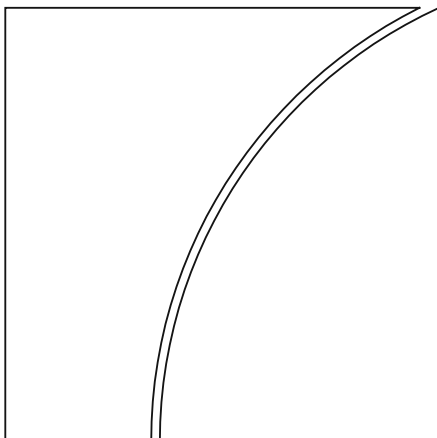


Committee on  
Payments and Market  
Infrastructures

Board of the International  
Organization of Securities  
Commissions



Implementation  
monitoring of PFMI:  
Level 2 assessment  
report for Singapore

July 2017



BANK FOR INTERNATIONAL SETTLEMENTS



**OICU-IOSCO**

This publication is available on the BIS website ([www.bis.org](http://www.bis.org)) and the IOSCO website ([www.iosco.org](http://www.iosco.org)).

© *Bank for International Settlements and International Organization of Securities Commissions 2017. All rights reserved. Brief excerpts may be reproduced or translated provided the source is stated.*

ISBN 978-92-9259-071-0 (online)

# Contents

- 1. Executive summary..... 1
  - 1.1 Legal and regulatory framework ..... 2
  - 1.2 Key findings of the assessment..... 3
  - 1.3 Summary response from the assessed jurisdiction’s authorities ..... 4
  
- 2. Introduction ..... 5
  - 2.1 Broader context of the Level 2 assessment..... 5
  - 2.2 Objective and rating ..... 6
  - 2.3 Scope ..... 7
  - 2.4 Process ..... 8
  
- 3. Overview of the regulatory, supervisory and oversight framework..... 9
  - 3.1 Payment systems ..... 9
  - 3.2 Central counterparties and securities settlement systems..... 10
  - 3.3 Central securities depositories ..... 10
  - 3.4 Trade repositories..... 10
  
- 4. Assessment and recommendations..... 12
  - 4.1 Summary assessment of completeness and consistency with the Principles..... 12
  - 4.2 Singapore’s completeness and consistency with the Principles – Review and recommendations..... 16
  
- Annex A: List of abbreviations..... 136
- Annex B: Reference documents..... 138
- Annex C: FMIs in Singapore subject to the Principles ..... 140



## 1. Executive summary

In April 2012, the Committee on Payments and Market Infrastructures (CPMI<sup>1</sup>) and the International Organization of Securities Commissions (IOSCO) issued the *Principles for financial market infrastructures* (PFMI).<sup>2</sup> The principles within the PFMI (the Principles) set expectations for the design and operation of key financial market infrastructures (FMIs) to enhance their safety and efficiency and, more broadly, to limit systemic risk and foster transparency and financial stability. The Principles apply to all systemically important payment systems (PSs), central securities depositories (CSDs), securities settlement systems (SSSs), central counterparties (CCPs) and trade repositories (TRs) (collectively FMIs). These FMIs collectively clear, settle and record transactions in financial markets. In line with the G20's expectations, CPMI and IOSCO members have committed to implement and apply the PFMI in their respective jurisdictions.

Following the publication of the PFMI, the CPMI and IOSCO agreed to monitor the implementation of the PFMI in 28 jurisdictions that are members of the Financial Stability Board (FSB), the CPMI or IOSCO.<sup>3</sup> To this end, the CPMI-IOSCO Steering Group<sup>4</sup> established a standing working-level group (the Implementation Monitoring Standing Group (IMSG)) to design, organise and carry out the implementation monitoring assessments.<sup>5</sup>

The implementation monitoring programme is proceeding at three levels: a Level 1 assessment of the status of the implementation process; a Level 2 assessment of the completeness of the implemented framework and its consistency with the PFMI; and a Level 3 assessment of the consistency in outcomes of such frameworks.<sup>6</sup> While, in the case of the Principles, Level 2 and Level 3

<sup>1</sup> The Committee on Payment and Settlement Systems (CPSS) changed its name to the Committee on Payments and Market Infrastructures (CPMI) on 1 September 2014. Please note that references to reports published before that date use the Committee's old name.

<sup>2</sup> The CPSS-IOSCO *Principles for financial market infrastructures* (April 2012) can be found on the websites of the BIS at [www.bis.org/cpmi/publ/d101.htm](http://www.bis.org/cpmi/publ/d101.htm) and International Organization of Securities Commissions (IOSCO) at [www.iosco.org/library/pubdocs/pdf/IOSCOPD377.pdf](http://www.iosco.org/library/pubdocs/pdf/IOSCOPD377.pdf).

<sup>3</sup> The 28 jurisdictions participating in the PFMI implementation monitoring exercise are Argentina, Australia, Belgium, Brazil, Canada, Chile, China, the European Union, France, Germany, Hong Kong SAR, India, Indonesia, Italy, Japan, Korea, Mexico, the Netherlands, Russia, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.

<sup>4</sup> The Steering Group comprises a subset of the members of the CPMI and the IOSCO Board, and is responsible for providing operational guidance on behalf of the parent committees on joint CPMI-IOSCO work.

<sup>5</sup> The IMSG comprises representatives from a subset of the Steering Group member jurisdictions that reflect a balance of CPMI and IOSCO members and geographical dispersion, as well as a range of supervisors/overseers of domestic and global FMIs.

<sup>6</sup> To date, the IMSG has completed Level 1 assessments of all 28 jurisdictions' implementation of both the Principles and the responsibilities for authorities (the Responsibilities), across all FMI types, as well as Level 2 assessments of the implementation of the Principles in respect of CCPs and TRs in the European Union, Japan and the United States, and in respect of all FMI types in Australia and Hong Kong SAR. The CPMI and IOSCO have also conducted the first Level 3 assessment of the implementation of the Principles; this review focused on a subset of Principles in the PFMI that relate to financial risk management and recovery practices by CCPs, including certain practices related to governance of risk management, credit risk management, liquidity risk management, margin, collateral policy and investments and default management and recovery planning. This first review considered outcomes achieved in this area by examining a number of globally and locally active CCPs that clear derivative products (both exchange-traded and over-the-counter (OTC)). More information is available at [www.bis.org/cpmi/info\\_mios.htm?m=3%7C16%7C599](http://www.bis.org/cpmi/info_mios.htm?m=3%7C16%7C599).

assessments have proceeded separately, in the case of the Responsibilities the IMSG considered it more appropriate and more efficient to carry out a combined Level 2 and Level 3 assessment.<sup>7</sup>

This report presents the CPMI and IOSCO conclusions of a Level 2 assessment of whether, and to what degree, the content of the legal, regulatory and oversight frameworks, including rules and regulations, any relevant policy statements, or other forms of implementation applied to systemically important payment systems, CSDs/SSSs, CCPs and TRs in Singapore, are complete and consistent with the Principles. It is concluded that the legal, regulatory and oversight frameworks in Singapore are complete and consistent with the Principles with the one exception of Principle 24 for TRs. However, it should be noted that Level 2 assessments do not evaluate whether FMIs are in observance with these measures, nor does it assess the effectiveness of the application of the legal and regulatory or oversight framework to FMIs by authorities (for example, through supervisory practices).

The work on the Level 2 assessment was carried out as a peer review from August 2016 to May 2017. The assessment reflects the status of the Singaporean legal, regulatory and oversight framework as of 15 July 2016. Accordingly, assessment ratings reflect the implementation measures in place as of 15 July; other measures that were introduced after this date, or other material developments, are noted where relevant but were not considered in assigning ratings of consistency.

## 1.1 Legal and regulatory framework

The Monetary Authority of Singapore (MAS) is the sole authority that is responsible for regulation, supervision and oversight of FMIs in Singapore.

MAS' regulatory role and powers for PSs are set out in the Payment Systems (Oversight) Act (PS(O)A).<sup>8</sup> For the PS that are owned and operated by MAS, MAS issued a policy statement *Standards for MAS-Operated Financial Market Infrastructure* (Standards for MAS-Operated FMIs)<sup>9</sup> to hold itself to minimum standards set out in the PFMI.

MAS' regulatory role and powers for CCPs, CSDs, SSSs and TRs are set out in the Securities and Futures Act, Cap 289 (SFA).<sup>10</sup> Pursuant to the relevant parts of the SFA, MAS has issued regulations<sup>11</sup> and notices<sup>12</sup> setting out further obligations. The Standards for MAS-Operated FMIs apply to a CSD/SSS owned and operated by MAS.

Further, MAS issued a general policy statement *Monograph on Supervision of Financial Market Infrastructures in Singapore* (Monograph)<sup>13</sup> that describes MAS' approach to supervising FMIs in

<sup>7</sup> CPMI-IOSCO, *Assessment and review of application of Responsibilities for authorities*, November 2015, [www.bis.org/cpmi/publ/d139.htm](http://www.bis.org/cpmi/publ/d139.htm).

<sup>8</sup> Payment Systems (Oversight) Act (PS(O)A) - [statutes.agc.gov.sg/aol/search/display/view.w3p;page=0;query=DocId%3A23349004-82c6-4ca2-aba3-324d8ad824c1%20Depth%3A0%20Status%3Ainforce;rec=0](http://statutes.agc.gov.sg/aol/search/display/view.w3p;page=0;query=DocId%3A23349004-82c6-4ca2-aba3-324d8ad824c1%20Depth%3A0%20Status%3Ainforce;rec=0)

<sup>9</sup> Standards for MAS-Operated Financial Market Infrastructures - [www.mas.gov.sg/~media/MAS/Regulations%20and%20Financial%20Stability/Regulations%20Guidance%20and%20Licensing/Payment%20and%20Settlement%20Systems/Standards%20for%20MASOperated%20FMIs.pdf](http://www.mas.gov.sg/~media/MAS/Regulations%20and%20Financial%20Stability/Regulations%20Guidance%20and%20Licensing/Payment%20and%20Settlement%20Systems/Standards%20for%20MASOperated%20FMIs.pdf)

<sup>10</sup> Securities and Futures Act, Cap 289 (SFA) - [statutes.agc.gov.sg/aol/search/display/view.w3p;page=0;query=DocId%3A25de2ec3-ac8e-44bf-9c88-927bf7eca056%20Depth%3A0%20Status%3Ainforce;rec=0;whole=yes](http://statutes.agc.gov.sg/aol/search/display/view.w3p;page=0;query=DocId%3A25de2ec3-ac8e-44bf-9c88-927bf7eca056%20Depth%3A0%20Status%3Ainforce;rec=0;whole=yes)

<sup>11</sup> Regulations are subsidiary legislation to the SFA and are intended to be a more granular application of powers conferred by the main Act.

<sup>12</sup> Notices are directions that impose legally binding requirements on a specified class of financial institutions or persons.

<sup>13</sup> Monograph on Supervision of Financial Market Infrastructures in Singapore, January 2013 (revised in January 2015) - [www.mas.gov.sg/news-and-publications/monographs-and-information-papers/2013/supervision-of-financial-market-infrastructures-in-singapore.aspx](http://www.mas.gov.sg/news-and-publications/monographs-and-information-papers/2013/supervision-of-financial-market-infrastructures-in-singapore.aspx)

Singapore. Notably, the Monograph states that MAS adopts the standards set out in the PFMI when carrying out its supervision of FMIs, and that all systemically important PSs, CSDs, SSSs, CCPs and TRs in Singapore are expected to comply with the PFMI.

## 1.2 Key findings of the assessment

### *Payment systems*

The Assessment Team (AT) concluded that all the Principles have been implemented in a complete and consistent manner through the Standards for MAS-Operated FMIs and the Monograph.

### *Central counterparties*

The AT concluded that all the Principles have been implemented in a complete and consistent manner through the SFA, the regulations and notices issued by MAS under the SFA, and the Monograph.

### *Securities settlement systems*

The AT concluded that all the Principles have been implemented in a complete and consistent manner through the SFA, the regulations and notices issued by MAS under the SFA, the Standards for MAS-Operated FMIs, and the Monograph.

### *Central securities depositories*

The AT concluded that all the Principles have been implemented in a complete and consistent manner through the SFA, the regulations and notices issued by MAS under the SFA, the Standards for MAS-Operated FMIs, and the Monograph.

### *Trade repositories*

The AT concluded that all the Principles, except for Principle 24, have been implemented in a complete and consistent manner through the SFA, the regulations and notices issued by MAS under the SFA, and the Monograph.

The AT observed some gaps between the regulatory framework in Singapore and Principle 24 (disclosure of market data by trade repositories) as elaborated in Section 4.1.6.

### *FMIs owned and operated by MAS*

In Singapore, MAS operates the New MAS Electronic Payment and Book-Entry System (MEPS+) which is both a PS and a CSD/SSS. MEPS+ consists of two sub-systems, namely MEPS+ Interbank Funds Transfer (MEPS+ IFT) for the settlement of large value Singapore dollars interbank funds transfers, and MEPS+ Singapore Government Securities (MEPS+ SGS) for the custody and settlement of scripless SGS and MAS Bills transactions.

As stated in the Standards for MAS-Operated FMIs, some elements or key considerations of the Principles are not applied to or are applied differently to the FMIs owned and operated by MAS. This approach is consistent with paragraph 1.23 of the PFMI as elaborated in the CPMI-IOSCO guidance note *Application of the Principles for financial market infrastructures to central bank FMIs* (CPMI-IOSCO CBFMI guidance).<sup>14</sup> Accordingly, the Principles applied to the central bank owned and operated FMIs in Singapore, within the context of this Report, have been evaluated to be consistent with the PFMI.

<sup>14</sup> The CBFMI guidance explains how the PFMI applies to FMIs that are owned and operated by central banks, expanding on paragraph 1.23 of the PFMI, and further clarifies the interaction between the PFMI and central bank policies.

### 1.3 Summary response from the assessed jurisdiction's authorities

MAS appreciates the AT's hard work and detailed evaluation and will consider the recommendations of the AT in future improvements to our regulatory and supervisory framework.

MAS has taken extensive steps to implement the PFMI throughout our regulatory and supervisory framework, including legislative instruments, policy statements, supervision and direct engagement with the FMIs. In some cases, MAS' implementation of the PFMI through legislative instruments involved the use of language differing from the PFMI for the purposes of facilitating supervisory implementation and consistency with Singapore's legislative drafting convention. MAS welcomes the AT's assessment that all the Principles have been implemented in a complete and consistent manner across FMI types (payment systems, central counterparties, securities settlement systems and central securities depositories), affirming the complementary nature of MAS' legislative instruments within the broader regulatory and supervisory framework applied by MAS to FMIs.

In respect of trade repositories, the AT identified a gap in respect of public disclosure of TR data, noting that MAS is actively considering appropriate requirements for the publishing of data in a manner that will help to achieve the objectives of public disclosure. MAS affirms our intent to ensure the provision of representative and informative disclosure to the market, taking into account data cleanliness, in line with the intent of the PFMI.



## 2. Introduction

This report presents the CPMI and IOSCO conclusions of the Level 2 assessment of the Principles across all FMI types in Singapore. The assessment reflects the status of the Singaporean legal, regulatory and oversight framework as of 15 July 2016. This assessment was conducted as a peer review from August 2016 to May 2017.<sup>15</sup> Accordingly, assessment ratings reflect the implementation measures in place as of 15 July 2016; other measures that were introduced after this date, or other material developments, are noted where relevant but were not considered in assigning ratings of consistency.

This assessment is part of the effort to conduct Level 2 assessments of the legal, regulatory and oversight frameworks implementing the Principles for all FMI types in the 28 jurisdictions participating in the PFMI implementation monitoring exercise. For practical reasons, the Level 2 assessments are being carried out sequentially for groups of jurisdictions which have reported that final implementation measures for the Principles are in force, corresponding to the maximum rating in the Level 1 assessments.<sup>16</sup>

The counterpart for the assessment was the Monetary Authority of Singapore (MAS), as it is the sole authority responsible for the regulation, supervision and oversight of FMIs in Singapore.

### 2.1 Broader context of the Level 2 assessment

In line with the G20's expectations, CPMI and IOSCO members have undertaken to incorporate the Principles and the Responsibilities included in the PFMI in their legal and regulatory frameworks. The CPMI and IOSCO regard full, timely and consistent implementation of the PFMI as fundamental to ensuring the safety and soundness of FMIs, avoiding regulatory arbitrage, and supporting the resilience of the global financial system.

To that end, the CPMI and IOSCO have been actively monitoring the implementation of the PFMI based on a monitoring framework that involves assessment at three levels:

- (1) Level 1, to assess whether jurisdictions have completed the process of adopting the legislation, regulations and other policies that will enable them to implement the Principles and Responsibilities;
- (2) Level 2, to assess whether the content of legislation, regulations and policies (the regulatory framework) is complete and consistent with the Principles and the Responsibilities; and
- (3) Level 3, to assess whether there is consistency in the outcomes of implementation of the Principles and Responsibilities.

The Level 1 exercise covered jurisdictions' adoption of both the Principles and Responsibilities, across all FMI types, and was based on a self-assessment by the jurisdictions. The Level 2 and Level 3 assessments of the Principles and the Responsibilities, by contrast, have been conducted as peer reviews across jurisdictions and in much greater detail.

<sup>15</sup> The CPMI and IOSCO thank the Assessment Team, which was led by Klaus Löber (European Central Bank) with the participation of Robert Hofmeister (European Central Bank), Kazunari Mochizuki (Japan Financial Services Agency), Veronica Fucile (Bank of Italy), Min-Kun Son (Bank of Korea), Anne Polaski (Commodity Futures Trading Commission) and Edward Kocis (Federal Reserve Board) as well as Mario Griffiths (CPMI Secretariat), Takeshi Shirakami (CPMI Secretariat) and Manabu Kishimoto (IOSCO Secretariat) as supporting members.

<sup>16</sup> CPMI-IOSCO, *Implementation monitoring of PFMI: Third update to Level 1 assessment report*, June 2016, [www.bis.org/cpmi/publ/d145.htm](http://www.bis.org/cpmi/publ/d145.htm).

The Principles assessments are ongoing, and are being considered separately at Level 2 and Level 3. For the Responsibilities, the IMISG combined the Level 2 and Level 3 assessments into a single exercise. The IMISG focused therefore on both the measures taken by the relevant authority to fulfil the Responsibilities, including its powers and the framework and processes in place to meet the requirements under the Responsibilities (Level 2), and how these measures translated into observed outcomes (Level 3).

The CPMI and IOSCO have conducted four Level 1 assessments since the publication of the PFMI. The initial assessment was published in August 2013<sup>17</sup> and the first update was published in May 2014,<sup>18</sup> followed by the second update in June 2015<sup>19</sup> and the third update in June 2016.<sup>20</sup> Overall, the third update shows that further progress has been made by the 28 participating jurisdictions since the previous update in completing the process of adopting legislation, regulations and/or policies to support implementation of the PFMI. The Level 1 assessments also showed that jurisdictions have implemented, or are in the process of implementing, the PFMI in different ways. Depending on the national legal and regulatory or oversight framework, some jurisdictions use a policy-based approach (ie rely on a policy statement as the primary tool for adopting the PFMI), some use a rules-based approach (ie rely on rules and/or regulations corresponding to the PFMI) and others combine these two approaches.

In this respect, MAS can be described as having adopted a mixture of policy-based and rules-based approaches for implementing the Principles for the different FMI types.<sup>21</sup> In the Level 1 assessments, Singapore reported that the final implementation measures are in force for all FMI types, for both the Principles and the Responsibilities. In the Level 2 and Level 3 assessments of the Responsibilities, Singapore was assessed to observe all the responsibilities for all FMI types.

The CPMI and IOSCO will continue to monitor jurisdictions' progress in implementing the Principles and Responsibilities in future assessments.

## 2.2 Objective and rating

The aim of the Level 2 assessment is to determine whether, and to what degree, the content of the legal and regulatory or oversight framework, including any relevant policy statements or other forms of implementation applied in Singapore, is complete and consistent with the Principles. The focus of the Level 2 assessment is on the relevant framework itself, not on the application of this framework by authorities, nor on the FMIs' observance.

Any planned regulatory changes that Singapore has for improving the degree of consistency with the Principles are also discussed in the assessment but were not considered in assigning ratings of consistency.

