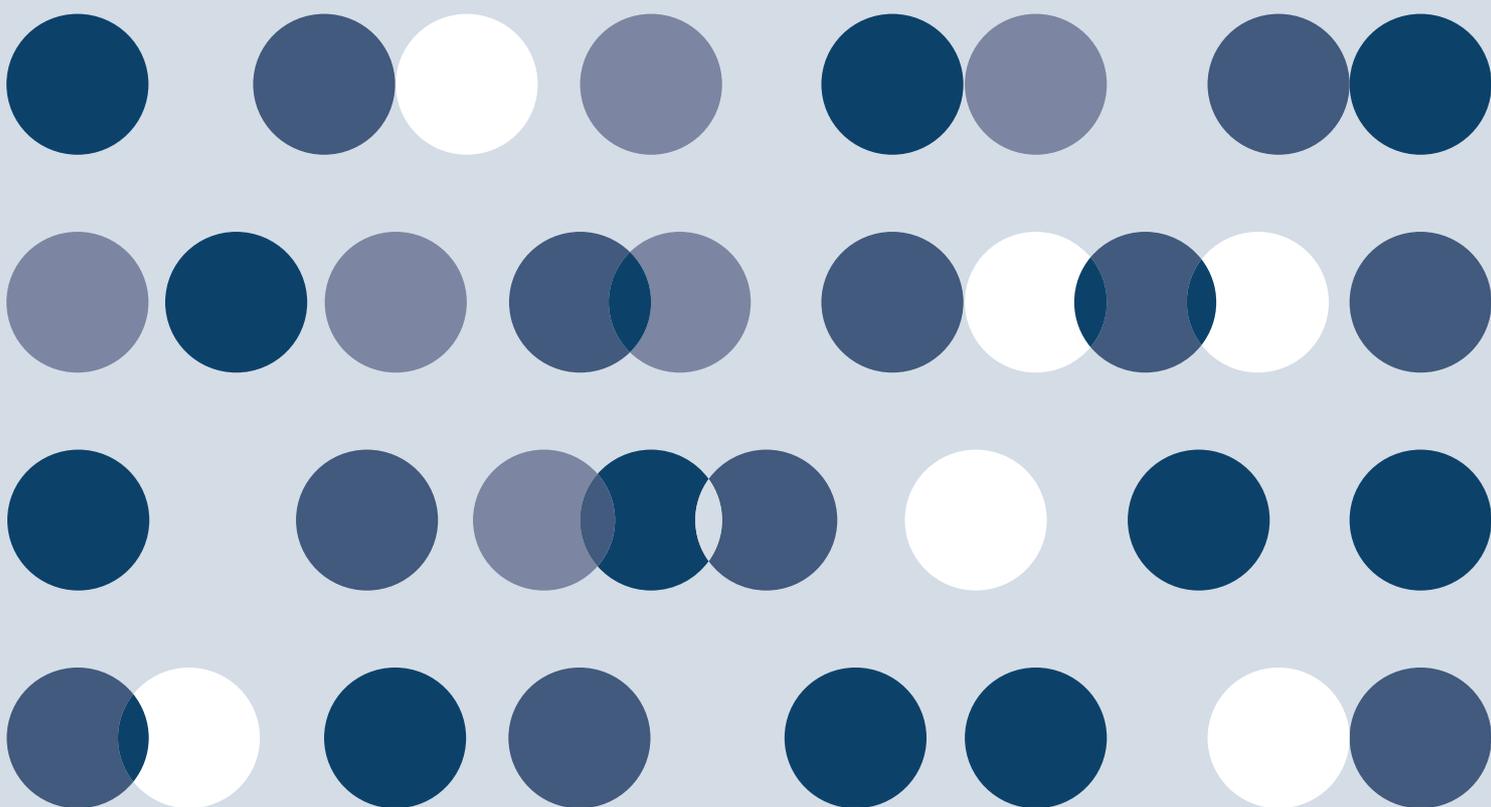


March 2017



HONG KONG SECURITIES CLEARING COMPANY LIMITED

PRINCIPLES FOR FINANCIAL MARKET
INFRASTRUCTURES DISCLOSURE



Responding Institution:

Hong Kong Securities Clearing Company 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 March 2017. This disclosure can be found at <http://www.hkex.com.hk/eng/market/clr/SpecialTopics/PFMI.htm>. For further information, please contact our hotline at 2979-7111 or email clearingps@hkex.com.hk.

GLOSSARY

Capitalised terms defined in the General Rules of CCASS (**CCASS Rules**) and CCASS Operational Procedures (**CCASS OP**) 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 CCASS Rules and CCASS OP, have the meanings given below.

Term	Definition
AC	Audit Committee
BIC	Bank Identification Code
BO	Banking Ordinance
BOCHK	Bank of China (Hong Kong) Limited
BSR(s)	Batch Settlement Run(s)
CAT(s)	Clearing Agency Transaction(s)
CCCP(s)	China Connect Clearing Participant(s)
CCP(s)	Central Counterparty(ies)
CP(s)	Clearing Participant(s)
CPMI	Committee on Payments and Market Infrastructures
CPSS	Committee on Payment and Settlement Systems
CSC	China Stock Connect System
CSD(s)	Central Securities Depository(ies)
CSRC	China Securities Regulatory Commission
DTC	The Depository Trust Company
EFN(s)	Exchange Fund Note(s)
EOT(s)	Exercised Options Trade(s)
ERM	Enterprise Risk Management
FMI	Financial Market Infrastructures
FRR	Securities and Futures (Financial Resources) Rules (Cap. 571N of the Laws of Hong Kong)
GF	Guarantee Fund

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	HKFE Clearing Corporation Limited
HKICL	Hong Kong Interbank Clearing Limited
HSBC	The Hongkong and Shanghai Banking Corporation Limited
IAC	Investment Advisory Committee
ICAC	Independent Commission Against Corruption of Hong Kong
IOSCO	International Organization of Securities Commissions
IP(s)	Investor Participant(s)
ITD	Information Technology Department
MCP(s)	Market Contingency Plan(s)
PBO	Prevention of Bribery Ordinance
PFMI	Principles for Financial Market Infrastructures, issued by CPSS-IOSCO
PSSVFO	Payment Systems and Stored Value Facilities Ordinance (Cap. 584 of the Laws of Hong Kong)
RC	Remuneration Committee
RCH(s)	Recognised Clearing House(s)
RMC	HKEX Statutory Risk Management Committee
RTGS	Real Time Gross Settlement
SEHK	The Stock Exchange of Hong Kong Limited
SEOCH	The SEHK Options Clearing House Limited
SFC	Securities and Futures Commission of Hong Kong
SFO	Securities and Futures Ordinance (Cap. 571 of the Laws of Hong Kong)
SSE	Shanghai Stock Exchange
SSS(s)	Securities Settlement System(s)
SZSE	Shenzhen Stock Exchange
UK	United Kingdom
US	United States

TABLE OF CONTENTS

GLOSSARY	3
CHAPTER 1: EXECUTIVE SUMMARY.....	7
CHAPTER 2: SUMMARY OF MAJOR CHANGES SINCE THE LAST UPDATE OF THE DISCLOSURE	9
CHAPTER 3: GENERAL BACKGROUND ON HKSCC	10
CHAPTER 4: PRINCIPLE-BY-PRINCIPLE SUMMARY DISCLOSURE	27
Principle 1: Legal Basis.....	27
Principle 2: Governance.....	29
Principle 3: Framework for the Comprehensive Management of Risks	34
Principle 4: Credit Risk.....	38
Principle 5: Collateral	48
Principle 6: Margin	50
Principle 7: Liquidity Risk	56
Principle 8: Settlement Finality	59
Principle 9: Money Settlements	61
Principle 10: Physical Deliveries.....	62
Principle 11: Central Securities Depositories	63
Principle 12: Exchange-of-value Settlement Systems	65
Principle 13: Participant-default Rules and Procedures	67
Principle 14: Segregation and Portability	70
Principle 15: General Business Risk	72
Principle 16: Custody and Investment Risks	74
Principle 17: Operational Risk	76
Principle 18: Access and Participation Requirements.....	79
Principle 19: Tiered Participation Arrangements	81
Principle 20: FMI Links	83
Principle 21: Efficiency and Effectiveness	85
Principle 22: Communication Procedures and Standards.....	87

