responsibilities of management in relation to MAS-operated FMIs must be clearly specified. The management for MAS-operated FMIs must have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMIs. *[PFMI P2; KC5]*

2.12 The board must establish a clear, documented risk-management framework for MAS-operated FMIs that includes the FMIs' risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements must ensure that the risk-management and internal control functions have sufficient authority, independence, resources, and access to the board. *[PFMI P2; KC6]*

2.13 The board must ensure that the design, rules, overall strategy, and major decisions of MAS-operated FMIs reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions must be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public. *[PFMI P2; KC7]*

### **Framework for the Comprehensive Management of Risks**

2.14 MAS-operated FMIs must have risk-management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMIs. Risk-management frameworks must be subject to periodic review. *[PFMI P3; KC1]*

2.15 MAS-operated FMIs must provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMIs. *[PFMI P3; KC2]*

2.16 MAS-operated FMIs must regularly review the material risks the FMIs bear from and pose 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. *[PFMI P3; KC3]*

### Credit Risk

2.17 The requirements in paras 2.18 to 2.21 are strictly in respect of credit risk arising from MAS-operated FMIs' activities.

2.18 MAS-operated FMIs must establish a robust framework to manage their credit exposures to their participants and the credit risks arising from their payment, clearing, and settlement processes. Credit exposure may arise from current exposures, potential future exposures, or both. *[PFMI P4; KC1]*

2.19 MAS-operated FMIs must identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk-management tools to control these risks. *[PFMI P4; KC2]*

2.20 MAS-operated FMIs must cover their current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (see paras 2.22 to 2.27 on collateral). If any MAS-operated FMI include a deferred net settlement ("DNS") payment system or DNS securities settlement system ("SSS") in which there is no settlement guarantee but where its participants face credit exposures arising from its payment, clearing, and settlement processes, such an FMI must maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system. *[PFMI P4; KC3]*

2.21 MAS-operated FMIs must establish explicit rules and procedures that address fully any credit losses they may face as a result of any individual or combined default among their participants with respect to any of their obligations to the FMIs. These rules and procedures must address how potentially uncovered credit losses would be allocated, including the repayment of any funds MAS-operated FMIs may borrow from liquidity providers. These rules and procedures must also indicate MAS-operated FMIs' process to replenish any financial resources that the FMIs may employ during a stress event, so that the FMIs can continue to operate in a safe and sound manner. *[PFMI P4; KC7]*

### Collateral

2.22 MAS-operated FMIs must generally limit the assets they (routinely) accept as collateral to those with low credit, liquidity, and market risks. This requirement is not

intended to constrain the eligible collateral MAS accepts in its lending operations. *[PFMI P5; KC1]*

2.23 MAS-operated FMIs must establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions. *[PFMI P5; KC2]*

2.24 In order to reduce the need for procyclical adjustments, MAS-operated FMIs must establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent. *[PFMI P5; KC3]*

2.25 MAS-operated FMIs must avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects. *[PFMI P5; KC4]*

2.26 If any MAS-operated FMI accepts cross-border collateral, the FMI must mitigate the risks associated with its use and ensure that the collateral can be used in a timely manner. *[PFMI P5; KC5]*

2.27 MAS-operated FMIs must use a collateral management system that is well-designed and operationally flexible. *[PFMI P5; KC6]*

### Liquidity Risk

2.28 MAS-operated FMIs must have a robust framework to manage their liquidity risks from their participants, settlement banks, nostro agents, custodian banks, liquidity providers, and other entities. *[PFMI P7; KC1]*

2.29 MAS-operated FMIs must have effective operational and analytical tools to identify, measure, and monitor their settlement and funding flows on an ongoing and timely basis, including their use of intraday liquidity. *[PFMI P7; KC2]*

2.30 MAS-operated FMIs must maintain sufficient liquid resources in all relevant currencies to effect same-day settlement, and where appropriate intraday or multiday settlement, of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that must include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions. *[PFMI P7; KC3]*

2.31 For the purpose of meeting their minimum liquid resource requirement, MAS-operated FMIs' qualifying liquid resources in each currency include cash at the central bank of issue and at creditworthy commercial banks, committed lines of credit, committed foreign exchange swaps, and committed repos, as well as highly

marketable collateral held in custody and investments that are readily available and convertible into cash with prearranged and highly reliable funding arrangements, even in extreme but plausible market conditions. If any MAS-operated FMI has access to routine credit at the central bank of issue, the FMI may count such access as part of the minimum requirement to the extent it has collateral that is eligible for pledging to (or for conducting other appropriate forms of transactions with) the relevant central bank. All such resources must be available when needed. *[PFMI P7; KC5]*