In conducting the assessment, the CPMI and IOSCO assessed whether there are gaps or shortcomings between implementation measures and the Principles and, if so, evaluated the materiality

<sup>17</sup> CPSS-IOSCO, *Implementation monitoring of PFMIs – Level 1 assessment report*, August 2013, [www.bis.org/cpmi/publ/d111.htm](http://www.bis.org/cpmi/publ/d111.htm).

<sup>18</sup> CPSS-IOSCO, *Implementation monitoring of PFMIs: first update to Level 1 assessment report*, May 2014, [www.bis.org/cpmi/publ/d117.htm](http://www.bis.org/cpmi/publ/d117.htm).

<sup>19</sup> CPMI-IOSCO, *Implementation monitoring of PFMIs: Second update to Level 1 assessment report*, June 2015, [www.bis.org/cpmi/publ/d129.htm](http://www.bis.org/cpmi/publ/d129.htm).

<sup>20</sup> CPMI-IOSCO, *Implementation monitoring of PFMI: Third update to Level 1 assessment report*, June 2016, [www.bis.org/cpmi/publ/d145.htm](http://www.bis.org/cpmi/publ/d145.htm).

<sup>21</sup> Refer to Section 3 for the overview of the regulatory, supervisory and oversight framework in Singapore.

of the potential impact of those gaps. Ratings were then assigned based on these determinations to reflect the degree of completeness and consistency between an implementation measure and a particular Principle.

The rating framework used in Level 2 assessments (Table 1) is an adaptation of the approach described in the PFMI Assessment Methodology (AM).<sup>22</sup> In order to reflect the fact that the purpose of the Level 2 assessment is to evaluate the completeness and consistency of a jurisdiction's implementation measures, rather than whether FMIs in the jurisdiction are in observance of the Principles, the rating levels are: "Consistent", "Broadly consistent", "Partly consistent", "Not consistent" and "Not applicable".

Status rating of the Level 2 assessment

Table 1

<b>Consistent</b>	The jurisdiction's regulatory framework is consistent with the Principle. The assessment has identified no gaps or shortcomings, or only a few gaps and/or shortcomings that have no material impact on completeness and/or consistency.
<b>Broadly consistent</b>	The jurisdiction's regulatory framework is broadly consistent with the Principle. The assessment has identified gaps and/or shortcomings that have a minor impact on completeness and/or consistency.
<b>Partly consistent</b>	The jurisdiction's regulatory framework is partly consistent with the Principle. The assessment has identified gaps and/or shortcomings that have a significant impact on completeness and/or consistency.
<b>Not consistent</b>	The jurisdiction's regulatory framework is not consistent with the Principle. The assessment has identified gaps and/or shortcomings that have a major impact on completeness and/or consistency.
<b>NA – No implementation measures needed (ie not applicable)</b>	This status corresponds to the case where no relevant FMI exists that is within the scope of the Principles. A rating of "NA" will be indicated only if no relevant regulatory measures are being taken and no such FMI is expected to develop within the jurisdiction.

### 2.3 Scope

This report covers the implementation measures in Singapore for all FMI types. The main implementation measures assessed for Singapore comprise: MAS' *Standards for MAS-Operated Financial Market Infrastructures* (Standards for MAS-Operated FMIs); MAS' *Notice on Financial Market Infrastructure Standards* (Notice on FMIs); MAS' *Notice on Financial Market Infrastructure Standards for CSDs* (Notice on FMIs (CSD)); and MAS' *Monograph on Supervision of Financial Market Infrastructures in Singapore* (Monograph).

These policy statements or regulatory instruments build on a number of relevant higher laws and regulations, most notably: the Payment Systems (Oversight) Act (PS(O)A); the Securities and Futures Act, Cap 289 (SFA); the Securities and Futures (Clearing Facilities) Regulations (SF(CF)R);<sup>23</sup> the Securities and Futures (Corporate Governance Of Approved Exchanges, Approved Clearing Houses And

<sup>22</sup> CPSS-IOSCO, *Principles for financial market infrastructures: Disclosure framework and assessment methodology*, December 2012, [www.bis.org/cpmi/publ/d106.htm](http://www.bis.org/cpmi/publ/d106.htm).

<sup>23</sup> Securities and Futures (Clearing Facilities) Regulations (SF(CF)R) - [www.mas.gov.sg/regulations-and-financial-stability/regulations-guidance-and-licensing/securities-futures-and-funds-management/regulations/2013/securities-and-futures-clearing-facilities-regulations-2013.aspx](http://www.mas.gov.sg/regulations-and-financial-stability/regulations-guidance-and-licensing/securities-futures-and-funds-management/regulations/2013/securities-and-futures-clearing-facilities-regulations-2013.aspx)

Approved Holding Companies) Regulations (SF(CG)R);<sup>24</sup> the Securities And Futures (Central Depository System) Regulations (SF(CDS)R); and the Securities and Futures (Trade Repositories) Regulations (SF(TR)R).<sup>25</sup>

The assessed legal, regulatory and oversight frameworks are further described in Section 3.

## 2.4 Process

This Level 2 assessment was carried out in three stages over the course of nine months, and the methodology used was the same as the one used for previous Level 2 assessments. In developing its methodology, the IMSG drew heavily on the AM, published in December 2012. The assessment proceeded as follows:

- (i) Collection of information based on MAS' responses to questionnaires;
- (ii) Off-site review and follow-up exchange of information and discussions with MAS and other members of the IMSG;
- (iii) Review of ratings by and response from MAS.

The aim was to gain insight into the regulatory, supervisory and oversight framework as well as the content of existing legislation, regulations and policies used in the implementation of the Principles for all FMI types established in Singapore.

The AT conducted a peer review based on the information provided by MAS as noted above. Interactions between the AT members and MAS helped ensure that the AT understood the content and intent of the Singaporean framework and gave the assessed jurisdiction an opportunity to provide feedback to the AT. In addition, discussions with other members of the IMSG helped ensure that a consistent approach was applied across all assessed FMI types and that the approach was consistent with that of previous assessments.

The report also reflects input from MAS that reviewed the findings and recommendations and provided a jurisdictional response. A concise summary of the views of MAS is included in the executive summary section of the report.

<sup>24</sup> Securities and Futures (Corporate Governance of Approved Exchanges, Approved Clearing Houses and Approved Holding Companies) Regulations (SF(CG)R) - [statutes.agc.gov.sg/aol/search/display/view.w3p;page=0;query=DocId%3Af758823d-ad6c-4b98-a898-ed21df9d64aa%20Depth%3A0%20Status%3Ainforce;rec=0](http://statutes.agc.gov.sg/aol/search/display/view.w3p;page=0;query=DocId%3Af758823d-ad6c-4b98-a898-ed21df9d64aa%20Depth%3A0%20Status%3Ainforce;rec=0).

<sup>25</sup> Securities and Futures (Trade Repositories) Regulations (SF(TR)R) - [www.mas.gov.sg/regulations-and-financial-stability/regulations-guidance-and-licensing/securities-futures-and-funds-management/regulations/2013/securities-and-futures-trade-repositories-regulations-2013.aspx](http://www.mas.gov.sg/regulations-and-financial-stability/regulations-guidance-and-licensing/securities-futures-and-funds-management/regulations/2013/securities-and-futures-trade-repositories-regulations-2013.aspx); or [statutes.agc.gov.sg/aol/search/display/view.w3p;page=0;query=DocId%3A50efa6e4-7b59-4ca1-9165-d801d9c8357e%20Depth%3A0%20Status%3Ainforce;rec=0;whole=yes](http://statutes.agc.gov.sg/aol/search/display/view.w3p;page=0;query=DocId%3A50efa6e4-7b59-4ca1-9165-d801d9c8357e%20Depth%3A0%20Status%3Ainforce;rec=0;whole=yes).

### 3. Overview of the regulatory, supervisory and oversight framework

MAS is the sole authority that is responsible for regulation, supervision and oversight of FMIs in Singapore.

MAS' regulatory role and powers for PSs are set out and provided in the Payment Systems (Oversight) Act (PS(O)A). For the PS owned and operated by MAS, MAS issued the Standards for MAS-Operated FMIs to hold itself to minimum standards set out in the PFMI.

MAS' regulatory role and powers for CCPs, CSDs, SSSs and TRs are set out in the SFA. Pursuant to the relevant parts of the SFA, MAS has issued the regulations and notices setting out further obligations. Any CCP, CSD, SSS and TR that seeks to offer its services in Singapore must be authorised/licensed by MAS before it can commence operations. In addition to obligations set forth in the SFA, regulations and notices, authorised/licensed CCPs, CSDs, SSSs and TRs are also subject to obligations arising from conditions imposed by MAS. The SFA provides MAS with supervisory powers over CCPs, CSDs, SSSs and TRs, including those for warnings and reprimands, directions, fines and composition, removal of officers, and revocation of authorisation of a CCP, CSD, SSSs and TR. For the CSD/SSS owned and operated by MAS, MAS issued the Standards for MAS-Operated FMIs to hold itself to minimum standards set out in the PFMI.

Further, MAS issued the Monograph that describes MAS' approach to supervising FMIs in Singapore. Notably, the Monograph states that MAS adopts the standards set out in the PFMI when carrying out its supervision of FMIs, and that all systemically important PSs, CSDs, SSSs, CCPs and TRs in Singapore are expected to comply with the PFMI.

#### 3.1 Payment systems

In Singapore, PSs, including systemically important payment systems, are regulated, supervised and overseen by MAS.

MAS derives its legal powers for PSs from the PS(O)A. MAS has information-gathering and regulatory powers under the PS(O)A. The regulatory powers under the PS(O)A allow MAS to designate and regulate PSs whose smooth operation is considered important for the stability of the financial system, or public confidence in the financial system. Specifically, MAS may designate a PS deemed to be either a systemically important PS (SIPS) or a system-wide important PS (SWIPS).

- SIPS are systems whose disruption could trigger, cause or transmit further disruption to participants or cause systemic disruption to the financial system of Singapore. All SIPS are subject to the PFMI. As of July 2016, MEPS+ is the only PS in Singapore designated as a SIPS and subject to the PFMI. MEPS+ is a RTGS system owned and operated by MAS.
- SWIPS are systems whose disruption could affect public confidence in PSs or the financial system of Singapore. Although a disruption or failure in these systems may have system-wide implications and may affect many users, there is negligible risk of systemic impact to financial stability. MAS does not subject SWIPS to the PFMI. The Singapore Dollar Cheque Clearing System, US Dollar Cheque Clearing System, Interbank GIRO System, Fast and Secure Transfers and NETS Electronic Fund Transfers at Point of Sale are considered SWIPS and have been designated under the PS(O)A as of July 2016. These SWIPS are commercially owned and operated.

Further, on the basis of the Monograph, MAS has committed itself to adopting the PFMI when carrying out its supervision on SIPS.

As the PS(O)A was designed for commercial payment systems, MAS has published the Standards for MAS-Operated FMIIs to hold MEPS+ to minimum standards set out in the PFMI.

### 3.2 Central counterparties and securities settlement systems

In Singapore, a corporation that operates a CCP or SSS is deemed systemically important and is regulated and supervised by MAS as an Approved Clearing House (ACH) under the same statutory framework.

MAS' legal powers for the regulation and supervision of CCPs and SSSs are derived from Part III of the SFA. Pursuant to Part III of the SFA, MAS has issued the following regulations and notices setting out further obligations on CCPs and SSSs: (1) SF(CF)R on the general obligations of CCPs and SSSs on matters such as authorisation, risk management and capital requirements; (2) SF(CG)R on the corporate governance requirements for CCPs, SSSs and their holding companies; and (3) Notice on FMIIs that complements the SFA and accompanying regulations in setting out the Principles and key considerations of the PFMI with which CCPs and SSSs must comply.

Further, on the basis of the Monograph, MAS has committed itself to adopting the PFMI when carrying out its supervision on ACHs.

For the MAS-owned and operated SSS, MAS has published the Standards for MAS-Operated FMIIs to hold the SSS to minimum standards set out in the PFMI.

As of July 2016, there are three CCPs in Singapore, the Central Depository (Pte) Limited (CDP), Singapore Exchange Derivatives Clearing Limited (SGX-DC) and ICE Clear Singapore Pte Ltd (ICSG), and two SSSs, CDP and MEPS+. All are subject to the PFMI.

### 3.3 Central securities depositories

In Singapore, a CSD is regulated and supervised by MAS as a Central Depository System (CDS).

MAS' legal powers for the regulation and supervision of CSDs are derived from Part IIIAA of the SFA. Pursuant to Part IIIAA of the SFA, MAS has issued the following regulations and notices setting out further obligations on CSDs: (1) SF(CDS)R on the general obligations of CSDs; and (2) Notice on FMI (CSD) to complement the SFA and SF(CDS)R in setting out the Principles and key considerations of the PFMI with which CSDs must comply.

Further, on the basis of the Monograph, MAS has committed itself to adopting the PFMI when carrying out its supervision on licensed CSDs.

For the MAS-owned and operated CSD, MAS has published the Standards for MAS-Operated FMIIs to hold the CSD to minimum standards set out in the PFMI.

As of July 2016, there are two CSDs in Singapore, CDP and MEPS+. Both are subject to the PFMI.

### 3.4 Trade repositories

In Singapore, a TR is regulated and supervised by MAS as a Licensed Trade Repository (LTR). MAS' legal powers for the regulation and supervision of TRs are derived from Part IIA of SFA. Pursuant to Part IIA of the SFA, MAS has issued the following regulations and notices setting out further obligations on TRs: (1) SF(TR)R on the general obligations of TRs; and (2) Notice on FMIIs that complements the SFA and SF(TR)R in setting out the PFMI principles and key considerations with which TRs must comply. This is the same notice that also applies to CCPs and SSSs (as described in Section 3.3 above).

Further, on the basis of the Monograph, MAS has committed itself to adopting the PFMI when carrying out its supervision on LTRs.

Additionally, MAS has a Memorandum of Understanding (MOU) with other authorities to allow TRs to provide them with prescribed information necessary for market transparency and disclosure of trade data.

As of July 2016, there is one TR in Singapore, DTCC Data Repository (Singapore) Pte. Ltd. (DDRS), and it is subject to PFMI.

## 4. Assessment and recommendations

### 4.1 Summary assessment of completeness and consistency with the Principles

This section provides a high-level summary of the consistency and completeness of the regimes in Singapore for PSs, CCPs, CSDs/SSSs and TRs with respect to the Principles. A more detailed assessment, including citations of the relevant legislation, regulation, policy and guidance, and notes explaining the assigned ratings, is provided in a tabular form in Section 4.2.

#### 4.1.1 Overview

The AT found that Singapore has consistently adopted all but one of the Principles across FMI types. The approach taken by Singapore to adopt the PFMI included a mixture of primary laws, secondary regulations and notices, supervisory conditions and directions, and policy statements.

For PSs, MAS' adoption of the Principles through the Standards for MAS-Operated FMIs and the Monograph was assessed to be consistent and complete. For CCPs, MAS' adoption of the Principles through the SFA, SF(CF)R, Notice on FMIs and the Monograph was assessed to be consistent and complete. For CSDs, MAS' adoption of the Principles through the SFA, SF(CDS)R, Notice on FMI (CSD), the Standards for MAS-Operated FMIs and the Monograph was assessed to be consistent and complete. For SSSs, MAS' adoption of the Principles through the SFA, SF(CF)R, Notice on FMIs, the Standards for MAS-Operated FMIs and the Monograph was assessed to be consistent and complete. For TRs, MAS have adopted all the Principles, except for Principle 24, consistently through SFA, SF(TR)R and Notice on FMIs and the Monograph. Tables 2–5 summarise the assessment ratings by Principle for each FMI type.

#### 4.1.2 General observations

In conducting the assessment, the AT considered all of MAS' implementation measures issued before the cut-off date for the assessment.

For FMIs not operated by MAS, the AT identified a number of KCs<sup>26</sup> for which the applicable regulations or notices are not articulated in full conformity with, or do not have the same level of granularity as, the respective KCs in the PFMI. MAS, through its ongoing supervision, expects FMIs to comply with the PFMI in their entirety. This expectation is in accordance with its commitment made in the Monograph, which states that MAS adopts the standards set out in the PFMI when carrying out its supervision of FMIs. The Monograph, combined with evidence from MAS that demonstrated effective uses of the Principles as part of its supervision, was considered sufficient to assume the general applicability and enforceability of the Principles and KCs through the approach taken by MAS. Accordingly, in conducting the assessment, the AT considered the complementary aspect of the requirements imposed by the Monograph and through MAS' ongoing supervision in cases where the relevant regulations or notices are not articulated in full conformity with, or do not have the same level of granularity as, the respective KCs.

<sup>26</sup> These include Principle 2 KC 1, Principle 2 KC 4, Principle 3 KC 4, Principle 15 KC 4, Principle 18 KC 3, Principle 20 KC1 and Principle 24 KC 3 for CCPs, CSDs/SSS and TRs.



### 4.1.3 Payment systems

Ratings summary <sup>27</sup> for PSs		Table 2
Assessment category	Principle	
<i>Consistent</i>	<i>Principles 1, 2, 3, 4, 5, 7, 8, 9, 12, 13, 15, 16, 17, 18, 19, 21, 22 and 23</i>	
<i>Broadly consistent</i>	<i>None</i>	
<i>Partly consistent</i>	<i>None</i>	
<i>Not consistent</i>	<i>None</i>	
<i>Not applicable</i>	<i>None</i>	

The AT concluded that the Principles relevant for PSs have been implemented in a complete and consistent manner through the Standards for MAS-Operated FMIs and the Monograph.

The AT notes that some elements or key considerations of the Principles are not applied to or are applied differently to the PS owned and operated by MAS, which is the only PS in Singapore that is subject to the PFMI as a systemically important payment system. This approach is consistent with paragraph 1.23 of the PFMI as further clarified in the CPMI-IOSCO CBFMI guidance. (See Section 4.1.7 below.)

### 4.1.4 Central counterparties

Ratings summary <sup>28</sup> for CCPs		Table 3
Assessment category	Principle	
<i>Consistent</i>	<i>Principles 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22 and 23</i>	
<i>Broadly consistent</i>	<i>None</i>	
<i>Partly consistent</i>	<i>None</i>	
<i>Not consistent</i>	<i>None</i>	
<i>Not applicable</i>	<i>None</i>	

The AT concluded that the Principles relevant for CCPs have been implemented in a complete and consistent manner through the SFA, SF(CF)R, Notice on FMIs and the Monograph (including complementary requirements imposed as part of ongoing supervision by MAS).

<sup>27</sup> The rating summary lists only those Principles that are applicable to the given type as defined in paragraphs 1.10–1.14 and shown in Table 1 of the PFMI.

<sup>28</sup> The rating summary lists only those Principles that are applicable to the given type as defined in paragraphs 1.10–1.14 and shown in Table 1 of the PFMI.

#### 4.1.5 Central securities depositories and securities settlement systems

Ratings summary for CSDs/SSSs		Table 4
Assessment category	Principle	
<i>Consistent</i>	<i>Principles 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22 and 23</i>	
<i>Broadly consistent</i>	<i>None</i>	
<i>Partly consistent</i>	<i>None</i>	
<i>Not consistent</i>	<i>None</i>	
<i>Not applicable</i>	<i>None</i>	

The AT concluded that the Principles relevant for CSDs have been implemented in a complete and consistent manner through the SFA, SF(CDS)R, Notice on FMI (CSD), the Standards for MAS-Operated FMIs and the Monograph (including the complementary requirements imposed as part of ongoing supervision by MAS).

The AT concluded that the Principles relevant for SSSs have been implemented in a complete and consistent manner through the SFA, SF(CF)R, Notice on FMIs, the Standards for MAS-Operated FMIs and the Monograph (including complementary requirements imposed as part of ongoing supervision by MAS).

The AT notes that some elements or KCs of the Principles relevant for CSDs/SSSs are not applied to or applied differently to the CSD/SSS owned and operated by MAS. This approach is consistent with paragraph 1.23 of the PFMI as further clarified in the CPMI-IOSCO CBFMI guidance. (See 4.1.7 below.)

