

HKFE Clearing Corporation Limited

Principles for Financial Market Infrastructures Disclosure



Responding Institution:

HKFE Clearing Corporation Limited

Jurisdiction(s) in which the FMI Operates:

Hong Kong Special Administrative Region of the People's Republic of China

Authority Regulating, Supervising or Overseeing the FMI:

Securities and Futures Commission of Hong Kong

The date of this disclosure is February 2021. This disclosure can be found at http://www.hkex.com.hk/Services/Clearing/Listed-Derivatives/PFMI?sc_lang=en. For further information, please contact our hotline at 2979-7222 or email clearingpsd@hkex.com.hk.

GLOSSARY

Capitalised terms defined in the Rules of HKCC (**HKCC Rules**) and Clearing House Procedures for Futures/Options Contracts Traded on the Automated Trading System of the Exchange (**HKATS**) (**HKCC Procedures**) have the same meaning when used in this disclosure document. Terms defined in the Principles for Financial Market Infrastructures (**PFMI**) published by the Committee on Payment and Settlement Systems (**CPSS**)¹ and the International Organization of Securities Commissions (**IOSCO**) in April 2012 have the same meaning when used in this disclosure document.

The terms in the following table, which are not defined in the HKCC Rules and HKCC Procedures, have the meanings given below.

Term	Definition
AHT	After-hours Trading
API	Application Programme Interface
BRC	Board Risk Committee
CBPL	Capital Based Position Limit
CCP(s)	Central Counterparty(ies)
CH Margin	Clearing House Margin
Clearstream	Clearstream Banking S.A.
CMU	Central Moneymarkets Unit
CNH	Renminbi (Hong Kong)
CPMI	Committee on Payments and Market Infrastructures
CPSS	Committee on Payment and Settlement Systems
CRC	Clearing Risk Committee
CSD	Central Securities Depository
DMG	Default Management Group
EFBN	Hong Kong Exchange Fund Bills and Notes
EMIR	European Market Infrastructure Regulations
ERiC	Executive Risk Committee
EUR	Euro
FMI	Financial Market Infrastructures
FRR	Securities and Futures (Financial Resources) Rules (Cap. 571N of the Laws of Hong Kong)
GRM	Group Risk Management
HKCC Board	The board of directors of HKCC

¹ 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.

Term	Definition
HKCC Procedures	Clearing House Procedures for Futures/Options Contracts Traded on HKATS
HKCC Rules	Rules of HKCC
HKD	Hong Kong Dollar
HKEX Board	The board of directors of HKEX
HKFE	Hong Kong Futures Exchange Limited
HKFE Board	The board of directors of HKFE
HKICL	Hong Kong Interbank Clearing Limited
HKMA	Hong Kong Monetary Authority
HSI	Hang Seng Index
ICAC	Corruption Prevention Department of the Hong Kong Independent Commission Against Corruption
IDM	Intra-day Margin
IOSCO	International Organization of Securities Commissions
JPY	Japanese Yen
MCP	Market Contingency Plan
PBO	Prevention of Bribery Ordinance (Cap. 201 of the Laws of Hong Kong)
PFMI	Principles for Financial Market Infrastructures, issued by CPSS-IOSCO
PRiME	The Portfolio Risk Management System of HKEX
RCH(s)	Recognised Clearing House(s)
RF	Reserve Fund
RI	Registered Institution
RMB	Renminbi
RMC	HKEX Statutory Risk Management Committee
RM Capital	Risk Management Capital
RTGS	Real Time Gross Settlement
SEHK	The Stock Exchange of Hong Kong Limited
SFC	The Securities and Futures Commission of Hong Kong
SFO	Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong)
SGD	Singapore Dollar
SITG	Skin-in-the-game
SWIFT	Society for Worldwide Interbank Financial Telecommunication
UK	United Kingdom
USD	United States Dollar
VA	Variation Adjustment

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CHAPTER 1: EXECUTIVE SUMMARY

- 1 HKFE Clearing Corporation Limited (**HKCC**)² is a Hong Kong incorporated wholly-owned subsidiary of Hong Kong Exchanges and Clearing Limited (**HKEX**). HKCC is recognised by the Securities and Futures Commission (**SFC**), Hong Kong’s statutory regulator for the securities and futures markets, under Section 37(1) of the Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong) (**SFO**) as a recognised clearing house (**RCH**). Section 59(1) of the SFO provides that subject to very limited exceptions, no person shall become a “controller” of an RCH unless the person is a “recognised exchange controller”³. Currently, HKEX is the only exchange controller recognised by the SFC. HKEX owns the entire issued share capital of HKCC and is a listed public company in Hong Kong.
- 2 As an RCH, HKCC is required at all times to comply with various statutory duties under the SFO, which are further described in this disclosure document. In August 2013, the SFC published guidelines requiring RCHs to observe on an ongoing basis the PFMI, to the extent that these apply to a central counterparty (**CCP**).
- 3 HKCC provides clearing and settlement services for the contracts traded on Hong Kong Futures Exchange Limited (**HKFE**), which operates the only recognised futures exchange in Hong Kong. HKCC has implemented a comprehensive risk management framework which is designed to ensure the timely settlement of relevant derivatives contracts, by adequately controlling credit, market and liquidity risks. HKCC has appropriate policies, procedures and controls in place to manage the additional risks that its services are exposed to, including legal risk, settlement risk, general business risk, custody and investment risks, and operational risk.
- 4 HKCC’s approach to observing each applicable principle⁴ in the PFMI is summarised in this disclosure document. This document is written pursuant to and in accordance with the guidelines set forth in the Disclosure framework and Assessment methodology issued by CPSS-IOSCO in December 2012.

² HKCC was first recognised as an RCH in 1995 under the repealed Securities and Futures (Clearing Houses) Ordinance. Its recognition under the SFO (which came into force in April 2003) was deemed to be effective pursuant to the transitional provisions in Schedule 10 of the SFO. The recognition remains in force as at the date of this document.

³ “Controller” is defined to mean a “shareholder controller” (i.e. a person controlling 35% voting rights of a corporation) or an “indirect controller” (i.e. a person controlling 5% or more voting rights of a corporation).

⁴ Two of the 24 PFMI principles are not applicable to HKCC as a CCP. They are Principle 11: Central Securities Depositories and Principle 24: Disclosure of Market Data by Trade Repositories.

CHAPTER 2: SUMMARY OF MAJOR CHANGES SINCE THE LAST UPDATE OF THE DISCLOSURE⁵

- 5 May 2019 - HKFE and HKCC upgraded their derivatives platforms, namely Hong Kong Futures Automated Trading System (**HKATS**) and Derivatives Clearing and Settlement System (**DCASS**). A new browser-based frontend application, i.e. HKATS Online, is available for block trade facilities and serves as a contingency access to the HKATS. Similarly, a new browser-based frontend application, namely DCASS Online, is provided to the HKCC Participants replacing DCASS Servers and DCASS Terminals.
- 6 May 2019 - HKCC launched Client Connect, a single platform to unify all client access to HKEX services and enhance overall user experience.
- 7 June 2019 - HKFE extended the after-hours trading (**AHT**) session on certain equity index, currency and commodity products to 3:00 a.m. Hong Kong Time.
- 8 August 2019 - HKCC introduced stress movement assumption on implied volatilities of option contracts in Reserve Fund (**RF**) stress testing.
- 9 October 2019 - HKCC admits banking entities, i.e. registered institutions (**RIs**) under the SFO, as General Clearing Participants (**GCPs**).
- 10 January 2020 - HKCC entered the interim list of third-country CCPs under the Temporary Recognition Regime of the Central Counterparties (Amendments, etc., and Transitional Provision) (EU Exit) Regulations 2018 of the UK, which enables HKCC to continue to provide clearing services and activities in the UK.
- 11 September 2020 - HKCC enhanced its Capital-based Position Limit (**CBPL**) policy. The revised policy allows HKCC Participants who meet a set of criteria to apply for an extension of existing CBPL measures.
- 12 September 2020 - HKCC accepts Singapore Dollar (**SGD**) as cash collateral for HKCC Participants to meet their margin obligations.
- 13 October 2020 – HKCC introduced an additional cash collateral deposit collection batch in the Common Collateral Management System (**CCMS**) to provide HKCC Participants an option for same day collateral substitution.
- 14 HKFE launched the following new products:
 - (a) USD-denominated London Metal Mini Futures in August 2019;

⁵ The last update was on February 2019.

- (b) Weekly Hang Seng Index Options and Weekly Hang Seng China Enterprises Index Options in September 2019;
- (c) Indian Rupee Currency Futures in November 2019;
- (d) Physically settled USD and CNH Silver Futures in June 2020;
- (e) 38 MSCI Asia and Emerging Market Index Futures between July to September 2020;
and
- (f) Hang Seng TECH Index Futures in November 2020.

CHAPTER 3: GENERAL BACKGROUND ON HKCC

GENERAL DESCRIPTION OF HKCC AND THE MARKETS IT SERVES

- 15 HKCC was incorporated in 1984. It operates the automated derivatives clearing and settlement system (**DCASS**) and the common collateral management system (**CCMS**) as a CCP providing clearing and settlement services for derivatives traded on HKFE and managing collateral received from its participants.
- 16 As an RCH operating within the statutory framework under Division 3 of Part III of the SFO, HKCC acts in the interest of the public in discharging its statutory duties, as described in further detail below. It also aims to maintain financial stability and promote transparency of the derivatives market in Hong Kong by offering expeditious clearing and robust risk management services to market participants.

ORGANISATIONAL STRUCTURE OF HKCC

- 17 As mentioned, HKCC is a wholly-owned subsidiary of HKEX, which is a recognised exchange controller under Division 4 of Part III of the SFO with its own statutory duties, including the duty to ensure that any RCH controlled by it performs its duties properly. HKEX is thus legally obliged to take on an active role in overseeing and ensuring the proper functioning of HKCC.
- 18 HKEX is a listed company on the Main Board of The Stock Exchange of Hong Kong Limited (**SEHK**). It is the holding company of the following three exchanges and five clearing houses in Hong Kong and the United Kingdom (**UK**):
 - (a) SEHK;
 - (b) HKFE;
 - (c) The London Metal Exchange (**LME**);
 - (d) Hong Kong Securities Clearing Company Limited (**HKSCC**);
 - (e) The SEHK Options Clearing House Limited (**SEOCH**);
 - (f) HKCC;
 - (g) OTC Clearing Hong Kong Limited; and
 - (h) LME Clear Limited.

GOVERNANCE STRUCTURE OF HKCC

- 19 HKCC's governance structure comprises the board of directors of HKCC (**HKCC Board**) and two committees of HKFE⁶ that have been established to assist the HKCC Board with the management and operation of HKCC's services. In addition, HKCC leverages the board of directors of HKEX (**HKEX Board**) to provide leadership and guidance for all the HKEX Group's activities and oversee the execution of HKEX's business strategies and its various committees, including:
- (a) the HKEX statutory Risk Management Committee (**RMC**) which may formulate and advise on risk management matters of HKEX Group for consideration by HKEX, and provides an added layer of oversight and supervision over the safety and soundness of HKCC's own risk management safeguards;
 - (b) the Board Risk Committee (**BRC**), which oversees the overall risk management framework and advises the HKEX Board on HKEX Group's risk related matters; and
 - (c) the HKEX Audit, Nomination, Remuneration and Investment Advisory Committees, to carry out the important functions of independent financial and operational audit, the nomination of directors and oversight in the determination of directors and staff remuneration and advising on investment policies, respectively.
- 20 The HKCC Board currently consists of four members who are senior executives of HKEX, including the Chief Executive of HKEX who is Chairman of HKCC. It oversees HKCC's activities and the execution of its business strategies. The HKCC Board has delegated its power to adjudicate disciplinary matters to the Disciplinary and Disciplinary Appeals Committees of HKFE, whose members are appointed by the board of directors of HKFE (**HKFE Board**). HKFE's Disciplinary Committees comprise member(s) of the HKFE Board and/or other such persons as the HKFE Board may appoint. HKFE's Disciplinary Appeals Committee comprises non-executive directors of HKFE and/or other persons as the HKFE Board may appoint.
- 21 HKEX also appointed the Clearing Consultative Panel, with members selected from representatives of market participants and industry experts in the clearing business, to act as an advisory body to the HKEX Board and its management to provide market expertise and advice relating to HKEX's clearing businesses, including HKSCC, HKCC and SEOCH.
- 22 HKCC's day-to-day business is managed by two dedicated departments: the On-Exchange and OTC Clearing Department and the Clearing Risk Management Department. The senior management of HKCC is responsible to and takes directions from the HKCC Board.

PRODUCT COVERAGE

⁶ Refers to Disciplinary Committee and Disciplinary Appeals Committee of HKFE

- 23 HKCC clears all the derivatives contracts traded on HKFE. The current categories of derivatives products cleared by HKCC are as follows:
- (a) equity index products;
 - (b) equity products;
 - (c) currency products;
 - (d) interest rate products; and
 - (e) metal products.
- 24 All derivatives contracts⁷ traded on HKFE are cash settled upon final settlement, except US Dollar vs Renminbi (Hong Kong) currency futures and options contracts and physically settled CNH and United States Dollar (**USD**) gold/silver futures contracts. US Dollar vs Renminbi (Hong Kong) currency futures contracts are settled upon delivery of USD by the seller and payment of final settlement value in RMB by the buyer upon final settlement. US Dollar vs Renminbi (Hong Kong) currency options contracts are settled upon delivery of USD by the writer of call options / holder of put options and payment of final settlement value in RMB by the holder of call options / writer of put options upon final settlement. Physically settled CNH and USD gold/silver futures contracts are settled upon physical delivery of physical gold/silver by the seller and payment of final settlement value in the settlement currency by the buyer upon final settlement.

PARTICIPANTS OF HKCC (HKCC PARTICIPANTS)

- 25 HKCC Participants must be participants of HKFE (**Exchange Participants**) and licensed financial institutions. HKCC maintains two types of participation, namely:
- (a) Clearing Participant (**CP**) that clears and settles its own and its clients' trades executed on HKFE; and
 - (b) General Clearing Participant (**GCP**) that clears and settles its own and its clients' trades executed on HKFE, and/or provides third party clearing services to other Exchange Participants which decide to outsource their clearing and settlement functions.
- 26 At the end of December 2020, there were 168 HKCC Participants, including 159 CPs and 9 GCPs.

⁷ The current full list of derivatives contracts is publicly available on the HKEX website <https://www.hkex.com.hk/Products/Listed-Derivatives>.

RISK MANAGEMENT FRAMEWORK

- 27 HKEX Group complies with the Group Risk Management (**GRM**) framework approved by the HKEX Board to identify, assess and manage risks using a holistic and integrated framework. Individual business or functional units are responsible for monitoring and controlling material risks inherent in their processes on an ongoing basis.
- 28 HKCC has a comprehensive risk management framework to identify, monitor and manage all of its key risks, which includes the following key components:
- (a) HKCC Participant admission requirements and regular risk scoring analysis for identifying and monitoring risks posed by HKCC Participants. Please refer to the description under Principle 4: Credit Risk and Principle 18: Access and Participant Requirements;
 - (b) processes for mark-to-market, margining and collection of collateral to cover current and potential future exposures. Please refer to the description under Principle 6: Margin;
 - (c) Capital Based Position Limit (**CBPL**) imposed to ensure that risk exposures are commensurate with financial strength of HKCC Participants. Please refer to the description under Principle 4: Credit Risk;
 - (d) RF and other financial resources for the purpose of supporting its role as a CCP in the event of an HKCC Participant default. Please refer to the description under Principle 4: Credit Risk;
 - (e) collateral policy to limit acceptable collateral to assets with low credit, market and liquidity risks. Please refer to the description under Principle 5: Collateral;
 - (f) clear and enforceable HKCC Participant default rules and procedures. Please refer to the description under Principle 13: Participant-default Rules and Procedures;
 - (g) strict appointment criteria for its settlement banks with ongoing monitoring of their performance. Please refer to the description under Principle 9: Money Settlements;
 - (h) tiered participation arrangements to manage risk arising from third-party clearing service. Please refer to the description under Principle 19: Tiered Participation Arrangements;
 - (i) liquidity arrangements to measure, monitor, and manage liquidity risk. Please refer to the description under Principle 7: Liquidity Risk;
 - (j) comprehensive internal control, contingency and recovery procedures. Please refer to the description under Principle 17: Operational Risk; and

(k) investment strategy with risk controls that satisfy liquidity requirements and safeguard financial assets. Please refer to the description under Principle 16: Custody and Investment Risks.

29 The risk management framework is subject to ongoing review in response to developments in local and international financial markets, and the business needs of both HKCC and HKCC Participants. Any change to the framework is subject to the prevailing approval processes.

OPERATIONAL RELIABILITY

30 HKCC, as a CCP, has primary operational objectives to provide via DCASS and CCMS, its clearing, settlement and collateral management services on each business day as scheduled and to ensure that system recovery can be achieved within two hours following a disruption to HKCC's critical functions, under specific contingency scenarios.

31 The system capacity of DCASS and CCMS is scaled based on the projected transaction volumes and a capacity buffer has been put in place to handle potential stress volumes.

LEGAL AND REGULATORY FRAMEWORK

32 Under Section 40 of the SFO, HKCC has the power to make rules that are necessary and desirable for the proper regulation and efficient operation of its clearing or settlement facilities, and for the proper regulation of HKCC Participants. However, no rule or amendment of any rule will have effect unless the SFC has given its approval in writing under Section 41 of the SFO.

33 HKCC Participants are required to comply with the HKCC Rules, HKCC Procedures, the notices of approval of their HKCC participation and other requirements of HKCC, such as those found in circulars issued from time to time by HKCC. The Hong Kong legal framework provides a high degree of legal certainty for each material aspect of HKCC's activities that supports and allows HKCC to conduct all material aspects of its activities.