Principle 23:	Disclosure of Rules, Key Procedures, and Market Data	88
Principle 24:	Disclosure of Market Data by Trade Repositories	91
CHAPTER 5:	LIST OF PUBLICLY AVAILABLE RESOURCES ON THE HKEX WEBSITE	92

CHAPTER 1: EXECUTIVE SUMMARY

- 1 Hong Kong Securities Clearing Company Limited (**HKSCC**)² is a Hong Kong incorporated wholly-owned subsidiary of Hong Kong Exchanges and Clearing Limited (**HKEX**). HKSCC 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, the sole shareholder of HKSCC and a listed public company in Hong Kong.
- 2 As an RCH, HKSCC 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**), securities settlement system (**SSS**) and central securities depository (**CSD**).
- 3 HKSCC provides clearing, settlement, depository and nominee services to the securities market in Hong Kong, primarily for securities traded on The Stock Exchange of Hong Kong Limited (**SEHK**), which is recognised by the SFC as a recognised exchange company. With effect from 17 November 2014, HKSCC established CSD and clearing links with the China Securities Depository and Clearing Corporation Limited (**ChinaClear**) for the provision of clearing, settlement, depository and nominee services for trades executed through Shanghai-Hong Kong Stock Connect (**Shanghai Connect**)⁴. Such links were extended to provide for the clearing, settlement, depository and nominee services for trades executed through Shenzhen-Hong Kong Stock Connect (**Shenzhen Connect**)⁵ with effect from 5 December 2016.
- 4 HKSCC has implemented a comprehensive risk management framework which is designed to ensure the timely settlement of relevant securities transactions, by adequately controlling

² HKSCC was first recognised as an RCH in 1992 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 On 17 November 2014, SEHK, the Shanghai Stock Exchange (**SSE**), HKSCC and ChinaClear launched Shanghai Connect, a pilot programme established to enable mutual stock market access between Mainland China and Hong Kong stock markets in accordance with the principles set out in the joint announcement issued by the SFC and the China Securities Regulatory Commission (**CSRC**) on 10 April 2014.

⁵ On 5 December 2016, SEHK, the Shenzhen Stock Exchange (**SZSE**), HKSCC and ChinaClear launched Shenzhen Connect to widen mutual stock market access between Mainland China and Hong Kong. Shenzhen Connect has been developed according to the principles set out in the joint announcement issued by the SFC and CSRC on 16 August 2016.

credit, market and liquidity risks. HKSCC 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.

- 5 HKSCC's approach to observing each applicable principle⁶ 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.

⁶ Two of the 24 PFMI principles are not applicable to HKSCC as a CCP, SSS operator and CSD. They are Principle 10: Physical Deliveries and Principle 24: Disclosure of Market Data by Trade Repositories.

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

- 6 HKSCC started to publish quantitative disclosure documents on the HKEX website from December 2015 in accordance with the guidelines set forth in the “Public quantitative disclosure standards for central counterparties” published by CPMI-IOSCO in February 2015.
- 7 Since 18 April 2016, HKSCC has introduced an additional interbank bulk settlement run for Renminbi (**RMB**) at night with Hong Kong Interbank Clearing Limited (**HKICL**) to support same day settlement finality for settlement instructions on a delivery versus payment basis in respect of SSE securities under Shanghai Connect and when Shenzhen Connect was launched on 5 December 2016, in respect of SZSE securities under Shenzhen Connect also.
- 8 On 5 December 2016, SEHK, SZSE, HKSCC and ChinaClear launched Shenzhen Connect in furtherance of mutual stock market access between Mainland China and Hong Kong. In connection with the launch, HKSCC and ChinaClear extended the CSD and clearing links established for Shanghai Connect to provide clearing and settlement, depository and nominee services to their respective participants in respect of trades executed through Shenzhen Connect.

CHAPTER 3: GENERAL BACKGROUND ON HKSCC

GENERAL DESCRIPTION OF HKSCC AND THE MARKETS IT SERVES

- 9 HKSCC was incorporated in 1989. It launched the automated central clearing and settlement system (**CCASS**) in 1992. HKSCC operates CCASS as a CCP, SSS, and CSD providing clearing and settlement as well as depository and nominee services for securities that are accepted as eligible by HKSCC (**Eligible Securities**).
- 10 As an RCH operating within the statutory framework under Division 3 of Part III of the SFO, HKSCC 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 securities market in Hong Kong by offering expeditious clearing and robust risk management services to market participants.
- 11 HKSCC has established CSD and clearing links with ChinaClear to facilitate the clearing and settlement of trades executed through Shanghai Connect and Shenzhen Connect (collectively, **Shanghai and Shenzhen Connect**) and to provide depository, nominee and other related services for Hong Kong, overseas and Mainland investors.

ORGANISATIONAL STRUCTURE OF HKSCC

- 12 As mentioned, HKSCC 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 HKSCC.
- 13 HKEX is a listed company on the Main Board of 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) Hong Kong Futures Exchange Limited;
 - (c) The London Metal Exchange;
 - (d) HKSCC;
 - (e) The SEHK Options Clearing House Limited (**SEOCH**);
 - (f) HKFE Clearing Corporation Limited (**HKCC**);
 - (g) OTC Clearing Hong Kong Limited; and

- (h) LME Clear Limited.

GOVERNANCE STRUCTURE OF HKSCC

- 14 HKSCC's governance structure comprises the board of directors of HKSCC (**HKSCC Board**) and three committees that have been established to assist the HKSCC Board with the management and operation of HKSCC's services. In addition, HKSCC leverages on the board of directors of HKEX (**HKEX Board**) to provide leadership and guidance for all the activities of HKEX and its subsidiaries (**HKEX Group**) 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 HKSCC's own risk management safeguards;
 - (b) the HKEX Risk Committee, which oversees the overall risk management framework and advises the HKEX Board on the risk the HKEX Group faces; 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.
- 15 The HKSCC Board currently consists of four members who are senior executives of HKEX, including the Chief Executive of HKEX who is Chairman of HKSCC. It oversees HKSCC's activities and the execution of its business strategies. The HKSCC Board has its own Risk Management and Disciplinary and Disciplinary Appeals Committees to assist in the discharge of these functions. HKSCC's Risk Management and Disciplinary Committees comprise one or more directors of HKSCC and/or such other persons as the HKSCC Board may appoint. HKSCC's Disciplinary Appeals Committee comprises one or more independent non-executive directors of HKEX and/or other persons co-opted by the HKSCC Board.
- 16 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.
- 17 HKSCC's day-to-day business is managed by two designated departments within HKEX: the Cash & Derivatives Clearing Department and the Cash & Derivatives Clearing Risk Management Department. The Head of Clearing of the HKEX Group is the Chief Executive of HKSCC. The Head of Cash & Derivatives Clearing Risk Management has a dual reporting line – one to the Head of Clearing and other to the Group Risk Officer. The senior management of HKSCC is responsible to and takes directions from the HKSCC Board.