#### 4.1.6 Trade repositories

Ratings summary <sup>29</sup> for TRs		Table 5
Assessment category	Principle	
<i>Consistent</i>	<i>Principles 1, 2, 3, 15, 17, 18, 19, 20, 21, 22 and 23</i>	
<i>Broadly consistent</i>	<i>None</i>	
<i>Partly consistent</i>	<i>Principle 24</i>	
<i>Not consistent</i>	<i>None</i>	
<i>Not applicable</i>	<i>None</i>	

MAS has incorporated the Principles into its policy and regulatory framework for the regulation, supervision and oversight of TRs and has mostly done so in a complete and consistent manner. The AT nevertheless identified gaps between the regulatory documents and the PFMI with respect to Principle 24 (disclosure of market data by trade repositories).

- DDRS, the sole TR operating in Singapore as of the cut-off date, is required by MAS, as part of its ongoing supervision, to submit to MAS all the transaction data reported to DDRS.

<sup>29</sup> The rating summary lists only those Principles that are applicable to the given type as defined in paragraphs 1.10–1.14 and shown in Table 1 of the PFMI.

Further, MAS entered into a MOU with the relevant authorities to provide them with access to the data in DDRS.

- MAS has authority under the SFA to direct a TR to publish information related to the transactions reported to it. As of the cut-off date, however, MAS had not exercised this authority. Accordingly, there are currently neither legal nor supervisory requirements or expectations set forth by MAS for, nor actual practice of, disclosure of the TR data to the public, which is a major aspect of Principle 24.
- It is acknowledged that MAS is actively considering appropriate requirements for TRs to publish the data in a manner that will help to achieve the objectives of the public disclosure.

#### 4.1.7 FMI's owned and operated by MAS

In Singapore, MAS owns and operates MEPS+, which is both a SIPS and a CSD/SSS and subject to the Principles.

Under the Standards for MAS-Operated FMI's, some elements or KCs of the Principles are not applied to, or are applied differently to, the FMI's owned and operated by MAS.<sup>30</sup> MAS has incorporated the KCs of the PFMI near-verbatim into the Standards for MAS-Operated FMI's that are applicable to the FMI's owned and operated by MAS. However, the Standards for MAS-Operated FMI's contain caveat statements for certain Principles and KCs that refer to the CPMI-IOSCO CBFMI guidance and note that adherence to these Principles and KCs in the PFMI are not intended to constrain certain roles performed by MAS as the central bank.

This approach taken by MAS is consistent with paragraph 1.23 of the PFMI as further clarified in the CPMI-IOSCO CBFMI guidance, given that MAS intends to generally adhere to the relevant PFMI requirements and to apply exemptions only where constraints are identified and justified; and that such exemptions are indeed strictly limited to those Principles and KCs that are referenced in the CPMI-IOSCO CBFMI guidance. Accordingly, the Principles applied to these central bank-owned and -operated FMI's in Singapore, within the context of this Report, have been evaluated to be consistent with the PFMI.

<sup>30</sup> Those Principles and KCs are Principle 3 KC4, Principle 4, Principle 5 KC 1, Principle 13, Principle 15 KCs 2–5, Principle 16 and 18.

## 4.2 Singapore's completeness and consistency with the Principles – Review and recommendations

### 4.2.1 Payment systems

Implementation of the principles			
1. Text of applicable Principles and Key Considerations (KCs) <sup>31</sup>	2. Implementation measures of the jurisdiction	3. Key conclusions for principle	4. Recommendations and comments
<p><b>Principle 1: Legal basis</b></p> <p><b>An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.</b></p>	Refer to KCs.	<b>Consistent</b>	
1. <i>The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.</i>	Paragraph 2.2 of the Standards for MAS-Operated FMIs		
2. <i>An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.</i>	Paragraph 2.3 of the Standards for MAS-Operated FMIs		
3. <i>An FMI should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant, participants' customers, in a clear and understandable way.</i>	Paragraph 2.4 of the Standards for MAS-Operated FMIs		
4. <i>An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under</i>	Paragraph 2.5 of the Standards for MAS-Operated FMIs		

<sup>31</sup> Only the relevant principles for PSs (as set forth in the annex E of the PFMI) are included.

<i>such rules and procedures will not be voided, reversed, or subject to stays.</i>			
5. <i>An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.</i>	Paragraph 2.6 of the Standards for MAS-Operated FMIs		
<b>Principle 2: Governance</b> <b>An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.</b>	Refer to KCs.	<b>Consistent</b>	
1. <i>An FMI should have objectives that place a high priority on the safety and efficiency of the FMI and explicitly support financial stability and other relevant public interest considerations.</i>	Paragraph 2.7 of the Standards for MAS-Operated FMIs		
2. <i>An FMI should have documented governance arrangements that provide clear and direct lines of responsibility and accountability. These arrangements should be disclosed to owners, relevant authorities, participants, and, at a more general level, the public.</i>	Paragraph 2.8 of the Standards for MAS-Operated FMIs		
3. <i>The roles and responsibilities of an FMI's board of directors (or equivalent) should be clearly specified, and there should be documented procedures for its functioning, including</i>	Paragraph 2.9 of the Standards for MAS-Operated FMIs		

<i>procedures to identify, address, and manage member conflicts of interest. The board should review both its overall performance and the performance of its individual board members regularly.</i>			
4. <i>The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s).</i>	Paragraph 2.10 of the Standards for MAS-Operated FMIs		
5. <i>The roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI.</i>	Paragraph 2.11 of the Standards for MAS-Operated FMIs		
6. <i>The board should establish a clear, documented risk-management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk-management and internal control functions have sufficient authority, independence, resources, and access to the board.</i>	Paragraph 2.12 of the Standards for MAS-Operated FMIs		
7. <i>The board should ensure that the FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders</i>	Paragraph 2.13 of the Standards for MAS-Operated FMIs		

<p><i>and, where there is a broad market impact, the public.</i></p>			
<p><b>Principle 3: Framework for the comprehensive management of risks</b></p> <p><b>An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.</b></p>	<p>Refer to KCs.</p>	<p><b>Consistent</b></p>	
<p>1. <i>An FMI should have risk-management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMI. Risk-management frameworks should be subject to periodic review.</i></p>	<p>Paragraph 2.14 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMI.</i></p>	<p>Paragraph 2.15 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should regularly review the material risks it bears from and poses to other entities (such as other FMIs, settlement banks, liquidity providers, and service providers) as a result of interdependencies and develop appropriate risk-management tools to address these risks.</i></p>	<p>Paragraph 2.16 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>An FMI should identify scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern and assess the effectiveness of a full range of options for recovery or orderly wind-down. An FMI should prepare appropriate</i></p>	<p><i>Not applicable for central bank-owned and operated FMIs as elaborated in the CPMI-IOSCO Guidance note on Application of the Principles for financial market infrastructures to central bank FMIs (August 2015).</i></p>	<p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for</i></p>	

<p><i>plans for its recovery or orderly wind-down based on the results of that assessment. Where applicable, an FMI should also provide relevant authorities with the information needed for purposes of resolution planning.</i></p>		<p><i>financial market infrastructures to central bank FMIs.</i></p>	
<p><b>Principle 4: Credit risk</b></p> <p><b>An FMI should effectively measure, monitor, and manage its credit exposures to participants and those arising from its payment, clearing, and settlement processes. An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure to the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure to the CCP in extreme but plausible market conditions.</b></p>	<p>Refer to KCs</p> <p>As explained in paragraph 2.17 of the Standards for MAS-Operated FMIs, the implementation measures for this principle are strictly in respect of credit risk arising from MAS-operated FMIs' activities.</p>	<p><b>Consistent</b></p> <p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs.</i></p>	



<p>1. <i>An FMI should establish a robust framework to manage its credit exposures to its participants and the credit risks arising from its payment, clearing, and settlement processes. Credit exposure may arise from current exposures, potential future exposures, or both.</i></p>	<p>Paragraph 2.18 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk-management tools to control these risks.</i></p>	<p>Paragraph 2.19 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>A payment system or SSS should cover its current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (see Principle 5 on collateral). In the case of a DNS payment system or DNS SSS in which there is no settlement guarantee but where its participants face credit exposures arising from its payment, clearing, and settlement processes, such an FMI should maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.</i></p>	<p>Paragraph 2.20 of the Standards for MAS-Operated FMIs</p>		
<p>7. <i>An FMI should establish explicit rules and procedures that address fully any credit losses it may face as a result of any individual or combined default among its participants with respect to any of their obligations to the FMI. These rules and procedures should address how potentially uncovered credit losses would be allocated, including the repayment of any</i></p>	<p>Paragraph 2.21 of the Standards for MAS-Operated FMIs</p>		

<p><i>funds an FMI may borrow from liquidity providers. These rules and procedures should also indicate the FMI's process to replenish any financial resources that the FMI may employ during a stress event, so that the FMI can continue to operate in a safe and sound manner.</i></p>			
<p><b>Principle 5: Collateral</b>  <b>An FMI that requires collateral to manage its or its participants' credit exposure should accept collateral with low credit, liquidity, and market risks. An FMI should also set and enforce appropriately conservative haircuts and concentration limits.</b></p>	<p>Refer to KCs.</p>	<p><b>Consistent</b></p>	
<p>1. <i>An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks.</i></p>	<p>Paragraph 2.22 of the Standards for MAS-Operated FMIs.</p>	<p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs</i>.</p>	
<p>2. <i>An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.</i></p>	<p>Paragraph 2.23 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>In order to reduce the need for procyclical adjustments, an FMI should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent.</i></p>	<p>Paragraph 2.24 of the Standards for MAS-Operated FMIs</p>		

4. <i>An FMI should avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects.</i>	Paragraph 2.25 of the Standards for MAS-Operated FMIs		
5. <i>An FMI that accepts cross-border collateral should mitigate the risks associated with its use and ensure that the collateral can be used in a timely manner.</i>	Paragraph 2.26 of the Standards for MAS-Operated FMIs		
6. <i>An FMI should use a collateral management system that is well-designed and operationally flexible.</i>	Paragraph 2.27 of the Standards for MAS-Operated FMIs		
<p><b>Principle 7: Liquidity risk</b></p> <p><b>An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate liquidity obligation for the FMI in extreme but plausible market conditions.</b></p>	Refer to KCs.	<b>Consistent</b>	
1. <i>An FMI should have a robust framework to manage its liquidity risks from its participants,</i>	Paragraph 2.28 of the Standards for MAS-Operated FMIs		

<p><i>settlement banks, nostro agents, custodian banks, liquidity providers, and other entities.</i></p>			
<p>2. <i>An FMI should have effective operational and analytical tools to identify, measure, and monitor its settlement and funding flows on an ongoing and timely basis, including its use of intraday liquidity.</i></p>	<p>Paragraph 2.29 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>A payment system or SSS, including one employing a DNS mechanism, should maintain sufficient liquid resources in all relevant currencies to effect same-day settlement, and where appropriate intraday or multiday settlement, of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions.</i></p>	<p>Paragraph 2.30 of the Standards for MAS-Operated FMIs</p>		
<p>5. <i>For the purpose of meeting its minimum liquid resource requirement, an FMI's qualifying liquid resources in each currency include cash at the central bank of issue and at creditworthy commercial banks, committed lines of credit, committed foreign exchange swaps, and committed repos, as well as highly marketable collateral held in custody and investments that are readily available and convertible into cash with prearranged and highly reliable funding arrangements, even in extreme but plausible market conditions. If an FMI has access to routine credit at the central bank of issue, the FMI may count such access</i></p>	<p>Paragraph 2.31 of the Standards for MAS-Operated FMIs</p>		

<p><i>as part of the minimum requirement to the extent it has collateral that is eligible for pledging to (or for conducting other appropriate forms of transactions with) the relevant central bank. All such resources should be available when needed.</i></p>			
<p>6. <i>An FMI may supplement its qualifying liquid resources with other forms of liquid resources. If the FMI does so, then these liquid resources should be in the form of assets that are likely to be saleable or acceptable as collateral for lines of credit, swaps, or repos on an ad hoc basis following a default, even if this cannot be reliably prearranged or guaranteed in extreme market conditions. Even if an FMI does not have access to routine central bank credit, it should still take account of what collateral is typically accepted by the relevant central bank, as such assets may be more likely to be liquid in stressed circumstances. An FMI should not assume the availability of emergency central bank credit as a part of its liquidity plan.</i></p>	<p>Paragraph 2.32 of the Standards for MAS-Operated FMIs</p>		
<p>7. <i>An FMI should obtain a high degree of confidence, through rigorous due diligence, that each provider of its minimum required qualifying liquid resources, whether a participant of the FMI or an external party, has sufficient information to understand and to manage its associated liquidity risks, and that it has the capacity to perform as required under its commitment. Where relevant to assessing a liquidity provider's performance reliability with respect to a particular currency, a liquidity provider's potential access to credit from the central bank of issue may be taken</i></p>	<p>Paragraph 2.33 of the Standards for MAS-Operated FMIs</p>		

<p><i>into account. An FMI should regularly test its procedures for accessing its liquid resources at a liquidity provider.</i></p>			
<p>8. <i>An FMI with access to central bank accounts, payment services, or securities services should use these services, where practical, to enhance its management of liquidity risk.</i></p>	<p>Paragraph 2.34 of the Standards for MAS-Operated FMIs</p>		
<p>9. <i>An FMI should determine the amount and regularly test the sufficiency of its liquid resources through rigorous stress testing. An FMI should have clear procedures to report the results of its stress tests to appropriate decision makers at the FMI and to use these results to evaluate the adequacy of and adjust its liquidity risk-management framework. In conducting stress testing, an FMI should consider a wide range of relevant scenarios. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions. Scenarios should also take into account the design and operation of the FMI, include all entities that might pose material liquidity risks to the FMI (such as settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs), and where appropriate, cover a multiday period. In all cases, an FMI should document its supporting rationale for, and should have appropriate governance arrangements relating</i></p>	<p>Paragraph 2.35 of the Standards for MAS-Operated FMIs</p>		

<p><i>to, the amount and form of total liquid resources it maintains.</i></p>			
<p>10. <i>An FMI should establish explicit rules and procedures that enable the FMI to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations on time following any individual or combined default among its participants. These rules and procedures should address unforeseen and potentially uncovered liquidity shortfalls and should aim to avoid unwinding, revoking, or delaying the same-day settlement of payment obligations. These rules and procedures should also indicate the FMI's process to replenish any liquidity resources it may employ during a stress event, so that it can continue to operate in a safe and sound manner.</i></p>	<p>Paragraph 2.36 of the Standards for MAS-Operated FMIs</p>		
<p><b>Principle 8: Settlement finality</b> <b>An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.</b></p>	<p>Refer to KCs.</p>	<p><b>Consistent</b></p>	
<p>1. <i>An FMI's rules and procedures should clearly define the point at which settlement is final.</i></p>	<p>Paragraph 2.37 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should complete final settlement no later than the end of the value date, and preferably intraday or in real time, to reduce settlement risk. An LVPS or SSS should consider</i></p>	<p>Paragraph 2.38 of the Standards for MAS-Operated FMIs</p>		

<i>adopting RTGS or multiple-batch processing during the settlement day.</i>			
3. <i>An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.</i>	Paragraph 2.39 of the Standards for MAS-Operated FMIs		
<b>Principle 9: Money settlements</b> <b>An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.</b>	Refer to KCs.	<b>Consistent</b>	
1. <i>An FMI should conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks.</i>	Paragraph 2.40 of the Standards for MAS-Operated FMIs		
2. <i>If central bank money is not used, an FMI should conduct its money settlements using a settlement asset with little or no credit or liquidity risk.</i>	Paragraph 2.41 of the Standards for MAS-Operated FMIs		
3. <i>If an FMI settles in commercial bank money, it should monitor, manage, and limit its credit and liquidity risks arising from the commercial settlement banks. In particular, an FMI should establish and monitor adherence to strict criteria for its settlement banks that take account of, among other things, their regulation and supervision, creditworthiness, capitalisation, access to liquidity, and</i>	Paragraph 2.42 of the Standards for MAS-Operated FMIs		



<i>operational reliability. An FMI should also monitor and manage the concentration of credit and liquidity exposures to its commercial settlement banks.</i>			
4. <i>If an FMI conducts money settlements on its own books, it should minimise and strictly control its credit and liquidity risks.</i>	Paragraph 2.43 of the Standards for MAS-Operated FMIs		
5. <i>An FMI's legal agreements with any settlement banks should state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received should be transferable as soon as possible, at a minimum by the end of the day and ideally intraday, in order to enable the FMI and its participants to manage credit and liquidity risks.</i>	Paragraph 2.44 of the Standards for MAS-Operated FMIs		
<b>Principle 12: Exchange-of-value settlement systems</b> <b>If an FMI settles transactions that involve the settlement of two linked obligations (for example, securities or foreign exchange transactions), it should eliminate principal risk by conditioning the final settlement of one obligation upon the final settlement of the other.</b>	Refer to KCs.	<b>Consistent</b>	
1. <i>An FMI that is an exchange-of-value settlement system should eliminate principal risk by ensuring that the final settlement of one obligation occurs if and only if the final</i>	Paragraph 2.53 of the Standards for MAS-Operated FMIs		

<p><i>settlement of the linked obligation also occurs, regardless of whether the FMI settles on a gross or net basis and when finality occurs.</i></p>			
<p><b>Principle 13: Participant-default rules and procedures</b></p> <p><b>An FMI should have effective and clearly defined rules and procedures to manage a participant default. These rules and procedures should be designed to ensure that the FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations.</b></p>	<p>Refer to KCs</p> <p>As explained in paragraph 2.54 of the Standards for MAS-Operated FMIs, the implementation measures for this principle are not intended to constrain MAS' policies and actions for maintaining financial stability including managing participant defaults.</p>	<p><b>Consistent</b></p> <p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs</i>.</p>	
<p>1. <i>An FMI should have default rules and procedures that enable the FMI to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.</i></p>	<p>Paragraph 2.55 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in its rules.</i></p>	<p>Paragraph 2.56 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should publicly disclose key aspects of its default rules and procedures.</i></p>	<p>Paragraph 2.57 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>An FMI should involve its participants and other stakeholders in the testing and review of the FMI's default procedures, including any close-out procedures. Such testing and review should be conducted at least annually or following material changes to the rules and</i></p>	<p>Paragraph 2.58 of the Standards for MAS-Operated FMIs</p>		

<p><i>procedures to ensure that they are practical and effective.</i></p>			
<p><b>Principle 15: General business risk</b>  <b>An FMI should identify, monitor, and manage its general business risk and hold sufficient liquid net assets funded by equity to cover potential general business losses so that it can continue operations and services as a going concern if those losses materialise. Further, liquid net assets should at all times be sufficient to ensure a recovery or orderly wind-down of critical operations and services.</b></p>	<p>Refer to KCs.</p>	<p><b>Consistent</b></p>	
<p>1. <i>An FMI should have robust management and control systems to identify, monitor, and manage general business risks, including losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses.</i></p>	<p>Paragraph 2.59 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should hold liquid net assets funded by equity (such as common stock, disclosed reserves, or other retained earnings) so that it can continue operations and services as a going concern if it incurs general business losses. The amount of liquid net assets funded by equity an FMI should hold should be determined by its general business risk profile and the length of time required to achieve a recovery or orderly wind-down, as appropriate, of its critical operations and services if such action is taken.</i></p>	<p><i>Not applicable for central bank-owned and operated FMIs as explained in the PFMI and elaborated in the CPMI-IOSCO Guidance note on Application of the Principles for financial market infrastructures to central bank FMIs (August 2015).</i></p>	<p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs</i>.</p>	

<p>3. <i>An FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets funded by equity to implement this plan. At a minimum, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses. These assets are in addition to resources held to cover participant defaults or other risks covered under the financial resources principles. However, equity held under international risk-based capital standards can be included where relevant and appropriate to avoid duplicate capital requirements.</i></p>	<p><i>Not applicable for central bank-owned and operated FMIs as explained in the PFMI and elaborated in the CPMI-IOSCO note on Application of the Principles for financial market infrastructures to central bank FMIs (August 2015).</i></p>	<p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs</i>.</p>	
<p>4. <i>Assets held to cover general business risk should be of high quality and sufficiently liquid in order to allow the FMI to meet its current and projected operating expenses under a range of scenarios, including in adverse market conditions.</i></p>	<p><i>Not applicable for central bank-owned and operated FMIs as explained in the PFMI and elaborated in the CPMI-IOSCO note on Application of the Principles for financial market infrastructures to central bank FMIs (August 2015).</i></p>	<p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs</i>.</p>	
<p>5. <i>An FMI should maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed. This plan should be approved by the board of directors and updated regularly.</i></p>	<p><i>Not applicable for central bank-owned and operated FMIs as explained in the PFMI and elaborated in the CPMI-IOSCO note on Application of the Principles for financial market infrastructures to central bank FMIs (August 2015).</i></p>	<p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs</i>.</p>	