2.32 MAS-operated FMIs may supplement their qualifying liquid resources with other forms of liquid resources. If any MAS-operated FMI does so, then these liquid resources must 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. If any MAS-operated FMI does not have access to routine central bank credit, it must still take into account of what collateral is typically accepted by the relevant central bank, as such assets may be more likely to be liquid in stressed circumstances. MAS-operated FMIs must not assume the availability of emergency central bank credit as a part of their liquidity plan. *[PFMI P7; KC6]*

2.33 MAS-operated FMIs must obtain a high degree of confidence, through rigorous due diligence, that each provider of their minimum required qualifying liquid resources, whether a participant of the FMIs or an external party, has sufficient information to understand and to manage its associated liquidity risks, and that it has the capacity to perform as required under its commitment. Where relevant to assessing a liquidity provider's performance reliability with respect to a particular currency, a liquidity provider's potential access to credit from the central bank of issue may be taken into account. MAS-operated FMIs must regularly test their procedures for accessing their liquid resources at a liquidity provider. *[PFMI P7; KC7]*

2.34 MAS-operated FMIs must use their access to central bank accounts, payment services, or securities services, where practical, to enhance their management of liquidity risk. *[PFMI P7; KC8]*

2.35 MAS-operated FMIs must determine the amount and regularly test the sufficiency of their liquid resources through rigorous stress testing. MAS-operated FMIs must have clear procedures to report the results of their stress tests to appropriate decision makers within the organisation and to use these results to evaluate the adequacy of and adjust their liquidity risk-management framework. In conducting stress testing, MAS-operated FMIs must consider a wide range of relevant scenarios. Scenarios must 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 must also take into account the design and operation of MAS-operated FMIs, include all entities that might pose material liquidity risks to the FMIs (such as settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs), and where appropriate, cover a multiday period. In all cases, MAS-operated FMIs must document their supporting rationale for, and must have appropriate governance arrangements relating to, the amount and form of total liquid resources they maintain. *[PFMI P7; KC9]*

2.36 MAS-operated FMIs must establish explicit rules and procedures that enable the FMIs to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations on time following any individual or combined default among their participants. These rules and procedures must address unforeseen and potentially uncovered liquidity shortfalls and must aim to avoid unwinding, revoking, or delaying the same-day settlement of payment obligations. These rules and procedures must also indicate MAS-operated FMIs' process to replenish any liquidity resources they may employ during a stress event, so that they can continue to operate in a safe and sound manner. *[PFMI P7; KC10]*

### Settlement Finality

2.37 MAS-operated FMIs rules and procedures must clearly define the point at which settlement is final. *[PFMI P8; KC1]*

2.38 MAS-operated FMIs must complete final settlement no later than the end of the value date, and preferably intraday or in real time, to reduce settlement risk. MAS-operated FMIs must consider adopting RTGS or multiple-batch processing during the settlement day. *[PFMI P8; KC2]*

2.39 MAS-operated FMIs must clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant. *[PFMI P8; KC3]*

### Money Settlements

2.40 MAS-operated FMIs must conduct their money settlements in central bank money, where practical and available, to avoid credit and liquidity risks. *[PFMI P9; KC1]*

2.41 If central bank money is not used, MAS-operated FMIs must conduct their money settlements using a settlement asset with little or no credit or liquidity risk. *[PFMI P9; KC2]*

2.42 If any MAS-operated FMI settles in commercial bank money, it must monitor, manage and limit its credit and liquidity risk arising from the commercial settlement banks. In particular, the FMI must 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 FMI must also monitor and manage the concentration of credit and liquidity exposures to its commercial settlement banks. *[PFMI P9; KC3]*

2.43 If any MAS-operated FMI conducts money settlements on its own books, it must minimise and strictly control its credit and liquidity risks. *[PFMI P9; KC4]*

2.44 MAS-operated FMIs' legal agreements with any settlement banks must state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received must be transferable as soon as possible, at a minimum by the end of the day and ideally intraday, in order to enable the FMIs and their participants to manage credit and liquidity risks. *[PFMI P9; KC5]*

### Physical Deliveries

2.45 MAS-operated FMIs' rules must clearly state their obligations with respect to the delivery of physical instruments or commodities. *[PFMI P10; KC1]*

2.46 MAS-operated FMIs must identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities. *[PFMI P10; KC2]*

### Central Securities Depositories

2.47 MAS-operated CSD must have appropriate rules, procedures, and controls, including robust accounting practices, to safeguard the rights of securities issuers and holders, prevent the unauthorised creation or deletion of securities, and conduct periodic and at least daily reconciliation of securities issues it maintains. *[PFMI P11; KC1]*