PRODUCT COVERAGE

- 18 HKSCC currently accepts the following securities as Eligible Securities for clearing, settlement and custody:
- (a) securities traded on SEHK and admitted into CCASS (**SEHK Securities**);
 - equity securities;
 - equity warrants;
 - depository receipts;
 - debt securities;
 - unit trusts and mutual funds; and
 - structured products; and
 - (b) securities listed on SSE or SZSE that are eligible for trading under Shanghai Connect or Shenzhen Connect (**China Connect Securities**).
- 19 At the end of 2016, the number of SEHK Securities and China Connect Securities admitted into CCASS was 7,807 and 1,595 respectively. CCASS provides a variety of services in its depository including nominee services and securities transfers free of or versus payment to facilitate, among other things, settlements between brokers and custodians, securities borrowing and lending, and margin financing.

PARTICIPANTS OF HKSCC (CCASS PARTICIPANTS)

- 20 HKSCC has seven types of CCASS Participants, namely:
- (a) Direct Clearing Participant (**DCP**) that clears and settles its own and its clients' trades executed on or through SEHK (**Exchange Trades**);
 - (b) General Clearing Participant (**GCP**) that clears and settles Exchange Trades of its own and its clients, and/or provides third party clearing services to exchange participants of SEHK (**Exchange Participants**) which decide to outsource their clearing and settlement functions;
 - (c) Clearing Agency Participant that operates a central securities clearing and settlement system and/or CSD system or that has entered into clearing and/or CSD links with HKSCC;
 - (d) Custodian Participant that provides custodian services to other CCASS Participants, intermediaries or investors in relation to Eligible Securities;

- (e) Stock Lender Participant that lends Eligible Securities to other CCASS Participants, intermediaries or investors for business purposes;
 - (f) Stock Pledgee Participant that lends money to other CCASS Participants, intermediaries or investors and accepts Eligible Securities as a pledge; and
 - (g) Investor Participant (**IP**) that holds Eligible Securities (other than China Connect Securities) in its own name with HKSCC solely for custody purposes.
- 21 DCPs and GCPs may register with HKSCC as China Connect Clearing Participants (**CCCPs**) to clear and settle trades in China Connect Securities (**China Connect Securities Trades**) executed through Shanghai and Shenzhen Connect.
- 22 HKSCC's CCP services are applicable to DCPs and GCPs, which are collectively known as clearing participants (**CPs**), and in connection with Shanghai and Shenzhen Connect, ChinaClear. SSS and CSD services are available to all CCASS Participants except for services relating to China Connect Securities which are not available to IPs. CCASS Participants, other than IPs, are generally licensed financial institutions. IPs can be individual investors or corporate investors.
- 23 At the end of 2016, there were 25,630 CCASS Participants, with details as follows:

Number of CCASS Participants (at the end of 2016)

DCPs	533
GCPs	9
Clearing Agency Participants	2
Custodian Participants	35
Stock Lender Participants	Nil
Stock Pledgee Participants	5
IPs	25,046

RISK MANAGEMENT FRAMEWORK

- 24 HKEX Group complies with the enterprise risk management (**ERM**) 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.
- 25 HKSCC has a comprehensive risk management framework to identify, monitor and manage all its key risks, which includes the following key components:
- (a) CCASS Participant admission requirements and regular risk scoring analysis for identifying and monitoring risks posed by CPs. Please refer to the description under Principle 4: Credit Risk and Principle 18: Access and Participant Requirements;

- (b) admission requirements for ChinaClear applying to be a China Connect Clearing House with which HKSCC has entered into CSD and clearing links for Shanghai and Shenzhen Connect. Please refer to the description under Principle 4: Credit Risk;
- (c) processes for mark-to-market, margining and collection of concentration collateral (**Concentration Collateral**) and additional collateral (**Additional Collateral**) in respect of Exchange Trades to cover current and potential future exposures. Please refer to the description under Principle 6: Margin;
- (d) processes for collection of Mainland Settlement Deposit and Mainland Security Deposit in respect of China Connect Securities Trades to cover current and potential future exposures. Please refer to the description under Principle 6: Margin;
- (e) requirement for ChinaClear to post collateral securities (**Collateral Securities**) with HKSCC to cover all its short CNS positions in Exchange Trades where possible. Please refer to the description under Principle 4: Credit Risk and Principle 5: Collateral;
- (f) guarantee fund (**GF**) and other financial resources for the purpose of supporting its role as a CCP in the event of a CP default. Please refer to the description under Principle 4: Credit Risk;
- (g) collateral policy to limit acceptable collateral to assets with low credit, market and liquidity risks. Please refer to the description under Principle 5: Collateral;
- (h) clear and enforceable CP and ChinaClear default rules and procedures. Please refer to the description under Principle 13: Participant-default Rules and Procedures;
- (i) reliance on CCASS Rules to limit HKSCC's obligations to CPs of HKSCC in the event of ChinaClear default. Please refer to the description under Principle 13: Participant-default Rules and Procedures;
- (j) strict appointment criteria for its settlement banks with ongoing monitoring of their performance. Please refer to the description under Principle 9: Money Settlements;
- (k) specific arrangements for tiered participation. Please refer to the description under Principle 19: Tiered Participation Arrangements;
- (l) liquidity arrangements to measure, monitor, and manage liquidity risk. Please refer to the description under Principle 7: Liquidity Risk;
- (m) comprehensive internal control, contingency and recovery procedures. Please refer to the description under Principle 17: Operational Risk; and
- (n) 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.

- 26 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 HKSCC and CCASS Participants. Any change to the framework is subject to the prevailing approval processes.

OPERATIONAL RELIABILITY

- 27 HKSCC, as a CCP, SSS operator, and CSD, has primary operational objectives to provide via CCASS, its clearing, settlement, depository and nominee services on each business day as scheduled and to ensure that system recovery can be achieved within two hours following a disruption to HKSCC's critical functions, under specific contingency scenarios.
- 28 CCASS has scalability and load balancing features that allow it to support higher volumes by upgrading and expanding hardware without significant architecture changes. The system capacity 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

- 29 Under Section 40 of the SFO, HKSCC has the power to make rules as are necessary and desirable for the proper regulation and efficient operation of its clearing or settlement facilities, and for the proper regulation of CCASS 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.
- 30 CCASS Participants are required to comply with the CCASS Rules, CCASS OP, the participant agreements⁷ and other requirements of HKSCC, such as those found in circulars issued from time to time by HKSCC. The Hong Kong legal framework provides a high degree of legal certainty for each material provision of the CCASS Rules that supports and allows HKSCC to conduct all material aspects of its activities.
- 31 In addition to the rules and contractual arrangements referred to above, the legal basis/framework supporting the material aspects of HKSCC'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;

⁷ Participant agreements are only applicable to CCASS Participants other than IPs. For IPs, upon successful application, they must undertake to HKSCC that they shall comply with and be bound by the Terms and Conditions for Investor Participants.