<p><b>Principle 16: Custody and investment risks</b></p> <p><b>An FMI should safeguard its own and its participants' assets and minimise the risk of loss on and delay in access to these assets. An FMI's investments should be in instruments with minimal credit, market, and liquidity risks.</b></p>	<p>Refer to KCs.</p> <p>As explained in paragraph 2.60 of the Standards for MAS-Operated FMIs, the implementation measures for this principle are not intended to constrain MAS' investment policies (including that for reserve management) or the disclosure of those policies.</p>	<p><b>Consistent</b></p> <p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs</i>.</p>	
<p>1. <i>An FMI should hold its own and its participants' assets at supervised and regulated entities that have robust accounting practices, safekeeping procedures, and internal controls that fully protect these assets.</i></p>	<p>Paragraph 2.61 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should have prompt access to its assets and the assets provided by participants, when required.</i></p>	<p>Paragraph 2.62 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.</i></p>	<p>Paragraph 2.63 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>An FMI's investment strategy should be consistent with its overall risk-management strategy and fully disclosed to its participants, and investments should be secured by, or be claims on, high-quality obligors. These investments should allow for quick liquidation with little, if any, adverse price effect.</i></p>	<p>Paragraph 2.64 of the Standards for MAS-Operated FMIs</p>		

<p><b>Principle 17: Operational risk</b></p> <p><b>An FMI should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale or major disruption.</b></p>	<p>Refer to KCs.</p>	<p><b>Consistent</b></p>	
<p>1. <i>An FMI should establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.</i></p>	<p>Paragraph 2.65 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI's board of directors should clearly define the roles and responsibilities for addressing operational risk and should endorse the FMI's operational risk-management framework. Systems, operational policies, procedures, and controls should be reviewed, audited, and tested periodically and after significant changes.</i></p>	<p>Paragraph 2.66 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.</i></p>	<p>Paragraph 2.67 of the Standards for MAS-Operated FMIs</p>		

<p>4. <i>An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.</i></p>	<p>Paragraph 2.68 of the Standards for MAS-Operated FMIs</p>		
<p>5. <i>An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.</i></p>	<p>Paragraph 2.69 of the Standards for MAS-Operated FMIs</p>		
<p>6. <i>An FMI should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption. The plan should incorporate the use of a secondary site and should be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements.</i></p>	<p>Paragraph 2.70 of the Standards for MAS-Operated FMIs</p>		
<p>7. <i>An FMI should identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In addition, an FMI should identify, monitor, and manage the risks its operations might pose to other FMIs.</i></p>	<p>Paragraph 2.71 of the Standards for MAS-Operated FMIs</p>		

<p><b>Principle 18: Access and participation requirements</b></p> <p><b>An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.</b></p>	<p>Refer to KCs.</p> <p>As explained in paragraph 2.72 of the Standards for MAS-Operated FMIs, the implementation measures for this principle 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.</p>	<p><b>Consistent</b></p> <p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs</i>.</p>	
<p>1. <i>An FMI should allow for fair and open access to its services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements.</i></p>	<p>Paragraph 2.73 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to and commensurate with the FMI's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, an FMI should endeavour to set requirements that have the least-restrictive impact on access that circumstances permit.</i></p>	<p>Paragraph 2.74 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should monitor compliance with its participation requirements on an ongoing basis and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements.</i></p>	<p>Paragraph 2.75 of the Standards for MAS-Operated FMIs</p>		



<p><b>Principle 19: Tiered participation arrangements</b></p> <p><b>An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.</b></p>	<p>Refer to KCs.</p>	<p><b>Consistent</b></p>	
<p>1. <i>An FMI should ensure that its rules, procedures, and agreements allow it to gather basic information about indirect participation in order to identify, monitor, and manage any material risks to the FMI arising from such tiered participation arrangements.</i></p>	<p>Paragraph 2.76 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.</i></p>	<p>Paragraph 2.77 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should identify indirect participants responsible for a significant proportion of transactions processed by the FMI and indirect participants whose transaction volumes or values are large relative to the capacity of the direct participants through which they access the FMI in order to manage the risks arising from these transactions.</i></p>	<p>Paragraph 2.78 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.</i></p>	<p>Paragraph 2.79 of the Standards for MAS-Operated FMIs</p>		

<p><b>Principle 21: Efficiency and effectiveness</b></p> <p><b>An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.</b></p>	<p>Refer to KCs.</p>	<p><b>Consistent</b></p>	
<p>1. <i>An FMI should be designed to meet the needs of its participants and the markets it serves, in particular, with regard to choice of a clearing and settlement arrangement; operating structure; scope of products cleared, settled, or recorded; and use of technology and procedures.</i></p>	<p>Paragraph 2.86 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should have clearly defined goals and objectives that are measurable and achievable, such as in the areas of minimum service levels, risk-management expectations, and business priorities.</i></p>	<p>Paragraph 2.87 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.</i></p>	<p>Paragraph 2.88 of the Standards for MAS-Operated FMIs</p>		
<p><b>Principle 22: Communication procedures and standards</b></p> <p><b>An FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording.</b></p>	<p>Refer to KCs.</p>	<p><b>Consistent</b></p>	

<p>1. <i>An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.</i></p>	<p>Paragraph 2.89 of the Standards for MAS-Operated FMIs</p>		
<p><b>Principle 23: Disclosure of rules, key procedures, and market data</b></p> <p><b>An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed.</b></p>	<p>Refer to KCs.</p>	<p><b>Consistent</b></p>	
<p>1. <i>An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.</i></p>	<p>Paragraph 2.90 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should disclose clear descriptions of the system's design and operations, as well as the FMI's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMI.</i></p>	<p>Paragraph 2.91 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should provide all necessary and appropriate documentation and training to facilitate participants' understanding of the FMI's rules and procedures and the risks they face from participating in the FMI.</i></p>	<p>Paragraph 2.92 of the Standards for MAS-Operated FMIs</p>		

<p>4. <i>An FMI should publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The FMI should provide clear descriptions of priced services for comparability purposes.</i></p>	<p>Paragraph 2.93 of the Standards for MAS-Operated FMIs</p>		
<p>5. <i>An FMI should complete regularly and disclose publicly responses to the CPSS-IOSCO Disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.</i></p>	<p>Paragraph 2.94 of the Standards for MAS-Operated FMIs</p>		

## 4.2.2 Central counterparties

<b>Implementation of the principles</b>			
<b>1. Text of applicable Principles and Key Considerations (KCs)<sup>32</sup></b>	<b>2. Implementation measures of the jurisdiction</b>	<b>3. Key conclusions for principle</b>	<b>4. Recommendations and comments</b>
<p><b>Principle 1: Legal basis</b></p> <p><b>An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.</b></p>		<b>Consistent</b>	
<p>1. <i>The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.1.1</p>		
<p>2. <i>An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.1.2</p>		
<p>3. <i>An FMI should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant, participants' customers, in a clear and understandable way.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.1.3</p>		
<p>4. <i>An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.1.4</p>		

<sup>32</sup> Only the relevant principles for CCPs (as set forth in the annex E of the PFMI) are included.

<p>5. <i>An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.1.5</p>		
<p><b>Principle 2: Governance</b></p> <p><b>An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.</b></p>		<p><b>Consistent</b></p>	<p>Where there are gaps/inconsistencies in language or requirements between the relevant regulations and notices and the PFMI, MAS should consider providing more clarity to CCPs with respect to minimum standards.</p>
<p>1. <i>An FMI should have objectives that place a high priority on the safety and efficiency of the FMI and explicitly support financial stability and other relevant public interest considerations.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.2.1</p>	<p>While the language used in Notice on Financial Market Infrastructure Standards 3.2.1 is closely aligned to the KC, the word “explicitly” was not included. The absence of an explicit requirement could render a CCP’s objectives subject to interpretation and thereby weaken the objectives with respect to financial stability and other relevant public interest considerations.</p>	
<p>2. <i>An FMI should have documented governance arrangements that provide clear and direct lines of responsibility and accountability. These arrangements should be disclosed to owners, relevant authorities, participants, and, at a more general level, the public.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.2.2</p>	<p>While the language used in Notice on Financial Market Infrastructure Standards 3.2.2 is closely aligned to the KC, it limits the referenced governance arrangements to those for its board of directors (or equivalent) and limits the referenced</p>	

		<p>lines of responsibility and accountability to those between management and the board. As such, the requirements do not extend to lower staff levels.</p> <p>In practice, in accordance with the policy statement in the Monograph, MAS takes guidance from the PFMI explanatory note and MAS expects management to ensure clear and direct lines of responsibility and accountability, including for lower levels.</p>	
<p>3. <i>The roles and responsibilities of an FMI's board of directors (or equivalent) should be clearly specified, and there should be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest. The board should review both its overall performance and the performance of its individual board members regularly.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.2.3</p>		
<p>4. <i>The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s).</i></p>	<p>Securities and Futures Act, section 57(1)(i) and 81ZF(1)</p> <p>Securities and Futures Act, section 71(1) and 81ZF(2)</p> <p>Securities and Futures (Corporate Governance of Approved Exchanges, Approved Clearing Houses and Approved Holding Companies) Regulations, section 6(1)</p> <p>Securities and Futures (Corporate Governance of Approved Exchanges,</p>	<p>The requirements in the referenced regulations do not explicitly require board members to have appropriate incentives and the board to have a mixture of skills of members to fulfil multiple roles of the board.</p> <p>In practice, in accordance with the policy statement in the monograph, MAS considers relevant aspects under KC4 (including the skills and incentives for the person to satisfy the board's multiple roles) in its</p>	

	<p>Approved Clearing Houses and Approved Holding Companies) Regulations, section 2</p> <p>Securities and Futures (Corporate Governance of Approved Exchanges, Approved Clearing Houses and Approved Holding Companies) Regulations, section 10</p>	regulatory approval process of the appointment of the board members.	
<p>5. <i>The roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.2.4</p>		
<p>6. <i>The board should establish a clear, documented risk-management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk-management and internal control functions have sufficient authority, independence, resources, and access to the board.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.2.5</p>		
<p>7. <i>The board should ensure that the FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.2.6</p>		



<p><b>Principle 3: Framework for the comprehensive management of risks</b></p> <p><b>An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.</b></p>		<p><b>Consistent</b></p>	<p>Where there are gaps/inconsistencies in language or requirements between the relevant regulations and notices and the PFMI, MAS should consider providing more clarity to CCPs with respect to minimum standards.</p>
<p>1. <i>An FMI should have risk-management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMI. Risk-management frameworks should be subject to periodic review.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.3.1 Securities and Futures Act, section 59</p>		
<p>2. <i>An FMI should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMI.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.3.2</p>		
<p>3. <i>An FMI should regularly review the material risks it bears from and poses to other entities (such as other FMIs, settlement banks, liquidity providers, and service providers) as a result of interdependencies and develop appropriate risk-management tools to address these risks.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.3.3</p>		
<p>4. <i>An FMI should identify scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern and assess the effectiveness of a full range of options for recovery or orderly wind-down. An FMI should prepare appropriate plans for its recovery or orderly wind-down based on the results of that assessment. Where applicable, an FMI should also provide relevant authorities with</i></p>	<p>Securities and Futures (Clearing Facilities) Regulations, section 17 Securities and Futures Act, section 63 MAS Act, section 30AAZK</p>	<p>MAS has not explicitly stated in its Securities and Futures (Clearing Facilities) Regulations that a CCP shall <u>identify scenarios</u> that may potentially prevent [the CCP] from being able to provide its critical operations and services as a going concern and <u>assess the effectiveness of a full range of options</u> for recovery or orderly wind-down.</p>	

<p><i>the information needed for purposes of resolution planning.</i></p>		<p>In practice, MAS requires each CCP to have a recovery and orderly wind-down plan, and it assesses whether the CCP has an appropriate and effective plan. As part of this assessment, MAS determines whether the CCP identified scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern, and assessed the effectiveness of a full range of options for recovery or orderly winding-down.</p>	
<p><b>Principle 4: Credit risk</b></p> <p><b>An FMI should effectively measure, monitor, and manage its credit exposures to participants and those arising from its payment, clearing, and settlement processes. An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure to the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient</b></p>		<p><b>Consistent</b></p>	

<p><b>to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure to the CCP in extreme but plausible market conditions.</b></p>			
<p>1. <i>An FMI should establish a robust framework to manage its credit exposures to its participants and the credit risks arising from its payment, clearing, and settlement processes. Credit exposure may arise from current exposures, potential future exposures, or both.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.4.1</p>		
<p>2. <i>An FMI should identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk-management tools to control these risks.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.4.2</p>		
<p>4. A CCP should cover its current and potential future exposures to each participant fully with a high degree of confidence using margin and other prefunded financial resources (see Principle 5 on collateral and Principle 6 on margin). In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential</p>	<p>Notice on Financial Market Infrastructure Standards 3.4.4 MAS Capital Conditions</p>	<p>The AT notes that Singapore’s current requirements are consistent with respect to Cover 1, which is the currently applicable standard, given that no CCP in Singapore has a more complex risk profile or is considered systemically important in multiple jurisdictions.</p>	

<p>stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. In all cases, a CCP should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount of total financial resources it maintains.</p>			
<p>5. <i>A CCP should determine the amount and regularly test the sufficiency of its total financial resources available in the event of a default or multiple defaults in extreme but plausible market conditions through rigorous stress testing. A CCP should have clear procedures to report the results of its stress tests to appropriate decision makers at the CCP and to use these results to evaluate the adequacy of and adjust its total financial resources. Stress tests should be performed daily using standard and predetermined parameters and assumptions. On at least a monthly basis, a CCP should perform a comprehensive and thorough analysis of stress testing scenarios, models, and underlying parameters and assumptions used to ensure they are appropriate for determining the CCP's required level of default protection in light of current and evolving market conditions. A CCP should perform this analysis of stress testing more frequently when the products cleared or markets served display high volatility, become less liquid, or when the size or concentration of positions held by a CCP's participants increases significantly. A full validation of a CCP's risk-management model should be performed at least annually.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.4.5</p>		

<p>6. <i>In conducting stress testing, a CCP should consider the effect of a wide range of relevant stress scenarios in terms of both defaulters' positions and possible price changes in liquidation periods. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.4.6</p>		
<p>7. <i>An FMI should establish explicit rules and procedures that address fully any credit losses it may face as a result of any individual or combined default among its participants with respect to any of their obligations to the FMI. These rules and procedures should address how potentially uncovered credit losses would be allocated, including the repayment of any funds an FMI may borrow from liquidity providers. These rules and procedures should also indicate the FMI's process to replenish any financial resources that the FMI may employ during a stress event, so that the FMI can continue to operate in a safe and sound manner.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.4.7</p>		

<p><b>Principle 5: Collateral</b></p> <p><b>An FMI that requires collateral to manage its or its participants' credit exposure should accept collateral with low credit, liquidity, and market risks. An FMI should also set and enforce appropriately conservative haircuts and concentration limits.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.5.1</p>		
<p>2. <i>An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.5.2</p>		
<p>3. <i>In order to reduce the need for procyclical adjustments, an FMI should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.5.3</p>		
<p>4. <i>An FMI should avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.5.4</p>		
<p>5. <i>An FMI that accepts cross-border collateral should mitigate the risks associated with its use and ensure that the collateral can be used in a timely manner.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.5.5</p>		

6. <i>An FMI should use a collateral management system that is well-designed and operationally flexible.</i>	Notice on Financial Market Infrastructure Standards 3.5.6		
<b>Principle 6: Margin</b> <b>A CCP should cover its credit exposures to its participants for all products through an effective margin system that is risk-based and regularly reviewed.</b>		<b>Consistent</b>	
1. <i>A CCP should have a margin system that establishes margin levels commensurate with the risks and particular attributes of each product, portfolio, and market it serves.</i>	Notice on Financial Market Infrastructure Standards 3.6.1		
2. <i>A CCP should have a reliable source of timely price data for its margin system. A CCP should also have procedures and sound valuation models for addressing circumstances in which pricing data are not readily available or reliable.</i>	Notice on Financial Market Infrastructure Standards 3.6.2		
3. <i>A CCP should adopt initial margin models and parameters that are risk-based and generate margin requirements sufficient to cover its potential future exposure to participants in the interval between the last margin collection and the close out of positions following a participant default. Initial margin should meet an established single-tailed confidence level of at least 99 percent with respect to the estimated distribution of future exposure. For a CCP that calculates margin at the portfolio level, this requirement applies to each portfolio's distribution of future exposure. For a CCP that calculates margin at more-granular</i>	Notice on Financial Market Infrastructure Standards 3.6.3		

<p><i>levels, such as at the subportfolio level or by product, the requirement must be met for the corresponding distributions of future exposure. The model should (a) use a conservative estimate of the time horizons for the effective hedging or close out of the particular types of products cleared by the CCP (including in stressed market conditions), (b) have an appropriate method for measuring credit exposure that accounts for relevant product risk factors and portfolio effects across products, and (c) to the extent practicable and prudent, limit the need for destabilising, procyclical changes.</i></p>			
<p>4. <i>A CCP should mark participant positions to market and collect variation margin at least daily to limit the build-up of current exposures. A CCP should have the authority and operational capacity to make intraday margin calls and payments, both scheduled and unscheduled, to participants.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.6.4</p>		
<p>5. <i>In calculating margin requirements, a CCP may allow offsets or reductions in required margin across products that it clears or between products that it and another CCP clear, if the risk of one product is significantly and reliably correlated with the risk of the other product. Where two or more CCPs are authorised to offer cross-margining, they must have appropriate safeguards and harmonised overall risk-management systems.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.6.5</p>		
<p>6. <i>A CCP should analyse and monitor its model performance and overall margin coverage by conducting rigorous daily backtesting and at least monthly, and more-frequent where appropriate, sensitivity analysis. A CCP should regularly conduct an assessment of the theoretical and</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.6.6</p>		



<p><i>empirical properties of its margin model for all products it clears. In conducting sensitivity analysis of the model's coverage, a CCP should take into account a wide range of parameters and assumptions that reflect possible market conditions, including the most-volatile periods that have been experienced by the markets it serves and extreme changes in the correlations between prices.</i></p>			
<p>7. <i>A CCP should regularly review and validate its margin system.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.6.7</p>		
<p><b>Principle 7: Liquidity risk</b></p> <p><b>An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate liquidity obligation for the FMI in extreme but plausible market conditions.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should have a robust framework to manage its liquidity risks from its participants, settlement banks, nostro agents, custodian banks, liquidity providers, and other entities.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.7.2</p>		

<p>2. <i>An FMI should have effective operational and analytical tools to identify, measure, and monitor its settlement and funding flows on an ongoing and timely basis, including its use of intraday liquidity-</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.7.3</p>		
<p>4. <i>A CCP should maintain sufficient liquid resources in all relevant currencies to settle securities-related payments, make required variation margin payments, and meet other payment obligations on time with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should consider maintaining additional liquidity resources sufficient to cover a wider range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.7.5</p>		
<p>5. <i>For the purpose of meeting its minimum liquid resource requirement, an FMI's qualifying liquid resources in each currency include cash at the central bank of issue and at creditworthy commercial banks, committed lines of credit, committed foreign exchange swaps, and committed repos, as well as highly marketable collateral held in custody and investments that are</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.7.1 Notice on Financial Market Infrastructure Standards 3.7.6</p>		