2.48 MAS-operated CSD must prohibit overdrafts and debit balances in securities accounts. *[PFMI P11; KC2]*

2.49 MAS-operated CSD must maintain securities in an immobilised or dematerialised form for their transfer by book entry. Where appropriate, MAS-

operated CSD must provide incentives to immobilise or dematerialise securities. *[PFMI P11; KC3]*

2.50 MAS-operated CSD must protect assets against custody risk through appropriate rules and procedures consistent with its legal framework. *[PFMI P11; KC4]*

2.51 MAS-operated CSD must employ a robust system that ensures segregation between the CSD's own assets and the securities of its participants and segregation among the securities of participants. Where supported by the legal framework, the CSD must also support operationally the segregation of securities belonging to a participant's customers on the participant's books and facilitate the transfer of customer holdings. *[PFMI P11; KC5]*

2.52 MAS-operated CSD must identify, measure, monitor, and manage its risks from other non-CSD activities that it may perform; additional tools may be necessary in order to address these risks. *[PFMI P11; KC6]*

### **Exchange-of-value Settlement Systems**

2.53 Any MAS-operated FMI that is an exchange-of-value settlement system must eliminate principal risk by ensuring that the final settlement of one obligation occurs if and only if the final settlement of the linked obligation also occurs, regardless of whether the FMI settles on a gross or net basis and when finality occurs. *[PFMI P12; KC1]*

### **Participant-default Rules and Procedures**

2.54 The requirements in paras 2.55 to 2.58 are not intended to constrain MAS' policies and actions for maintaining financial stability including managing participant defaults.

2.55 MAS-operated FMIs must have default rules and procedures that enable the FMIs to continue to meet their obligations in the event of a participant default and that address the replenishment of resources following a default. *[PFMI P13; KC1]*

2.56 MAS-operated FMIs must be well prepared to implement their default rules and procedures, including any appropriate discretionary procedures provided for in their rules. These rules and procedures must be designed to ensure that the FMIs can take timely action to contain losses and liquidity pressures and continue to meet their obligations. *[PFMI P13; KC2]*

2.57 MAS-operated FMIs must publicly disclose key aspects of their default rules and procedures. *[PFMI P13; KC3]*

2.58 MAS-operated FMIs must involve their participants and other stakeholders in the testing and review of the FMIs' default procedures, including any close-out procedures. Such testing and review must be conducted at least annually or following material changes to the rules and procedures to ensure that they are practical and effective. *[PFMI P13; KC4]*

### **General Business Risk**

2.59 MAS-operated FMIs must 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. *[PFMI P15; KC1]*

### **Custody and Investment Risks**

2.60 The requirements in paras 2.61 to 2.64 are not intended to constrain MAS' policies on investment strategy (including that for reserve management) or the disclosure of that strategy.

2.61 MAS-operated FMIs must hold their own and their participants' assets at supervised and regulated entities that have robust accounting practices, safekeeping procedures, and internal controls that fully protect these assets. *[PFMI P16; KC1]*

2.62 MAS-operated FMIs must have prompt access to their assets and the assets provided by participants, when required. *[PFMI P16; KC2]*

2.63 MAS-operated FMIs must evaluate and understand their exposures to their custodian banks, taking into account the full scope of their relationships with each. *[PFMI P16; KC3]*

2.64 MAS-operated FMIs' investment strategy must be consistent with their overall risk-management strategy and fully disclosed to their participants, and investments must be secured by, or be claims on, high-quality obligors. These investments must allow for quick liquidation with little, if any, adverse price effect. *[PFMI P16; KC4]*

## Operational Risk

2.65 MAS-operated FMIs must establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks, both internal and external. *[PFMI P17; KC1]*

2.66 The board of directors in relation to MAS-operated FMIs must clearly define the roles and responsibilities for addressing operational risk and must endorse MAS-operated FMIs' operational risk-management framework. Systems, operational policies, procedures, and controls must be reviewed, audited, and tested periodically and after significant changes. *[PFMI P17; KC2]*

2.67 MAS-operated FMIs must have clearly defined operational reliability objectives and must have policies in place that are designed to achieve those objectives. *[PFMI P17; KC3]*

2.68 MAS-operated FMIs must ensure that they have scalable capacity adequate to handle increasing stress volumes and to achieve their service-level objectives. *[PFMI P17; KC4]*

2.69 MAS-operated FMIs must have comprehensive physical and information security policies that address all potential vulnerabilities and threats. *[PFMI P17; KC5]*

2.70 MAS-operated FMIs must 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 must incorporate the use of a secondary site and must be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The plan must be designed to enable the FMIs to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. MAS-operated FMIs must regularly test these arrangements. *[PFMI P17; KC6]*

2.71 MAS-operated FMIs must identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to their operations. In addition, MAS-operated FMIs must identify, monitor, and manage the risks their operations might pose to other FMIs. *[PFMI P17; KC7]*

## Access and Participation Requirements

2.72 The requirements in paras 2.73 to 2.75 are not intended to constrain MAS' policies on the parties to whom it is prepared to offer central bank accounts and the terms of offer.