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) the Payment Systems and Stored Value Facilities Ordinance (**PSSVFO**) (Cap. 584 of the Laws of Hong Kong) in respect of payment settlement finality; and
 - (e) general Hong Kong common law in relation to contracts, tort and property.
- 32 HKSCC conducts its business in Hong Kong. All relevant documents issued by HKSCC in respect of its business and services are governed by Hong Kong law. HKSCC has engaged an independent law firm to issue a Hong Kong law opinion which provides a high level of confidence that the material provisions of the CCASS Rules (including default procedures) are enforceable under Hong Kong law.
- 33 The CSRC and the SFC have approved the launch of Shanghai and Shenzhen Connect. The regulatory framework governing the operation of the CSD and clearing links arrangements under Shanghai and Shenzhen Connect includes:
- (a) the joint announcements⁹ issued by the CSRC and the SFC approving the launch of Shanghai and Shenzhen Connect;
 - (b) the CSRC's special provisions on Shanghai and Shenzhen Connect¹⁰;
 - (c) the agreements¹¹ entered into between HKSCC and relevant parties, including ChinaClear;
 - (d) the CCASS Rules and CCASS OP updated to reflect the operational model of the CSD and clearing links;
 - (e) ChinaClear's rules and procedures, as supplemented by its special rules on Shanghai and Shenzhen Connect¹²; and
 - (f) the existing legal and regulatory framework of Hong Kong and Mainland China with respect to the operation of HKSCC and ChinaClear as clearing houses and CSDs.
- 34 HKSCC has engaged independent law firms to provide legal analysis on the CSD and clearing links arrangements with ChinaClear which provides a high level of confidence that

⁹ The joint announcements can be found on the SFC's website at <http://www.sfc.hk/edistributionWeb/gateway/EN/news-and-announcements/news/corporate-news/doc?refNo=14PR136> for Shanghai Connect and <http://www.sfc.hk/edistributionWeb/gateway/EN/news-and-announcements/news/doc?refNo=16PR126> for Shenzhen Connect.

¹⁰ The CSRC's special provisions on Shanghai and Shenzhen Connect (in Chinese only) can be found on its own website at http://www.csrc.gov.cn/pub/zjhpublic/G00306201/201609/t20160930_304241.htm.

¹¹ The agreements includes the Four-Party Agreement entered into between SEHK, SSE, HKSCC and ChinaClear for Shanghai Connect; the Four-Party Agreement entered into between SEHK, SZSE, HKSCC and ChinaClear for Shenzhen Connect; and the CSD and Clearing Links Agreement entered into between HKSCC and ChinaClear.

¹² ChinaClear's special rules on Shanghai and Shenzhen Connect (in Chinese only) can be found on its own website at http://www.chinaclear.cn/zdjs/editor_file/20160930195326513.pdf.

the CSD and clearing links arrangements have a well-founded legal basis in Hong Kong and Mainland China.

35 HKSCC is regulated by the SFC under Division 3 of Part III of the SFO. Under Section 38 of the SFO, HKSCC 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. HKSCC 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 CCASS Participants comply with the rules. Additionally, HKSCC 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.

36 In discharging its statutory duties, HKSCC 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 HKSCC. The SFC has the power to require HKSCC to comply with its directions, orders and requirements. In addition to the statutory duties under the SFO, HKSCC is required by the SFC to comply with the PFMI to the extent that they apply to CCP, SSS and CSD.

37 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 HKSCC:

- (a) “market contracts”¹³ with an RCH and the provision of property pursuant to “market contracts”;
- (b) the provision of “market collateral”¹⁴ to an RCH; contracts effected by an RCH for the purpose of realising property provided as “market collateral”; disposals of property 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”;

¹³ “Market contract” means, inter alia, 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, for the purpose of the clearing and settlement of a transaction in securities or futures contracts that is (i) effected on a recognized stock market or a recognized futures market; or (ii) subject to the rules of a recognized exchange company.

¹⁴ “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.

- (c) a “market charge”¹⁵ 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”¹⁶ of an RCH.

38 The finality conferred as mentioned above means that actions taken by an RCH upon a default of its DCP 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 DCP or GCP in Hong Kong.

SYSTEM DESIGN AND OPERATIONS

- 39 HKSCC has developed and implemented its own system, CCASS, to support its roles as a CCP, SSS operator and CSD. HKSCC provides stock clearing accounts and stock segregated accounts in CCASS to facilitate CCASS Participants (other than IPs) to separately identify their clients’ securities deposited with HKSCC from their own. Under Shanghai and Shenzhen Connect, HKSCC also provides special segregated accounts (**SPSAs**) to facilitate investors meeting pre-trade checking requirement for China Connect Securities and at the same time maintaining compliance with their asset segregation requirements. HKSCC provides only one stock account to an IP to hold its own securities and two stock accounts to ChinaClear to hold Mainland investors’ SEHK Securities on an omnibus basis under Shanghai Connect and Shenzhen Connect separately.
- 40 CCASS includes an integrated common collateral management system (**CCMS**), which is used by three of the HKEX clearing houses (i.e. HKSCC, HKCC and SEOCH) to manage the collateral received from their CPs. HKSCC provides one CCMS collateral account to each CP and two CCMS collateral accounts to ChinaClear for Shanghai Connect and Shenzhen Connect for recording and managing its marks, margin and collateral deposited with HKSCC. The following paragraphs provide a brief description of HKSCC’s core services and operations, covering clearing, settlement, depository and custody.

As a CCP

Exchange Trades

- 41 The vast majority of Exchange Trades (99.9%) are cleared and settled under the CNS System¹⁷. The rest of these trades are settled under the Isolated Trades System¹⁸.

¹⁵ “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.

¹⁶ “Default proceedings” means any proceedings or other action taken by an RCH under its default rules.

¹⁷ **CNS System** means Continuous Net Settlement System, which is the settlement method for settling the novated contracts in CCASS.

Trade Capture, Novation and Netting

- 42 SEHK transmits details of Exchange Trades directly from its trading system (**AMS**)¹⁹ to CCASS in real-time.
- 43 The key features of the CNS System are:
- (a) **Novation** – HKSCC novates each Exchange Trade²⁰ and assumes the role of seller to the buying CP or ChinaClear and buyer to the selling CP or ChinaClear. Upon novation, HKSCC 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**); and
 - (b) **Daily netting** – the stock positions of a CP under the Market Contracts on the same day, in the same Eligible Security, are offset against each other to result in one net long or net short stock position with HKSCC (**CNS Position**) in each Eligible Security on each business day. The stock positions of ChinaClear under Shanghai Connect and Shenzhen Connect are netted and settled separately.

Securities Settlement

- 44 Settlement of CNS Positions (other than positions in China Connect Securities) is on a T+2 basis. All securities settlements are effected through book-entry transfers between stock accounts in CCASS.
- 45 CPs and ChinaClear with short CNS Positions can deliver securities to HKSCC by inputting delivery instructions (**DIs**) or through multiple batch settlement runs (**BSRs**)²¹.
- 46 Shares allocated to the stock accounts of CPs and ChinaClear with long CNS Positions are put on-hold until their money obligations are settled.

Money Settlement

- 47 Money settlement takes place through the Real Time Gross Settlement (**RTGS**)²² systems operated by HKICL. HKSCC does not have a banking licence in Hong Kong so it does not have direct access to the RTGS systems. HKSCC needs to appoint licensed banks as its settlement banks (**Settlement Banks**) to process CCASS money transactions in multiple currencies, including Hong Kong dollar (**HKD**), RMB and United States dollar (**USD**) on its behalf in the RTGS systems.

¹⁸ Two Exchange Participants who are parties to the trade can opt at the time of the trade to settle directly between themselves on a trade-for-trade basis. HKSCC does not become the CCP of such trades.

¹⁹ AMS means SEHK's trading system, the Automatic Order Matching and Execution System.

²⁰ HKSCC may exercise its general rights not to act as a CCP for an Exchange Trade by excluding such trade from novation. The selling CP and buying CP will settle the trade directly between themselves on a trade-for-trade basis.

²¹ BSRs are processed by CCASS automatically as scheduled four times on each settlement day, at around 10:30 am, 12:00 noon, 2:00 pm and 3:45 pm.

²² The RTGS systems are operated by HKICL, which is jointly owned by the Hong Kong Monetary Authority (**HKMA**) and the Hong Kong Association of Banks.