<p><i>readily available and convertible into cash with prearranged and highly reliable funding arrangements, even in extreme but plausible market conditions. If an FMI has access to routine credit at the central bank of issue, the FMI may count such access as part of the minimum requirement to the extent it has collateral that is eligible for pledging to (or for conducting other appropriate forms of transactions with) the relevant central bank. All such resources should be available when needed.</i></p>			
<p>6. <i>An FMI may supplement its qualifying liquid resources with other forms of liquid resources. If the FMI does so, then these liquid resources should be in the form of assets that are likely to be saleable or acceptable as collateral for lines of credit, swaps, or repos on an ad hoc basis following a default, even if this cannot be reliably prearranged or guaranteed in extreme market conditions. Even if an FMI does not have access to routine central bank credit, it should still take account of what collateral is typically accepted by the relevant central bank, as such assets may be more likely to be liquid in stressed circumstances. An FMI should not assume the availability of emergency central bank credit as a part of its liquidity plan.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.7.7</p>		
<p>7. <i>An FMI should obtain a high degree of confidence, through rigorous due diligence, that each provider of its minimum required qualifying liquid resources, whether a participant of the FMI or an external party, has sufficient information to understand and to manage its associated liquidity risks, and that it has the capacity to perform as required under its commitment. Where relevant to</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.7.8</p>		

<p><i>assessing a liquidity provider's performance reliability with respect to a particular currency, a liquidity provider's potential access to credit from the central bank of issue may be taken into account. An FMI should regularly test its procedures for accessing its liquid resources at a liquidity provider.</i></p>			
<p>8. <i>An FMI with access to central bank accounts, payment services, or securities services should use these services, where practical, to enhance its management of liquidity risk.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.7.9</p>		
<p>9. <i>An FMI should determine the amount and regularly test the sufficiency of its liquid resources through rigorous stress testing. An FMI should have clear procedures to report the results of its stress tests to appropriate decision makers at the FMI and to use these results to evaluate the adequacy of and adjust its liquidity risk-management framework. In conducting stress testing, an FMI should consider a wide range of relevant scenarios. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions. Scenarios should also take into account the design and operation of the FMI, include all entities that might pose material liquidity risks to the FMI (such as settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs), and where appropriate, cover a multiday period. In all cases, an FMI should document its supporting rationale</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.7.10</p>		

<p><i>for, and should have appropriate governance arrangements relating to, the amount and form of total liquid resources it maintains.</i></p>			
<p>10. <i>An FMI should establish explicit rules and procedures that enable the FMI to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations on time following any individual or combined default among its participants. These rules and procedures should address unforeseen and potentially uncovered liquidity shortfalls and should aim to avoid unwinding, revoking, or delaying the same-day settlement of payment obligations. These rules and procedures should also indicate the FMI's process to replenish any liquidity resources it may employ during a stress event, so that it can continue to operate in a safe and sound manner.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.7.11</p>		
<p><b>Principle 8: Settlement finality</b> <b>An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI's rules and procedures should clearly define the point at which settlement is final.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.8.1</p>		
<p>2. <i>An FMI should complete final settlement no later than the end of the value date, and preferably intraday or in real time, to reduce settlement risk. An LVPS or SSS should consider adopting RTGS or</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.8.2</p>		

<i>multiple-batch processing during the settlement day.</i>			
3. <i>An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.</i>	Notice on Financial Market Infrastructure Standards 3.8.3		

<b>Principle 9: Money settlements</b> <b>An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.</b>		<b>Consistent</b>	
1. <i>An FMI should conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks.</i>	Notice on Financial Market Infrastructure Standards 3.9.1		
2. <i>If central bank money is not used, an FMI should conduct its money settlements using a settlement asset with little or no credit or liquidity risk.</i>	Notice on Financial Market Infrastructure Standards 3.9.2		
3. <i>If an FMI settles in commercial bank money, it should monitor, manage, and limit its credit and liquidity risks arising from the commercial settlement banks. In particular, an FMI should establish and monitor adherence to strict criteria for its settlement banks that take account of, among other things, their regulation and supervision, creditworthiness, capitalisation, access to liquidity, and operational reliability. An FMI should also monitor and manage the</i>	Notice on Financial Market Infrastructure Standards 3.9.3		

<i>concentration of credit and liquidity exposures to its commercial settlement banks.</i>			
4. <i>If an FMI conducts money settlements on its own books, it should minimise and strictly control its credit and liquidity risks.</i>	Notice on Financial Market Infrastructure Standards 3.9.4		
5. <i>An FMI's legal agreements with any settlement banks should state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received should be transferable as soon as possible, at a minimum by the end of the day and ideally intraday, in order to enable the FMI and its participants to manage credit and liquidity risks.</i>	Notice on Financial Market Infrastructure Standards 3.9.5		
<b>Principle 10: Physical deliveries</b> <b>An FMI should clearly state its obligations with respect to the delivery of physical instruments or commodities and should identify, monitor, and manage the risks associated with such physical deliveries.</b>		<b>Consistent</b>	
1. <i>An FMI's rules should clearly state its obligations with respect to the delivery of physical instruments or commodities.</i>	Notice on Financial Market Infrastructure Standards 3.10.1		
2. <i>An FMI should identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities.</i>	Notice on Financial Market Infrastructure Standards 3.10.2		

<p><b>Principle 12: Exchange-of-value settlement systems</b></p> <p><b>If an FMI settles transactions that involve the settlement of two linked obligations (for example, securities or foreign exchange transactions), it should eliminate principal risk by conditioning the final settlement of one obligation upon the final settlement of the other.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI that is an exchange-of-value settlement system should eliminate principal risk by ensuring that the final settlement of one obligation occurs if and only if the final settlement of the linked obligation also occurs, regardless of whether the FMI settles on a gross or net basis and when finality occurs.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.12.1</p>		
<p><b>Principle 13: Participant-default rules and procedures</b></p> <p><b>An FMI should have effective and clearly defined rules and procedures to manage a participant default. These rules and procedures should be designed to ensure that the FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should have default rules and procedures that enable the FMI to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.13.1</p>		



2. <i>An FMI should be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in its rules.</i>	Notice on Financial Market Infrastructure Standards 3.13.2		
3. <i>An FMI should publicly disclose key aspects of its default rules and procedures.</i>	Notice on Financial Market Infrastructure Standards 3.13.3		
4. <i>An FMI should involve its participants and other stakeholders in the testing and review of the FMI's default procedures, including any close-out procedures. Such testing and review should be conducted at least annually or following material changes to the rules and procedures to ensure that they are practical and effective.</i>	Notice on Financial Market Infrastructure Standards 3.13.4		

<p><b>Principle 14: Segregation and portability</b></p> <p><b>A CCP should have rules and procedures that enable the segregation and portability of positions of a participant's customers and the collateral provided to the CCP with respect to those positions.</b></p>		<b>Consistent</b>	Where there are gaps/inconsistencies in language or requirements between the relevant regulations and the PFMI, MAS should consider providing more clarity to CCPs with respect to minimum standards.
1. <i>A CCP should, at a minimum, have segregation and portability arrangements that effectively protect a participant's customers' positions and related collateral from the default or insolvency of that participant. If the CCP additionally offers protection of such customer positions and collateral against the concurrent default of the participant and a fellow customer, the CCP should take steps to ensure that such protection is effective.</i>	<p>Notice on Financial Market Infrastructure Standards 3.14.1</p> <p>Securities and Futures (Clearing Facilities) Regulations, section 23</p>	<p>Notice on Financial Market Infrastructure Standards 3.14.1 is closely aligned to the KC except that the references to customer's collateral have been omitted.</p> <p>Securities and Futures (Clearing Facilities) Regulations, section 23 provides for the segregation and protection of customer's collateral in the event of insolvency of a participant, either (i) for an individual</p>	

		<p>segregated account (on a book-keeping basis); or (ii) on a commingled basis with other customers (ie an omnibus account). However, Securities and Futures (Clearing Facilities) Regulations, section 23 does not appear to directly address portability of customer collateral.</p> <p>In practice, in accordance with the policy statement in the Monograph, MAS reviews a CCP's default management rules and processes and expects a CCP to have rules that permit it to port (i) a customer's collateral in an individual segregated account if the default is not caused by the customer itself, and (ii) customers' collateral in the omnibus account if the default is not caused by any customer in the omnibus account. In addition, consistent with KC 4, Notice on Financial Market Infrastructure Standards 3.14.4 requires a CCP to publicly disclose its rules, policies, and procedures relating to the portability of a participant's customers' positions and related collateral. Therefore, the omission of a reference to the portability of customer's collateral does not materially affect the implementation of KC 1 in practice.</p>	
<p>2. <i>A CCP should employ an account structure that enables it readily to identify positions of a</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.14.2</p>		

<i>participant's customers and to segregate related collateral. A CCP should maintain customer positions and collateral in individual customer accounts or in omnibus customer accounts.</i>	Securities and Futures (Clearing Facilities) Regulations, section 23		
3. <i>A CCP should structure its portability arrangements in a way that makes it highly likely that the positions and collateral of a defaulting participant's customers will be transferred to one or more other participants.</i>	Notice on Financial Market Infrastructure Standards 3.14.3		
4. <i>A CCP should disclose its rules, policies, and procedures relating to the segregation and portability of a participant's customers' positions and related collateral. In particular, the CCP should disclose whether customer collateral is protected on an individual or omnibus basis. In addition, a CCP should disclose any constraints, such as legal or operational constraints, that may impair its ability to segregate or port a participant's customers' positions and related collateral.</i>	Notice on Financial Market Infrastructure Standards 3.14.4		

<b>Principle 15: General business risk</b> <b>An FMI should identify, monitor, and manage its general business risk and hold sufficient liquid net assets funded by equity to cover potential general business losses so that it can continue operations and services as a going concern if those losses materialise. Further, liquid net assets should at all times be sufficient to ensure a recovery or orderly wind-down of critical operations and services.</b>		<b>Consistent</b>	Where there are gaps/inconsistencies in language or requirements between the relevant regulations and the PFMI, MAS should consider providing more clarity to CCPs with respect to minimum standards.
--	--	-------------------	---

<p>1. <i>An FMI should have robust management and control systems to identify, monitor, and manage general business risks, including losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.15.1</p>		
<p>2. <i>An FMI should hold liquid net assets funded by equity (such as common stock, disclosed reserves, or other retained earnings) so that it can continue operations and services as a going concern if it incurs general business losses. The amount of liquid net assets funded by equity an FMI should hold should be determined by its general business risk profile and the length of time required to achieve a recovery or orderly wind-down, as appropriate, of its critical operations and services if such action is taken.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.15.2</p>		
<p>3. <i>An FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets funded by equity to implement this plan. At a minimum, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses. These assets are in addition to resources held to cover participant defaults or other risks covered under the financial resources principles. However, equity held under international risk-based capital standards can be included where relevant and appropriate to avoid duplicate capital requirements.</i></p>	<p>Securities and Futures (Clearing Facilities) Regulations, section 17 MAS Capital Conditions</p>		
<p>4. <i>Assets held to cover general business risk should be of high quality and sufficiently liquid in order to allow the FMI to meet its current and projected</i></p>	<p>MAS Capital Conditions</p>	<p>MAS Capital Conditions do not provide a positive list of types of assets that qualify as "financial</p>	

<p><i>operating expenses under a range of scenarios, including in adverse market conditions.</i></p>		<p>resources” to be held to cover general business risk, in particular, with respect to the level of credit quality.</p> <p>In practice, in accordance with its policy statement in the Monograph, MAS requires as part of its ongoing supervision that assets held to cover general business risk should be of high quality and sufficiently liquid.</p>	
<p>5. <i>An FMI should maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed. This plan should be approved by the board of directors and updated regularly.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.15.3</p>		
<p><b>Principle 16: Custody and investment risks</b></p> <p><b>An FMI should safeguard its own and its participants’ assets and minimise the risk of loss on and delay in access to these assets. An FMI’s investments should be in instruments with minimal credit, market, and liquidity risks.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should hold its own and its participants’ assets at supervised and regulated entities that have robust accounting practices, safekeeping procedures, and internal controls that fully protect these assets.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.16.1</p>		
<p>2. <i>An FMI should have prompt access to its assets and the assets provided by participants, when required.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.16.2</p>		

3. <i>An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.</i>	Notice on Financial Market Infrastructure Standards 3.16.3		
4. <i>An FMI's investment strategy should be consistent with its overall risk-management strategy and fully disclosed to its participants, and investments should be secured by, or be claims on, high-quality obligors. These investments should allow for quick liquidation with little, if any, adverse price effect.</i>	Notice on Financial Market Infrastructure Standards 3.16.4		
<p><b>Principle 17: Operational risk</b></p> <p><b>An FMI should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale or major disruption.</b></p>		<b>Consistent</b>	
1. <i>An FMI should establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.</i>	Securities and Futures Act, section 59		
2. <i>An FMI's board of directors should clearly define the roles and responsibilities for addressing operational risk and should endorse the FMI's operational risk-management framework.</i>	Notice on Financial Market Infrastructure Standards 3.17.1		

<i>Systems, operational policies, procedures, and controls should be reviewed, audited, and tested periodically and after significant changes.</i>			
3. <i>An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.</i>	Notice on Financial Market Infrastructure Standards 3.17.2		
4. <i>An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.</i>	Notice on Financial Market Infrastructure Standards 3.17.3		
5. <i>An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.</i>	Notice on Financial Market Infrastructure Standards 3.17.4		
6. <i>An FMI should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption. The plan should incorporate the use of a secondary site and should be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements.</i>	Securities and Futures (Clearing Facilities) Regulations, section 16 Notice on Financial Market Infrastructure Standards 3.17.5		
7. <i>An FMI should identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In addition, an FMI should identify, monitor, and</i>	Notice on Financial Market Infrastructure Standards 3.17.6		

<i>manage the risks its operations might pose to other FMIs.</i>			
<p><b>Principle 18: Access and participation requirements</b></p> <p><b>An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.</b></p>		<b>Consistent</b>	Where there are gaps/inconsistencies in language or requirements between the relevant regulations and the PFMI, MAS should consider providing more clarity to CCPs with respect to minimum standards.
<p>1. <i>An FMI should allow for fair and open access to its services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements.</i></p>	<p>Securities and Futures Act, section 57(1)(d)</p> <p>Securities and Futures (Clearing Facilities) Regulations, section 29(a)</p>		
<p>2. <i>An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to and commensurate with the FMI's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, an FMI should endeavour to set requirements that have the least-restrictive impact on access that circumstances permit.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.18.1</p>		
<p>3. <i>An FMI should monitor compliance with its participation requirements on an ongoing basis and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements.</i></p>	<p>Securities and Futures Act, section 57(1)(d)</p> <p>Securities and Futures (Clearing Facilities) Regulations, section 29(b)</p>	<p>Securities and Futures (Clearing Facilities) Regulations, section 29(b) requires an ACH to include in its business rules requirements "providing for the expulsion, suspension or disciplining" of a member for a contravention of its business rules. However, it does not</p>	



		<p>address procedures for facilitating an “orderly exit” of a suspended or expelled member nor does it address the public disclosure of relevant procedures.</p> <p>In practice, in accordance with the policy statement in the Monograph, MAS expects an ACH to further elaborate, in its rules, the treatment of the member’s outstanding obligations to the ACH upon expulsion or suspension. Further, as the business rules of the ACH are subject to MAS’ review, MAS will take guidance from the PFMI, including the need for the ACH to have rules to provide for the orderly exit of the participant.</p>	
<p><b>Principle 19: Tiered participation arrangements</b></p> <p><b>An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.</b></p>		<b>Consistent</b>	
<p>1. <i>An FMI should ensure that its rules, procedures, and agreements allow it to gather basic information about indirect participation in order to identify, monitor, and manage any material risks to the FMI arising from such tiered participation arrangements.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.19.1</p>		

2. <i>An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.</i>	Notice on Financial Market Infrastructure Standards 3.19.2		
3. <i>An FMI should identify indirect participants responsible for a significant proportion of transactions processed by the FMI and indirect participants whose transaction volumes or values are large relative to the capacity of the direct participants through which they access the FMI in order to manage the risks arising from these transactions.</i>	Notice on Financial Market Infrastructure Standards 3.19.3		
4. <i>An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.</i>	Notice on Financial Market Infrastructure Standards 3.19.4		
<p><b>Principle 20: FMI links</b></p> <p><b>An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks.</b></p>		<b>Consistent</b>	Where there are gaps/inconsistencies in language or requirements between the relevant regulations and the PFMI, MAS should providing more clarity to CCPs with respect to minimum standards.

<p>1. <i>Before entering into a link arrangement and on an ongoing basis once the link is established, an FMI should identify, monitor, and manage all potential sources of risk arising from the link arrangement. Link arrangements should be designed such that each FMI is able to observe the other principles in this report.</i></p>	<p>Securities and Futures Act, section 59 Securities and Futures (Clearing Facilities) Regulations, section 11(3) and 12(1)(b) Notice on Financial Market Infrastructure Standards 3.20.1</p>	<p>The referenced regulations and notice do not explicitly set the requirements that mirror/implement the first sentence of the KC.  In practice, in accordance with its policy statement in the Monograph, MAS ensures as part of its approval process that a link will be established in compliance with the PFMI, including the need to identify and mitigate potential risks from the link.</p>	
<p>2. <i>A link should have a well-founded legal basis, in all relevant jurisdictions, that supports its design and provides adequate protection to the FMIs involved in the link.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.20.2</p>		
<p>7. <i>Before entering into a link with another CCP, a CCP should identify and manage the potential spill-over effects from the default of the linked CCP. If a link has three or more CCPs, each CCP should identify, assess, and manage the risks of the collective link arrangement.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.20.3</p>		
<p>8. <i>Each CCP in a CCP link arrangement should be able to cover, at least on a daily basis, its current and potential future exposures to the linked CCP and its participants, if any, fully with a high degree of confidence without reducing the CCP's ability to fulfil its obligations to its own participants at any time.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.20.4</p>		

<p><b>Principle 21: Efficiency and effectiveness</b></p> <p><b>An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should be designed to meet the needs of its participants and the markets it serves, in particular, with regard to choice of a clearing and settlement arrangement; operating structure; scope of products cleared, settled, or recorded; and use of technology and procedures.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.21.1</p>		
<p>2. <i>An FMI should have clearly defined goals and objectives that are measurable and achievable, such as in the areas of minimum service levels, risk-management expectations, and business priorities.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.21.2</p>		
<p>3. <i>An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.21.3</p>		
<p><b>Principle 22: Communication procedures and standards</b></p> <p><b>An FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording.</b></p>		<p><b>Consistent</b></p>	

<p>1. <i>An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.22.1</p>		
<p><b>Principle 23: Disclosure of rules, key procedures, and market data</b></p> <p><b>An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.23.1</p>		
<p>2. <i>An FMI should disclose clear descriptions of the system's design and operations, as well as the FMI's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMI.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.23.2</p>		
<p>3. <i>An FMI should provide all necessary and appropriate documentation and training to facilitate participants' understanding of the FMI's rules and procedures and the risks they face from participating in the FMI.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.23.3</p>		

<p>4. <i>An FMI should publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The FMI should provide clear descriptions of priced services for comparability purposes.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.23.4</p>		
<p>5. <i>An FMI should complete regularly and disclose publicly responses to the CPSS-IOSCO Disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.23.5</p>		

#### 4.2.3 Central securities depositories and securities settlement systems

Implementation of the principles			
1. Text of applicable Principles and Key Considerations (KCs) <sup>33</sup>	2. Implementation measures of the jurisdiction	3. Key conclusions for principle	4. Recommendations and comments
<p><b>Principle 1: Legal basis</b></p> <p><b>An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.</b></p>		<b>Consistent</b>	
<p>1. <i>The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.1.1</p> <p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.1.1</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.2 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.1.2</p>		

<sup>33</sup> Only the relevant principles for CSDs or SSSs (as set forth in the annex E of the PFMI) are included.