2.73 MAS-operated FMIs must allow for fair and open access to their services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements. *[PFMI P18; KC1]*

2.74 MAS-operated FMIs' participation requirements must be justified in terms of the safety and efficiency of the FMIs and the markets it serves, be tailored to and commensurate with the FMIs' specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, MAS-operated FMIs must endeavour to set requirements that have the least-restrictive impact on access that circumstances permit. *[PFMI P18; KC2]*

2.75 MAS-operated FMIs must monitor compliance with their participation requirements on an ongoing basis and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements. *[PFMI P18; KC3]*

### **Tiered Participation Arrangements**

2.76 MAS-operated FMIs must ensure that their rules, procedures, and agreements allow them to gather basic information about indirect participation in order to identify, monitor, and manage any material risks to the FMIs arising from such tiered participation arrangements. *[PFMI P19; KC1]*

2.77 MAS-operated FMIs must identify material dependencies between direct and indirect participants that might affect the FMIs. *[PFMI P19; KC2]*

2.78 MAS-operated FMIs must identify indirect participants responsible for a significant proportion of transactions processed by the FMIs and indirect participants whose transaction volumes or values are large relative to the capacity of the direct participants through which they access MAS-operated FMIs in order to manage the risks arising from these transactions. *[PFMI P19; KC3]*

2.79 MAS-operated FMIs must regularly review risks arising from tiered participation arrangements and must take mitigating action when appropriate. *[PFMI P19; KC4]*

### **FMI Links**

2.80 Before entering into a link arrangement and on an ongoing basis once the link is established, MAS-operated FMIs must identify, monitor, and manage all potential sources of risk arising from the link arrangement. Link arrangements must be designed such that each FMI is able to observe the other principles in the PFMI. *[PFMI P20; KC1]*

2.81 A link must have a well-founded legal basis, in all relevant jurisdictions, that supports its design and provides adequate protection to the FMIs involved in the link. *[PFMI P20; KC2]*

2.82 If MAS-operated CSD is linked to other CSD(s), it must measure, monitor, and manage the credit and liquidity risks arising from linkages. Any credit extensions between MAS-operated FMIs and linked CSDs must be covered fully with high-quality collateral and be subject to limits. *[PFMI P20; KC3]*

2.83 Provisional transfers of securities between MAS-operated FMIs and linked CSDs must be prohibited or, at a minimum, the retransfer of provisionally transferred securities must be prohibited prior to the transfer becoming final. *[PFMI P20; KC4]*

2.84 An investor CSD must only establish a link with an issuer CSD if the arrangement provides a high level of protection for the rights of the investor CSD's participants. *[PFMI P20; KC5]*

2.85 An investor CSD that uses an intermediary to operate a link with an issuer CSD must measure, monitor, and manage the additional risks (including custody, credit, legal, and operational risks) arising from the use of the intermediary. *[PFMI P20; KC6]*

### Efficiency and Effectiveness

2.86 MAS-operated FMIs must be designed to meet the needs of their participants and the markets they serve, 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. *[PFMI P21; KC1]*

2.87 MAS-operated FMIs must 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. *[PFMI P21; KC2]*

2.88 MAS-operated FMIs must have established mechanisms for the regular review of their efficiency and effectiveness. *[PFMI P21; KC3]*

### Communication Procedures and Standards

2.89 MAS-operated FMIs must use, or at a minimum accommodate, internationally accepted communication procedures and standards. *[PFMI P22; KC1]*

## Disclosure of Rules, Key Procedures, and Market Data

2.90 MAS-operated FMIs must adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures must also be publicly disclosed. *[PFMI P23; KC1]*

2.91 MAS-operated FMIs must disclose clear descriptions of the system's design and operations, as well as the FMIs' and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMIs. *[PFMI P23; KC2]*

2.92 MAS-operated FMIs must provide all necessary and appropriate documentation and training to facilitate participants' understanding of the FMIs' rules and procedures and the risks they face from participating in the FMIs. *[PFMI P23; KC3]*

2.93 MAS-operated FMIs must publicly disclose their fees at the level of individual services they offer as well as their policies on any available discounts. MAS-operated FMIs must provide clear descriptions of priced services for comparability purposes. *[PFMI P23; KC4]*

2.94 MAS-operated FMIs must complete regularly and disclose publicly responses to the CPMI-IOSCO Disclosure framework for financial market infrastructures. MAS-operated FMIs also must, at a minimum, disclose basic data on transaction volumes and values. *[PFMI P23; KC5]*