34 In addition to the rules and contractual arrangements referred to above, the legal basis/framework supporting the material aspects of HKCC's activities also includes the following:

- (a) the Bankruptcy Ordinance (Cap. 155 of the Laws of Hong Kong);
- (b) the Companies Ordinance⁸;
- (c) the SFO; and

⁸ Companies Ordinance refers to both the Companies Ordinance (Cap. 622 of the Laws of Hong Kong) and the Companies (Winding Up and Miscellaneous Provisions) Ordinance (Cap. 32 of the Laws of Hong Kong).

- (d) general Hong Kong common law in relation to contracts, tort and property.
- 35 HKCC conducts its business in Hong Kong. All relevant documents issued by HKCC in respect of its business and services are governed by Hong Kong law. HKCC has engaged an independent law firm to issue a Hong Kong law opinion which provides a high level of confidence that the HKCC Rules (including the default procedures and contract re-novation and delivery arrangements) are enforceable under Hong Kong law.
- 36 HKCC is regulated by the SFC under Division 3 of Part III of the SFO. Under Section 38 of the SFO, HKCC has the duty to ensure, so far as is reasonably practicable, that there are orderly, fair and expeditious clearing and settlement arrangements for transactions cleared or settled through its facilities and that risks associated with its business and operations are managed prudently. HKCC must operate its facilities in accordance with the rules approved by the SFC under Section 41 of the SFO as mentioned earlier, and formulate and implement appropriate procedures for ensuring that HKCC Participants comply with the rules. Additionally, HKCC must at all times provide and maintain:
- (a) adequate and properly equipped premises;
 - (b) competent personnel; and
 - (c) automated systems with adequate capacity, facilities to meet contingencies or emergencies, security arrangements and technical support,
- for the conduct of its business.
- 37 In discharging its statutory duties, HKCC is under an obligation to act in the interest of the public, having particular regard to the interest of the investing public. It is required to ensure that the interest of the public prevails where it conflicts with the interest of HKCC. The SFC has the power to require HKCC to comply with its directions, orders and requirements. In addition to the statutory duties under the SFO, HKCC is required by the SFC to comply with the PFMI to the extent that they apply to a CCP.
- 38 Division 3 of Part III of the SFO sets out the regulatory framework for RCHs including provisions for recognition of an RCH and the duties of an RCH as well as the statutory protections for an RCH. It confers finality on the following, which applies to HKCC:
- (a) “market contracts”⁹ with an RCH and the provision of property pursuant to “market contracts”;
 - (b) the provision of “market collateral”¹⁰ to an RCH; contracts effected by an RCH for the purpose of realising property provided as “market collateral”; disposals of property

⁹ In brief, “market contract” means a contract subject to the rules of an RCH entered into by the RCH with its clearing participant whether or not pursuant to a novation.

¹⁰ “Market collateral” means any property which is held by or deposited with an RCH for the purpose of securing liabilities arising directly in connection with the RCH’s ensuring the settlement of a market contract.

pursuant to such contracts; or disposals of property in accordance with the rules of an RCH as to the application of property provided as “market collateral”;

- (c) a “market charge”¹¹ taken by an RCH; a disposal of property as a result of which the property becomes subject to a “market charge”; any transaction pursuant to which that disposal was made; or a disposal of property made in enforcing a “market charge”; and
- (d) “default proceedings”¹² of an RCH.

39 The finality conferred as mentioned above means that actions taken by an RCH upon a default of its CP and GCP in respect of market contracts and the dispositions of market collateral or assets subject to a market charge are not vulnerable to insolvency avoidance and clawback laws otherwise applicable upon the insolvency of a CP and GCP in Hong Kong.

SYSTEM DESIGN AND OPERATIONS

40 HKCC uses DCASS and CCMS to support its roles as a CCP. DCASS is fully integrated with the common trading platform for HKEX’s derivatives markets, which is HKATS. DCASS is also integrated with CCMS, which is used by three of the HKEX clearing houses (i.e. HKSCC, HKCC and SEOCH) to manage the collateral received from their participants.

41 HKCC offers an account structure to HKCC Participants that effectively segregates the trades, positions and collateral of HKCC Participants and their clients. HKCC provides different types of position accounts in DCASS (**Clearing Accounts**), including:

- (a) house account (**House Account**) to record HKCC Participants’ own trades and positions;
- (b) two types of client accounts (**Client Accounts**): omnibus client account (**Omnibus Client Account**) and individual client account (**Individual Client Account**), for HKCC Participants to record their clients’ trades and positions; and
- (c) market maker account (**Market Maker Account**) to record the trades and positions arising from market making activities conducted by HKCC Participants or their clients.

42 HKCC also offers different types of collateral accounts in CCMS (**CCMS Collateral Accounts**), including house collateral account (**House Collateral Account**), client collateral account (**Client Collateral Account**) and market maker collateral account (**Market Maker Collateral Account**) to facilitate HKCC Participants to separately identify the collateral relating to their clients, market making activities and themselves. HKCC posts all obligations arising from (a) positions of House Accounts to House Collateral Accounts; (b) positions of Client Accounts to the applicable Client Collateral Accounts; and (c) positions of

¹¹ “Market charge” means a charge (whether fixed or floating) in favour of an RCH over any property which is held by or deposited with the RCH and for the purpose of securing liabilities arising directly in connection with the RCH’s ensuring the settlement of a market contract.

¹² “Default proceedings” means any proceedings or other action taken by an RCH under its default rules.

Market Maker Accounts to the applicable Market Maker Collateral Accounts. The following paragraphs provide a brief description of HKCC's core services and operations.

Clearing and Settlement of Derivatives Contracts

Trade Capture and Registration

- 43 HKFE transmits details of the matched and validated trades directly from HKATS to DCASS in real-time. Upon receiving trades from HKATS, HKCC registers the trades¹³ in DCASS.

Novation

- 44 After registration, the registered contract is replaced by two contracts through novation, one between the selling HKCC Participant and HKCC as the buyer and the other one between the buying HKCC Participant and HKCC as the seller. Upon novation, HKCC acts as the CCP, and assumes counterparty risks associated with the novated contracts, which are also known as market contracts and defined as such in the SFO (**Market Contracts**).
- 45 Upon the final settlement stage of physically settled CNH and USD gold/silver futures contracts HKCC will allocate short positions of HKCC Participants to long positions of HKCC Participants as part of a matching process. Following: (i) confirmation from the selling HKCC Participant's Approved Depository that it has earmarked the required quantity of gold/silver; and (ii) receipt by HKCC of funds in respect of the buying HKCC Participant's payment obligation, the contracts between the buying HKCC Participants and HKCC and HKCC and the selling HKCC Participants shall be novated and new contracts (each a "Re-novated Contract") shall arise directly between the relevant buying and selling HKCC Participants. Under each Re-novated Contract: all rights and obligations between HKCC and the relevant buying or selling HKCC participants under each relevant pending contract shall be simultaneously discharged and replaced by the rights and obligations between the relevant buying HKCC Participant and relevant selling HKCC Participant; and HKCC shall be fully and finally released and discharged from all its obligations and liabilities as a CCP to the relevant buying and selling HKCC Participant under each relevant pending contract.

Creation of Positions

- 46 HKCC records the respective rights and obligations of each Market Contract as a position in the relevant Clearing Account of the HKCC Participant to which the contract has been designated in accordance with the details transmitted from HKATS. The positions of an account (either on a net or gross basis) therefore reflect the consolidated rights and obligations arising from all Market Contracts that have been allocated to that account.

¹³ HKCC has general rights to accept or refuse the registration of trades executed through HKATS. In the event that HKCC refuses a trade, it will notify HKFE and the HKCC Participants who were parties to the trade.

Post-trade Management

- 47 HKCC offers post-trade management functions to facilitate HKCC Participants to manage their trades and positions in DCASS. An HKCC Participant can give up a trade to another HKCC Participant that has to agree to take up the trade before the give up/take up can be effected. An HKCC Participant can transfer a trade/position between accounts of its own. An HKCC Participant can also transfer a position to another HKCC Participant by completing a stipulated form that is signed by both HKCC Participants and submitted to HKCC in accordance with the HKCC Rules and HKCC Procedures.

Money Settlement

- 48 HKCC does not have a banking licence in Hong Kong so it does not have direct access to the Real Time Gross Settlement (RTGS)¹⁴ systems. HKCC appoints seven licensed banks as its settlement banks (**Settlement Banks**) to process money transactions in multiple currencies, including Hong Kong Dollar (HKD), RMB, USD, Euro (EUR), Japanese yen (JPY) and SGD on its behalf via intra-bank transfers.
- 49 HKCC Participants are required to maintain accounts in respective currencies at any of the Settlement Banks for money settlement purposes and must authorise the Settlement Banks to accept instructions from HKCC to directly transfer funds from their accounts to HKCC's accounts with the Settlement Banks.
- 50 HKCC uses SWIFT¹⁵ to send payment instructions to the Settlement Banks to effect payments to and from HKCC Participants' bank accounts via intra-bank transfers, with the scheduled and ad hoc money settlement processes. The deadlines to settle the relevant payments of each money settlement process are summarised in the table below:

Money Settlement Process	Payment Deadline
Scheduled processes:	
<ul style="list-style-type: none">– Daily settlement of day-end variation adjustment (VA), Margin and fees– Day-end settlement of payment obligations arising from the final settlement of cash settled contracts	By 9:15 am of the next business day
<ul style="list-style-type: none">– Settlement of final settlement value arising from physically settled CNH and USD gold/silver futures contracts and deliverable currency futures and option contracts	By 9:15 am of the second business day after expiry
<ul style="list-style-type: none">– Daily settlement of mandatory intra-day VA and clearing house Margin (CH Margin)	Within 2 hours after notification
Ad hoc processes:	

¹⁴ The RTGS systems are operated by the Hong Kong Interbank Clearing Limited (HKICL), which is jointly owned by the Hong Kong Monetary Authority (HKMA) and the Hong Kong Association of Banks.

¹⁵ SWIFT means the Society for Worldwide Interbank Financial Telecommunication.

Money Settlement Process	Payment Deadline
– Ad hoc settlement of intra-day VA	Within 1 hour after notification
– Ad hoc settlement of additional contributions to the RF	By 4:00 p.m. on the first business day after the distribution of the notification report

- 51 An HKCC Participant's obligation to make payment will not be treated as having been discharged until HKCC has received a payment confirmation from the Settlement Bank via SWIFT that the funds in the required currency have been received and credited into HKCC's bank account maintained with the Settlement Bank.

Final settlement of RMB Currency Futures and Options – US Dollar vs Renminbi (Hong Kong) Currency Futures and Options

- 52 Money obligations arising from the final settlement of US Dollar vs Renminbi (Hong Kong) currency futures and options contracts in Renminbi (**RMB**) and USD are debited from or credited to the CCMS Collateral Accounts of respective HKCC Participants. HKCC generates payment instructions to collect any money obligations which are settled by 9:15 am on the Final Settlement Day. HKCC will only allow HKCC Participants to withdraw the amount in one currency leg if and only if the money obligations in another currency leg have been settled.

Final settlement of physically settled CNH and USD gold/silver futures contracts

- 53 Physical delivery obligations on the final settlement of the contracts are to be settled between selling HKCC Participants and buying HKCC Participants via transfer of physical gold/silver within their respective depository accounts maintained in an Approved Depository. The buying HKCC Participant is to transfer the amount of its payment obligation to a settlement account specified by HKCC no later than 9:15 am on the Final Settlement Day. HKCC will release the final settlement value to the selling HKCC Participant later on the Final Settlement Day once it has received confirmation from the Approved Depository that the transfer of the physical gold/silver from the selling HKCC Participant's account to the buying HKCC Participant's account has been effected. Please refer to the description under Principle 8: Settlement Finality and Principle 10: Physical Deliveries.

Collateral Management

- 54 HKCC uses CCMS to manage HKCC Participants' collateral holdings and obligations. Collateral deposited is marked-to-market and valued on a regular basis with relevant haircut rates applied. This collateral can be used to meet HKCC Participants' Margin requirement. Also, HKCC Participants can manage their collateral through CCMS, and make collateral deposit and withdrawal requests via CCMS. Please refer to the description under Principle 5: Collateral.

CHAPTER 4: PRINCIPLE-BY-PRINCIPLE SUMMARY DISCLOSURE

Principle 1: Legal Basis

An FMI should have a well-founded, clear, transparent, and enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.

MATERIAL ASPECTS OF ACTIVITIES

- 1.1 The material aspects of HKCC's activities that require legal certainty are:
- (a) participantship in HKCC;
 - (b) the rights and obligations of HKCC and HKCC Participants in respect of HKCC's services, including clearing, settlement and collateral management;
 - (c) the formation by novation, enforceability of netting arrangements and settlement finality of Market Contracts;
 - (d) the rights and interests of HKCC and HKCC Participants to financial provisions constituting Margin, collateral and RF;
 - (e) the settlement finality of Market Contracts with HKCC Participants;
 - (f) the HKCC Rules and HKCC Procedures concerning HKCC Participant default;
 - (g) the procedures for the recovery and wind-down of HKCC; and
 - (h) the implications of the insolvency of HKCC Participants or HKCC.

LEGAL SOUNDNESS

- 1.2 HKCC conducts business in Hong Kong. The Hong Kong legal framework supports and allows HKCC to conduct all material aspects of its activities as a CCP. The legal basis/framework supporting the material aspects of HKCC's activities includes the Bankruptcy Ordinance; Companies Ordinance; SFO; the general Hong Kong common law in relation to contracts, tort and property; and the rules binding HKCC and HKCC Participants.
- 1.3 HKCC is an RCH regulated by the SFC, Hong Kong's statutory regulator for the securities and futures markets, under Section 37(1) of the SFO. The SFO is Hong Kong's principal securities and futures legislation, which sets out the regulatory framework for HKCC in its capacity as an RCH.

- 1.4 All HKCC Participants are incorporated in Hong Kong and are subject to the relevant laws of Hong Kong. The HKCC Rules and HKCC Procedures are governed by Hong Kong law. Amendments to the HKCC Rules and HKCC Procedures are drafted and/or reviewed by the internal lawyers of HKEX Group and where considered appropriate/necessary external legal opinions are sought. No rules or amendment of any rule will have effect unless the SFC has given its approval in writing. HKCC outlines and (as needed) evidences the legal basis for its activities to the SFC upon request. Where appropriate, HKCC shares the existence of relevant legal opinions with appropriate recipients, such as members of the Clearing Consultative Panel, etc. in an effort to promote confidence and transparency among HKCC Participants.
- 1.5 There is a high degree of certainty that actions taken under the HKCC Rules and HKCC Procedures will not be voided, reversed or subject to stays. This is especially so in the light of SFO provisions that expressly override various insolvency laws in relation to HKCC. HKCC is not aware of any court of any relevant jurisdiction that has held its activities or arrangements to be unenforceable.
- 1.6 HKCC has engaged independent law firms to issue Hong Kong law opinions which provide a high level of confidence that the HKCC Rules (including the default procedures and the contract re-novation and delivery arrangements for physically settled contracts) are enforceable under Hong Kong law and a high degree of certainty on the finality of actions taken under the HKCC Rules under Hong Kong law.
- 1.7 HKCC accepts and holds US Treasuries delivered by HKCC Participants at its account opened with Clearstream Banking S.A. (**Clearstream**), a custodian bank incorporated in Luxemburg. HKCC has obtained a Luxemburg legal opinion which provides a high level of confidence that the outright transfer of ownership of US Treasuries pursuant to the HKCC Rules is recognised as being legal, valid, binding and enforceable under Luxemburg law once the book entry is made on HKCC's account at Clearstream.

OVERSEAS RECOGNITION

- 1.8 The Board of Supervisors of the European Securities and Markets Authority adopted a decision to recognise HKCC as a third country CCP under Chapter 4 of Title III of the European Market Infrastructure Regulations on 27 April 2015.
- 1.9 On 31 January 2020, HKCC entered the interim list of third-country CCPs under the Temporary Recognition Regime of the Central Counterparties (Amendments, etc., and Transitional Provision) (EU Exit) Regulations 2018 of the UK, which enables HKCC to continue to provide clearing services and activities in the UK.

Principle 2: Governance

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

REGULATORY REQUIREMENTS

- 2.1 As mentioned above, HKCC has various statutory duties, including to ensure, so far as reasonably practicable, that there are orderly, fair and expeditious clearing and settlement arrangements for transactions cleared or settled through its facilities and that risks associated with its business and operations are managed prudently. It must, at all times, provide and maintain adequate and properly equipped premises, competent personnel, and automated systems with adequate capacity, facilities to meet contingencies or emergencies, security arrangements and technical support, for the conduct of its business. In discharging its statutory duties, HKCC is under an obligation to act in the interest of the public, having particular regard to the interest of the investing public. Where there is a conflict between the public interest and HKCC's own interest, HKCC is required to ensure that the interest of the public prevails.
- 2.2 As an RCH, HKCC's Articles of Association, the HKCC Rules and HKCC Procedures, fees and fee structure, and all amendments must be approved by the SFC before they become effective.

GOVERNANCE OF HKEX

- 2.3 HKEX, a publicly listed company in Hong Kong, is HKCC's holding company. HKEX is currently the only exchange controller recognised by the SFC under Division 4 of Part III of the SFO. As a recognised exchange controller, HKEX has a statutory duty to ensure, among other things, that any RCH controlled by it (including HKCC) performs its duties competently. Accordingly, HKEX actively oversees and ensures the proper functioning of HKCC. HKEX exercises appropriate control and oversight over the performance of HKCC's functions and overall operation, financial arrangements, risk management, business and strategic direction.
- 2.4 HKEX adopts a group governance structure over its Hong Kong regulated exchanges and clearing houses, including HKCC. As a recognised exchange controller, HKEX's board structure and the appointment of HKEX's chairman, chief executive and chief operating officer must comply with the SFO's requirements. The appointment of the chairman of HKEX requires the approval of the Chief Executive of Hong Kong, and the appointments of its chief executive and chief operating officer require the approval of the SFC. Further, the Financial Secretary of Hong Kong has the power to appoint up to 8 members to the

HKEX Board where the Financial Secretary of Hong Kong is satisfied that it is appropriate to do so in the interest of the investing public or in the public's interest.