- 48 CPs and ChinaClear are required to maintain accounts in respective currencies at any bank approved by HKSCC as designated banks (**Designated Banks**) for money settlement purposes and must authorise the Designated Banks to accept instructions from HKSCC to directly debit from and credit to their Designated Bank accounts.
- 49 HKSCC nets all money obligations arising from CNS Positions so that each CP has one net payment against HKSCC (either receiving or paying) as the CCP in a particular currency (i.e. HKD, RMB or USD) on a settlement day. The money obligations arising from the CNS Positions of ChinaClear under Shanghai Connect and Shenzhen Connect are netted separately. HKSCC then generates money settlement instructions to receive money from or to pay money to CPs and ChinaClear, and sends them to HKICL for clearing and settlement by the RTGS systems.
- 50 In general, money obligations arising from CNS Positions on a settlement day are settled through Settlement Banks of HKSCC and Designated Banks of CPs and ChinaClear in the evening of the settlement day via the RTGS systems. HKICL conducts the interbank bulk settlement runs (**Interbank Settlement Runs**) at around 5:50 pm, by debiting from and/or crediting to the Settlement Banks' and Designated Banks' settlement accounts with the HKMA for HKD, with The Hongkong and Shanghai Banking Corporation Limited (**HSBC**)²³ for USD, and with the Bank of China (Hong Kong) Limited (**BOCHK**)²⁴ for RMB.
- 51 After completion of the Interbank Settlement Runs, the Settlement Banks and Designated Banks reflect the money settlement results in the bank accounts that HKSCC, CPs and ChinaClear maintain with them. The payments are valued and available on the settlement day.

Intra-day Money Settlement

- 52 In addition to the end-of-day money settlement for CNS Positions, HKSCC enables CPs and ChinaClear to settle the money legs of their CNS Positions with intra-day finality.
- 53 In general, CPs and ChinaClear with long CNS Positions will be allocated shares in the BSRs that are put on-hold by HKSCC during the settlement day until good and irrevocable payments are made. If these 'Long' CPs or ChinaClear would like to use the allocated shares prior to the end of the settlement day, they can inform HKSCC via CCASS, and effect intra-day payments to HKSCC via RTGS payments or intra-bank transfers before 2:30 pm for the release of the on-hold allocated shares.
- 54 For intra-day payments effected through the RTGS systems, HKICL will inform HKSCC after the Designated Banks' settlement accounts with the HKMA/HSBC/BOCHK (for HKD/USD/RMB payments, respectively) are debited and HKSCC's Settlement Banks' settlement accounts with the HKMA/HSBC/BOCHK are credited. For intra-day payments

²³ HSBC is appointed by the HKMA as the USD Settlement Institution.

²⁴ BOCHK is appointed by the People's Bank of China as the RMB Clearing Bank in Hong Kong.

effected through intra-bank transfers, HKSCC monitors its bank accounts with Settlement Banks to confirm good and irrevocable payments are credited to HKSCC's bank accounts.

- 55 Upon receipt of good and irrevocable intra-day payments from the 'Long' CPs or ChinaClear, HKSCC will release the corresponding quantities of allocated shares for the use of those CPs or ChinaClear and thus achieving intra-day finality.
- 56 In general, CPs or ChinaClear with short CNS Positions receive good and irrevocable payments in the end-of-day money settlement processes. However, CPs or ChinaClear with short CNS Positions can also elect to receive intra-day payments from HKSCC, at around 2:30 pm, before the end of the settlement day by delivering shares to HKSCC in the first three BSRs.

China Connect Securities Trades

- 57 For China Connect Securities Trades, HKSCC on the one hand settles with ChinaClear in Mainland China on behalf of CCCPs, and on the other hand settles with CCCPs in Hong Kong under the CNS System. There is no contractual relationship between CCCPs and ChinaClear.
- 58 China Connect Securities Trades follow the settlement cycle of the Mainland stock market, where stock is settled on T-day, and money is settled on T+1.

Trade Capture, Novation and Netting

- 59 SEHK transmits details of China Connect Securities Trades directly from its order routing system (**CSC**)²⁵ to CCASS in real-time. After the close of Mainland stock market, HKSCC reconciles the provisional clearing data files retrieved from ChinaClear's system against the trade records from SEHK.
- 60 Once ChinaClear assumes the settlement rights and obligations of the relevant China Connect Securities Trades, such China Connect Securities Trades will be registered with HKSCC, and at the same time in Hong Kong simultaneously create through novation a Market Contract between HKSCC as CCP and a CCCP as clearing participant.
- 61 The Market Contract between HKSCC and the CCCP is cleared and settled in Hong Kong under the CCASS Rules. The China Connect Securities Trade between HKSCC and ChinaClear is cleared and settled in Mainland China in accordance with the rules and procedures of ChinaClear.
- 62 Similar to Exchange Trades, HKSCC performs daily netting on all China Connect Securities Trades for settlement under the CNS system in CCASS.

²⁵ CSC means China Stock Connect System, through which exchange participants of SEHK may place orders for China Connect Securities to the SEHK Subsidiary, SEHK's wholly-owned subsidiary, who facilitate cross-boundary order routing for Shanghai and Shenzhen Connect.

Securities Settlement

- 63 ChinaClear settles securities trades for both the Shanghai and Shenzhen markets (**China Connect Markets**) by debiting and crediting investors' (including HKSCC) stock accounts by 6:00 pm on T day.
- 64 HKSCC conducts two BSRs in CCASS for HKSCC to settle China Connect Securities CNS stock positions with CCCPs.
- (a) **1st BSR at around 5:30 pm** – HKSCC debits the stock accounts of those CCCPs who are holding short positions in China Connect Securities in this BSR, before HKSCC delivers China Connect Securities to settle any corresponding net short positions with ChinaClear at 6:00 pm on the same day. HKSCC follows its CNS allocation algorithm to allocate the shares to those CCCPs who are holding long positions in the relevant China Connect Securities.
- (b) **2nd BSR at around 7:00 pm** – HKSCC allocates China Connect Securities that HKSCC receives from ChinaClear at around 6:00 pm to the relevant CCCPs who are holding long positions in this BSR.
- 65 CNS Positions in China Connect Securities may be settled via these two BSRs or through inputting DI²⁶.
- 66 China Connect Securities allocated to CCCPs' stock accounts for CNS settlement are put on hold until the relevant money obligations have been fulfilled.

Money Settlement

- 67 China Connect Securities are traded and settled in RMB. HKSCC only accepts RMB from CCCPs for the settlement of China Connect Securities Trades.
- 68 Money settlement of China Connect Securities Trades takes place on T+1 through the RMB RTGS system. CNS money positions in SSE securities and SZSE securities of the same CCCP on a trading day are netted into a payable or receivable amount for settlement with HKSCC. HKSCC then issues CHATS Payment Instructions in the net amount to CCCPs' Designated Banks on T+1 morning.
- (a) CCCPs who have a net payable item on China Connect Securities Trades are required to settle their payment obligations to HKSCC by 12:00 noon on T+1; and
- (b) CCCPs who have a net receivable item on China Connect Securities Trades, HKSCC will transfer money into their Designated Bank accounts shortly after 12:30pm on T+1.
- 69 HKSCC has maintained a bank account with a settlement bank designated by ChinaClear in Mainland China to handle money transactions and cross-border remittance for China Connect Securities Trades.

²⁶ CCCP can input DIs to settle its CNS Positions from 4:00 pm to 7:00 pm on each T day.