	<p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.1.2</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.3 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant, participants' customers, in a clear and understandable way.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.1.3</p> <p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.1.3</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.4 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.1.4</p> <p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.1.4</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.5 of the Standards for MAS-Operated FMIs</p>		



<p>5. <i>An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.</i></p>	<p><b><u>SSS</u></b> Notice on Financial Market Infrastructure Standards 3.1.5</p> <p><b><u>CSD</u></b> Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.1.5</p> <p><b>SSS/CSD owned and operated by MAS</b> Paragraph 2.6 of the Standards for MAS-Operated FMIs</p>		
<p><b>Principle 2: Governance</b></p> <p><b>An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.</b></p>		<p><b>Consistent</b></p>	<p>Where there are gaps/inconsistencies in language or requirements between the relevant regulations and the PFMI, MAS should consider providing more clarity to SSSs with respect to minimum standards.</p>
<p>1. <i>An FMI should have objectives that place a high priority on the safety and efficiency of the FMI and explicitly support financial stability and other relevant public interest considerations.</i></p>	<p><b><u>SSS</u></b> Notice on Financial Market Infrastructure Standards 3.2.1</p> <p><b><u>CSD</u></b> Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.2.1</p>	<p>While the wording used in the Notice on Financial Market Infrastructure Standards and Notice for Central Securities Depositories 3.2.1 is closely aligned to the KC, the word “explicitly” is not included. The absence of an explicit requirement could render a CSDs/SSSs objectives subject</p>	

	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.7 of the Standards for MAS-Operated FMIs</p>	<p>to interpretation and thereby weaken the objectives with respect to financial stability and other relevant public interest considerations.</p>	
<p>2. <i>An FMI should have documented governance arrangements that provide clear and direct lines of responsibility and accountability. These arrangements should be disclosed to owners, relevant authorities, participants, and, at a more general level, the public.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.2.2</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.2.2</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.8 of the Standards for MAS-Operated FMIs</p>	<p><b>SSS and CSD</b></p> <p>While the wording used in Notice on Financial Market Infrastructure Standards 3.2.2 and Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.2.2 is closely aligned to the KC, it limits the referenced governance arrangements to those for its board of directors (or equivalent) and limits the referenced lines of responsibility and accountability to those between management and the board. As such, the requirements do not extend to lower staff levels.</p> <p>In practice, in accordance with the policy statement in the Monograph, MAS takes guidance from the PFMI explanatory note and MAS expects management to ensure clear and direct lines of responsibility and</p>	

		accountability, including for lower levels.	
<p>3. <i>The roles and responsibilities of an FMI's board of directors (or equivalent) should be clearly specified, and there should be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest. The board should review both its overall performance and the performance of its individual board members regularly.</i></p>	<p><b><u>SSS</u></b> Notice on Financial Market Infrastructure Standards 3.2.3</p> <p><b><u>CSD</u></b> Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.2.3</p> <p><b>SSS/CSD owned and operated by MAS</b> Paragraph 2.9 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s).</i></p>	<p><b><u>SSS</u></b> Securities and Futures Act, section 57(1)(i) and 81ZF(1) Securities and Futures Act, section 71(1) and 81ZF(2) Securities and Futures (Corporate Governance of Approved Exchanges, Approved Clearing Houses and Approved Holding Companies) Regulations, section 6(1) Securities and Futures (Corporate Governance of Approved Exchanges, Approved Clearing Houses and Approved Holding Companies) Regulations, section 2 Securities and Futures (Corporate Governance of Approved Exchanges, Approved Clearing Houses and Approved Holding Companies) Regulations, section 10</p>	<p><b><u>SSS</u></b> The requirements in the referenced regulations do not explicitly require board members to have appropriate incentives and the board to ensure a mixture of skills of members to fulfil multiple roles of the board.  In practice, in accordance with the policy statement in the monograph, MAS considers relevant aspects under KC4 (including the skills and incentives for the person to satisfy the board's multiple roles) in its regulatory approval process</p>	

	<p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.2.4</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.10 of the Standards for MAS-Operated FMIs</p>	<p>of the appointment of the board members.</p>	
<p>5. <i>The roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.2.4</p> <p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.2.5</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.11 of the Standards for MAS-Operated FMIs</p>		
<p>6. <i>The board should establish a clear, documented risk-management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk-management and internal control functions have sufficient authority, independence, resources, and access to the board.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.2.5</p> <p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.2.6</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.12 of the Standards for MAS-Operated FMIs</p>		

<p>7. <i>The board should ensure that the FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public.</i></p>	<p><b><u>SSS</u></b> Notice on Financial Market Infrastructure Standards 3.2.6</p> <p><b><u>CSD</u></b> Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.2.7</p> <p><b>SSS/CSD owned and operated by MAS</b> Paragraph 2.13 of the Standards for MAS-Operated FMIs</p>		
<p><b>Principle 3: Framework for the comprehensive management of risks</b></p> <p><b>An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.</b></p>		<p><b>Consistent</b></p>	<p>Where there are gaps/inconsistencies in language or requirements between the relevant regulations and the PFMI, MAS should consider providing more clarity to SSSs with respect to minimum standards.</p>
<p>1. <i>An FMI should have risk-management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMI. Risk-management frameworks should be subject to periodic review.</i></p>	<p><b><u>SSS</u></b> Notice on Financial Market Infrastructure Standards 3.3.1 Securities and Futures Act, section 59</p> <p><b><u>CSD</u></b> Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.3.1</p>		

	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.14 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMI.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.3.2</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.3.2</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.15 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should regularly review the material risks it bears from and poses to other entities (such as other FMIs, settlement banks, liquidity providers, and service providers) as a result of interdependencies and develop appropriate risk-management tools to address these risks.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.3.3</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.3.3</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.16 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>An FMI should identify scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern and assess the effectiveness of a full range of options for recovery or orderly wind-down. An FMI should prepare appropriate plans for its recovery or orderly wind-</i></p>	<p><b>SSS</b></p> <p>Securities and Futures (Clearing Facilities) Regulations, section 17</p> <p>Securities and Futures Act, section 63</p>	<p><b>SSS</b></p> <p>MAS has not explicitly stated in its Securities and Futures (Clearing Facilities) Regulations that an SSS shall</p>	

<p><i>down based on the results of that assessment. Where applicable, an FMI should also provide relevant authorities with the information needed for purposes of resolution planning.</i></p>	<p>MAS Act, section 30AAZK</p> <p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.3.4</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p><i>Not applicable for central bank-owned and operated FMIs as elaborated in the CPMI-IOSCO Guidance note on Application of the Principles for financial market infrastructures to central bank FMIs (August 2015).</i></p>	<p><u>identify scenarios</u> that may potentially prevent [the SSS] from being able to provide its critical operations and services as a going concern and <u>assess the effectiveness of a full range of options</u> for recovery or orderly wind-down.</p> <p>In practice, MAS requires each SSS to have a recovery and orderly wind-down plan, and it assesses whether the SSS has an appropriate and effective plan. As part of this assessment, MAS determines whether the SSS identified scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern, and assessed the effectiveness of a full range of options for recovery or orderly winding-down.</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market</i></p>	
--	--	--	--

		infrastructures to central bank FMI.	
<p><b>Principle 4: Credit risk</b></p> <p><b>An FMI should effectively measure, monitor, and manage its credit exposures to participants and those arising from its payment, clearing, and settlement processes. An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure to the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure to the CCP in extreme but plausible market conditions.</b></p>	<p><b>SSS owned and operated by MAS</b></p> <p>As explained in paragraph 2.17 of the Standards for MAS-Operated FMIs, the implementation measures for this principle are strictly in respect of credit risk arising from MAS-operated FMIs' activities.</p>	<p><b>Consistent</b></p> <p><b>SSS owned and operated by MAS</b></p> <p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs</i>.</p>	
<p>1. <i>An FMI should establish a robust framework to manage its credit exposures to its participants and the credit risks arising from its payment, clearing, and settlement processes. Credit exposure may arise from current exposures, potential future exposures, or both.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.4.1</p>		



	<p><b>SSS owned and operated by MAS</b> Paragraph 2.18 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk-management tools to control these risks.</i></p>	<p><b>SSS</b> Notice on Financial Market Infrastructure Standards 3.4.2</p> <p><b>SSS owned and operated by MAS</b> Paragraph 2.19 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>A payment system or SSS should cover its current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (see Principle 5 on collateral). In the case of a DNS payment system or DNS SSS in which there is no settlement guarantee but where its participants face credit exposures arising from its payment, clearing, and settlement processes, such an FMI should maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.</i></p>	<p><b>SSS</b> Notice on Financial Market Infrastructure Standards 3.4.3</p> <p><b>SSS owned and operated by MAS</b> Paragraph 2.20 of the Standards for MAS-Operated FMIs</p>		
<p>7. <i>An FMI should establish explicit rules and procedures that address fully any credit losses it may face as a result of any individual or combined default among its participants with respect to any of their obligations to the FMI. These rules and procedures should address how potentially uncovered credit losses would be allocated, including the repayment of any funds an FMI may borrow from liquidity providers. These rules and procedures should also indicate the FMI's process to replenish any financial resources that the FMI may</i></p>	<p><b>SSS</b> Notice on Financial Market Infrastructure Standards 3.4.7</p> <p><b>SSS owned and operated by MAS</b> Paragraph 2.21 of the Standards for MAS-Operated FMIs</p>		

<p><i>employ during a stress event, so that the FMI can continue to operate in a safe and sound manner.</i></p>			
<p><b>Principle 5: Collateral</b>  <b>An FMI that requires collateral to manage its or its participants' credit exposure should accept collateral with low credit, liquidity, and market risks. An FMI should also set and enforce appropriately conservative haircuts and concentration limits.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.5.1</p> <p><b>SSS owned and operated by MAS</b>  Paragraph 2.22 of the Standards for MAS-Operated FMIs.</p>	<p><b>SSS owned and operated by MAS</b></p> <p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs</i>.</p>	
<p>2. <i>An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.5.2</p> <p><b>SSS owned and operated by MAS</b>  Paragraph 2.23 of the Standards for MAS-Operated FMIs</p>		

<p>3. <i>In order to reduce the need for procyclical adjustments, an FMI should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.5.3  <b>SSS owned and operated by MAS</b>  Paragraph 2.24 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>An FMI should avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.5.4  <b>SSS owned and operated by MAS</b>  Paragraph 2.25 of the Standards for MAS-Operated FMIs</p>		
<p>5. <i>An FMI that accepts cross-border collateral should mitigate the risks associated with its use and ensure that the collateral can be used in a timely manner.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.5.5  <b>SSS owned and operated by MAS</b>  Paragraph 2.26 of the Standards for MAS-Operated FMIs</p>		
<p>6. <i>An FMI should use a collateral management system that is well-designed and operationally flexible.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.5.6  <b>SSS owned and operated by MAS</b>  Paragraph 2.27 of the Standards for MAS-Operated FMIs</p>		

<p><b>Principle 7: Liquidity risk</b></p> <p><b>An FMI should effectively measure, monitor, and manage its liquidity risk. An FMI should maintain sufficient liquid resources in all relevant currencies to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate liquidity obligation for the FMI in extreme but plausible market conditions.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should have a robust framework to manage its liquidity risks from its participants, settlement banks, nostro agents, custodian banks, liquidity providers, and other entities.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.7.2</p> <p><b>SSS owned and operated by MAS</b></p> <p>Paragraph 2.28 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should have effective operational and analytical tools to identify, measure, and monitor its settlement and funding flows on an ongoing and timely basis, including its use of intraday liquidity.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.7.3</p> <p><b>SSS owned and operated by MAS</b></p> <p>Paragraph 2.29 of the Standards for MAS-Operated FMIs</p>		

<p>3. <i>A payment system or SSS, including one employing a DNS mechanism, should maintain sufficient liquid resources in all relevant currencies to effect same-day settlement, and where appropriate intraday or multiday settlement, of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.7.4  <b>SSS owned and operated by MAS</b>  Paragraph 2.30 of the Standards for MAS-Operated FMIs</p>		
<p>5. <i>For the purpose of meeting its minimum liquid resource requirement, an FMI's qualifying liquid resources in each currency include cash at the central bank of issue and at creditworthy commercial banks, committed lines of credit, committed foreign exchange swaps, and committed repos, as well as highly marketable collateral held in custody and investments that are readily available and convertible into cash with prearranged and highly reliable funding arrangements, even in extreme but plausible market conditions. If an FMI has access to routine credit at the central bank of issue, the FMI may count such access as part of the minimum requirement to the extent it has collateral that is eligible for pledging to (or for conducting other appropriate forms of transactions with) the relevant central bank. All such resources should be available when needed.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.7.1  Notice on Financial Market Infrastructure Standards 3.7.6  <b>SSS owned and operated by MAS</b>  Paragraph 2.31 of the Standards for MAS-Operated FMIs</p>		
<p>6. <i>An FMI may supplement its qualifying liquid resources with other forms of liquid resources. If the FMI does so, then these liquid resources should be in the form of assets that are likely to be saleable or acceptable as collateral for lines of credit, swaps, or repos on an ad hoc basis following a default, even if this cannot be</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.7.7</p>		

<p><i>reliably prearranged or guaranteed in extreme market conditions. Even if an FMI does not have access to routine central bank credit, it should still take account of what collateral is typically accepted by the relevant central bank, as such assets may be more likely to be liquid in stressed circumstances. An FMI should not assume the availability of emergency central bank credit as a part of its liquidity plan.</i></p>	<p><b>SSS owned and operated by MAS</b> Paragraph 2.32 of the Standards for MAS-Operated FMIs</p>		
<p>7. <i>An FMI should obtain a high degree of confidence, through rigorous due diligence, that each provider of its minimum required qualifying liquid resources, whether a participant of the FMI or an external party, has sufficient information to understand and to manage its associated liquidity risks, and that it has the capacity to perform as required under its commitment. Where relevant to assessing a liquidity provider's performance reliability with respect to a particular currency, a liquidity provider's potential access to credit from the central bank of issue may be taken into account. An FMI should regularly test its procedures for accessing its liquid resources at a liquidity provider.</i></p>	<p><b>SSS</b> Notice on Financial Market Infrastructure Standards 3.7.8 <b>SSS owned and operated by MAS</b> Paragraph 2.33 of the Standards for MAS-Operated FMIs</p>		
<p>8. <i>An FMI with access to central bank accounts, payment services, or securities services should use these services, where practical, to enhance its management of liquidity risk.</i></p>	<p><b>SSS</b> Notice on Financial Market Infrastructure Standards 3.7.9 <b>SSS owned and operated by MAS</b> Paragraph 2.34 of the Standards for MAS-Operated FMIs</p>		
<p>9. <i>An FMI should determine the amount and regularly test the sufficiency of its liquid resources through rigorous stress testing. An FMI should have clear procedures to report the results of its stress tests to appropriate decision makers at the FMI and to use</i></p>	<p><b>SSS</b> Notice on Financial Market Infrastructure Standards 3.7.10 <b>SSS owned and operated by MAS</b></p>		

<p><i>these results to evaluate the adequacy of and adjust its liquidity risk-management framework. In conducting stress testing, an FMI should consider a wide range of relevant scenarios. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions. Scenarios should also take into account the design and operation of the FMI, include all entities that might pose material liquidity risks to the FMI (such as settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs), and where appropriate, cover a multiday period. In all cases, an FMI should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount and form of total liquid resources it maintains.</i></p>	<p>Paragraph 2.35 of the Standards for MAS-Operated FMIs</p>		
<p>10. An FMI should establish explicit rules and procedures that enable the FMI to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations on time following any individual or combined default among its participants. These rules and procedures should address unforeseen and potentially uncovered liquidity shortfalls and should aim to avoid unwinding, revoking, or delaying the same-day settlement of payment obligations. These rules and procedures should also indicate the FMI's process to replenish any liquidity resources it may employ during a stress event, so that it can continue to operate in a safe and sound manner.</p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.7.11  <b>SSS owned and operated by MAS</b>  Paragraph 2.36 of the Standards for MAS-Operated FMIs</p>		

<p><b>Principle 8: Settlement finality</b></p> <p><b>An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI's rules and procedures should clearly define the point at which settlement is final.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.8.1</p> <p><b>SSS owned and operated by MAS</b></p> <p>Paragraph 2.37 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should complete final settlement no later than the end of the value date, and preferably intraday or in real time, to reduce settlement risk. An LVPS or SSS should consider adopting RTGS or multiple-batch processing during the settlement day.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.8.2</p> <p><b>SSS owned and operated by MAS</b></p> <p>Paragraph 2.38 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.8.3</p> <p><b>SSS owned and operated by MAS</b></p> <p>Paragraph 2.39 of the Standards for MAS-Operated FMIs</p>		



<p><b>Principle 9: Money settlements</b></p> <p><b>An FMI should conduct its money settlements in central bank money where practical and available. If central bank money is not used, an FMI should minimise and strictly control the credit and liquidity risk arising from the use of commercial bank money.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.9.1</p> <p><b>SSS owned and operated by MAS</b></p> <p>Paragraph 2.40 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>If central bank money is not used, an FMI should conduct its money settlements using a settlement asset with little or no credit or liquidity risk.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.9.2</p> <p><b>SSS owned and operated by MAS</b></p> <p>Paragraph 2.41 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>If an FMI settles in commercial bank money, it should monitor, manage, and limit its credit and liquidity risks arising from the commercial settlement banks. In particular, an FMI should establish and monitor adherence to strict criteria for its settlement banks that take account of, among other things, their regulation and supervision, creditworthiness, capitalisation, access to liquidity, and operational reliability. An FMI should also monitor and manage the concentration of credit and liquidity exposures to its commercial settlement banks.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.9.3</p> <p><b>SSS owned and operated by MAS</b></p> <p>Paragraph 2.42 of the Standards for MAS-Operated FMIs</p>		

<p>4. <i>If an FMI conducts money settlements on its own books, it should minimise and strictly control its credit and liquidity risks.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.9.4</p> <p><b>SSS owned and operated by MAS</b>  Paragraph 2.43 of the Standards for MAS-Operated FMIs</p>		
<p>5. <i>An FMI's legal agreements with any settlement banks should state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received should be transferable as soon as possible, at a minimum by the end of the day and ideally intraday, in order to enable the FMI and its participants to manage credit and liquidity risks.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.9.5</p> <p><b>SSS owned and operated by MAS</b>  Paragraph 2.44 of the Standards for MAS-Operated FMIs</p>		
<p><b>Principle 10: Physical deliveries</b></p> <p><b>An FMI should clearly state its obligations with respect to the delivery of physical instruments or commodities and should identify, monitor, and manage the risks associated with such physical deliveries.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI's rules should clearly state its obligations with respect to the delivery of physical instruments or commodities.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.10.1</p> <p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.10.1</p>		

	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.45 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.10.2</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.10.2</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.46 of the Standards for MAS-Operated FMIs</p>		

**Comments with respect to Principle 10:**

The custody of commodities is not applicable to CSDs.