- 2.5 The HKEX Board consists of six directors¹⁶ appointed by the Financial Secretary of Hong Kong (including the chairman), six shareholder-elected directors and one ex officio executive director, namely the chief executive of HKEX. As a listed company, HKEX is regulated by the Rules Governing the Listing of Securities on the SEHK (**Listing Rules**) and supervised by the SFC in terms of its compliance with the Listing Rules. The composition of the HKEX Board meets the requirement of the Listing Rules by having at least three independent non-executive directors who represent at least one-third of the board. HKEX's Articles of Association contain provisions reflecting these requirements.
- 2.6 The HKEX Board plays a central supporting and supervisory role in the HKEX corporate governance structure, provides leadership and guidance for all the HKEX Group's activities, including HKCC's activities, and oversees the execution of HKEX's business strategies. The HKEX Board has overall responsibility for ensuring that appropriate systems of risk management and internal control are in place. HKEX Group's risk governance structure is based on the "3 lines of defence" model with oversight and direction from the HKEX Board and various committees of HKEX and its subsidiaries including HKCC.
- 2.7 HKCC is subject to the oversight and scrutiny of the HKEX Board committees on specific matters, including the RMC, BRC, Audit Committee, Remuneration Committee and Investment Committee. Unless there is a sound reason for them to diverge, HKCC's policies in these areas are intentionally consistent with the HKEX Group policies. For good group governance reasons, the following arrangements (among others) apply:
- (a) the RMC may formulate and advise on risk management matters relating to HKEX's activities and the activities of its regulated subsidiaries including HKCC for consideration by HKEX. The size and composition of the RMC must follow the provisions laid down in the SFO. The Financial Secretary of Hong Kong has the power to appoint at least three members to the RMC;
 - (b) the BRC oversees the overall risk management framework and advises the HKEX Board on HKEX Group's risk related matters;
 - (c) the Audit Committee reviews the accounting principles and practices adopted by HKEX Group, including HKCC, and assists the HKEX Board in auditing, internal control systems and financial reporting matters;
 - (d) the Remuneration Committee is responsible for the formulation of remuneration policy and the guidelines for the recruitment and remuneration of directors and senior management for the HKEX Board's approval. It reviews the remuneration of the

¹⁶ Directors are appointed by the Financial Secretary of Hong Kong pursuant to Section 77 of the SFO. In all respects other than the manner of their appointment, such directors are the same as the shareholder-elected directors of HKEX.

HKEX Board directors annually with reference to companies of comparable business or scale. Any change to the remuneration is subject to HKEX shareholders' approval; and

- (e) the Investment Committee's duties, powers and functions include providing market expertise and advice to the HKEX Board on investments of HKEX, including advice on investment policies, asset allocation and selection of fund managers and custodians.
- 2.8 HKEX has three consultative panels, namely (a) Cash Market Consultative Panel; (b) Derivatives Market Consultative Panel; and (c) Clearing Consultative Panel, each chaired by a member of the HKEX Board and comprised of a cross-section of appropriate market participants and acting as the advisory bodies to provide market expertise and advice relating to the cash market, derivatives market and clearing business respectively.
- 2.9 As mentioned, HKEX is subject to the Listing Rules including the Corporate Governance Code. Similar to other listed companies, HKEX is expected to (a) keep the market and shareholders informed of price sensitive information in a timely manner; (b) disclose and, where appropriate, obtain shareholders' approval in respect of important acquisitions and disposals; (c) publish financial information on an annual and semi-annual basis (HKEX elects to do so on a quarterly basis); and (d) overall observe a high standard of corporate governance.

GOVERNANCE OF HKCC

- 2.10 The HKEX Board and management supervise and control all HKEX operations, including HKCC. The HKCC Board currently consists of four directors, who are senior executives of HKEX. The HKCC Board directs and manages the activities of HKCC in accordance with the HKCC Rules, the applicable law and the regulatory regime governing HKCC. In addition, the HKCC Board has delegated its power to adjudicate disciplinary matters to the Disciplinary and Disciplinary Appeals Committees of HKFE.
- 2.11 The HKCC Board has multiple roles and responsibilities as set out in its terms of reference, including but not limited to:
- (a) managing HKCC's business in accordance with its Articles of Association;
 - (b) ensuring HKCC's compliance with the laws, rules and regulations governing it;
 - (c) promoting HKCC's vision, mission, principles, policies and values;
 - (d) overseeing and enhancing HKCC's development, and monitoring its strategic and annual operating plan as well as the financial budget;
 - (e) making rules for the proper regulation and efficient operations of the clearing and settlement facilities which HKCC operates;

- (f) making rules which provide for the taking of proceedings or other action if an HKCC Participant appears to be unable, or likely to become unable, to meet its obligations in respect of all unsettled or open Market Contracts to which it is a party;
- (g) overseeing all matters and formulating policies in relation to HKCC's internal control, businesses and corporate accommodation, risk management, and supervising the implementation of such policies;
- (h) reviewing HKCC's performance against targets and objectives, in particular its performance in matters of finance, business, corporate governance and corporate social responsibility; and
- (i) ensuring accountability towards and sufficient communication with HKCC's stakeholders, in particular its shareholders and HKCC Participants.

2.12 The organisational structure of the HKEX Group, the terms of reference and composition of the HKEX Board and its committees, the HKCC Board and HKFE's committees are published on the HKEX website for access by the public. Please refer to *Chapter 5 - List of Publicly Available Resources on the HKEX Website*, for a list of publicly available resources about HKCC.

HKCC MANAGEMENT

2.13 HKCC's management consists of the employees, executives and staff within the HKEX Group who have the function of designing, implementing and administering the HKCC Rules and HKCC Procedures and managing HKCC and its clearing, settlement and collateral management services. HKCC's senior management team is responsible, among others, for making recommendations to, and implementing decisions of, the HKCC Board, managing the operation of the company's business, ensuring HKCC's activities are consistent with its objectives and risk tolerance, and that internal control and risk management procedures are properly designed and executed.

LEGAL RESPONSIBILITIES

2.14 HKCC is a "public body" for the purposes of the Prevention of Bribery Ordinance (**PBO**). Under the PBO, HKCC's employees are public servants for the purposes of the PBO and subject to the stringent controls in relation to public bodies. It is an offence under the PBO for a public servant to solicit or accept any advantage relating to his work in the public body concerned unless he has written permission of the public body. Furthermore, there are provisions in the PBO specifically focusing on persons having dealings with public bodies. It is an offence for anyone to offer an advantage to a public servant as an inducement for performing or abstaining from performing any act in his capacity as a public servant or for procuring of any contract with a public body for the performance of any work. The Corruption Prevention Department of the Hong Kong Independent Commission Against Corruption (**ICAC**) gives special attention to public bodies and meets with them regularly for necessary corruption prevention work.

- 2.15 HKEX has a Group Anti-Bribery and Anti-Corruption Policy which applies to all employees of HKEX Group, directors of HKEX and its subsidiaries including HKCC, and members of committees of HKEX Group. HKEX Group is committed to ensuring that no bribes, kickbacks or similar gifts, payments or advantages are solicited from or given or offered to any person, whether in the public or private sector, for any purpose.

CONFLICTS OF INTEREST POLICY

- 2.16 HKEX has implemented procedures to deal with conflicts of interest. Directors and committee members of HKEX and its subsidiaries including HKCC must avoid conflicts of interest and fully disclose any interest in transactions, arrangements, contracts or potential contracts with any company within HKEX Group and shall abstain from discussion and voting if there is an actual or potential conflict of interest in accordance with the guideline on conduct contained in the Director's Handbook issued to them. The Director's Handbook is publicly available on the HKEX website. Additionally, all employees and directors who are HKEX employees must comply with HKEX's Conflict of Interest policy which is set out in the Code of Conduct, contained in HKEX's Human Resources Manual. HKEX employees must avoid conflict of interests, whether direct or indirect, or whether actual or potential, which may compromise their integrity and put HKEX's interests and reputation at stake.

Principle 3: Framework for the Comprehensive Management of Risks

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

RISK MANAGEMENT FRAMEWORK

- 3.1 HKEX has in place a GRM framework to identify, assess, monitor and manage the entire range of risks inherent in its business and operations arising from both internal and external sources on an ongoing basis. HKEX, including HKCC, reviews the risk management framework regularly, covering the following risks:
- (a) **Legal and regulatory risk** – the Hong Kong legal framework supports and allows HKCC to conduct all material aspects of its activities as a CCP. Legal and regulatory division also observes changes in laws and regulations that may affect CCP. For legal risk, please refer to the description under Principle 1: Legal Basis;
 - (b) **Liquidity risk** – HKCC assesses its liquidity needs daily, including using stress testing and maintains sufficient liquid resources to ensure that it is able to meet its payment and delivery obligations in a timely manner including under default scenarios in extreme but plausible market conditions. Please refer to the description under Principle 7: Liquidity Risk;
 - (c) **Credit risk** – to minimise the risk that HKCC Participants would be unable to meet their payment and delivery obligations under Market Contracts, and the requirements for Margin, RF contribution (**RF Contribution**) and collateral, in a timely manner, HKCC applies risk-related participation requirements. These include the imposition of minimum capital requirements and daily credit risk monitoring of HKCC Participants through a set of risk metrics. HKCC maintains financial resources sufficient to cover a wide range of potential stress scenarios including default scenarios in extreme but plausible market conditions. Please refer to the description under Principle 4: Credit Risk;
 - (d) **Market risk** – HKCC imposes Margin requirements to cover current and potential future market fluctuations. All outstanding positions resulting from Market Contracts are marked to market and subject to Margin calculation on daily basis. Furthermore, HKCC collects holiday margin (**Holiday Margin**) to mitigate the potential market risk on the reopening of Hong Kong markets after a holiday break. Please refer to the description under Principle 4: Credit Risk and Principle 6: Margin;
 - (e) **Settlement risk** – payments between HKCC and HKCC Participants are made via intra-bank transfers to and from HKCC's bank accounts with the Settlement Banks. HKCC minimises settlement risk by imposing stringent appointment criteria for its Settlement Banks, ongoing monitoring on concentration of exposures and regular

assessment of their performance. Please refer to the description under Principle 9: Money Settlements;

- (f) **General business risk** – HKCC follows HKEX’s GRM framework to identify, monitor and manage all risks including general business risk. External and internal factors including but not limited to regulatory developments, market conditions, business strategy and control procedures on spending are evaluated and reviewed regularly. Please refer to the description under Principle 15: General Business Risk;
- (g) **Custody and investment risks** – HKCC adopts stringent selection criteria when appointing settlement and custodian banks to safe keep its own investments and HKCC Participants’ assets. HKCC’s investment strategy follows the primary principles of HKEX Group Investment Policy – Internally Managed Funds (**Investment Policy**), which is set by the Investment Committee and approved by the HKEX Board, with an aim to preserve capital, remain sufficiently liquid and minimise risk while optimising return on investments. Please refer to the description under Principle 16: Custody and Investment Risks; and
- (h) **Operational risk** – HKCC follows HKEX’s GRM framework to identify, monitor and manage all risks including operational risks. Risk measures and controls are in place to address specific operational risks that may affect its critical operations and services, including cyber security risk, physical security risk and business continuity risk. Please refer to the description under Principle 17: Operational Risk.

RISK MANAGEMENT POLICIES, PROCEDURES AND SYSTEMS

- 3.2 HKCC’s risk management is an integral part of HKEX’s GRM framework, approved by the BRC. It mandates a consistent and effective approach, applied across the HKEX Group to manage the risks and is based on the international standard ISO (International Organization for Standardization) 31000 - Risk Management. The risks specific to HKCC’s clearing activities are identified, assessed, reported and monitored. Please see the Risk Committee Report¹⁷ for more details of the GRM Framework.
- 3.3 Effective risk management is important to the HKEX Group’s achievement of its strategic goals. The HKEX Group manages risk across multiple risk domains, including but not limited to financial, business and strategic, operational (including IT and cyber security) and legal and regulatory risks.
- 3.4 HKCC employs a holistic information and risk-control system to provide it with timely information to identify, monitor, and manage its risks. Procedures and controls are in place for HKCC to manage the risk borne by its activities. For instance, it receives real-time price data from HKFE, via HKATS, for the accurate and timely measurement and aggregation of risk exposures. Furthermore, it uses various price data inputs, to determine the daily settlement price for each contract, which is used in the margining and

¹⁷ https://www.hkexgroup.com/-/media/HKEX-Group-Site/ssd/Corporate-Governance/Documents/riskreport_e.pdf

mark-to-market processes. HKCC monitors its current exposure and potential future exposure to each HKCC Participant's Market Contracts during each business day. HKCC uses DCASS, together with CCMS, to aggregate and centrally manage its exposures and calculate the amount of Margin or other collateral to be collected from each HKCC Participant. Please refer to the description under Principle 6: Margin.

- 3.5 HKCC monitors various metrics on a daily basis as part of its risk monitoring framework, including but not limited to:
- (a) the adequacy of coverage of Margin against HKCC's exposures, at current market prices; and
 - (b) stress test data relative to historic exposures compared across HKCC Participants and under extreme but plausible market conditions.

RECOVERY AND WIND DOWN PLAN

- 3.6 HKCC conducts regular business impact analyses of its critical business processes and systems. HKCC identifies scenarios that could impair its operations and maintains appropriate contingency arrangements to minimise possible damage to HKCC, its markets, participants and investors. HKEX, together with HKCC, maintains an up-to-date Market Contingency Plan (**MCP**) and participates in the regular Market Contingency Rehearsal Exercise (**Market Wide Rehearsal**) led by the government of the Hong Kong Special Administrative Region. HKEX's Business Continuity Management function provides coordinating support for the Market Wide Rehearsal with financial regulators and has a responsibility to develop, implement and support HKEX's market contingency planning, policies, procedures and activities across the organization. HKEX runs system recovery and business continuity drills regularly with relevant stakeholders where applicable.
- 3.7 HKCC maintains a recovery plan that is intended to be used in the event that HKCC experiences a threat to its viability and financial stability that may prevent the continued provision of critical services. Consistent with the guidance in the CPMI-IOSCO Recovery of financial market infrastructures report¹⁸, the recovery plan outlines the recovery planning process of HKCC, including identification of critical services, stress scenarios, triggers to implement the plan, as well as the recovery tools available and the scenarios that the recovery tools should be applied to. Please refer to the descriptions under Principle 4: Credit Risk, Principle 7: Liquidity Risk, Principle 13: Participant-default Rules and Procedures and Principle 15: General Business Risk for details of the recovery tools.
- 3.8 In the extreme situation that HKCC has decided it does not have the necessary resources to continue the clearing and settlement services, it will maintain its operations until it has wound down its clearing and settlement services in relation to futures and options

¹⁸ CPMI-IOSCO Recovery of financial market infrastructures issued in October 2014 and revised report issued in July 2017.

contracts in an orderly manner (**Clearing Service Termination Event**) with the remaining financial resources, as described under Principle 15: General Business Risk. HKCC will terminate every open contract between HKCC and the HKCC Participants and all prevailing obligations in respect of each such contract between them shall cease and be replaced with the obligations to pay or receive the termination amounts in accordance with the HKCC Rules and HKCC Procedures.

CLOSE-OUT NETTING IN THE EVENT OF CCP DEFAULT

- 3.9 In the event of an HKCC failure to pay event or an HKCC insolvency event as referred to in HKCC Rules 545 to 551, HKCC Participants have the right to terminate all their open contracts with HKCC. At the time of termination, all obligations of the HKCC Participants will be closed-out, netted and set-off in accordance with the HKCC Rules and HKCC Procedures.

REVIEW OF THE EFFECTIVENESS OF RISK MANAGEMENT POLICIES, PROCEDURES AND SYSTEMS

- 3.10 In formulating new policies or making material changes to existing policies, HKCC would consult and solicit feedbacks from market participants.
- 3.11 The Clearing Risk Management Department meets on a quarterly basis with the RMC to provide an update on HKCC's risk exposures and on the effectiveness of its risk management framework. The RMC will be consulted in relation to any proposed material changes to the risk management framework before they are submitted to the HKEX Board for approval.
- 3.12 There is also a BRC which meets at least four times a year. Its main function is to oversee the overall risk management framework and advise the HKEX Board on HKEX Group's risk-related matters. Reporting to the BRC, the Executive Risk Committee (**ERiC**) is responsible for reviewing and endorsing risk management policy and frameworks, and identifying and reviewing risks from all risk themes.
- 3.13 In addition, the Clearing Risk Committee (**CRC**) acts as a specialised risk management committee that focuses on reviewing and assessing risk matters concerning HKEX Hong Kong clearing houses including HKCC and reports to both ERiC and BRC.

Principle 4: Credit Risk

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

KEY COMPONENTS OF HKCC RISK MANAGEMENT FRAMEWORK

Credit Exposure to HKCC Participants

- 4.1 As a CCP, HKCC has a comprehensive risk management framework to monitor and manage its credit exposure, based on the following key components :
- (a) HKCC Participant admission requirements and regular risk scoring analysis for identifying and monitoring risks posed by HKCC Participants;
 - (b) processes for mark-to-market, margining, collection of concentration risk margin (**Concentration Risk Margin**), Holiday Margin and RF Additional Margin;
 - (c) CBPL imposed to ensure that risk exposure is commensurate with the financial strength of HKCC Participants;
 - (d) RF and other financial resources to cover default losses exceeding the collateral collected from the defaulting HKCC Participants;
 - (e) clear and enforceable HKCC Participant default rules and procedures. Please refer to the description under Principle 13: Participant-default Rules and Procedures; and
 - (f) adequate collateral policy to accept collateral with low credit, market and liquidity risks. Please refer to the description under Principle 5: Collateral.
- 4.2 The risk management framework is subject to both regular as well as ad-hoc reviews in response to changing regulatory requirements, business needs or developments in the

financial markets. HKCC also seeks market feedback via risk forums, consultative panels, industry associations and bilateral meetings with HKCC Participants. Any change to the framework will be subject to the established internal and external approval processes. HKCC Participants will be informed of any changes where appropriate via circulars, which are publicly available on the HKEX website.