Clearing Agency Transactions (CATs)

- 70 CATs refer to exercised option trades (**EOTs**) transmitted from SEOCH to CCASS for clearing and settlement of the underlying securities of stock option contracts. SEOCH is a recognised clearing house for the stock option contracts traded on SEHK, being regulated and supervised by the SFC. SEOCH is a Clearing Agency Participant of HKSCC to facilitate the clearing and settlement of EOTs. An agreement between SEOCH and HKSCC defines the obligations and liabilities of SEOCH and HKSCC.
- 71 EOTs are transmitted directly from the derivatives clearing system of SEOCH to CCASS at day end. Upon receipt of EOTs, HKSCC accepts them for settlement under the CNS System. CATs are cleared and settled in the same way as Exchange Trades.

As an SSS operator

Settlement Instructions (SIs)

- 72 HKSCC provides securities transfer/settlement and payment processing services to CCASS Participants to facilitate their various business activities, such as for transferring securities between brokers and custodians, for stock borrowing and lending, for pledging securities with banks or finance companies to secure loans, and for settling over-the-counter (OTC) obligations. HKSCC does not act as a CCP for these services.
- 73 SI service requires both the delivering and receiving CCASS Participants (other than IPs) to input the details of an SI as agreed between them to CCASS for matching. Settlement of matched SIs happens on the stipulated settlement date in the SI.
- 74 Settlement of SIs in CCASS is effected on a transaction-for-transaction basis, directly between the CCASS Participants concerned. Settlement may be done via free of payment (**FOP**) transfer, delivery against payment (**DVP**) and real time delivery against payment (**RDP**) methods²⁷.

Investor Settlement Instructions (ISIs)

- 75 HKSCC also provides securities transfer services between IPs and other CCASS Participants (except other IPs) for transfers²⁸ arising from various activities including trade settlement between investors and their intermediaries, stock borrowing and lending, pledging and portfolio movements.

²⁷ HKSCC supports two payment methods, namely (i) the RDP method for simultaneous settlement of securities transfer and associated funds transfer; and (ii) the general DVP method which facilitates settlement of securities transfers throughout the day, while settlement of any related funds transfers is via HKICL's Interbank Settlement Runs before the end of the settlement day except that money settlement of some DVP SIs in China Connect Securities is confirmed on the next business day (please refer to the description under paragraph 8.3).

²⁸ IPs are required to maintain China Connect Securities with their brokers or custodians, thus, HKSCC does not support ISI transfers for China Connect Securities.

- 76 CCASS Participants (rather than IPs) are required to input the details of ISIs into CCASS, i.e. one sided input. Depending on the needs of the IPs concerned, IPs may specify that their affirmation is required before ISIs are settled in CCASS.
- 77 Similar to the settlement of SIs, ISIs may be settled on a transaction-for-transaction basis via FOP, DVP or RDP method, according to the IPs' and CCASS Participants' needs.

As a CSD

Depository and Nominee Services

- 78 Many Eligible Securities, in particular common stocks, are issued in physical form²⁹ in Hong Kong. Holders of common stocks may choose to hold shares in physical form outside CCASS and register their shareholdings in their own names. Alternatively, they may deposit their physical certificates into CCASS via CCASS Participants.
- 79 Share certificates deposited into CCASS must be supported by a validly signed instrument of transfer for re-registration into the name of HKSCC's nominee, HKSCC Nominees Limited (**HKSCC Nominees**)³⁰. Once accepted by HKSCC, the securities deposited are reflected by a credit entry made to the specified stock account of the depositing CCASS Participant. Securities held in CCASS are fungible. Currently, securities deposited into CCASS are given immediate credit in the stock accounts of depositing CCASS Participants (other than IPs³¹) and are available for use in settlement activities.
- 80 HKSCC is not the share registrar of Eligible Securities held in CCASS. HKSCC delivers all deposited share certificates upon receipt to the respective share registrars for re-registration into the name of HKSCC Nominees. Once re-registered, HKSCC Nominees becomes the registered shareholder on the company's register of members and holds the legal title to the shares on behalf of CCASS Participants and/or their clients who are the beneficial owners.
- 81 CCASS Participants may withdraw shares (other than China Connect Securities) from CCASS in respect of their holdings recorded in their stock accounts. Based on the withdrawal instructions authorised by CCASS Participants, HKSCC retrieves share certificates from its vault for their collection at the depository counter normally on the same day or the following day, depending on the time when the instructions are authorised.
- 82 ChinaClear maintains two omnibus stock accounts in CCASS to keep the aggregate shareholdings of SEHK Securities under Shanghai Connect and Shenzhen Connect separately on behalf of for all eligible ChinaClear members. ChinaClear maintains details

²⁹ Structured products are mainly issued in global form and certificates are not available for withdrawal; most exchange traded funds and debt securities are usually issued in scripless form.

³⁰ HKSCC Nominees is a wholly owned subsidiary of HKSCC.

³¹ For IPs, the securities deposited will be put on-hold and only made available for use upon completion of the re-registration of the share certificates.

of shareholdings of SEHK Securities in its own system and records at investor level. HKSCC does not normally provide physical deposit or physical withdrawal services to ChinaClear with respect to the SEHK Securities held in its omnibus stock accounts with CCASS except physical withdrawal of non-eligible securities (if available) or unless otherwise mutually agreed between HKSCC and ChinaClear.

- 83 As the shares held in CCASS are in the name of HKSCC Nominees, HKSCC also handles corporate actions on behalf of CCASS Participants, including:
- (a) distribution of dividends and bonus shares to CCASS Participants after receiving them from issuers' share registrars;
 - (b) accepting voting instructions from CCASS Participants to vote on their behalf at general meetings; and
 - (c) accepting corporate action instructions for open offers, rights issues and redemptions, etc. from CCASS Participants for submission to issuers' share registrars.

Depository and Nominee Services for China Connect Securities

- 84 HKSCC, as ChinaClear's clearing participant, has opened and maintained two omnibus stock accounts with ChinaClear to hold China Connect Securities for each China Connect Market separately on behalf of CCASS Participants. The total shareholding of HKSCC in each China Connect Security in such omnibus stock accounts is equal to the aggregate shareholdings of all CCASS Participants in such China Connect Security recorded in CCASS. Proper system processes and operational procedures have been established to ensure the records on both ends reconcile with each other.
- 85 According to the laws of Mainland China, listed companies are required to set up and maintain their register of shareholders in accordance with the records or register of securities holders provided by ChinaClear. As such, HKSCC is recognised as the registered holder of the China Connect Securities held in its omnibus stock accounts with ChinaClear. As provided for under the rules promulgated by the CSRC, SSE, SZSE and ChinaClear for Shanghai and Shenzhen Connect and the CCASS Rules and CCASS OP, HKSCC only holds such China Connect Securities as nominee. HKSCC has no proprietary interest in the China Connect Securities to the extent that they are credited to the stock account of a CCASS Participant in CCASS.
- 86 As HKSCC is recognized as the holder of China Connect Securities in its omnibus stock accounts with ChinaClear, HKSCC is entitled to entitlements and to exercise its rights under SSE and SZSE listed companies' corporate actions in respect of such China Connect Securities. HKSCC has extended its existing nominee services, including but not limited to, cash dividend, bonus issues, rights issues and voting, to CCASS Participants in respect of their China Connect Securities recorded in CCASS in accordance with the CCASS Rules and CCASS OP. HKSCC exercises its right as holder of China Connect Securities in

respect of any corporate action in accordance with instructions received from CCASS Participants.