<p><b>Principle 11: Central securities depositories</b></p> <p><b>A CSD should have appropriate rules and procedures to help ensure the integrity of securities issues and minimise and manage the risks associated with the safekeeping and transfer of securities. A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry.</b></p>		<b>Consistent</b>	
<p>1. <i>A CSD should 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</i></p>	<p><b>CSD</b></p>		

<p><i>securities, and conduct periodic and at least daily reconciliation of securities issues it maintains.</i></p>	<p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.11.1</p> <p><b>CSD owned and operated by MAS</b></p> <p>Paragraph 2.47 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>A CSD should prohibit overdrafts and debit balances in securities accounts.</i></p>	<p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.11.2</p> <p><b>CSD owned and operated by MAS</b></p> <p>Paragraph 2.48 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>A CSD should maintain securities in an immobilised or dematerialised form for their transfer by book entry. Where appropriate, a CSD should provide incentives to immobilise or dematerialise securities.</i></p>	<p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.11.3</p> <p><b>CSD owned and operated by MAS</b></p> <p>Paragraph 2.49 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>A CSD should protect assets against custody risk through appropriate rules and procedures consistent with its legal framework.</i></p>	<p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.11.4</p> <p><b>CSD owned and operated by MAS</b></p> <p>Paragraph 2.50 of the Standards for MAS-Operated FMIs</p>		

<p>5. A CSD should 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 should 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.</p>	<p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.11.5  <b>CSD owned and operated by MAS</b>  Paragraph 2.51 of the Standards for MAS-Operated FMIs</p>		
<p>6. A CSD should identify, measure, monitor, and manage its risks from other activities that it may perform; additional tools may be necessary in order to address these risks.</p>	<p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.11.6  <b>CSD owned and operated by MAS</b>  Paragraph 2.52 of the Standards for MAS-Operated FMIs</p>		
<p><b>Principle 12: Exchange-of-value settlement systems</b>  <b>If an FMI settles transactions that involve the settlement of two linked obligations (for example, securities or foreign exchange transactions), it should eliminate principal risk by conditioning the final settlement of one obligation upon the final settlement of the other</b></p>		<p><b>Consistent</b></p>	
<p>1. An FMI that is an exchange-of-value settlement system should eliminate principal risk by ensuring that the final settlement of one obligation occurs if and only if the final settlement of the linked obligation also occurs, regardless of whether the FMI settles on a gross or net basis and when finality occurs.</p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.12.1</p>		

	<p><b>SSS owned and operated by MAS</b></p> <p>Paragraph 2.53 of the Standards for MAS-Operated FMIs</p>		
<p><b>Principle 13: Participant-default rules and procedures</b></p> <p><b>An FMI should have effective and clearly defined rules and procedures to manage a participant default. These rules and procedures should be designed to ensure that the FMI can take timely action to contain losses and liquidity pressures and continue to meet its obligations.</b></p>	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>As explained in paragraph 2.54 of the Standards for MAS-Operated FMIs, the implementation measures for this principle are not intended to constrain MAS' policies and actions for maintaining financial stability including managing participant defaults.</p>	<p><b>Consistent</b></p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs</i>.</p>	
<p>1. <i>An FMI should have default rules and procedures that enable the FMI to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.13.1</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.13.1</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.55 of the Standards for MAS-Operated FMIs</p>		

<p>2. An FMI should be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in its rules.</p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.13.2</p> <p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.13.2</p> <p><b>SSS/CSD owned and operated by MAS</b>  Paragraph 2.56 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should publicly disclose key aspects of its default rules and procedures.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.13.3</p> <p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.13.3</p> <p><b>SSS/CSD owned and operated by MAS</b>  Paragraph 2.57 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>An FMI should involve its participants and other stakeholders in the testing and review of the FMI's default procedures, including any close-out procedures. Such testing and review should be conducted at least annually or following material changes to the rules and procedures to ensure that they are practical and effective.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.13.4</p> <p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.13.4</p>		

	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.58 of the Standards for MAS-Operated FMIs</p>		
<p><b>Principle 15: General business risk</b></p> <p><b>An FMI should identify, monitor, and manage its general business risk and hold sufficient liquid net assets funded by equity to cover potential general business losses so that it can continue operations and services as a going concern if those losses materialise. Further, liquid net assets should at all times be sufficient to ensure a recovery or orderly wind-down of critical operations and services.</b></p>		<p><b>Consistent</b></p>	<p>Where there are gaps/inconsistencies in language or requirements between the relevant regulations and the PFMI, MAS should consider providing more clarity to SSSs with respect to minimum standards.</p>
<p>1. <i>An FMI should have robust management and control systems to identify, monitor, and manage general business risks, including losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.15.1</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.15.1</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.59 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should hold liquid net assets funded by equity (such as common stock, disclosed reserves, or other retained earnings) so that it can continue operations and services as a going concern if it incurs general business losses. The amount of liquid net assets funded by equity an FMI should hold should be</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.15.2</p>	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI,</p>	



<p><i>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.</i></p>	<p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.15.2</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p><i>Not applicable for central bank-owned and operated FMIs as explained in the PFMI and elaborated in the CPMI-IOSCO Guidance note on Application of the Principles for financial market infrastructures to central bank FMIs (August 2015).</i></p>	<p>as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs.</i></p>	
<p>3. <i>An FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets funded by equity to implement this plan. At a minimum, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses. These assets are in addition to resources held to cover participant defaults or other risks covered under the financial resources principles. However, equity held under international risk-based capital standards can be included where relevant and appropriate to avoid duplicate capital requirements.</i></p>	<p><b><u>SSS</u></b></p> <p>Securities and Futures (Clearing Facilities) Regulations, section 17</p> <p>MAS Capital Conditions</p> <p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.15.3</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p><i>Not applicable for central bank-owned and operated FMIs as explained in the PFMI and elaborated in the CPMI-IOSCO note on Application of the Principles for financial market infrastructures to central bank FMIs (August 2015).</i></p>	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs.</i></p>	
<p>4. <i>Assets held to cover general business risk should be of high quality and sufficiently liquid in order to allow the FMI to meet its current and projected operating</i></p>	<p><b><u>SSS</u></b></p> <p>MAS Capital Conditions</p>	<p><b><u>SSS</u></b></p> <p>MAS Capital Conditions do not provide a positive list of types of assets that qualify as</p>	

<p><i>expenses under a range of scenarios, including in adverse market conditions.</i></p>	<p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.15.4</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p><i>Not applicable for central bank-owned and operated FMIs as explained in the PFMI and elaborated in the CPMI-IOSCO note on Application of the Principles for financial market infrastructures to central bank FMIs (August 2015).</i></p>	<p>“financial resources” to be held to cover general business risk, in particular, with respect to the level of credit quality.</p> <p>In practice, in accordance with its policy statement in the Monograph, MAS requires as part of its ongoing supervision that assets held to cover general business risk should be of high quality and sufficiently liquid.</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs.</i></p>	
<p>5. <i>An FMI should maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed. This plan should be approved by the board of directors and updated regularly.</i></p>	<p><b><u>SSS</u></b></p> <p>Notice on Financial Market Infrastructure Standards 3.15.3</p> <p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.15.5</p>	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market</i></p>	

	<p><b>SSS/CSD owned and operated by MAS</b></p> <p><i>Not applicable for central bank-owned and operated FMIs as explained in the PFMI and elaborated in the CPMI-IOSCO note on Application of the Principles for financial market infrastructures to central bank FMIs (August 2015).</i></p>	<p><i>infrastructures to central bank FMIs.</i></p>	
<p><b>Principle 16: Custody and investment risks</b></p> <p><b>An FMI should safeguard its own and its participants' assets and minimise the risk of loss on and delay in access to these assets. An FMI's investments should be in instruments with minimal credit, market, and liquidity risks.</b></p>	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>As explained in paragraph 2.60 of the Standards for MAS-Operated FMIs, the implementation measures for this principle are not intended to constrain MAS' investment policies (including that for reserve management) or the disclosure of those policies.</p>	<p><b>Consistent</b></p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs.</i></p>	
<p>1. <i>An FMI should hold its own and its participants' assets at supervised and regulated entities that have robust accounting practices, safekeeping procedures, and internal controls that fully protect these assets.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.16.1</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.16.1</p>		

	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.61 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should have prompt access to its assets and the assets provided by participants, when required.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.16.2</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.16.2</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.62 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.16.3</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.16.3</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.63 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>An FMI's investment strategy should be consistent with its overall risk-management strategy and fully disclosed to its participants, and investments should be secured by, or be claims on, high-quality obligors.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.16.4</p>		

<p><i>These investments should allow for quick liquidation with little, if any, adverse price effect.</i></p>	<p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.16.4</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.64 of the Standards for MAS-Operated FMIs</p>		
<p><b>Principle 17: Operational risk</b></p> <p><b>An FMI should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale or major disruption.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.</i></p>	<p><b><u>SSS</u></b></p> <p>Securities and Futures Act, section 59</p> <p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.17.1</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.65 of the Standards for MAS-Operated FMIs</p>		

<p>2. <i>An FMI's board of directors should clearly define the roles and responsibilities for addressing operational risk and should endorse the FMI's operational risk-management framework. Systems, operational policies, procedures, and controls should be reviewed, audited, and tested periodically and after significant changes.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.17.1</p> <p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.17.2</p> <p><b>SSS/CSD owned and operated by MAS</b>  Paragraph 2.66 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.17.2</p> <p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.17.3</p> <p><b>SSS/CSD owned and operated by MAS</b>  Paragraph 2.67 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.17.3</p> <p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.17.4</p>		

	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.68 of the Standards for MAS-Operated FMIs</p>		
<p>5. <i>An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.17.4</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.17.5</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.69 of the Standards for MAS-Operated FMIs</p>		
<p>6. <i>An FMI should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption. The plan should incorporate the use of a secondary site and should be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.17.5</p> <p>Securities and Futures (Clearing Facilities) Regulations, section 16</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.17.6</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.70 of the Standards for MAS-Operated FMIs</p>		
<p>7. <i>An FMI should identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.17.6</p>		

<p><i>addition, an FMI should identify, monitor, and manage the risks its operations might pose to other FMIs.</i></p>	<p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.17.7</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.71 of the Standards for MAS-Operated FMIs</p>		
<p><b>Principle 18: Access and participation requirements</b></p> <p><b>An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.</b></p>	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>As explained in paragraph 2.72 of the Standards for MAS-Operated FMIs, the implementation measures for this principle 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.</p>	<p><b>Consistent</b></p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>The approach taken by MAS is consistent with paragraph 1.23 of the PFMI, as elaborated in the CPMI-IOSCO Guidance note <i>Application of the Principles for financial market infrastructures to central bank FMIs</i>.</p>	<p>Where there are gaps/inconsistencies in language or requirements between the relevant regulations and the PFMI, MAS should consider providing more clarity to SSSs with respect to minimum standards.</p>
<p>1. <i>An FMI should allow for fair and open access to its services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements.</i></p>	<p><b><u>SSS</u></b></p> <p>Securities and Futures Act, section 57(1)(d)</p> <p>Securities and Futures (Clearing Facilities) Regulations, section 29(a)</p> <p><b><u>CSD</u></b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.18.1</p>		



	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.73 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to and commensurate with the FMI's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, an FMI should endeavour to set requirements that have the least-restrictive impact on access that circumstances permit.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.18.1</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.18.2</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.74 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should monitor compliance with its participation requirements on an ongoing basis and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements.</i></p>	<p><b>SSS</b></p> <p>Securities and Futures Act, section 57(1)(d)</p> <p>Securities and Futures (Clearing Facilities) Regulations, section 29(b)</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.18.3</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.75 of the Standards for MAS-Operated FMIs</p>	<p><b>SSS</b></p> <p>Securities and Futures (Clearing Facilities) Regulations, section 29(b) requires an ACH to include in its business rules requirements "providing for the expulsion, suspension or disciplining" of a member for a contravention of its business rules. However, it does not address procedures for facilitating an "orderly exit" of a suspended or expelled member nor does it address the public disclosure of relevant procedures.</p>	

		<p>In practice, in accordance with the policy statement in the Monograph, MAS expects an ACH to further elaborate, in its rules, the treatment of the member's outstanding obligations to the ACH upon expulsion or suspension. Further, as the business rules of the ACH are subject to MAS' review, MAS will take guidance from the PFMI, including the need for the ACH to have rules to provide for the orderly exit of the participant.</p>	
<p><b>Principle 19: Tiered participation arrangements</b> <b>An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should ensure that its rules, procedures, and agreements allow it to gather basic information about indirect participation in order to identify, monitor, and manage any material risks to the FMI arising from such tiered participation arrangements.</i></p>	<p><b>SSS</b> Notice on Financial Market Infrastructure Standards 3.19.1</p> <p><b>CSD</b> Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.19.1</p>		

	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.76 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.19.2</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.19.2</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.77 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should identify indirect participants responsible for a significant proportion of transactions processed by the FMI and indirect participants whose transaction volumes or values are large relative to the capacity of the direct participants through which they access the FMI in order to manage the risks arising from these transactions.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.19.3</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.19.3</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.78 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.19.4</p>		

	<p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.19.4</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.79 of the Standards for MAS-Operated FMIs</p>		
<p><b>Principle 20: FMI links</b></p> <p><b>An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks.</b></p>		<p><b>Consistent</b></p>	<p>Where there are gaps/inconsistencies in language or requirements between the relevant regulations and the PFMI, MAS should consider providing more clarity to SSSs with respect to minimum standards.</p>
<p>1. <i>Before entering into a link arrangement and on an ongoing basis once the link is established, an FMI should identify, monitor, and manage all potential sources of risk arising from the link arrangement. Link arrangements should be designed such that each FMI is able to observe the other principles in this report.</i></p>	<p><b>SSS</b></p> <p>Securities and Futures Act, section 59</p> <p>Securities and Futures (Clearing Facilities) Regulations, section 11(3) and 12(1)(b)</p> <p>Notice on Financial Market Infrastructure Standards 3.20.1</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.20.1</p>	<p><b>SSS</b></p> <p>The referenced regulations and notice do not explicitly set the requirements that mirror/implement the first sentence of the KC.</p> <p>In practice, in accordance with its policy statement in the Monograph, MAS ensures as part of its approval process that a link will be established in compliance with the PFMI, including the need to identify and mitigate potential risks from the link.</p>	

	<p><b>SSS/CSD owned and operated by MAS</b> Paragraph 2.80 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>A link should have a well-founded legal basis, in all relevant jurisdictions, that supports its design and provides adequate protection to the FMIs involved in the link.</i></p>	<p><b>SSS</b> Notice on Financial Market Infrastructure Standards 3.20.2</p> <p><b>CSD</b> Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.20.2</p> <p><b>SSS/CSD owned and operated by MAS</b> Paragraph 2.81 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>Linked CSDs should measure, monitor, and manage the credit and liquidity risks arising from each other. Any credit extensions between CSDs should be covered fully with high-quality collateral and be subject to limits.</i></p>	<p><b>CSD</b> Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.20.3</p> <p><b>CSD owned and operated by MAS</b> Paragraph 2.82 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>Provisional transfers of securities between linked CSDs should be prohibited or, at a minimum, the retransfer of provisionally transferred securities should be prohibited prior to the transfer becoming final.</i></p>	<p><b>CSD</b> Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.20.4</p> <p><b>CSD owned and operated by MAS</b> Paragraph 2.83 of the Standards for MAS-Operated FMIs</p>		

<p>5. <i>An investor CSD should only establish a link with an issuer CSD if the arrangement provides a high level of protection for the rights of the investor CSD's participants.</i></p>	<p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.20.5</p> <p><b>CSD owned and operated by MAS</b>  Paragraph 2.84 of the Standards for MAS-Operated FMIs</p>		
<p>6. <i>An investor CSD that uses an intermediary to operate a link with an issuer CSD should measure, monitor, and manage the additional risks (including custody, credit, legal, and operational risks) arising from the use of the intermediary.</i></p>	<p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.20.6</p> <p><b>CSD owned and operated by MAS</b>  Paragraph 2.85 of the Standards for MAS-Operated FMIs</p>		
<p><b>Principle 21: Efficiency and effectiveness</b></p> <p><b>An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.</b></p>	<p><b><u>SSS</u></b>  Securities and Futures Act, section 75(1)(a)</p>	<p><b>Consistent</b></p>	
<p>1. <i>An FMI should be designed to meet the needs of its participants and the markets it serves, in particular, with regard to choice of a clearing and settlement arrangement; operating structure; scope of products cleared, settled, or recorded; and use of technology and procedures.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.21.1</p> <p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.21.1</p>		

	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.86 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should have clearly defined goals and objectives that are measurable and achievable, such as in the areas of minimum service levels, risk-management expectations, and business priorities.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.21.2</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.21.2</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.87 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.21.3</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.21.3</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.88 of the Standards for MAS-Operated FMIs</p>		

<p><b>Principle 22: Communication procedures and standards</b></p> <p><b>An FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.22.1</p> <p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.22.1</p> <p><b>SSS/CSD owned and operated by MAS</b>  Paragraph 2.89 of the Standards for MAS-Operated FMIs</p>		
<p><b>Principle 23: Disclosure of rules, key procedures, and market data</b></p> <p><b>An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed.</b></p>		<p><b>Consistent</b></p>	



<p>1. <i>An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.23.1</p> <p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.23.1</p> <p><b>SSS/CSD owned and operated by MAS</b>  Paragraph 2.90 of the Standards for MAS-Operated FMIs</p>		
<p>2. <i>An FMI should disclose clear descriptions of the system's design and operations, as well as the FMI's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMI.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.23.2</p> <p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.23.2</p> <p><b>SSS/CSD owned and operated by MAS</b>  Paragraph 2.91 of the Standards for MAS-Operated FMIs</p>		
<p>3. <i>An FMI should provide all necessary and appropriate documentation and training to facilitate participants' understanding of the FMI's rules and procedures and the risks they face from participating in the FMI.</i></p>	<p><b><u>SSS</u></b>  Notice on Financial Market Infrastructure Standards 3.23.3</p> <p><b><u>CSD</u></b>  Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.23.3</p>		

	<p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.92 of the Standards for MAS-Operated FMIs</p>		
<p>4. <i>An FMI should publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The FMI should provide clear descriptions of priced services for comparability purposes.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.23.4</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.23.4</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.93 of the Standards for MAS-Operated FMIs</p>		
<p>5. <i>An FMI should complete regularly and disclose publicly responses to the CPSS-IOSCO Disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.</i></p>	<p><b>SSS</b></p> <p>Notice on Financial Market Infrastructure Standards 3.23.5</p> <p><b>CSD</b></p> <p>Notice on Financial Market Infrastructure Standards for Central Securities Depositories 3.23.5</p> <p><b>SSS/CSD owned and operated by MAS</b></p> <p>Paragraph 2.94 of the Standards for MAS-Operated FMIs</p>		

#### 4.2.4 Trade repositories

Implementation of the principles			
1. Text of applicable Principles and Key Considerations (KCs) <sup>34</sup>	2. Implementation measures of the jurisdiction	3. Key Conclusions for principle	4. Recommendations and comments
<p><b>Principle 1: Legal basis</b></p> <p><b>An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.</b></p>		<b>Consistent</b>	
<p>1. <i>The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.</i></p>	Notice on Financial Market Infrastructure Standards 3.1.1		
<p>2. <i>An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.</i></p>	Notice on Financial Market Infrastructure Standards 3.1.2		
<p>3. <i>An FMI should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant, participants' customers, in a clear and understandable way.</i></p>	Notice on Financial Market Infrastructure Standards 3.1.3		
<p>4. <i>An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays.</i></p>	Notice on Financial Market Infrastructure Standards 3.1.4		

<sup>34</sup> Only the relevant principles for TRs (as set forth in the annex E of the PFMI) are included.