Credit Exposure to Settlement Banks

- 4.3 HKCC has a robust framework to manage its credit exposure to its Settlement Banks. The framework covers financial and operational criteria for the appointment and ongoing monitoring of Settlement Banks. Please refer to the description under Principle 9: Money Settlements.

CREDIT EXPOSURE TO HKCC PARTICIPANTS

- 4.4 The following are the key measures adopted by HKCC to manage its credit exposure to HKCC Participants.

HKCC Participant Admission Requirements and Regular Risk Scoring Analysis

- 4.5 Currently, licensed corporations¹⁹ and RIs²⁰ under the SFO can be admitted as HKCC Participants. A CP must be a licensed corporation whilst a GCP must be a licensed corporation or an RI. The SFC and the Hong Kong Monetary Authority (**HKMA**) are the front-line regulators of licensed corporations and RIs respectively. HKCC is responsible for monitoring HKCC Participants' clearing and settlement activities and their compliance with HKCC Rules.
- 4.6 HKCC sets participant admission requirements to ensure that the risk profile of each HKCC Participant meets the required standard. HKCC requires CPs and GCPs that are licensed corporations to have minimum liquid capital higher than the minimum liquid capital required under the Securities and Futures (Financial Resources) Rules (Chapter 571N of the Laws of Hong Kong) (**FRR**). GCPs that are registered institutions should have a minimum Tier 1 capital of HK\$390 million.
- 4.7 During the HKCC Participant admission review process, HKCC considers the key operational and internal control aspects of the applicant, including the experience of its key personnel and reviews its compliance and risk management policies and systems. All admitted HKCC Participants must comply with the continuing obligations set out in the HKCC Rules.
- 4.8 HKCC routinely measures and monitors its current and potential future credit exposures to HKCC Participants that are licensed corporations with reference to their monthly

¹⁹ More specifically, licensed corporations that are licensed to carry on Type 2 Regulated Activity (Dealing in Futures Contracts) under the SFO.

²⁰ More specifically, an RI (i.e. a registered institution) that is registered to carry on Type 2 Regulated Activity (Dealing in Futures Contracts) under the SFO.

financial returns obtained through the SFC. Daily risk scoring analysis is also conducted based on the Counterparty Risk Exposure Scoring Toolkit in which each HKCC Participant is assessed and assigned a risk score based on key risk measures including expected uncollateralized loss, open settlement positions, operational weaknesses such as settlement delays, counterparty leverage and credit rating of the HKCC Participant. The methodology provides a dynamic and holistic risk management tool to monitor HKCC Participant's exposure and credit risk more effectively and enhance decision-making on applying additional risk management measures.

Mark-to-Market and Margining

- 4.9 To cover its current credit exposure, HKCC marks all open positions to market based on their respective settlement prices to calculate the VA for each Clearing Account. The VA calculation is conducted twice daily after the end of the normal trading session and the AHT session.
- 4.10 To cover its future credit exposure, HKCC calculates the CH Margin requirements of HKCC Participants twice daily using HKEX's Portfolio Risk Management System (**PRiME**)²¹ based on its assessment of the maximum potential losses of a futures or an options contract or a portfolio of futures and options contracts over the margin period of risk (currently one day) under 16 simulated market scenarios and a defined confidence level. Ad hoc intra-day margin (**IDM**) will also be triggered when there is a CH Margin erosion of 25% in any HKCC product during normal trading sessions. Prior to the final settlement day of the physically settled contracts, HKCC will impose a spot month charge / physical delivery contract charge on spot month physical delivery contracts to mitigate the potential risks arising from physical delivery.
- 4.11 HKCC also imposes Concentration Risk Margin on an HKCC Participant if the projected aggregate loss (less any CH Margin) of that HKCC Participant in any product group based on the RF stress assumptions (**Net Projected Loss**) is greater than 30% of the total Net Projected Loss of all HKCC Participants and the total Net Projected Loss of the product group concerned is in excess of HK\$500 million. Prior to a holiday period, HKCC collects Holiday Margin based on the adjusted CH Margin levels from HKCC Participants.
- 4.12 HKCC performs daily back-testing and monthly sensitivity analyses to assess its Margin model performance and Margin coverage. The back-testing results show that the model performance and Margin coverage are satisfactory. For further details regarding the Margin methodology, please refer to the description under Principle 6: Margin.

²¹ PRiME is a SPAN (Standard Portfolio Analysis of Risk) compatible margining algorithm. SPAN is a registered trademark of the Chicago Mercantile Exchange. PRiME is documented in the "PRiME Margining Guide" which is publicly available on the HKEX website: <https://www.hkex.com.hk/-/media/HKEX-Market/Services/Clearing/Listed-Derivatives/Risk-Management/Margin/Clearing-House-Margining-Methodology-PRiME/PRiME-Margining-Guide.pdf>

CBPL

- 4.13 HKCC imposes CBPL on each HKCC Participant based on its latest liquid capital or, in the case of a GCP which is a registered institution, its adjusted capital, plus the cash RF contribution, to ensure the risk exposure of each HKCC Participant is commensurate with its financial strength. An HKCC Participant in breach of its CBPL must take remedial action to observe compliance within the timeline set by HKCC and an additional margin (**Additional Margin**) equivalent to at least 25% of its exposure in excess of its position limits will be imposed on the HKCC Participant until the breach is rectified. In addition, during the AHT session where banking services are not available, HKCC performs monitoring of HKCC Participants' CBPL based on the latest market prices and positions on an hourly basis (plus ad-hoc if necessary) to ensure HKCC Participants' exposures are within the limits.

RF and other Financial Resources

- 4.14 HKCC maintains a RF to meet its obligations and liabilities as a CCP if losses arising from one or more HKCC Participant defaults cannot be fully covered by the Margin (including all aforementioned additional collateral such as Concentration Risk Margin) collected from the defaulting HKCC Participants. The RF can also be used as a source of liquid funds to meet any immediate payment obligations of HKCC in relation to an HKCC Participant default. The RF comprises HKCC Participants' contributions, HKCC's appropriations to the RF (also known as "Skin-in-the-game" or "**SITG**" and equals to 10% of the RF size) and interest income of the RF.
- 4.15 An HKCC Participant's RF Contribution is comprised of a fixed component (**Fixed Contribution**) and a variable component (**Variable Contribution**). A review of the size of RF and corresponding determination of HKCC Participants' contribution is conducted on a monthly basis and more frequently if appropriate. A maximum threshold (**RF Threshold**) is imposed on the RF size with reference to the highest RF size in the past 10 years. HKCC informs HKCC Participants of any change in the size of the RF after a review via circular.
- 4.16 The Fixed Contribution for each CP and GCP is HK\$1.5 million and HK\$7.5 million respectively. The total Variable Contribution to be collected from all HKCC Participants is determined with reference to stress testing results, and each HKCC Participant is required to contribute according to its allocated share. In arriving at an HKCC Participant's Variable Contribution requirement, a Variable Contribution Credit of up to HK\$1 million is granted to every HKCC Participant. As a result, an HKCC Participant will only be required to provide Variable Contribution for the amount in excess of the Variable Contribution Credit.
- 4.17 HKEX currently sets aside HK\$4 billion of shareholders' funds as HKEX Risk Management Capital (**RM Capital**) for strengthening the risk management regime of the clearing houses and supporting their roles as CCPs. The RM Capital also supports,

among other things, HKCC's appropriations to the RF and Variable Contribution Credits provided to the HKCC Participants.

CREDIT EXPOSURE TO SETTLEMENT BANKS

4.18 HKCC is also exposed to credit risk of its Settlement Banks and has in place a Settlement Bank policy approved by the HKEX Board to manage such exposures. Please refer to the description under Principle 9: Money Settlements for details.

STRESS TESTING – SUFFICIENCY OF FINANCIAL RESOURCES

4.19 HKCC has a comprehensive stress testing framework in place to ascertain the sufficiency of the RF and other financial resources. It conducts daily stress testing against HKCC Participants' open positions taking into consideration the projected risk exposure of the RF and prevailing market conditions. The risk exposure of the RF is assessed with reference to three key assumptions:

- (a) price movements²² ($\pm 20\%$ for key markets);
- (b) implied volatility movement²³ for options contracts (from -32% to $+91\%$); and
- (c) simultaneous default of the single largest HKCC Participant and the fifth largest HKCC Participant.

4.20 Moreover, HKCC evaluates stress testing of the Hang Seng Index (**HSI**) futures market at the highest historical price movement of $\pm 25\%$ ²⁴ on a daily basis to monitor the adequacy of the RF together with other financial resources. Stress testing results are reported to HKEX's senior management on a daily basis, to the SFC on a weekly basis, to the CRC on a monthly basis, to the ERiC, BRC and the RMC on a quarterly basis.

4.21 Based on the daily stress testing results, HKCC will demand additional Variable Contributions from HKCC Participants if the risk exposure of the RF exceeds 90% of the sum of the existing RF size and the aggregate Variable Contribution Credit utilized by all HKCC participants. HKCC also re-calculates the required RF size on the first business day of every month based on the maximum daily stress testing results in the most recent 60 business days. In both ad hoc and monthly reviews, a buffer equivalent to 10% of the maximum risk exposure calculated in the most recent 60 business days is incorporated in determining the required RF size. The size of the RF cannot exceed the

²² The price movement assumptions for HKCC products:

- (a) Equity and Equity Index products: ± 6 to $\pm 56\%$;
- (b) Currency products: $\pm 4\%$ to $\pm 9\%$;
- (c) Interest Rate products: $\pm 30\%$; and
- (d) Commodity products: ± 12 to $\pm 25\%$.

²³ The implied volatility movement assumptions for HKCC products:

- (a) Equity Index products: -32% to $+91\%$
- (b) Currency products: -11% to $+38\%$

²⁴ The movement during the market crash in 1987 which was exacerbated by the four-day closure of the Hong Kong markets has been excluded. It is believed that such market closure will not recur in the foreseeable future.

RF Threshold. The RF Additional Margin will be collected from the relevant HKCC Participants when the RF Threshold is reached. Please refer to the description under paragraph 4.23 for more details.

- 4.22 The share of Variable Contribution of each HKCC Participant is determined with reference to HKCC Participants' share of average net Margin liabilities in the most recent 60 business days. HKCC provides reports to HKCC Participants of their required RF Contributions following each monthly and ad hoc review. The required Variable Contributions are collected on the first business day from the date of the notification.

RF Additional Margin

- 4.23 When the size of the RF has reached the RF Threshold, HKCC will collect RF Additional Margin from an HKCC Participant if its Net Projected Loss is in excess of 50% of the RF Threshold in order to cover the risk exposure in excess of the RF. The amount of RF Additional Margin is equal to the Net Projected Loss of the HKCC Participant less 50% of the RF Threshold. If an HKCC Participant is subject to RF Additional Margin based on its Net Projected Loss as of the end of a given day, it is required to settle such RF Additional Margin by 11:00 am of the next business day.

Review of Stress Testing Model

- 4.24 HKCC reviews its stress testing model monthly to assess the appropriateness of the adopted assumptions, parameters and scenarios, taking into consideration the latest market dynamics such as local and international market conditions, participant default events and new HKFE products and/or trading arrangements. This review will be conducted more frequently when the market is unusually volatile, less liquid or when the concentration of positions held by HKCC Participants increases significantly. HKCC performs an annual independent validation of the model.
- 4.25 HKCC also conducts monthly reverse stress testing to identify the extreme scenarios and market conditions in which the RF and other financial resources would not provide sufficient coverage of tail risk. HKCC conducts the testing by applying a combination of different extreme price movements and counterparty default scenarios against both hypothetical and actual portfolios of HKCC Participants. The reverse stress testing results are reported to the CRC and the SFC on a monthly basis.

USE OF RF AND OTHER FINANCIAL RESOURCES – THE WATERFALL

- 4.26 In the event of an HKCC Participant default, HKCC will first use the available non-pooled resources, such as various margins (CH Margin, Holiday Margin and Concentration Risk Margin) collected from the defaulting HKCC Participant. Thereafter, HKCC will apply other financial resources in accordance with HKCC Rule 706(c). Please refer to the description under Principle 13: Participant-default Rules and Procedures.

Allocation of Default Losses and Replenishment Arrangements

- 4.27 In the event of an HKCC Participant default where non-defaulting HKCC Participants' contributions to the RF are used to cover a default loss under the HKCC Rules, the contributions will be applied to share the default loss on a pro-rata basis by reference to HKCC Participants' respective contributions to the RF on the business day immediately prior to the date of default declaration.

Recovery Plan

- 4.28 The recovery plan would be triggered where the defaulting HKCC Participant's collateral is insufficient or total pre-funded financial resources are anticipated to be insufficient. The following are the recovery tools available to HKCC to allocate its uncovered credit losses arising from HKCC Participant default.

Assessment

- 4.29 Whenever the whole or part of the RF is applied to cover a closing-out loss of a default or the total pre-funded financial resources are anticipated to be insufficient, HKCC will issue a notice of assessment (**Notice of Assessment**) demanding each non-defaulting HKCC Participants to provide such additional contributions to the RF. The non-defaulting HKCC Participants must provide Assessments within one business day after the date of the Notice of Assessment or within such other time period as may be specified by HKCC.
- 4.30 HKCC may call for Assessments over a period of five business days from the date on which HKCC declares an HKCC Participant to be a defaulter (referred to as the "**Capped Liability Period**"). The Capped Liability Period would be extended by five business days (starting from the date of another HKCC Participant being declared as a defaulter) each time should there be a subsequent default(s) within a Capped Liability Period. The aggregate liability of an HKCC Participant to provide Assessments in respect of any default that occurs during the Capped Liability Period shall be limited to an amount which is equal to the HKCC Participant's Fixed Contribution and Variable Contribution calculated on the business day immediately preceding the start of the Capped Liability Period, plus one time such amount. Assessment shall not be required from HKCC Participants whose participantships have been effectively terminated by HKCC at or prior to the start of the Capped Liability Period.
- 4.31 HKCC Participants can limit their liabilities to any subsequent event of default that may occur following the expiry of the Capped Liability Period if they submit the notice of resignation and satisfy the participantship termination requirements before the expiration of the Capped Liability Period. HKCC also provides the resigning HKCC Participant with five additional business days following the expiry of such Capped Liability Period to close out / transfer its clients' positions in which such HKCC Participant is required to post additional collateral to cover its full stress loss.

Voluntary Recapitalization

- 4.32 In the event that financial resources made available through Assessments are insufficient to cover the remaining credit losses, HKCC may issue a notice (**Voluntary Recap Request Notice**) requesting each non-defaulting HKCC Participant to make a payment of funds to HKCC. There is no binding obligation on non-defaulting HKCC Participants to provide such additional resources to HKCC. If the total amount collected from non-defaulting HKCC Participants is not sufficient, any amounts received will be refunded to relevant non-defaulting HKCC Participants on the next business day.

Loss Distribution Process

- 4.33 Loss Distribution Process (at times referred to as Variation Margin Gains Haircut) allocates credit losses caused by HKCC Participant default by haircutting variation adjustment to profit-making non-defaulting HKCC Participants on a pro-rata basis. It may be applied in the event that the defaulting HKCC Participant's collateral, RF, Assessments and Voluntary Recapitalization have been utilized and losses remain. HKCC will consult the SFC for activation of the Loss Distribution Process.

Replenishment of RF

- 4.34 Following the expiration of the Capped Liability Period, HKCC Participants will be required to replenish their RF Contributions upon notification. RF replenishments will not be applied to any remaining uncovered credit losses related to an HKCC Participant default(s) during such Capped Liability Period. RF replenishments must be funded within one business day or as otherwise communicated by HKCC.
- 4.35 If there is a shortfall in HKCC's SITG contribution following the expiration of the Capped Liability Period, HKCC will seek replenishment of SITG. SITG replenishment is subject to the approval of the HKCC Board and an assessment of prevailing conditions and regulatory capital requirements applicable to HKCC. SITG replenishments will not be applied to any remaining uncovered credit losses related to an HKCC Participant default(s) during such Capped Liability Period.

Recovery of Default Losses

- 4.36 HKCC has the right to pursue recovery of any default loss incurred through legal proceedings against the defaulting HKCC Participant. Any recovered amount, net of recovery costs and expenses, may be refunded to the relevant HKCC Participants and/or HKCC in the reverse order of application in the default waterfall.
- 4.37 The above arrangements are documented in Chapter VII of the HKCC Rules.

Principle 5: Collateral

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

ACCEPTABLE COLLATERAL

- 5.1 HKCC accepts a range of eligible assets which have low credit, liquidity and market risk as collateral. HKCC has defined standards for eligible collateral, which are approved by the HKEX Board and subject to consultation with the SFC to determine which assets could be accepted as collateral, including:
- (a) sufficient liquidity in Hong Kong or international markets (if applicable);
 - (b) high quality with low credit risk;
 - (c) low wrong way risk (if applicable); and
 - (d) sufficient business/market demand.
- 5.2 Currently, HKCC accepts the following types of collateral from HKCC Participants to meet their Margin requirement:
- (a) cash (HKD, USD, RMB, EUR, JPY and SGD);
 - (b) Hong Kong Exchange Fund Bills and Notes (**EFBN**); and
 - (c) US Treasuries.
- 5.3 RF Contributions can be made in cash (HKD) (subject to a minimum) or EFBN. In practice, most HKCC Participants pledge cash collateral with HKCC.