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 HKSCC's activities that require legal certainty are:
- (a) participants in HKSCC;
 - (b) the rights and obligations of HKSCC and its CCASS Participants in respect of CCASS services, including clearing, settlement, depository and custody;
 - (c) the formation by novation, enforceability of netting arrangements and settlement finality of Market Contracts;
 - (d) the rights and interests of HKSCC, CPs and ChinaClear to financial provisions constituting marks (**Marks**), margin (**Margin**), Mainland Settlement Deposit, Mainland Security Deposit, collateral and GF;
 - (e) the settlement finality of Market Contracts with CPs or ChinaClear and securities transfers between CCASS Participants;
 - (f) the CCASS Rules and CCASS OP concerning CP and ChinaClear default;
 - (g) the procedures for the recovery and wind-down of HKSCC;
 - (h) the implications of the insolvency of CCASS Participants or HKSCC; and
 - (i) the operation of the CSD and clearing links arrangements with ChinaClear.

LEGAL SOUNDNESS

- 1.2 HKSCC conducts business in Hong Kong. The Hong Kong legal framework supports and allows HKSCC to conduct all material aspects of its activities as a CCP, SSS operator and CSD. The legal basis/framework supporting the material aspects of HKSCC's activities includes the Bankruptcy Ordinance; Companies Ordinance; SFO; PSSVFO; the general Hong Kong common law in relation to contracts, tort and property; the rules and agreements binding HKSCC and CCASS Participants; and the regulatory framework governing the operation of the CSD and clearing links arrangements.

- 1.3 HKSCC 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 HKSCC in its capacity as an RCH.
- 1.4 All DCPs and most GCPs are incorporated in Hong Kong. The GCPs that are not incorporated in Hong Kong are all foreign-incorporated banks with branch offices in Hong Kong that are regulated by the HKMA under the Banking Ordinance (Cap. 155 of the Laws of Hong Kong) (**BO**) as authorised institutions. Such GCPs are, as at the date of this disclosure document, incorporated in Australia, France, Germany, UK and the United States (**US**).
- 1.5 The CCASS Rules, CCASS OP and the participant agreements are governed by Hong Kong law. Amendments to the CCASS Rules and CCASS OP are drafted and/or reviewed by the internal lawyers of HKEX Group and where considered appropriate/necessary external legal opinions are sought. No rule or amendment of any rule will have effect unless the SFC has given its approval in writing. HKSCC outlines and (as needed) evidences the legal basis for its activities to the SFC upon request. Where appropriate, HKSCC 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 CCASS Participants.
- 1.6 There is a high degree of certainty that actions taken under the CCASS Rules and CCASS OP 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 HKSCC. HKSCC is not aware of any court of any relevant jurisdiction that has held its activities or arrangements to be unenforceable by any court.
- 1.7 HKSCC has obtained legal advice in each jurisdiction where it currently accepts CPs and is confident that it has a well-founded, clear, transparent and enforceable legal basis for each material aspect of its activities in such jurisdictions.
- 1.8 HKSCC has engaged independent law firms to provide legal analysis on the CSD and clearing links arrangements. HKSCC is confident that the CSD and clearing links arrangements have a well-founded legal basis in Mainland China and Hong Kong. The CSRC and the SFC have approved the launch of Shanghai and Shenzhen Connect and the regulatory framework governing the operation of the CSD and clearing links arrangements under Shanghai and Shenzhen Connect are clearly defined.

OVERSEAS RECOGNITION

- 1.9 The Board of Supervisors of the European Securities and Markets Authority adopted a decision to recognise HKSCC as a third country CCP under Chapter 4 of Title III of the European Market Infrastructure Regulations on 27 April 2015. The recognition allows HKSCC to continue providing clearing services to GCPs established in European Union.

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, HKSCC 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, HKSCC 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 HKSCC's own interest, HKSCC is required to ensure that the interest of the public prevails.
- 2.2 As an RCH, HKSCC's Articles of Association, the CCASS Rules and CCASS OP, 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 HKSCC'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 HKSCC) performs its duties competently. Accordingly, HKEX actively oversees and ensures the proper functioning of HKSCC. HKEX exercises appropriate control and oversight over the performance of HKSCC'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 HKSCC. 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 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 directors³² 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 HKSCC'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 HKSCC.
- 2.7 HKSCC is subject to the oversight and scrutiny of the HKEX Board committees on specific matters, including the RMC, Risk Committee, Audit Committee (**AC**), Remuneration Committee (**RC**) and Investment Advisory Committee (**IAC**). Unless there is a sound reason for them to diverge, HKSCC'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 HKSCC 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 Risk Committee oversees the overall risk management framework and advises the HKEX Board on HKEX Group's risk related matters;
 - (c) the AC reviews the accounting principles and practices adopted by the HKEX Group, including HKSCC, and assists the HKEX Board in auditing, internal control systems and financial reporting matters;

³² 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.

- (d) the RC 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. The RC reviews the remuneration of the 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 IAC'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 HKSCC

- 2.10 The HKEX Board and management supervise and control all HKEX operations, including HKSCC. The HKSCC Board currently consists of four directors, who are senior executives of HKEX. The HKSCC Board directs and manages the activities of HKSCC in accordance with the CCASS Rules, the applicable law and regulatory regime governing HKSCC. In addition, HKSCC has its own Risk Management, Disciplinary and Disciplinary Appeals Committees to assist in the discharge of its own statutory duties and other functions.
- 2.11 The HKSCC Board has multiple roles and responsibilities as set out in its terms of reference, including but not limited to:
- (a) managing HKSCC's business in accordance with its Articles of Association;
 - (b) ensuring HKSCC's compliance with the laws, rules and regulations governing it;
 - (c) promoting HKSCC's vision, mission, principles, policies and values;
 - (d) overseeing and enhancing HKSCC'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 HKSCC operates;
- (f) making rules which provide for the taking of proceedings or other action if a CP or ChinaClear 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 HKSCC's internal control, businesses and corporate accommodation, risk management, and supervising the implementation of such policies;
- (h) reviewing HKSCC'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 HKSCC's stakeholders, in particular its shareholders and CCASS Participants.

2.12 The organisational structure of the HKEX Group, the terms of reference and composition of the HKEX Board and its committees, and the HKSCC Board and its 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 HKSCC.

HKSCC MANAGEMENT

2.13 HKSCC's management consists of the employees, executives and staff within the HKEX Group who have the function of designing, implementing and administering the CCASS Rules and CCASS OP and managing HKSCC and its clearing, settlement, depository and nominee services. The Head of Clearing of the HKEX Group is the Chief Executive of HKSCC. HKSCC's senior management team is responsible, among others, for making recommendations to, and implementing decisions of, the HKSCC Board, managing the operation of the company's business, ensuring HKSCC'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 Both HKEX and HKSCC are "public bodies" for the purposes of the Prevention of Bribery Ordinance (**PBO**). Under the PBO, HKEX and HKSCC'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 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 the HKEX Group, directors of HKEX and its subsidiaries including HKSCC, and members of committees of the HKEX Group. The 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 HKSCC has implemented procedures to deal with conflicts of interest. Directors and committee members of HKEX and its subsidiaries including HKSCC should 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 the 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 put in place an ERM 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 and HKSCC review the risk management framework regularly, covering the following risks:
- (a) **Legal risk** – the Hong Kong legal framework supports and allows HKSCC to conduct all material aspects of its activities as a CCP, SSS operator and CSD. Please refer to the description under Principle 1: Legal Basis;
 - (b) **Liquidity risk** – HKSCC 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 its CPs or ChinaClear would be unable to meet their payment and delivery obligations under Market Contracts, and the requirements for Marks, Margin, GF contribution (**GF Contribution**), Mainland Settlement Deposit, Mainland Security Deposit or other collateral, in a timely manner, HKSCC applies risk-related participation requirements. These include the imposition of minimum liquid capital requirements on CPs and daily credit risk monitoring of its CPs and ChinaClear through a set of risk metrics to determine and set the Marks, Margin, Mainland Settlement Deposit, Mainland Security Deposit or other collateral required. HKSCC maintains financial resources sufficient to cover a wide range of potential stress scenarios including CP default scenarios in extreme but plausible market conditions. HKSCC also has risk management measures in place to manage the risk arising from the default of ChinaClear. Please refer to the description under Principle 4: Credit Risk;
 - (d) **Market risk** – In respect of Exchange Trades, HKSCC imposes Marks and Margin 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, HKSCC will collect intra-day margin from CPs in advance of Hong Kong holidays during which major overseas markets are open for trading. Also, for any Eligible Securities in respect of Exchange Trades, each of which HKSCC considers to be high risk, HKSCC may require CPs to provide Concentration Collateral. Furthermore, HKSCC has the right to demand Additional Collateral from any CPs and ChinaClear as it deems necessary to cover