<p>5. <i>An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.1.5</p>		
<p><b>Principle 2: Governance</b></p> <p><b>An FMI should have governance arrangements that are clear and transparent, promote the safety and efficiency of the FMI, and support the stability of the broader financial system, other relevant public interest considerations, and the objectives of relevant stakeholders.</b></p>		<p><b>Consistent</b></p>	<p>Where there are gaps/inconsistencies in language or requirements between the relevant regulations and the PFMI, MAS should consider providing more clarity to TRs with respect to minimum standards.</p>
<p>1. <i>An FMI should have objectives that place a high priority on the safety and efficiency of the FMI and explicitly support financial stability and other relevant public interest considerations.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.2.1</p>	<p>While the language used in Notice on Financial Market Infrastructure Standards 3.2.1 is closely aligned to the KC, the word “explicitly” was not included. The absence of an explicit requirement could render a TR’s objectives subject to interpretation and thereby weaken the objectives with respect to financial stability and other relevant public interest considerations.</p>	
<p>2. <i>An FMI should have documented governance arrangements that provide clear and direct lines of responsibility and accountability. These arrangements should be disclosed to owners, relevant authorities, participants, and, at a more general level, the public.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.2.2</p>	<p>While the language used in Notice on Financial Market Infrastructure Standards 3.2.2 is closely aligned to the KC, it limits the referenced governance arrangements to those for its board of directors (or equivalent) and limits the referenced lines of responsibility and accountability to those between</p>	

		<p>management and the board. As such, the requirements do not extend to lower staff levels.</p> <p>In practice, in accordance with the policy statement in the Monograph, MAS takes guidance from the PFMI explanatory note and MAS expects management to ensure clear and direct lines of responsibility and accountability, including for lower levels.</p>	
<p>3. <i>The roles and responsibilities of an FMI's board of directors (or equivalent) should be clearly specified, and there should be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest. The board should review both its overall performance and the performance of its individual board members regularly.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.2.3</p>		
<p>4. <i>The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s).</i></p>	<p>Securities and Futures Act, section 46I(1)(j) Securities and Futures Act, section 46V(1)</p>	<p>The requirements in the referenced regulations do not explicitly cover board members' incentives or a reference to the board's multiple roles and the inclusion of non-executive board member(s).</p> <p>In practice, in accordance with the policy statement in the monograph, MAS considers relevant aspects under KC4 (including the skills and incentives for the person to satisfy the board's multiple roles) in its regulatory approval process of the appointment of the board members.</p> <p>It is noted that MAS envisages legislative amendments to include TRs into the Securities and Futures (Corporate Governance of Approved Exchanges,</p>	

		Approved Clearing Houses and Approved Holding Companies) Regulations to establish requirements on independent directors and to provide further precision on the qualification criteria for board members as set out in these regulations currently applicable to CCPs and SSS.	
5. <i>The roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI.</i>	Notice on Financial Market Infrastructure Standards 3.2.4		
6. <i>The board should establish a clear, documented risk-management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk-management and internal control functions have sufficient authority, independence, resources, and access to the board.</i>	Notice on Financial Market Infrastructure Standards 3.2.5		
7. <i>The board should ensure that the FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public.</i>	Notice on Financial Market Infrastructure Standards 3.2.6		

<p><b>Principle 3: Framework for the comprehensive management of risks</b></p> <p><b>An FMI should have a sound risk-management framework for comprehensively managing legal, credit, liquidity, operational, and other risks.</b></p>		<p><b>Consistent</b></p>	<p>Where there are gaps/inconsistencies in language or requirements between the relevant regulations and the PFMI, MAS should consider providing more clarity to TRs with respect to minimum standards.</p>
<p>1. <i>An FMI should have risk-management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMI. Risk-management frameworks should be subject to periodic review.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.3.1</p> <p>Securities and Futures Act, section 46J</p>		
<p>2. <i>An FMI should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMI.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.3.2</p>		
<p>3. <i>An FMI should regularly review the material risks it bears from and poses to other entities (such as other FMIs, settlement banks, liquidity providers, and service providers) as a result of interdependencies and develop appropriate risk-management tools to address these risks.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.3.3</p>		
<p>4. <i>An FMI should identify scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern and assess the effectiveness of a full range of options for recovery or orderly wind-down. An FMI should prepare appropriate plans for its recovery or orderly wind-down based on the results of that assessment. Where</i></p>	<p>Securities and Futures (Trade Repositories) Regulations, section 14</p> <p>Securities and Futures Act, section 46N</p> <p>MAS Act, section 30AAZK</p>	<p>MAS has not explicitly stated in its Securities and Futures (Trade Repositories) Regulations that a TR shall <u>identify scenarios</u> that may potentially prevent [the TR] from being able to provide its critical operations and services as a going concern and <u>assess the</u></p>	

<p><i>applicable, an FMI should also provide relevant authorities with the information needed for purposes of resolution planning.</i></p>		<p><u>effectiveness of a full range of options</u> for recovery or orderly wind-down.</p> <p>In practice, MAS requires each TR to have a recovery and orderly wind-down plan, and it assesses whether the TR has an appropriate and effective plan. As part of this assessment, MAS determines whether the TR identified scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern, and assessed the effectiveness of a full range of options for recovery or orderly winding-down.</p>	
<p><b>Principle 15: General business risk</b></p> <p><b>An FMI should identify, monitor, and manage its general business risk and hold sufficient liquid net assets funded by equity to cover potential general business losses so that it can continue operations and services as a going concern if those losses materialise. Further, liquid net assets should at all times be sufficient to ensure a recovery or orderly wind-down of critical operations and services.</b></p>		<p><b>Consistent</b></p>	<p>Where there are gaps/inconsistencies in language or requirements between the relevant regulations and the PFMI, MAS should consider providing more clarity to TRs with respect to minimum standards.</p>
<p>1. <i>An FMI should have robust management and control systems to identify, monitor, and manage general business risks, including losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.15.1</p>		



<p>2. <i>An FMI should hold liquid net assets funded by equity (such as common stock, disclosed reserves, or other retained earnings) so that it can continue operations and services as a going concern if it incurs general business losses. The amount of liquid net assets funded by equity an FMI should hold should be determined by its general business risk profile and the length of time required to achieve a recovery or orderly wind-down, as appropriate, of its critical operations and services if such action is taken.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.15.2</p>		
<p>3. <i>An FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets funded by equity to implement this plan. At a minimum, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses. These assets are in addition to resources held to cover participant defaults or other risks covered under the financial resources principles. However, equity held under international risk-based capital standards can be included where relevant and appropriate to avoid duplicate capital requirements.</i></p>	<p>Securities and Futures (Trade Repositories) Regulations, section 14 MAS Capital Conditions</p>		
<p>4. <i>Assets held to cover general business risk should be of high quality and sufficiently liquid in order to allow the FMI to meet its current and projected operating expenses under a range of scenarios, including in adverse market conditions.</i></p>	<p>MAS Capital Conditions</p>	<p>MAS Capital Conditions do not provide a positive list of types of assets that qualify as “financial resources” to be held to cover general business risk, in particular, with respect to the level of credit quality.</p> <p>In practice, in accordance with its policy statement in the Monograph, MAS requires as part of its ongoing supervision that assets held to cover general business risk should be of high quality and sufficiently liquid.</p>	

<p>5. <i>An FMI should maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed. This plan should be approved by the board of directors and updated regularly.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.15.3</p>		
<p><b>Principle 17: Operational risk</b></p> <p><b>An FMI should identify the plausible sources of operational risk, both internal and external, and mitigate their impact through the use of appropriate systems, policies, procedures, and controls. Systems should be designed to ensure a high degree of security and operational reliability and should have adequate, scalable capacity. Business continuity management should aim for timely recovery of operations and fulfilment of the FMI's obligations, including in the event of a wide-scale or major disruption.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.</i></p>	<p>Securities and Futures Act, section 46J</p>		
<p>2. <i>An FMI's board of directors should clearly define the roles and responsibilities for addressing operational risk and should endorse the FMI's operational risk-management framework. Systems, operational policies, procedures, and controls should be reviewed, audited, and tested periodically and after significant changes.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.17.1</p>		

<p>3. <i>An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.17.2</p>		
<p>4. <i>An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.17.3</p>		
<p>5. <i>An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.17.4</p>		
<p>6. <i>An FMI should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption. The plan should incorporate the use of a secondary site and should be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.17.5 Securities and Futures (Trade Repositories) Regulations, section 13</p>		
<p>7. <i>An FMI should identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In addition, an FMI should identify, monitor, and manage the risks its operations might pose to other FMIs.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.17.6</p>		

<p><b>Principle 18: Access and participation requirements</b></p> <p><b>An FMI should have objective, risk-based, and publicly disclosed criteria for participation, which permit fair and open access.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should allow for fair and open access to its services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements.</i></p>	<p>Securities and Futures Act, section 46I(d) Securities and Futures (Trade Repositories) Regulations, section 18(a)</p>		
<p>2. <i>An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to and commensurate with the FMI's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, an FMI should endeavour to set requirements that have the least-restrictive impact on access that circumstances permit.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.18.1</p>		
<p>3. <i>An FMI should monitor compliance with its participation requirements on an ongoing basis and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.18.2</p>		
<p><b>Principle 19: Tiered participation arrangements</b></p> <p><b>An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should ensure that its rules, procedures, and agreements allow it to gather basic information about</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.19.1</p>		

<i>indirect participation in order to identify, monitor, and manage any material risks to the FMI arising from such tiered participation arrangements.</i>			
2. <i>An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.</i>	Notice on Financial Market Infrastructure Standards 3.19.2		
3. <i>An FMI should identify indirect participants responsible for a significant proportion of transactions processed by the FMI and indirect participants whose transaction volumes or values are large relative to the capacity of the direct participants through which they access the FMI in order to manage the risks arising from these transactions.</i>	Notice on Financial Market Infrastructure Standards 3.19.3		
4. <i>An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.</i>	Notice on Financial Market Infrastructure Standards 3.19.4		

<b>Principle 20: FMI links</b> <b>An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link-related risks.</b>		<b>Consistent</b>	Where there are gaps/inconsistencies in language or requirements between the relevant regulations and the PFMI, MAS should consider providing more clarity to TRs with respect to minimum standards.
1. <i>Before entering into a link arrangement and on an ongoing basis once the link is established, an FMI should identify, monitor, and manage all potential</i>	Securities and Futures Act, section 46J	The referenced regulations and notice do not explicitly set the requirements that	

<p><i>sources of risk arising from the link arrangement. Link arrangements should be designed such that each FMI is able to observe the other principles in this report.</i></p>	<p>Securities and Futures (Trade Repositories) Regulations, section 9(3) and 10(1)  Notice on Financial Market Infrastructure Standards 3.20.1</p>	<p>mirror/implement the first sentence of the KC.  In practice, in accordance with its policy statement in the Monograph, MAS ensures as part of its approval process that a link will be established in compliance with the PFMI, including the need to identify and mitigate potential risks from the link.</p>	
<p>2. <i>A link should have a well-founded legal basis, in all relevant jurisdictions, that supports its design and provides adequate protection to the FMIs involved in the link.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.20.2</p>		
<p>9. <i>A TR should carefully assess the additional operational risks related to its links to ensure the scalability and reliability of IT and related resources.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.20.5</p>		
<p><b>Principle 21: Efficiency and effectiveness</b>  <b>An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.</b></p>	<p>Securities and Futures Act, section 46I(1)</p>	<p><b>Consistent</b></p>	
<p>1. <i>An FMI should be designed to meet the needs of its participants and the markets it serves, in particular, with regard to choice of a clearing and settlement arrangement; operating structure; scope of products cleared, settled, or recorded; and use of technology and procedures.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.21.1</p>		

<p>2. <i>An FMI should have clearly defined goals and objectives that are measurable and achievable, such as in the areas of minimum service levels, risk-management expectations, and business priorities.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.21.2</p>		
<p>3. <i>An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.21.3</p>		
<p><b>Principle 22: Communication procedures and standards</b></p> <p><b>An FMI should use, or at a minimum accommodate, relevant internationally accepted communication procedures and standards in order to facilitate efficient payment, clearing, settlement, and recording.</b></p>		<p><b>Consistent</b></p>	
<p>1. <i>An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.22.1</p>		
<p><b>Principle 23: Disclosure of rules, key procedures, and market data</b></p> <p><b>An FMI should have clear and comprehensive rules and procedures and should provide sufficient information to enable participants to have an accurate understanding of the risks, fees, and other material costs they incur by participating in the FMI. All relevant rules and key procedures should be publicly disclosed.</b></p>		<p><b>Consistent</b></p>	

<p>1. <i>An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.23.1</p>		
<p>2. <i>An FMI should disclose clear descriptions of the system's design and operations, as well as the FMI's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMI.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.23.2</p>		
<p>3. <i>An FMI should provide all necessary and appropriate documentation and training to facilitate participants' understanding of the FMI's rules and procedures and the risks they face from participating in the FMI.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.23.3</p>		
<p>4. <i>An FMI should publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The FMI should provide clear descriptions of priced services for comparability purposes.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.23.4</p>		
<p>5. <i>An FMI should complete regularly and disclose publicly responses to the CPSS-IOSCO Disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.23.5</p>		



<p><b>Principle 24: Disclosure of market data by trade repositories</b></p> <p><b>A TR should provide timely and accurate data to relevant authorities and the public in line with their respective needs.</b></p>		<p><b>Partly Consistent</b></p>	<p>MAS is recommended to implement/complete measures that address the gaps identified in relation to KC1.</p> <p>Where there are gaps/inconsistencies in language or requirements between the relevant regulations and the PFMI, MAS should consider providing more clarity to TRs with respect to minimum standards.</p>
<p>1. <i>A TR should provide data in line with regulatory and industry expectations to relevant authorities and the public, respectively, that is comprehensive and at a level of detail sufficient to enhance market transparency and support other public policy objectives.</i></p>	<p>Securities and Futures Act, section 46A</p> <p>Securities and Futures Act, section 46ZJ(1)(e) and 46ZK(2)(a)</p>	<p>MAS has authority under the SFA to direct a TR to publish information related to the transactions reported to it. As of the cut-off date, however, MAS had not exercised the authority to direct DDRS, the sole LTR operating in Singapore as of the cut-off date, to publish such information. Accordingly, there are currently neither legal/supervisory requirements/expectations for, nor actual practice of, disclosure of the TR data to the public.</p> <p>The referenced regulations articulate specific requirements for a TR to provide data to MAS but do not do so with respect to the data provision to other relevant authorities. However, the AT</p>	<p>MAS is recommended to implement/complete measures that address the identified gaps.</p> <p>It is acknowledged that MAS is actively considering appropriate requirements for LTRs to publish the data in a manner that will help to achieve the objectives of the public disclosure.</p>

		<p>considers that MAS' implementation measures are consistent with this respect of PFMI (ie data provision to relevant authorities) on the basis of the Monograph for the following reasons:</p> <ol style="list-style-type: none"> <li>(1) DDRS is required by MAS as part of its ongoing supervision to submit to MAS all the transaction data reported to DDRS;</li> <li>(2) MAS entered into a MOU with the Australian Securities Investments Commission (ASIC) and the Reserve Bank of Australia (RBA) to provide them with access to the data in DDRS; and</li> <li>(3) Only ASIC and RBA are deemed to be such relevant authorities at this juncture.</li> </ol>	
<p>2. <i>A TR should have effective processes and procedures to provide data to relevant authorities in a timely and appropriate manner to enable them to meet their respective regulatory mandates and legal responsibilities.</i></p>	<p>Securities and Futures Act, section 46I(1)(h) Securities and Futures Act section 46ZJ(1)(e)</p>	<p>The referenced regulations do not explicitly establish requirements with respect to the timeliness and appropriateness of the manner of the data provision.</p> <p>In practice, in accordance with the policy statement in the Monograph, MAS sets the requirements that mirror KC2 when exercising its legal power to prescribe the manner of data provision by the TR to relevant authorities.</p>	
<p>3. <i>A TR should have robust information systems that provide accurate current and historical data. Data should be provided in a timely manner and in a format that permits it to be easily analysed.</i></p>	<p>Notice on Financial Market Infrastructure Standards 3.24.1</p>	<p>The referenced regulation refers to timeliness and format of the data only for cases "where the data is disclosed publicly" and does not separately address</p>	

		<p>timeliness and format of data provision to relevant authorities and participants.</p> <p>In practice, in accordance with the policy statement in the Monograph, MAS ensures as part of its licensing and ongoing supervision process that appropriate arrangements are in place for timely data provision and accessible data formatting including with respect to relevant authorities and participants.</p>	
--	--	--	--

## Annex A: List of abbreviations

AM	Assessment methodology
ACH	Approved Clearing House
AT	Assessment team
CCP	Central counterparty
CPMI	Committee on Payments and Market Infrastructures
CPSS	Committee on Payment and Settlement Systems
CSD	Central securities depository
DDRS	DTCC Data Repository (Singapore) Pte. Ltd.
FMI	Financial market infrastructure
FSB	Financial Stability Board
IMSG	Implementation Monitoring Standing Group
IOSCO	International Organization of Securities Commissions
LTR	Licensed Trade Repository
MAS	Monetary Authority of Singapore
MEPS+	New MAS Electronic Payment and Book-Entry System
MEPS+ IFT	MEPS+ Interbank Funds Transfer
MEPS+ SGS	MEPS+ Singapore Government Securities System
PFMI	Principles for financial market infrastructures
PS	Payment system
PS(O)A	Payment Systems (Oversight) Act
SFA	Securities and Futures Act
SF(CDS)R	Securities And Futures (Central Depository System) Regulations
SF(CF)R	Securities and Futures (Clearing Facilities) Regulations
SF(CG)R	Securities and Futures (Corporate Governance of Approved Exchanges, Approved Clearing Houses and Approved Holding Companies) Regulations

SF(TR)R	Securities and Futures (Trade Repositories) Regulations
SSS	Securities settlement system
Standards for MAS-Operated FMIs	Standards for MAS-Operated Financial Market Infrastructures
TR	Trade repository

## Annex B: Reference documents

Payment Systems (Oversight) Act (PS(O)A)

<http://statutes.agc.gov.sg/aol/search/display/view.w3p;page=0;query=DocId%3A23349004-82c6-4ca2-aba3-324d8ad824c1%20Depth%3A0%20Status%3Ainforce;rec=0>

Standards for MAS-Operated Financial Market Infrastructures

<http://www.mas.gov.sg/~media/MAS/Regulations%20and%20Financial%20Stability/Regulations%20Guidance%20and%20Licensing/Payment%20and%20Settlement%20Systems/Standards%20for%20MASOperated%20FMIs.pdf>

Securities and Futures Act, Cap 289 (SFA)

<http://statutes.agc.gov.sg/aol/search/display/view.w3p;page=0;query=DocId%3A25de2ec3-ac8e-44bf-9c88-927bf7eca056%20Depth%3A0%20Status%3Ainforce;rec=0;whole=yes>

Securities and Futures (Clearing Facilities) Regulations (SF(CF)R)

<http://www.mas.gov.sg/regulations-and-financial-stability/regulations-guidance-and-licensing/securities-futures-and-funds-management/regulations/2013/securities-and-futures-clearing-facilities-regulations-2013.aspx>

Securities and Futures (Corporate Governance of Approved Exchanges, Approved Clearing Houses and Approved Holding Companies) Regulations (SF(CG)R)

<http://statutes.agc.gov.sg/aol/search/display/view.w3p;page=0;query=DocId%3Af758823d-ad6c-4b98-a898-ed21df9d64aa%20Depth%3A0%20Status%3Ainforce;rec=0>

Securities And Futures (Central Depository System) Regulations (SF(CDS)R)

<http://www.mas.gov.sg/Regulations-and-Financial-Stability/Regulations-Guidance-and-Licensing/Securities-Futures-and-Funds-Management/Regulations/2015/Securities-and-Futures-Central-Depository-System-Regulations-2015.aspx>

Securities and Futures (Trade Repositories) Regulations (SF(TR)R)

<http://www.mas.gov.sg/regulations-and-financial-stability/regulations-guidance-and-licensing/securities-futures-and-funds-management/regulations/2013/securities-and-futures-trade-repositories-regulations-2013.aspx>

Notice on Financial Market Infrastructure Standards

<http://www.mas.gov.sg/Regulations-and-Financial-Stability/Regulations-Guidance-and-Licensing/Securities-Futures-and-Funds-Management/Notices/2016/Notice-on-Financial-Market-Infrastructure-Standards-Notice-No-SFA02A03N01.aspx>

Notice on Financial Market Infrastructure Standards for Central Securities Depositories

<http://www.mas.gov.sg/Regulations-and-Financial-Stability/Regulations-Guidance-and-Licensing/Securities-Futures-and-Funds-Management/Notices/2016/Notice-on-Financial-Market-Infrastructure-Standards-for-CSDs-Notice-No-SFA03AAN01.aspx>

Monetary Authority of Singapore, Monograph on Supervision of Financial Market Infrastructures in Singapore, January 2013 (revised in January 2015)

<http://www.mas.gov.sg/news-and-publications/monographs-and-information-papers/2013/supervision-of-financial-market-infrastructures-in-singapore.aspx>

CPSS-IOSCO, *Principles for financial market infrastructures*, April 2012  
<http://www.bis.org/cpmi/publ/d101a.pdf>

CPSS-IOSCO, *Principles for financial market infrastructures: disclosure framework and assessment methodology*, December 2012  
<http://www.bis.org/publ/cpmi106.pdf>

CPMI-IOSCO, *Implementation monitoring of PFMI: Third update to Level 1 assessment report*, June 2016  
<http://www.bis.org/cpmi/publ/d145.pdf>

CPMI-IOSCO, *Implementation monitoring of PFMI: Second update to Level 1 assessment report*, June 2015  
<http://www.bis.org/cpmi/publ/d129.pdf>

CPSS-IOSCO, *Implementation monitoring of PFMI: First update to Level 1 assessment report*, May 2014  
<http://www.bis.org/publ/cpmi117.pdf>

CPSS-IOSCO, *Implementation monitoring of PFMI – Level 1 assessment report*, August 2013  
<http://www.bis.org/publ/cpmi111.pdf>

CPMI-IOSCO, *Application of the Principles for financial market infrastructures to central bank FMIs*, August 2015  
<http://www.bis.org/cpmi/publ/d130.htm>

CPMI-IOSCO, *Assessment and review of application of Responsibilities for authorities*, November 2015  
<http://www.bis.org/cpmi/publ/d139.htm>

## Annex C: FMIs in Singapore subject to the Principles

### Systemically important PSs in Singapore

- New MAS Electronic Payment and Book-Entry System (MEPS+)

### CCPs

- ICE Clear Singapore Pte Ltd (ICSG)
- Singapore Exchange Derivatives Clearing Limited (SGX-DC)
- The Central Depository (Pte) Limited (CDP)

### CSDs/SSSs

- MEPS+
- CDP

### TRs

- DTCC Data Repository (Singapore) Pte. Ltd. (DDRS)