VALUATION AND HAIRCUT

- 5.4 HKCC marks to market all collateral at least once daily. HKCC uses market data from information vendors for the valuation of non-HKD cash collateral and US Treasuries and market prices published by the HKMA for the valuation of EFBN. HKCC has the discretion to use other values if it reasonably believes that market prices do not represent the fair values of the collateral concerned. Where the currency of the collateral is different from the settlement currency of the contracts (currently HKCC contracts are traded and settled in HKD, USD, RMB, JPY and SGD), haircuts are applied. HKCC also applies haircuts on US Treasuries and EFBN in accordance with their remaining time to maturities.

- 5.5 In determining the haircut rates, HKCC calculates the projected volatility of the collateral at a two-tailed confidence interval of 99.73% based on historical price movements of different time intervals (ranging from seven days to one year depending on the collateral type) and incorporates a buffer to minimise the need to adjust the rates frequently. For cash collateral, the sufficiency of haircuts is further validated by comparing with the value-at-risk calculation based on historical and hypothetical stress scenarios. HKCC also takes into consideration those extreme price movements in assessing the adequacy of the haircut rate of each collateral type.
- 5.6 HKCC continuously monitors the volatility of the collateral. HKCC performs monthly review of the haircut rates to ensure their adequacy. In exceptional situations that may affect the volatility of the collateral, ad hoc reviews will be conducted to assess the adequacy of the haircut rate. HKCC performs independent validation on the haircut methodology on an annual basis.

CAPS ON COLLATERAL

- 5.7 There are different caps imposed on collateral to ensure HKCC has sufficient liquid resource to fulfil its payment obligations in the event of an HKCC Participant default.
- 5.8 For RMB, JPY and SGD denominated products, each HKCC Participant is allowed to satisfy its CH Margin requirements by any acceptable cash collateral (e.g. HKD or USD) and/or non-cash collateral (where non-cash collateral could satisfy up to 50% of the Margin requirements only) up to a limit prescribed by HKCC (currently RMB 1 billion, JPY 750 million and SGD 25 million respectively). Any CH Margin requirements beyond such limit shall be satisfied by cash in the relevant settlement currency.
- 5.9 For products denominated in non-RMB/JPY/SGD currencies (e.g. HKD or USD), HKCC Participants are required to satisfy at least 50% of the CH Margin requirements by cash collateral in the settlement currency of the product. Not more than 50% of an HKCC Participant's CH Margin requirement could be covered by non-cash collateral and/or cash collateral in currency other than the settlement currency of the product.

CROSS-BORDER (OR FOREIGN) COLLATERAL

- 5.10 HKCC accepts cash collateral in foreign currencies (i.e. USD, RMB, EUR, JPY and SGD) deposited in banks in Hong Kong, which are selected in accordance with the approved HKCC standards, to ensure that HKCC can use the foreign currencies cash collateral in a timely manner.
- 5.11 In accepting US Treasuries as collateral, HKCC has assessed and mitigated the legal risks relating to the enforceability of HKCC's rights to such collateral. HKCC has entered into an agreement with its foreign-incorporated custodian bank, Clearstream, to ensure the collateral can be accessed and used in a timely manner.

COLLATERAL MANAGEMENT SYSTEM

- 5.12 HKCC uses an integrated collateral management system, CCMS, to provide collateral management services to HKCC Participants in accordance with the HKCC Rules, HKCC Procedures and internal procedures.
- 5.13 CCMS performs collateralisation to determine the collateral requirements of HKCC Participants, tracks collateral movements, performs valuations and handles money settlement in respect of intra-day / day end VA and Margin and other money obligations. CCMS also facilitates HKCC and HKCC Participants to perform their daily and ad hoc reporting and monitoring of collateral balances in CCMS Collateral Accounts. It ensures that only acceptable collateral is included in the evaluation of sufficiency of collateral posted. CCMS also offers flexibility to accept different collateral types and to adjust concentration limits and haircuts to accommodate changes in the on-going monitoring and management of collateral.

Principle 6: Margin

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

- 6.1 HKCC uses VA and CH Margin as the main tools to mitigate its current and future credit exposures to HKCC Participants. In addition, HKCC imposes Holiday Margin, Concentration Risk Margin, Additional Margin²⁵ and/or RF Additional Margin²⁶ on HKCC Participants. HKCC has in place the operational capacity to enforce, and does enforce, the timely calculation and collection of VA and Margin.

VARIATION ADJUSTMENT

- 6.2 To cover its current credit exposure, HKCC marks all open positions to market based on their respective settlement prices to calculate the VA for each Clearing Account. This is done routinely twice a day, after the end of the normal trading session and the AHT session.

CH MARGIN

- 6.3 To cover its future credit exposure, HKCC calculates the CH Margin requirements of HKCC Participants twice daily using PRiME based on its assessment of the maximum potential losses of a futures or an options contract or a portfolio of futures and options contracts over the margin period of risk (currently one day) under 16 simulated market scenarios and a defined confidence level. Furthermore, prior to the final settlement day of the physically settled contracts, HKCC will impose a spot month charge / physical delivery contract charge on spot month physical delivery contracts to mitigate the potential risks arising from physical delivery.

Benchmark Margin Rates (Benchmark Rates)

- 6.4 HKCC determines the Benchmark Rates for each product over the margin period of risk (currently one day) by using an exponentially weighted moving average model²⁷. A one-tailed confidence interval of 99.73% is adopted for global derivatives products²⁸, while a two-tailed confidence interval of 99.73% is adopted for other products²⁹. Historical data periods of 90-days are typically used with the model for a majority of HKCC products

²⁵ HKCC demands Additional Margin from an HKCC Participant who is in breach of its CBPL. Please refer to the description under Principle 4: Credit Risk.

²⁶ When the size of the RF has reached the RF Threshold, HKCC will collect RF Additional Margin from an HKCC Participant if its net projected loss is in excess of 50% of the RF Threshold. Please refer to the description under Principle 4: Credit Risk.

²⁷ A model used to project volatility based on historical data with more weight being placed on more recent ones.

²⁸ Commodity products and currency products.

²⁹ Equity index products, equity products, and interest rate products.

although a shorter data period is also used to better reflect risk characteristics of the selected product. For new products, HKCC determines the Benchmark Rates with reference to the potential volatility simulated using historical data from their underlying instruments or other highly correlated products.

Margin Rates (Margin Rates)

- 6.5 For global derivatives products, HKCC determines the final Margin Rates based on 75% of Benchmark Rates and 25% of stress margin, where stress margin is the highest Benchmark Rate in the past 5-year rolling data period, with a cushion of 10% and subject to a minimum rate³⁰ of the notional value of the relevant contract.
- 6.6 Other than the global derivatives products, HKCC determines the final Margin Rate based on the Benchmark Rate with a cushion of 10% and subject to a minimum rate of 5% of the notional value of the relevant contract. For a few selected products, minimum rates other than 5% are adopted³¹ to better reflect their risk characteristics.
- 6.7 HKCC reviews the Margin Rates monthly to keep track of changes in market volatility. In addition to monthly reviews, HKCC conducts daily monitoring and will increase the Margin Rates³² if they are found to be less than that calculated based on the latest market data. HKCC also considers other market factors that might lead to unusual volatility such as unstable political or financial situations in the determination of the relevant parameters for the calculation of the Margin Rates. HKCC informs HKCC Participants of any change to the Margin Rates via circulars which are published on HKEX website.

Margin Position

- 6.8 Positions maintained in the House Account and Market Maker Account are margined on a net basis. Client positions maintained in an Omnibus Client Account are margined on a gross basis while those maintained in Individual Client Accounts³³ are margined on a net basis. Only positions owned by the same client are eligible to be maintained in an Individual Client Account.
- 6.9 Margin netting is currently provided for positions in products with the same or specified products with different underlying instruments in net margined Clearing Accounts. HKCC offers portfolio margining for products with significant and reliable correlation based on a long-term relationship. To ensure that the significance and reliability of the relationship between the product pair are maintained, HKCC monitors the margin

³⁰ Subject to annual review.

³¹ The minimum rate ranged between 3% and 23% of the notional value.

³² A cushion in excess of 10% may be applied if the product concerned has already experienced CH Margin inadequacy during the month.

³³ There is another net margined client account called client offset claim account (**Client Offset Claim Account**). This account is used by an HKCC Participant to record positions which are of an offset nature of the same beneficial owner whose positions would otherwise be recorded in an Omnibus Client Account.

reduction parameters daily and has in place a suspension mechanism to temporarily suspend the portfolio margining arrangement for a product pair if their correlation drops below the threshold. HKCC continuously reviews and monitors the performance of portfolio margining to ensure the margin coverage is sufficient.

ASSESSMENT AND SETTLEMENT OF VA/MARGIN REQUIREMENTS

- 6.10 The VA and Margin requirements of each Clearing Account are assessed twice daily, i.e. after the end of the normal trading session and the AHT session. HKCC Participants assessed with VA and/or Margin requirements are required to meet such obligations (Margin requirements and VA net of lodged collateral) by 9:15 am and noon on the following business day for the normal trading and the AHT sessions respectively. For the assessment after the AHT session, HKCC Participants are only required to meet such obligations when their assessment amount exceeds the tolerance limit of HK\$2 million.
- 6.11 In addition, an IDM call will be triggered when there is a CH Margin erosion of 25% in any HKCC product during normal trading sessions. The call is conducted based on the intra-day VA calculated using HKCC Participants' real-time open positions and prevailing market prices. Apart from the ad hoc IDM call which is triggered by market volatility, HKCC conducts a routine intra-day assessment on each HKCC Participant's CBPL (please refer to the description under Principle 4: Credit Risk for details of CBPL monitoring) after the close of the morning trading session and issues IDM calls to HKCC Participants who are in breach of their CBPL. HKCC Participants with VA shortfalls (net of lodged collateral) exceeding HK\$1 million in each IDM call must settle the amount within one hour after notification.

HOLIDAY MARGIN

- 6.12 The Holiday Margin arrangement of HKCC is an established risk management measure designed to mitigate the potential market risk on the reopening of the Hong Kong markets after a holiday break that could arise from significant overseas market movements or the occurrence of certain geo-political events during the Hong Kong holidays. Prior to the holiday period, HKCC will determine the appropriate levels of Margin Rates and collect Holiday Margin based on the adjusted CH Margin levels from HKCC Participants. A mandatory IDM call will also be made in the afternoon on the trading day prior to the holiday period and, same as the normal IDM call, it has to be settled by HKCC Participants within one hour after notification.

CONCENTRATION RISK MARGIN

- 6.13 HKCC imposes Concentration Risk Margin on an HKCC Participant if the Net Projected Loss of that HKCC Participant in any product group is greater than 30% of the total Net Projected Loss of all HKCC Participants and the total Net Projected Loss of the product group concerned is in excess of HK\$500 million. The Concentration Risk Margin ranges from 20% to 50% of the CH Margin on the concentrated positions depending on the HKCC

Participant's concentration level in that particular product group. The HKCC Participant has to settle the Concentration Risk Margin before 11:00 am on the day of notification.

PRICE DATA FOR VA AND MARGIN CALCULATIONS

6.14 HKCC receives real-time price data from HKATS. HKCC determines the daily settlement prices for all futures and options contracts for VA and Margin calculations. HKCC primarily uses price data near market close, including quotes from market makers, to determine the daily settlement price for each contract. If it is not available, HKCC will calculate theoretical prices with reference to other relevant information such as price data of other contracts in the same underlying instrument. HKCC may, in its discretion, adjust or otherwise determine the price to be used if necessary.

BACK-TESTING AND SENSITIVITY ANALYSIS OF THE MARGINING MODEL

6.15 HKCC conducts daily Margin back-testing to test (a) Margin coverage by comparing the Margin Rates with the actual daily price movements; and (b) sufficiency of Margin on all HKCC Participants' Clearing Accounts by comparing the simulated closing-out losses with the Margin.

6.16 HKCC also performs sensitivity analysis of the margining model on a monthly basis to test how the level of Margin coverage and risk exposures are affected by different market conditions with different assumptions and model parameters such as lookback periods of different duration. This analysis will be conducted more frequently when the market is unusually volatile, less liquid or when the concentration of positions held by an individual HKCC Participant increases significantly.

6.17 A high level summary of the back-testing and sensitivity analysis results is disclosed to the public via the HKEX website on a monthly basis. HKCC also discloses margin coverage results in the PFMI quantitative disclosures on a quarterly basis.

6.18 HKCC performs an annual independent validation of the margining model. The validation includes the assessment of the robustness and effectiveness of the model as well as the back-testing methodology.

Principle 7: Liquidity Risk

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

SOURCES OF LIQUIDITY RISKS

7.1 The major sources of HKCC's liquidity risks are as follows:

- (a) **Default of HKCC Participants** – as a CCP, HKCC is exposed to liquidity risk primarily in relation to the funding of the defaulting HKCC Participant's closing out loss;
- (b) **Default of liquidity providers** – HKEX has arranged committed credit facilities with selected liquidity providers to meet the liquidity needs at the HKEX Group level; hence HKCC faces the risk of default of one or more liquidity providers;
- (c) **Operational or financial failure of Settlement Bank(s)/custodian bank(s)** – HKCC also faces liquidity risks related to the inability to meet the release of surplus Margin and RF collateral of HKCC Participants due to failure of Settlement Bank(s)/custodian bank(s). HKCC also considers the liquidity risk associated with the default of any entity that takes on multiple roles, e.g. where a Settlement Bank is also a liquidity provider and/or an affiliate of an HKCC Participant; and
- (d) **Illiquidity of investments or collateral** – HKEX's Investment Policy aims to ensure that investment portfolios are sufficiently liquid at all times. Please refer to the description under Principle 16: Custody and Investment Risks.

LIQUID RESOURCES

7.2 HKCC's liquidity requirement is managed together with those of HKSCC and SEOCH by HKEX at the HKEX Group level. HKEX compares the availability of respective funds against the liquidity requirement of HKCC, HKSCC and SEOCH on a daily basis when making investment decisions. Adjustments to the maturities of the funds invested will be made where necessary.

7.3 HKCC invest Margin fund, RF and HKCC corporate fund only in assets with low credit, market and liquidity risks in accordance with the Investment Policy. The Investment Policy sets out minimum liquidity requirements on investments to ensure that HKCC has sufficient liquid resources to meet projected and stressed funding requirements and

Group Credit Limit for Settlement and Investments Framework (**Credit Framework**) sets out a concentration limit for each Settlement Bank/custodian bank to limit credit risk to the HKEX Group.

- 7.4 To mitigate issues relating to counterparty concentration, a cap is set on the total amount of the Margin funds, RF, guarantee fund and corporate funds of HKEX Group, including HKCC, that can be deposited with any one of its counterparties including the systemically important HKD note-issuing banks.
- 7.5 In addition to using the Margin, RF and HKCC corporate funds, HKCC may also access HKEX's corporate funds (including the RM Capital) and liquidity facilities to address the liquidity needs of HKCC. HKCC does not have access to central bank services; however, HKEX has arranged a total of HK\$10 billion unsecured committed credit facilities with options to draw down on the same day in HKD, USD and RMB and on the next day in SGD³⁴ and JPY³⁵ from selected liquidity providers. In an HKCC Participant default situation, these facilities, together with the defaulting HKCC Participant's Margin, the RF, and the HKCC and HKEX corporate funds would be available to meet the liquidity needs over multiple days following the occurrence of the default. Uncommitted repo facilities of HK\$6.5 billion are also available in case of need, but do not count as liquidity resources pursuant to the PFMI. In addition, HKEX and HKCC have put in place committed foreign exchange facilities of RMB 8 billion for same day value, and SGD 50 million and JPY 1.5 billion for next day value.
- 7.6 HKCC discloses the size and composition of the qualifying liquid resources in the PFMI quantitative disclosures on a quarterly basis.
- 7.7 HKEX has established procedures in applying different types of liquid resources at the HKEX Group's disposal to complete its payment obligations. The cash on hand will first be utilised and if additional resources are needed, HKEX may opt for early-termination of fixed-termed bank deposits, sales or repo of investment holdings and/or committed bank facility drawdowns based on the prevailing market conditions. Unannounced drawdown tests on liquidity providers are conducted on an annual basis to ensure that the committed credit facilities are readily available when needed.

MANAGING LIQUIDITY RISK AND STRESS TESTING

- 7.8 HKCC has a robust liquidity management framework with effective measurement, monitoring and management of liquidity risk. For daily liquidity assessment, HKCC does not only assume the default of HKCC Participants and their affiliates in their own market. HKCC also assumes the default of such participants and their affiliates in other on-exchange markets of HKEX (i.e. HKSCC and SEOCH) to ensure HKCC, and other HKEX on-exchange CCPs would have sufficient liquid resources to cover their payment

³⁴ Capped at SGD 100 million

³⁵ Capped at JPY 1.5 billion

obligations with a high degree of confidence under extreme but plausible market conditions.

- 7.9 The liquidity requirement required for each relevant currency in relation to HKCC Participant default is measured daily in accordance with a predefined stress testing policy, assumptions and procedures. As HKEX manages its liquidity funding at the HKEX Group level, the daily assessment covers a number of potential stress scenarios, including the default of the participant and its affiliates that generate the largest aggregate payment obligations across HKSCC, HKCC and SEOCH under extreme but plausible market conditions on a combined basis (such assumption being the same as the price movement assumptions used for the sufficiency of financial resources stress testing as described under Principle 4: Credit Risk). The daily assessment targets to cover the combined liquidity requirements of HKSCC, HKCC and SEOCH at a confidence level of at least 99% in a two-year lookback period. The assessment also considers the liquidity requirement associated with the default of Settlement Bank(s), custodian bank(s) and/or liquidity provider(s) at HKEX Group level and the results are monitored daily.
- 7.10 The Clearing Risk Management Department reports the liquidity stress testing results to HKCC's senior management and the SFC on a daily basis, to the CRC on a monthly basis and to the ERiC, BRC and RMC on a quarterly basis.
- 7.11 On a monthly basis, the Clearing Risk Management Department reviews the liquidity stress testing model to assess the appropriateness of the assumptions, parameters and scenarios by analysing the latest local and international market dynamics, HKCC Participant default events and new business initiatives. This monthly review will be conducted more frequently when the market is unusually volatile or less liquid or when the concentration of positions held by HKCC Participants increases significantly. HKCC performs an annual independent validation of the model.
- 7.12 HKCC also performs reverse stress testing on liquidity on a monthly basis to identify the extreme scenarios and market conditions in which liquid resources would not be sufficient.

RECOVERY TOOLS TO ADDRESS UNCOVERED LIQUIDITY SHORTFALLS

- 7.13 Where the liquid resources set out in the above paragraphs are unavailable or otherwise insufficient or anticipated to be insufficient, HKCC may utilize the following recovery measures.

HKCC's Obligations as CCP under Market Contracts

- 7.14 Under HKCC Rule 310, to the extent that the aggregate of funds or assets available to HKCC are insufficient to meet its obligations to HKCC Participants under Market Contracts, each HKCC Participant is only entitled to receive payment pro-rata to the amount due to it as compared to the amount due to all HKCC Participants. HKCC remains liable for the Market Contracts but payment of the balance due is only made when and to the extent that funds or assets are subsequently available. In relation to

HKCC's obligations under Market Contracts to deliver underlying instruments or a particular currency to HKCC Participants, HKCC Rules 409(c), 411(e) and 611 state that if HKCC determines that it is not possible or reasonably practicable to deliver the underlying instruments or currency, it may make money compensation or pay in a different currency in whole or in part to the relevant HKCC Participants in such amounts as HKCC may determine to be fair and reasonable.

Replenishment of Liquid Resources

7.15 For the replenishment of the RF, please refer to Principle 4: Credit Risk for more details.

Principle 8: Settlement Finality

An FMI should provide clear and certain final settlement, at a minimum by the end of the value date. Where necessary or preferable, an FMI should provide final settlement intraday or in real time.

- 8.1 HKCC acts as the CCP to clear and settle derivatives contracts traded on HKFE. Upon receiving trades from HKFE, via HKATS, HKCC registers³⁶ those trades in DCASS. Once registered, such contracts shall be irrevocable. HKCC will novate and replace the registered contracts with Market Contracts in accordance with the HKCC Rules and HKCC Procedures. Currently, all contracts cleared by HKCC are settled in cash except for the physically settled CNH and USD gold/silver futures contracts which are physically settled.
- 8.2 HKCC has both daily scheduled and ad hoc money settlement processes to settle HKCC Participants' money obligations, with different deadlines on a daily basis. HKCC sends payment instructions to HKCC's Settlement Banks for settlement via intra-bank transfers during the day. Money settlement will only be considered final and conclusive when HKCC receives payment confirmations from the Settlement Banks that the funds in the required currency have been received and credited to HKCC's bank accounts. The points at which settlement of both receiving and delivering payments become final and irrevocable are stipulated in the agreements signed between HKCC and its Settlement Banks. The deadlines to settle the relevant payments of each cash settlement process (as summarised in the table in paragraph 47 of *Chapter 3 - General Background on HKCC*) are set out in the HKCC Procedures.
- 8.3 HKCC designs its processes and operations to ensure final settlement no later than the end of the settlement day. The points at which settlement of obligations between HKCC and HKCC Participants become final are stipulated in the HKCC Rules and HKCC Procedures, which are made pursuant to the provisions of the SFO. The SFO together with the HKCC Rules and HKCC Procedures protect the settlement processed by HKCC from the proceedings related to insolvency or bankruptcy.

Final settlement of physically settled CNH and USD gold/silver futures contracts

- 8.4 Physically settled CNH and USD gold/silver futures contracts involve physical delivery of gold/silver by selling HKCC Participants and payment of the final settlement value by the buying HKCC Participants upon final settlement in accordance with the contract specifications and relevant Rules and Procedures of HKCC and HKFE.
- 8.5 When the conditions as stated in the HKCC Rules and Procedures are met, a contract re-novation process will be triggered (i.e. the Market Contracts previously created

³⁶ HKCC has general rights to accept or refuse the registration of trades executed through HKATS. In the event that HKCC refuses a trade, it will notify HKFE and the HKCC Participants who were parties to the trade.

between: (i) HKCC and the selling HKCC Participant; and (ii) HKCC and the buying HKCC Participant will be Re-novated and replaced by a Re-novated Contract between the selling HKCC Participant and its allocated buying HKCC Participant directly). HKCC's role will change from a CCP to a facilitator (i.e. Settlement Agent) to facilitate the settlement of the Re-novated contract between the selling HKCC Participant and its allocated buying HKCC Participant by instructing the Approved Depository to effect the physical delivery of gold/silver from the selling HKCC Participant's depository account to the buying HKCC Participant's depository account and releasing the full amount of the final settlement value received from the buying HKCC Participant to the selling HKCC Participant's designated bank account. (Details of the physical delivery process will be covered in Principle 10).

- 8.6 Settlement is final when final settlement value has been transferred from the buying HKCC Participant to the selling HKCC Participant and the physical gold/silver has been transferred from the selling HKCC Participant to the buying HKCC Participant.

Principle 9: Money Settlements

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

- 9.1 As described under Principle 8: Settlement Finality, HKCC conducts money settlements in HKD, RMB, USD, EUR, JPY and SGD with HKCC Participants through Settlement Banks. In Hong Kong, only HKD is settled in central bank money across the books of HKMA. Because HKCC is not an HKMA licensed bank and therefore does not have direct access to the RTGS systems operated by HKICL, it has appointed seven Hong Kong licensed banks as its Settlement Banks to conduct money settlement with HKCC Participants via intra-bank transfers on its behalf.
- 9.2 To manage the credit and liquidity risk exposure to the funds held or processed by its Settlement Banks, HKCC applies criteria in selecting its Settlement Banks. Each appointed Settlement Bank must be an HKMA licensed bank, with Tier 1 capital under the Banking (Capital) Rules of not less than HK\$390 million or such other level as prescribed by HKCC from time to time³⁷, and with proven operational capability and reliability, such as the ability to meet HKCC's payment cut-off schedules. The appointed Settlement Bank is required to sign an agreement with HKCC, which covers obligations of the Settlement Bank, irrevocability of transfers and immediate availability of inward payments. Pursuant to the agreements, all confirmations effected by each Settlement Bank in relation to credits to HKCC's account are final and conclusive, and may not be revoked by the Settlement Bank without the prior agreement in writing by HKCC. Funds credited to HKCC's bank accounts are cleared and immediately available to HKCC.
- 9.3 HKCC conducts due diligence reviews of each of its Settlement Banks periodically, with ad hoc reviews, where necessary. The review includes validations of its status being a HKMA licensed bank, financial strength and operational reliability. HKCC also monitors and manages the concentration of exposures to Settlement Banks periodically. The liquidity stress testing described under Principle 7: Liquidity Risk includes scenarios for the failure of HKCC Settlement Banks.
- 9.4 In the case of physically settled CNH and USD gold/silver futures contracts, upon the creation of the Re-novated Contracts HKCC becomes a Settlement Agent for both HKCC Participants. Although HKCC no longer acts as CCP under the Re-novated Contracts it does facilitate the settlement. HKCC receives the payment from the buying HKCC Participant and places the funds in a segregated account. HKCC will release such funds to the selling HKCC Participant only when it has received confirmation from the Approved

³⁷ Please refer to the below link for more information: https://www.hkex.com.hk/Services/Clearing/Listed-Derivatives/Getting-Started/Becoming-a-HKCC-SEIOCH-Settlement-Bank-and-Designated-Bank?sc_lang=en

Depository that the transfer of the physical gold/silver from the selling HKCC Participant's account to the buying HKCC Participant's account has been effected.

Principle 10: Physical Deliveries

An FMI should clearly state its obligations with respect to the delivery of physical instruments or commodities and should identify, monitor, and manage the risks associated with such physical deliveries.

- 10.1 HKCC facilitates the physical delivery of gold/silver for its physically settled CNH and USD gold/silver futures contracts. HKCC clearly states its obligations as well as HKCC Participants' obligations with respect to the physical settlement in Chapter 2A of the HKCC Procedures.
- 10.2 Where a spot month contract remains open at the end of the last trading day, the selling HKCC Participant will be required to deliver physical gold/silver to the buying HKCC Participant through their respective depository accounts maintained in an Approved Depository. The responsibilities and procedures relating to the transfer of the physical gold/silver are set out in the agreements entered into between the Approved Depository and the HKCC Participants, the agreement between HKCC and the Approved Depository and the relevant provisions of the Rules and Procedures of HKCC.
- 10.3 Each selling HKCC Participant under a Re-novated Contract makes various warranties under such Re-novated Contracts to the buying HKCC Participants including that it has good title to the gold/silver that it delivers and that at the time of delivery the gold/silver will be free and clear of any encumbrances whatsoever. The HKCC Rules provide that ownership of the gold/silver will pass from the selling HKCC Participant to the buying HKCC Participant under a Re-novated Contract at the time that HKCC releases funds in respect of the payment obligation of the buying HKCC Participant to the selling HKCC Participant.
- 10.4 HKCC allocates buying HKCC Participants to selling HKCC Participants on the last trading day. Physical delivery obligations arising from the Re-novated Contracts are to be settled between selling HKCC Participants and buying HKCC Participants via transfer of physical gold/silver within their respective depository accounts maintained in the Approved Depository as discussed in paragraph 10.2 above. Payment obligations arising from Re-novated Contracts are to be settled by amounts being debited from or credited to the CCMS Collateral Accounts of the respective HKCC Participants. If there is any shortfall in the CCMS Collateral Account of a buying HKCC Participant, HKCC will generate a payment instruction to the settlement bank of the buying HKCC Participant to collect any outstanding amount (which must be settled by 9:15 am on the Final Settlement Day).
- 10.5 Once the earmarking of the required quantity of gold/silver in the selling HKCC Participant's depository account has been confirmed by the Approved Depository, and the full amount of the payment obligation from the buying HKCC Participant has been received, contract re-novation occurs. HKCC will then instruct the Approved Depository to transfer the earmarked gold/silver from the selling HKCC Participant's depository

account to the buying HKCC Participant's depository account. HKCC will release the final settlement value to the selling HKCC Participants later on the Final Settlement Day when it has received confirmation from the Approved Depository that the transfer of the physical gold/silver from the selling HKCC Participant's account to the buying HKCC Participant's account has been effected.

- 10.6 Due to the re-novation arrangement, HKCC does not bear the risk and cost associated with the storage, ownership, quality and delivery of the underlying gold/silver.
- 10.7 In its capacity as a Settlement Agent, HKCC has processes and controls to track, manage and facilitate key events in the delivery process. These include appointing an Approved Depository, instructing the Approved Depository to earmark the physical gold/silver of the selling HKCC Participant, instructing the Approved Depository to transfer the physical gold/silver from the account of the selling HKCC Participant to the account of the buying HKCC Participant, and receiving funds from the buying HKCC Participant.
- 10.8 HKCC's role as a CCP ceases immediately upon the creation of a Re-novated Contract. The Re-novated Contract will discharge and replace all rights and obligations between HKCC and the relevant buying and selling HKCC Participants under the physically settled CNH or USD gold/silver futures contract, and HKCC will be fully discharged and released from all its obligations as a CCP in respect of such contracts. Deliveries will then be made by the Approved Depository transferring the gold/silver from the depository account of the selling HKCC Participant to that of the buying HKCC Participant within the Approved Depository. HKCC has established selection criteria and performed due diligence in order to assess whether the Approved Depository is suitable to take on such a role.
- 10.9 HKCC will increase CH margin levels of spot month contracts several days prior to the last trading day to the day before the Final Settlement Day (please refer to Principle 6 for details). In case an HKCC Participant is unable to fulfil its obligation to make or receive delivery of gold/silver and/or is in breach of the position restrictions that are applicable to a Non-delivery HKCC Participant, HKCC will calculate an amount of Cash Compensation payable by or impose a non-delivery charge (as applicable) on the HKCC Participant according to Chapter 2A of the HKCC Procedures.

Principle 11: Central Securities Depositories

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

As HKCC is not a Central Securities Depository, Principle 11: Central Securities Depositories is not applicable.

Principle 12: Exchange-of-value Settlement Systems

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

- 12.1 HKCC settles US Dollar vs Renminbi (Hong Kong) currency futures and options contracts, which involves the settlement of two linked obligations upon final settlement. HKCC describes the settlement mechanisms of the two linked obligations, including the timing of finality for settling Market Contracts and the delivery and payment obligations arising from their expiries in the HKCC Rules and HKCC Procedures.
- 12.2 Upon the expiry of US Dollar vs Renminbi (Hong Kong) currency futures and options contracts, HKCC debits and credits the corresponding money obligations, in both RMB and USD, the CCMS Collateral Accounts of respective HKCC Participants. Delivery in a currency leg and payment in another currency leg constitutes linked obligations. HKCC Participants have to settle their money obligations by making good payments to HKCC before 9:15 am on the Final Settlement Day. HKCC only allows HKCC Participants to withdraw from their CCMS Collateral Accounts on the Final Settlement Day the amount in RMB/USD arising from the final settlement of US Dollar vs Renminbi (Hong Kong) currency futures and options contracts if instructions are given to HKCC before 11:00 am on the Final Settlement Day. HKCC would then effect payments to HKCC Participants after 11:00 am on the Final Settlement Day, if and only if their money obligations in another currency leg have been settled.

Principle 13: Participant-default Rules and Procedures

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

EVENT OF DEFAULT

- 13.1 The HKCC Rules define the default events and the actions that can be taken when an event of default (**Event of Default**) occurs. As set out in HKCC Rule 509, an Event of Default includes, among other things:
- (a) an HKCC Participant's failure to meet any payment obligations due to HKCC;
 - (b) an HKCC Participant's failure to comply with any position limits imposed by HKCC; and
 - (c) insolvency proceedings involving an HKCC Participant.
- 13.2 If an HKCC Participant commits an Event of Default, HKCC may declare the defaulting HKCC Participant as a defaulter under HKCC Rule 510 and, in its absolute discretion, take certain remedial actions, including:
- (a) suspend the defaulting HKCC Participant's participation and prohibit the defaulting HKCC Participant's access to HKCC's facilities;
 - (b) close out, settle, sell, transfer (together with the associated collateral) and hedge the open contracts of the defaulting HKCC Participant;
 - (c) realise any non-cash collateral of the defaulting HKCC Participant; and
 - (d) apply any amounts of the defaulting HKCC Participant to meet the liability due to HKCC, subject to certain provisions in relation to client asset protection³⁸.

DEFAULT PROCEDURES

- 13.3 HKCC has appointed selected HKCC Participants as authorised brokers (i.e. liquidation agents and/or auction participants) to facilitate the closing-out, hedging and auction of certain open contracts³⁹ of a defaulting HKCC Participant. The detailed procedures

³⁸ HKCC Rules 415 and 416 stipulate that any amount standing to the credit of the House Collateral Account of the defaulting HKCC Participant may be applied by HKCC to set off liabilities in respect of its Client Collateral Accounts, but the amount standing to the credit of any Client Collateral Account cannot be used to set off liabilities of House Collateral Account.

³⁹ No closing-out, sale and hedging is required for gold futures and silver futures contract pending for physical delivery as HKCC will make cash compensation in lieu of delivery/receipt of physical gold / silver to settle the obligations.

were agreed with authorised brokers when they were appointed, and are rehearsed on an annual basis. HKCC validates the contact details, together with any material changes in the procedures, with the authorised brokers regularly to ensure all relevant information is up-to-date.

- 13.4 HKEX has established a Default Management Group (**DMG**), comprising senior executives from various divisions of HKEX including HKEX Group Risk Officer and Chief Operating Officer, to manage the default management process. HKCC has also established internal procedures which set out the roles and responsibilities of the key stakeholders in handling an Event of Default, as well as the communication procedures with internal and external parties such as the SFC and market participants.
- 13.5 HKCC conducts default drills annually with the DMG. The purpose of the default drill is to ensure the relevant parties are familiar with the default management process and to test the effectiveness of the default procedures. The Default Management Manual, which provides guidance for the default management process, is reviewed on an annual basis or following material change.
- 13.6 If HKCC is unable to re-establish a matched book through measures outlined above, HKCC may consider terminating specific contracts, a subset of contracts or all contracts in a particular product or market (**Contract Termination**). HKCC will consult the SFC for activation of Contract Termination. In the event of Contract Termination, the relevant contracts identified for termination shall be cash-settled based on the latest available closing prices.

TOTAL AVAILABLE RESOURCES AND DEFAULT WATERFALL

- 13.5 In the process of closing out the open positions of the defaulting HKCC Participant, HKCC would have access to: (a) Margin and other collateral from the defaulter and in the event that was insufficient; (b) the waterfall of resources described below including the RF and the recovery tools; and (c) various liquid resources maintained by HKEX including committed credit facilities made available by HKEX to HKCC. Please refer to the description under Principle 7: Liquidity Risk for further information.
- 13.6 Under HKCC Rule 706, the order of application of the RF is as follows:
- (a) RF contributions (including Fixed Contribution and Variable Contribution) of the defaulting HKCC Participant;
 - (b) Variable Contribution Credit granted to the defaulting HKCC Participant;
 - (c) RF accumulated interest income;
 - (d) the proceeds of any insurance policies arranged⁴⁰;

⁴⁰ Currently there is no insurance arrangement.

- (e) the resources of HKCC appropriated to the RF;
- (f) the Fixed Contributions made by all non-defaulting HKCC Participants;
- (g) the proceeds of any guarantees or facilities arranged⁴¹; and
- (h) the Variable Contributions and Variable Contribution Credits of all non-defaulting HKCC Participants on a pro-rata basis.

ALLOCATION OF DEFAULT LOSSES AND REPLENISHMENT ARRANGEMENTS

- 13.7 In the event of an HKCC Participant default where non-defaulting HKCC Participants' contributions to the RF are used to cover a default loss, such contributions will be applied to share the default loss on a pro-rata basis by reference to HKCC Participants' respective contributions to the RF on the business day immediately prior to the date of default declaration.
- 13.8 Where the defaulting HKCC Participant's collateral is insufficient or total pre-funded financial resources are anticipated to be insufficient, the recovery plan will be triggered. A number of recovery tools including Assessments, Voluntary Recapitalization and Loss Distribution Process can be applied by HKCC to allocate its uncovered credit losses arising from HKCC Participant default. Please refer to the description under Principle 4: Credit Risk for further information.
- 13.9 Following the expiry of the Capped Liability Period, HKCC Participants will be required to replenish their RF Contributions upon notification. At the same time, HKCC will also seek replenishment of SITG. Please refer to the description under Principle 4: Credit Risk for further information.

⁴¹ Currently there are no guarantees or facilities arrangements.

Principle 14: Segregation and Portability

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

- 14.1 The SFO lays out various requirements for recording client trades and segregating and safeguarding of client positions and collateral by all licensed corporations and RIs including the HKCC Participants. Compliance with these requirements is assessed as part of the routine market intermediaries' supervision program conducted by the SFC. In addition, HKCC requires HKCC Participants to properly identify and segregate their clients' positions and collateral from their own by making use of different types of Clearing Accounts and CCMS Collateral Accounts offered by HKCC. Please refer to the descriptions under paragraphs 14.3 and 14.5 for more details.
- 14.2 HKCC operates a principal-based clearing model. As the CCP, HKCC settles Market Contracts with HKCC Participants as principal in respect of each derivatives contract registered in their Clearing Accounts. HKCC provides HKCC Participants with facilities to open various Clearing Accounts and CCMS Collateral Accounts to facilitate the recording of their clients' positions and associated collateral, and porting of these positions and collateral to another HKCC Participant subject to the consent of the recipient HKCC Participant and their compliance with relevant provisions of the SFO (please refer to the description under paragraph 14.4), but has no direct contractual relationship with any client of HKCC Participants.

ACCOUNT STRUCTURE

- 14.3 HKCC offers different types of Clearing Accounts to record the positions of HKCC Participants and their clients. HKCC provides a House Account to each HKCC Participant to record its house positions, Omnibus Client Accounts and Individual Client Accounts to record its clients' positions, and Market Maker Accounts to record positions arising from market making activities. Positions maintained in the House Account and Market Maker Account are margined on a net basis. Client positions maintained in an Omnibus Client Account are margined on a gross basis while those maintained in Individual Client Accounts⁴² are margined on a net basis. Only positions owned by the same client are eligible to be maintained in an Individual Client Account.
- 14.4 The SFO requires HKCC Participants to identify each trade as being a house or client trade and whether it was executed as principal or agent and this information is recorded in contract notes provided to the clients and maintained as part of the HKCC Participant's records.

⁴² There is another net margined client account called Client Offset Claim Account. This account is used by an HKCC Participant to record positions which are of an offset nature (e.g. a calendar spread trade) of the same beneficial owner whose positions would otherwise be recorded in an Omnibus Client Account.

- 14.5 As mentioned in Principle 5, HKCC manages collateral via CCMS. HKCC provides different types of CCMS Collateral Account, including House Collateral Account, Client Collateral Account and Market Maker Collateral Account to HKCC Participants to allow them to separately identify and handle collateral relating to their clients, market makers and themselves. The House Collateral Account is for recording an HKCC Participant's own collateral and collateral movement transactions. HKCC posts all obligations arising from positions of an HKCC Participant's House Account to this House Collateral Account of the HKCC Participant and settles net with the HKCC Participant. The Client Collateral Account is for recording the collateral and collateral movement transactions of all clients of an HKCC Participant. HKCC posts all obligations arising from positions of all client accounts of an HKCC Participant (i.e. Omnibus Client Account and Individual Client Accounts) to this Client Collateral Account of the HKCC Participant and settles net with the HKCC Participant. The Market Maker Collateral Account is for recording the collateral and collateral movement transactions arising from market making activities conducted by an HKCC Participant or its client. HKCC posts all obligations arising from positions in the Market Maker Account of an HKCC Participant to the applicable Market Maker Collateral Account of the HKCC Participant and settles net with the HKCC Participant.
- 14.6 Collateral in client accounts of an HKCC Participant will be used for covering obligations of client positions only. HKCC Rules 415 and 416 stipulate that any amount standing to the credit of the House Collateral Account of the defaulting HKCC Participant may be applied by HKCC to set off liabilities in respect of its Client Collateral Accounts, but the amount standing to the credit of any Client Collateral Account cannot be used to set off liabilities of House Collateral Account.
- 14.7 Details of the account structure available for HKCC Participants to use for managing their positions and collateral are documented in Chapter I of the HKCC Procedures which is publicly available on the HKEX website.

PORTABILITY ARRANGEMENTS

- 14.8 HKCC offers facilities to support HKCC Participants to transfer their clients' positions and, if necessary, the associated Margin to other HKCC Participants subject to the consent of the recipient HKCC Participant. In the event of an HKCC Participant default, HKCC has powers under its default procedures to facilitate the transfer of client positions of the defaulting HKCC Participant, at the request of the clients, to a nominated non-defaulting HKCC Participant together with the Margin in respect of such positions, subject to consent from the recipient HKCC Participant and other conditions⁴³.
- 14.9 HKCC has also confirmed the legal soundness and enforceability of the segregation and portability arrangements provided by HKCC under Hong Kong law based on the legal opinions procured from an independent law firm in Hong Kong.

⁴³ For example, prior consent may be required from relevant regulatory and/or legal authorities.

Principle 15: General Business Risk

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

IDENTIFICATION OF BUSINESS RISKS

- 15.1 HKCC uses the HKEX's GRM framework to identify, monitor and manage all material risks including its general business risk. The GRM framework requires the identification of internal and external factors that could impair HKCC's financial position, an evaluation of their impacts and the likelihood of occurrence. HKCC establishes and implements key financial and internal controls and plans to mitigate, eliminate, monitor, and manage the risks.
- 15.2 HKCC has identified external and internal factors that pose business risks to HKCC, including:
- (a) the pace and direction of legislative reform in Hong Kong and in overseas jurisdictions and the impact this may have on user-participation in the services of HKCC;
 - (b) market conditions and the pace of development of offshore RMB denominated products, a developing market segment in which HKCC expects to have a competitive advantage;
 - (c) the effectiveness of HKCC's business strategy;
 - (d) operational issues that may impact HKCC's expenditure and investments; and
 - (e) the investment risk in its own assets. Please refer to the description under Principle 16: Custody and Investment Risks.

FINANCIAL RESOURCES FOR BUSINESS OPERATIONS

- 15.3 In its annual budget planning, HKEX takes into account its three-year strategic plan to forecast the operating and capital budget under normal, low and high transaction volume scenarios. In addition, HKEX monitors the impact of general business risk on its financial position through monthly reviews of profit and loss, actual and budget income and expenses, cash in and out flows, both at HKEX and its subsidiary levels, including HKCC, to ensure sufficient liquid net assets are maintained to meet general business obligations.

- 15.4 As part of its ongoing compliance requirements as an RCH, including compliance with the PFMI, and to ensure it can continue operations and services as a going concern, HKCC maintains at all times liquid net assets⁴⁴ funded by equity in an amount sufficient to cover its projected total operating expenditure for at least the following six months, and net current assets funded by equity or loans from HKEX (not being short-term loans or loans that are repayable on demand) sufficient to cover its projected total operating expenditure for at least the following 12 months. Liquid net assets maintained by HKCC meet the related regulatory requirements for a RCH under the PFMI⁴⁵.

RECOVERY AND WIND DOWN PLAN

- 15.5 HKCC's capital would be its main defence against various potential business losses. Recovery tool would be triggered in the event of potential capital inadequacy due to business losses. HKCC would look to recapitalise to recover its operations. HKEX, as a listed company, could inject additional capital into HKCC and potentially raise capital via the capital markets if needed.
- 15.6 In the event that HKCC could not continue as a viable entity and no other alternatives were available at the time, HKEX would be responsible for ensuring a smooth wind down of HKCC. This would involve, among other things, pursuing amounts due from defaulting HKCC Participants.

⁴⁴ The calculation of the liquid net assets excludes those being set aside for risk management purposes, such as HKCC's contribution to the RF.

⁴⁵ The PFMI states that FMIs (including clearing houses) should maintain sufficient liquid net assets funded by equity to cover potential general business losses and that (i) such liquid net assets be sufficient to ensure a recovery or orderly wind-down of critical operations and (ii) such amounts should be at least equal to six months of operating expenses.

Principle 16: Custody and Investment Risks

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

- 16.1 HKCC has a comprehensive framework to manage its custody and investment risks. HKCC only appoints custodians with accounting practices, safekeeping procedures and internal controls that ensure optimal protection of the assets being placed with them. HKCC invests its own assets under a conservative investment strategy described below.

CUSTODY OF ASSETS

- 16.2 HKCC applies stringent criteria in selecting its custodians. The custodian must fulfil the regulatory requirement (e.g. an HKMA licensed bank) and the capital requirement as specified by its relevant regulatory authority. HKCC holds its assets and HKCC Participants' assets under its control in bank and securities accounts in the name of HKCC. Currently, HKCC holds:

- (a) cash assets with selected banks in Hong Kong;
- (b) Medium-term-notes and certificate of deposits with the Central Moneymarkets Unit (**CMU**) of the HKMA;
- (c) EFBN as collateral with CMU; and
- (d) US Treasuries as collateral with Clearstream.

- 16.3 In opening the accounts with CMU and Clearstream, HKCC has conducted legal assessments to ensure the enforceability of the rights and interests of HKCC, particularly in those assets kept in the accounts.

INVESTMENT STRATEGY

- 16.4 HKCC's investment strategy follows the Investment Policy set out by the Investment Committee and approved by the HKEX Board as follows:

- (a) **Risk management** – The principal risk types, namely liquidity risk, credit and concentration risk, market risk, FX risk and operational risk shall be considered when managing investments. All investments are subject to limits and appropriate risk controls;
- (b) **Preservation of capital** – Risk taken on principal sums invested must be managed within limit as set out in the **Credit Framework**;

- (c) **Liquidity** – investment portfolios shall remain sufficiently liquid at all times to meet expected cash outflows and regulatory requirements;
- (d) **Return** – Return on investments should be optimised within the Investment Policy, the regulatory constraints and the approved risk tolerance as prescribed by the Credit Framework, the HKEX IC and the HKEX Board; and
- (e) **No conflict of public interest** – no investment activity shall, directly or indirectly, in any way affect the role of HKEX as a recognised exchange controller under the SFO, having particular regard to the interest of the public. The Investment Policy of HKEX sets out restrictions to prevent it from taking advantage of any inside information it may obtain as a recognised exchange controller in making investment decisions. For instance, HKEX is forbidden from investing in the securities of HKEX.

16.5 HKEX manages cash assets of HKEX Group in Hong Kong centrally through HKEX's treasury team (**HKEX Treasury**). HKEX Treasury places most of HKCC's cash assets as deposits⁴⁶ in banks in Hong Kong. HKCC can withdraw these deposits promptly and with same-day availability subject to the banks' customary notice periods. HKCC applies the primary principles of the Investment Policy, with an aim to preserve capital, remain sufficiently liquid and minimise risk while optimising return on investments. As part of HKEX's pre-account opening due diligence in respect of a prospective custodian, HKEX Treasury assesses whether the bank meets the explicit standards, with selection criteria based on supervision, minimum credit ratings of Baa3 (Moody's) and BBB- (Group Credit's internal credit ratings) and operational efficiency and approved by the HKEX Board.

16.6 Investment strategy is disclosed to the public through the periodic financial statements of HKEX, which are publicly available on the HKEX website.

⁴⁶ Currently, HKCC holds over 90% of the cash assets in the form of cash or deposits with selected banks, subject to applicable limits and concentration ratios.

Principle 17: Operational Risk

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

OPERATIONAL RISK MANAGEMENT FRAMEWORK

17.1 HKCC's operational risk management framework consists of the following elements:

- (a) **GRM framework** – HKCC applies HKEX's GRM framework to systematically identify, assess, monitor and control/mitigate material risks inherent in the business and operational processes including operational risk from both internal and external sources, on an ongoing basis. HKCC establishes and implements key controls and treatment plans to mitigate, eliminate, monitor, or manage the risks; and
- (b) **MCP** – HKCC has developed and maintains a MCP, which sets out the contingency and recovery procedures following a disruption to HKCC's critical functions, under specific contingency scenarios. HKCC's MCP aims to:
 - allow rapid recovery and timely resumption of critical functions following any disruptive events; and
 - minimise any damage caused by disruptions to the market and all stakeholders as a whole.

17.2 When designing the MCP, HKCC took into account interdependencies and external links with HKCC Participants, other FMIs and third-party service providers, such as Settlement Banks and communications network suppliers. The MCP addresses an extensive range of disruptive event scenarios, such as loss of access to workplace premises, power outages, system failures (both internal and external), natural disasters and extreme market movements. It sets out escalation and reporting procedures with various stakeholders, including the HKEX Board, RMC, HKCC Board, regulators, HKCC Participants, third-party service providers and market participants where appropriate.

17.3 HKCC maintains secondary backup sites for business operations and system data centres in different districts of Hong Kong that have different power and telecommunication exchanges from HKCC's primary production sites, in order to minimise any impact to HKCC Participants and the market in case of contingency. Production data of DCASS and CCMS is replicated to the system in the secondary backup site for business operations in real-time. In case of an emergency situation, the

DCASS/CCMS systems in the secondary data centre would become operational, and business operations would resume at the secondary backup site within two hours.

REVIEW, AUDIT AND TESTING

- 17.4 HKCC reviews the MCP on an annual basis or more frequently as required. In the annual MCP review exercise, HKCC conducts business impact analyses to identify critical business processes, internal and external resources and dependencies to support those business processes. HKCC assesses the impacts in case of disruptions and develops measures to manage the disruptions. HKCC agrees the contingency procedures with other FMI and third-party service providers, such as Settlement Banks, in case of failure of DCASS/CCMS or their systems. These are included in the agreements with them.
- 17.5 HKCC performs contingency drills on selective scenarios annually and after significant changes to systems and/or services to assure the effectiveness of operational procedures and control measures. HKCC Participants are invited to participate in the drills where appropriate. HKCC also provides continuous operational training to HKCC Participants, and conducts market rehearsals with HKCC Participants to test the operational flows, contingency and fallback plans before the rollout of major system changes.
- 17.6 In addition, HKCC participates in the Market Wide Rehearsal coordinated by the government of the Hong Kong Special Administrative Region which provides an opportunity to rehearse our responses to high impact issues with cross-market implications. HKCC also participates in drills of other FMIs and service providers when needed.

OPERATIONAL RELIABILITY OBJECTIVES AND CAPACITY SCALABILITY

- 17.7 The operational reliability objectives of HKCC are defined in the service agreements with its third-party service providers, HKCC's MCP, and its internal policies and procedures. Quantitative objectives include system availability and resilience and performance targets. The primary resilience objective is to ensure that system recovery can be achieved within two hours.
- 17.8 The system capacity of DCASS/CCMS is scaled based on the projected transaction volumes and a capacity buffer has been put in place to handle potential stress volumes.
- 17.9 The Information Technology Division of HKEX measures the system capacity utilisation on a daily basis and conducts a system capacity review at least semi-annually. It performs capacity planning taking the peak volumes and business growth into consideration to ensure that sufficient system capacity is in place to meet the agreed business service-level requirements. It also conducts ad hoc capacity reviews and planning for the launch of new services or unforeseeable business growth due to the changing business environment. HKEX will perform system performance tests for any new system enhancement or upgrade to ensure the adequacy of the system capacity to meet the business service level requirements.

PHYSICAL AND INFORMATION SECURITY POLICIES

17.10 HKCC follows HKEX Group's physical and information security policies that identify, assess, and manage potential physical and system vulnerabilities and threats. The physical security measures have been established to guard against unauthorised access, attacks and intrusions, and to minimise the impact of potential natural disasters to physical sites (i.e. all business operations offices and data centres, both primary and secondary backup sites). HKEX's Group Cyber and Technology Risk Management Department, which is independent of Information Technology Division of HKEX, oversees the information security strategy and policy for all application systems within the HKEX Group. The information security policy sets out implementation safeguards in relation to system configurations and management and is designed with reference to international standards.

Principle 18: Access and Participation Requirements

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

PARTICIPATION REQUIREMENTS AND ONGOING MONITORING

- 18.1 HKCC has established a set of objective, risk-based and transparent eligibility requirements for two categories of HKCC Participants, namely CP and GCP, to access its services fairly and openly. An HKCC Participant must (a) be an HKFE Exchange Participant; and (b) have a minimum liquid capital of the higher of its required liquid capital under the FRR, or HK\$5 million for CP and HK\$20 million for GCP respectively.
- 18.2 HKCC applies different financial requirements to different categories of HKCC Participants based on the services received from, and the potential risks posed to, HKCC. HKCC sets a higher RF Fixed Contribution level for a GCP as compared to a CP. In addition to good financial standing, HKCC considers key operational and internal control aspects of the applicant including the experience of its key personnel and the quality of its compliance and risk management policies and systems.
- 18.3 The admission criteria applicable to each category of HKCC Participant is stipulated in the HKCC Rules, which is publicly available on the HKEX website. HKCC Participants must comply with the HKCC Rules and HKCC Procedures in force from time to time, and must continue to comply on an ongoing basis with the criteria for admission.
- 18.4 HKCC monitors the ongoing compliance of HKCC Participants with their participation requirements. HKCC has also defined and publicly disclosed the HKCC Rules and HKCC Procedures for facilitating the suspension and orderly exit of an HKCC Participant that breaches or no longer meets the participation requirements. HKCC, as a CCP, also monitors HKCC Participants' ongoing financial standing through periodic reviews of regulatory reports submitted, such as the FRR reports and annual reports, etc. Please refer to the description under Principle 4: Credit Risk for the counterparty risk monitoring process.
- 18.5 HKCC reviews participant admission, access restrictions and eligibility requirements as a result of the changing market environment and regulatory requirements on a need basis. Any change in the admission requirements as detailed in the HKCC Rules is subject to the approvals of the HKCC Board and SFC.
- 18.6 Each application for HKCC Participants is decided by the HKCC Board. Any appeal against the decision of the HKCC Board to refuse an application may be made within 14 Business Days of being notified of the HKCC Board's decision to the Participant Admission Appeals Committee, which has been established to deal with such appeal requests in an independence and impartial manner.

SUSPENSION AND REVOCATION OF HKCC PARTICIPATION

- 18.7 As set out in the HKCC Rules, where an HKCC Participant breaches or no longer meets the participation requirements, HKCC may take disciplinary action against that HKCC Participant, including restricting its access to and/or using HKCC's facilities. HKCC may revoke the participantship of an HKCC Participant forthwith by notice under certain circumstances, such as upon the liquidation or winding-up of an HKCC Participant. The revocation of the participantship of an HKCC Participant does not affect any of its rights or obligations arising out of matters which occurred prior to the revocation and for the purpose of settlement of any contracts held by the HKCC Participant before the revocation. Where an HKCC Participant's right to access HKCC's facilities has been restricted or participantship has been suspended or revoked, HKCC will as soon as practicable notify other HKCC Participants, the SFC, and HKFE of the restriction, suspension or revocation.

Principle 19: Tiered Participation Arrangements

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

THIRD-PARTY CLEARING SERVICE

- 19.1 HKCC supports tiered participation arrangements through the offering of a third-party clearing service. A GCP can clear on behalf of an Exchange Participant, which is not a participant of HKCC (i.e. Non-clearing participant (**NCP**)).
- 19.2 HKCC deals with the GCP as principal and not as agent, and has no contractual relationship with the NCPs. Trades of the NCP will be registered in the name of the GCP that clears for the NCP. Positions of an NCP are maintained and margined according to the different Clearing Account types as described in paragraph 6.8 under Principle 6: Margin. Chapter III of the HKCC Rules governs the clearing arrangement between a GCP and an NCP. A GCP can clear and settle trades of an NCP on condition that there is in place a valid, binding and effective clearing agreement between the GCP and NCP. The GCP is required to inform HKCC after signing a clearing agreement with the NCP. The GCP shall also give prior written notice to HKCC if it or any of its NCP intends to terminate the clearing agreement between them.

MANAGING RISK ARISING FROM TIERED PARTICIPATION ARRANGEMENTS

- 19.3 As licensed corporations under the SFO, NCPs are required to comply with the FRR under the SFO and file with the SFC a monthly financial return reflecting their liquid capital levels for review and monitoring. The SFC, as the front-line regulator monitors and supervises the financial and operational capability of NCPs, is responsible for the regulatory oversight and monitoring of the risk management activities of the NCPs, including sending to HKEX relevant risk monitoring information on the NCPs, such as a risky broker list, where applicable. In addition, NCPs being Exchange Participants are required to comply with the rules of HKFE.
- 19.4 HKCC manages the risk arising from an NCP through active monitoring and assessment of the risk of the GCP, who is primarily responsible for the risk of that NCP. HKCC sets higher admission requirements for GCPs in terms of minimum capital level and Fixed Contribution to the RF (please refer to the description under Principle 4: Credit Risk) and requires a GCP, in conjunction with HKFE, to impose additional risk management measures and procedures on its NCP's positions where appropriate. In addition, HKCC performs regular risk scoring analysis to monitor the exposure and credit risk of the GCPs based on the Counterparty Risk Exposure Scoring Toolkit described under Principle 4: Credit Risk.

- 19.5 HKCC has also implemented necessary processes to generate timely information from its systems to identify, monitor and manage the risk of NCPs. Reports are generated by DCASS on a daily basis to list the breakdowns of the positions, CH Margin and VA of each of the NCPs of a GCP. In addition, for HKCC's risk assessment purposes, HKCC may require a GCP to provide further information of its NCPs, such as their financial resources in meeting their payment obligations. Based on the assessment results, HKCC may impose additional risk management measures on a GCP, including but not limited to, applying a more stringent position limit and/or requiring additional CH Margin from the GCP, when necessary.
- 19.6 HKCC has established internal operating procedures to facilitate the switching of its NCPs to a new GCP during a GCP default. HKCC Rule 510(f) empowers HKCC to transfer NCP's positions of a GCP together with the collateral to a new GCP that agrees to accept such transfer. NCPs of the defaulting GCP, without appointing a new GCP, will not be able to clear their trades in HKCC and the procedures in handling the default as described in Principle 13: Participant-default Rules and Procedures will apply.

Principle 20: FMI Links

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

- 20.1 Currently, HKCC has a central securities depository (**CSD**) link with CMU, to safe keep EFBN as collateral, on behalf of HKCC Participants.
- 20.2 HKCC has put in place appropriate measures to identify, monitor and manage link-related risks in this established CSD link with CMU. HKCC has signed an agreement with CMU to define the rights, obligations and liabilities of each party.
- 20.3 In establishing the link with CMU, HKCC has conducted legal assessments to ensure the enforceability of the rights and interests of HKCC, particularly in those assets kept in the accounts with CMU. Moreover, HKCC has assessed the relevant risks, such as legal, credit, custody and operational risks, and put in place appropriate procedures and controls to manage those risks as needed. HKCC reviews the link arrangements when necessary and if there are changes to the operational flows or risk management policies to ensure the link arrangements continue to meet regulatory standards and are consistent with HKCC's policies and standards.
- 20.4 CMU is the issuer CSD for EFBN. All operations of CMU are governed by the rules and procedures of CMU, and the laws of Hong Kong. CMU is under the supervision of the HKMA. HKCC is a recognised dealer appointed by the HKMA and a CMU member to operate the custody accounts with CMU in accordance with the rules and procedures of CMU.

Principle 21: Efficiency and Effectiveness

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

DESIGN OF THE OPERATIONAL MODEL

- 21.1 HKCC provides efficient and effective services which serve the needs of HKCC Participants and the derivatives market of Hong Kong. HKCC has implemented mechanisms to seek input and feedback from relevant stakeholders to assess the efficiency and effectiveness of its services, operations and arrangements.
- 21.2 In determining its operational arrangements, HKCC takes into account (a) the needs of the local market and environment; (b) the needs of the many overseas users of the derivatives market in Hong Kong; and (c) the requirements of international standards and practices. HKCC conducts soft consultations with relevant market participants and industry groups and solicits the views of the Clearing Consultative Panel on HKCC's proposals before they are finalised. For major changes to the policies, clearing and settlement arrangement, operating structure, and regime that would affect HKCC and HKCC Participants, HKCC also conducts public consultations⁴⁷ to seek views directly from the stakeholders.

OBJECTIVES

- 21.3 As an RCH, HKCC is given has several specific statutory duties and responsibilities as stipulated in the SFO. In summary, the objectives of HKCC are to ensure, so far as is reasonably practicable, that there are orderly, fair and expeditious clearing and settlement arrangements for any transactions cleared or settled through its facilities, that risks associated with its business and operations are managed prudently, that it operates its facilities in accordance with its HKCC Rules and HKCC Procedures as approved by the SFC and that it can at all times provide and maintain facilities to meet contingencies for the conduct of its business.
- 21.4 The SFC supervises HKCC's ongoing compliance with the statutory duties and objectives and other obligations of an RCH, including with PFMI. HKEX meets regularly with the RMC and Clearing Consultative Panel to discuss their views and feedback on HKEX's proposals, initiatives and clearing businesses. HKEX also periodically meets with market participants and industry groups to collect their views and feedback. Moreover, HKCC Participants can submit suggestions and feedback to HKCC via hotlines and emails.

⁴⁷ In recent years, HKEX conducted public consultations on the implementation of risk management reform measures and extension of AHT.

- 21.5 HKEX develops and adopts a three-year strategic plan which lays down the corporate strategies, and provides guidance on business priorities for the preparation of the annual operating plan. The HKEX Board approves the plans and assesses the achievements against the plans at least annually.
- 21.6 Furthermore, HKEX has established mechanisms to evaluate its efficiency and effectiveness, including:
- (a) achievements are subject to quarterly review by HKEX's senior management; and
 - (b) progress of all major initiatives is monitored by the Project Portfolio Review Committee. The committee, consisting of senior business heads, will identify, prioritise, authorise, monitor and control the initiatives in order to achieve the strategic business objectives and align them to strategy. It assesses and evaluates progress, identifies problems, and where appropriate escalates matters to the Management Committee⁴⁸ and HKEX Board.

⁴⁸ The Management Committee is authorised by the HKEX Board to oversee the HKEX Group's compliance with all statutory duties imposed on the HKEX Group under the relevant legislation, rules and regulations and do any such things to discharge its powers and functions conferred on it by the HKEX Board and its sub-committees.

Principle 22: Communication Procedures and Standards

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

- 22.1 HKCC uses internationally accepted communication procedures and protocols for exchanging messages across systems to facilitate efficient clearing and settlement arrangements. HKCC communicates with its Settlement Banks, CMU and Clearstream via SWIFT. HKCC Participants can access DCASS/CCMS via the Securities and Derivatives Network (SDNet) using TCP/IP protocol.
- 22.2 HKCC Participants can access DCASS through (a) web connection with supported configuration and installed with the standardised Window-based operating system; and/or (b) host-to-host connection with straight-through-processing via Application Programme Interface (**API**). The API is widely used in global markets. Any personal computer with supported versions of Microsoft Windows and Internet Explorer browser is able to access all CCMS functions.
- 22.3 HKCC adopts international communication standards on reference data and messaging format, including:
- (a) SWIFT standard message types complying with ISO 15022 standard are adopted as the payment, clearing and settlement instruction standards;
 - (b) risk parameter files generated for Margin calculation are in PC-SPAN compatible format; and
 - (c) three-byte ISO currency codes are used to represent currencies in DCASS/CCMS.

Principle 23: Disclosure of Rules, Key Procedures, and Market Data

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

RULES AND PROCEDURES

- 23.1 The HKCC Rules and HKCC Procedures contain the necessary and appropriate details of clearing and settlement, risk management, default and contingency arrangements, rights and obligations of HKCC and HKCC Participants, etc. Service fees, charges and other material costs incurred by HKCC Participants are also set out in the HKCC Rules and HKCC Procedures, including the rates, calculation methods, timing of debit and any concession where applicable, etc. The HKCC Rules and HKCC Procedures are written in plain English, and are available to HKCC Participants and the public via the HKEX website. Chinese version⁴⁹ of the HKCC Rules and HKCC Procedures are also publicly available on the HKEX website.
- 23.2 Any amendment to the HKCC Rules and HKCC Procedures is subject to the approval of the SFC. HKCC notifies HKCC Participants of proposed changes to the HKCC Rules and HKCC Procedures and the effective dates of the approved amendments via circulars which are also publicly available on the HKEX website.

DISCLOSURE

- 23.3 HKCC operates transparently, and provides sufficient information for HKCC Participants and other interested parties to identify and evaluate the risks associated with using HKCC's services and facilities. HKCC makes the following information publicly available on the HKEX website:
- (a) the HKCC Rules and HKCC Procedures, including fees and upcoming amendments;
 - (b) risk management arrangements, including high level summaries of the back-testing and sensitivity analysis results;
 - (c) clearing and settlement arrangements during typhoons, Extreme Conditions⁵⁰ and rainstorms;

⁴⁹ If there is any conflict between the meaning of words or terms in the Chinese version and in the English version, the meaning of the English version shall prevail.

⁵⁰ "Extreme Conditions" means the occurrence of "extreme conditions" as announced by any government authority of Hong Kong due to serious disruption of public transport services, extensive flooding, major landslides, large-scale power outage or any other adverse conditions before Typhoon Signal No. 8 or above is replaced with Typhoon Signal No. 3 or below.

- (d) DCASS/CCMS Terminal User Guides, including details of DCASS/CCMS design and operations, description of DCASS/CCMS reports, data files and report data file formats;
 - (e) PRiME Margining Guide, providing details of PRiME calculation algorithm;
 - (f) margin table, listing the estimated amount of client margin; and
 - (g) circulars and briefing materials for major projects.
- 23.4 HKCC organises regular training classes to help HKCC Participants and potential applicants to understand the DCASS/CCMS operations and risk management arrangements. Where appropriate, HKCC holds briefing sessions, seminars and informal meetings with HKCC Participants to facilitate their understanding of new initiatives (e.g. physically settled CNH and USD gold/silver futures contracts, system infrastructure enhancements such as extension of AHT and clearing) and the associated risk management measures. HKCC Participants and other interested parties can also call dedicated hotlines and send emails to HKCC if they have any questions.
- 23.5 Currently, HKCC publishes extensive periodic transaction data, including contract volume and open interest by derivatives products, through the HKEX website. Please refer to *Chapter 5 - List of Publicly Available Resources on the HKEX Website*, for a list of publicly available resources about HKCC.
- 23.6 HKCC publishes quantitative disclosure documents in accordance with the guidelines set forth in the “Public quantitative disclosure standards for central counterparties” released by CPMI-IOSCO in February 2015.
- 23.7 HKCC has plans to update this disclosure document following material changes and, at a minimum, at least every two years in accordance with the Disclosure Framework.

Principle 24: Disclosure of Market Data by Trade Repositories

A TR should provide timely and accurate data to relevant authorities and the public in line with their respective needs.

As HKCC is not a Trade Repository, Principle 24: Disclosure of Market Data by Trade Repositories is not applicable.

CHAPTER 5: LIST OF PUBLICLY AVAILABLE RESOURCES ON THE HKEX WEBSITE

OPERATIONS AND RISK MANAGEMENT FRAMEWORKS

- 1 Introduction to clearing and settlement services
(http://www.hkex.com.hk/services/clearing/listed-derivatives/overview?sc_lang=en)
- 2 Clearing arrangement for HKCC Participants
(http://www.hkex.com.hk/services/clearing/listed-derivatives/getting-started/third-party-clearing-by-hkcc-seoch-general-clearing-participants?sc_lang=en)
- 3 Risk management framework
(http://www.hkex.com.hk/services/clearing/listed-derivatives/risk-management?sc_lang=en)
- 4 Fees schedule
(https://www.hkex.com.hk/-/media/hkex-market/services/rules-and-forms-and-fees/rules/hkcc/rules/cc_appa)
- 5 Clearing and settlement arrangements during typhoons, Extreme Conditions and rainstorms
(https://www.hkex.com.hk/services/trading-hours-and-severe-weather-arrangements/severe-weather-arrangements/clearing-and-settlement?sc_lang=en)
- 6 Derivatives market (DCASS) statistics
(http://www.hkex.com.hk/market-data/statistics/consolidated-reports/hkex-monthly-market-highlights?sc_lang=en)

LEGAL AND REGULATORY INFORMATION

- 7 The HKCC Rules, HKCC Procedures and relevant updates
(http://www.hkex.com.hk/services/rules-and-forms-and-fees/rules/overview?sc_lang=en)
- 8 Circulars
(http://www.hkex.com.hk/Services/Circulars-and-Notices/Participant-and-Members-Circulars?sc_lang=en)
- 9 PFMI disclosure document
(http://www.hkex.com.hk/Services/Clearing/Listed-Derivatives/PFMI?sc_lang=en)

GOVERNANCE ARRANGEMENTS

- 10 Organisational structure of the HKEX Group
(http://www.hkexgroup.com/-/media/HKEX-Group-Site/Hr/org_chart.pdf)

- 11 Corporate governance of the HKEX Group
(http://www.hkexgroup.com/Corporate-Governance?sc_lang=en)
- 12 List of directors of HKEX
(http://www.hkexgroup.com/About-HKEX/Organisation/Board-and-Committees/Board?sc_lang=en)
- 13 List of members of HKEX's committees and consultative panels
(http://www.hkexgroup.com/About-HKEX/Organisation/Board-and-Committees/Committees-and-Consultative-Panels?sc_lang=en)
- 14 Terms of reference of the HKEX Board and its committees, and the Clearing Consultation Panel
(http://www.hkexgroup.com/About-HKEX/Organisation/Board-and-Committees?sc_lang=en)
- 15 List of directors of HKCC
(http://www.hkexgroup.com/About-HKEX/Organisation/Principal-Subsidiaries/List-of-Directors?sc_lang=en)
- 16 List of members of the Participant Admission Appeals Committee
(http://www.hkexgroup.com/About-HKEX/Organisation/Principal-Subsidiaries/Committees?sc_lang=en)
- 17 Terms of reference of the HKCC Board, and Participant Admission Appeals Committee
(http://www.hkexgroup.com/About-HKEX/Organisation/Principal-Subsidiaries/Terms-of-Reference?sc_lang=en)

PARTICIPANTSHIP

- 18 List of HKCC Participants
(<https://www.hkex.com.hk/eng/plw/Search.aspx?selectType=FC>)
- 19 Admission criteria for HKCC Participants
(https://www.hkex.com.hk/services/clearing/listed-derivatives/getting-started/becoming-a-hkcc-participant?sc_lang=en)

CLEARING AND SETTLEMENT SYSTEM

- 20 System information and user guides
(http://www.hkex.com.hk/services/clearing/listed-derivatives/infrastructure?sc_lang=en)

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