risks arising from their specific business activities, financial conditions or internal control environment. HKSCC collects Mainland Settlement Deposit and Mainland Security Deposit for China Connect Securities Trades to cover its exposures to each CP. Please refer to the description under Principle 4: Credit Risk and Principle 6: Margin;

- (e) **Settlement risk** – payments between HKSCC and CCASS Participants are made via Hong Kong's RTGS systems, through the Settlement Banks appointed by HKSCC. HKSCC 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** – HKSCC follows HKEX Group's ERM 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** – HKSCC adopts stringent selection criteria when appointing settlement and custodian banks to safe keep its own investment and CCASS Participants' assets. HKSCC's investment strategy follows the primary principles of HKEX's Investment Policy, Restrictions and Guidelines (**Investment Policy**), which is set by the IAC 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** – HKSCC follows HKEX Group's ERM framework to identify, monitor and manage all risks including operational risks. To address operational risks that may affect its critical operations and services, HKSCC has established Market Contingency Plans (**MCPs**) setting out the contingency and recovery procedures to address operational risks that may affect its critical operations and services under specific scenarios. In addition, HKSCC follows HKEX Group's physical and information security policies to manage potential physical and system vulnerabilities and threats. Please refer to the description under Principle 17: Operational Risk.

RISK MANAGEMENT POLICIES, PROCEDURES AND SYSTEMS

- 3.2 HKSCC employs a holistic information and risk-control system to provide it with timely information to manage its risks. CCASS allows for the accurate and timely measurement and aggregation of risk exposures in real-time based on the real-time price data and closing price files received from SEHK, and unsettled stock positions of CCASS Participants. CCASS enables HKSCC to monitor its current exposure and

potential future exposure to each CP's and ChinaClear's Market Contracts during each business day. HKSCC uses CCASS to aggregate and centrally manage its exposures and calculates the amount of Marks, Margin, Mainland Settlement Deposit, Mainland Security Deposit, or other collateral, to be collected from each CP and ChinaClear. Please refer to the description under Principle 6: Margin.

- 3.3 HKSCC 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 Marks and Margin against HKSCC's exposures in respect of Exchange Trades, at current market prices;
 - (b) the adequacy of coverage of Mainland Settlement Deposit and Mainland Security Deposit against HKSCC's exposures in respect of China Connect Securities Trades; and
 - (c) stress test data relative to historic exposures compared across CPs and under extreme but plausible market conditions.

RECOVERY AND WIND DOWN PLAN

- 3.4 HKSCC conducts regular business impact analysis of its critical business processes and systems. HKSCC identifies scenarios that could impair its operations and maintains appropriate contingency arrangements to minimise possible damage to HKSCC, its markets, participants and investors. HKEX, together with HKSCC, maintains up-to-date MCPs and participates in the regular Market Contingency Rehearsal Exercise (**Market Wide Rehearsal**) led by the Government of Hong Kong (**HKSAR Government**). HKEX's Information Security & Business Continuity Department 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.
- 3.5 In the extreme situation that HKSCC has decided it does not have the necessary resources to continue business as normal, it will maintain its operations until it has wound down its activities in an orderly manner with the remaining financial resources, as described further under Principle 15: General Business Risk.
- 3.6 HKSCC maintains a recovery plan that is intended to be used by the management of HKSCC in the event that HKSCC experiences a threat to its viability and financial stability that may prevent the continued provision of critical services. The recovery plan is prepared with consideration to the HKSCC rulebook and any applicable policies, plans and procedures of HKSCC and HKEX (where applicable). These include, but are not necessarily limited to, HKEX's Investment Policy; the Counterparty Risk Management Policies (of HKSCC, HKCC and SEOCH); the Liquidity Management Plan (of HKSCC,

HKCC and SEOCH); the HKEX Escalation and Incident Report Policy and the HKEX MCP.

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

- 3.7 The Cash & Derivatives Clearing Risk Management Department meets on a quarterly basis with the RMC to provide an update on HKSCC'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.
- 3.8 There is also a Risk Committee 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.

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 HKSCC RISK MANAGEMENT FRAMEWORK

- 4.1 HKSCC acts as a CCP for Exchange Trades and China Connect Securities Trades to be cleared and settled in CCASS under the CNS system. Under this arrangement, HKSCC undertakes the settlement obligations of CPs for their CNS Positions. In case of a CP default, HKSCC may suffer default loss arising from price movements during the closing-out of the defaulting CP's CNS Positions.

Credit Exposure to CPs

- 4.2 As a CCP, HKSCC has a risk management framework that incorporates the following key components to manage its credit exposure to its CPs :
- (a) CP admission requirements and regular risk scoring analysis for identifying and monitoring risks posed by CPs;
 - (b) processes for mark-to-market, margining, collection of Concentration Collateral and Additional Collateral in respect of Exchange Trades;
 - (c) processes for collection of Mainland Settlement Deposit and Mainland Security Deposit in respect of China Connect Securities Trades;
 - (d) GF and other financial resources to cover default losses exceeding the collateral collected from the defaulting CPs;
 - (e) clear and enforceable CP default rules and procedures. Please refer to the description under Principle 13: Participant-default Rules and Procedures; and

- (f) policies to limit acceptable collateral to assets with low credit, market and liquidity risks. Please refer to the description under Principle 5: Collateral.

4.3 The risk management framework is subject to various ongoing reviews. Ad hoc reviews will be conducted in response to changing regulatory requirements, business needs or developments in the financial markets. Any change to the framework will be subject to the established internal and external approval processes. CPs will be informed of any changes with appropriate notice and where appropriate via circulars which are publicly available on the HKEX website.

Credit Exposure to ChinaClear

4.4 HKSCC's risk management framework incorporates the following key components to manage its credit exposure to ChinaClear in Exchange Trades:

- (a) admission requirements for ChinaClear applying to be a China Connect Clearing House;
- (b) processes for mark-to-market, margining³³, collection of Concentration Collateral and Additional Collateral;
- (c) provision of Collateral Securities to cover short CNS Positions of ChinaClear where possible; and
- (d) well established default handling processes. Please refer to the description under Principle 13: Participant-default Rules and Procedures.

4.5 In addition, HKSCC's risk management framework incorporates the following key components to manage its credit exposure to ChinaClear acting as the home CCP for China Connect Securities Trades:

- (a) HKSCC's collateral recorded under HKSCC's account with ChinaClear and kept under designated accounts at third-party custody banks under the name of ChinaClear to increase the protection to HKSCC's collateral; and
- (b) reliance on CCASS Rules to limit HKSCC's obligations to HKSCC CPs in the event of ChinaClear default. Please refer to the description under Principle 13: Participant-default Rules and Procedures.

4.6 The risk management framework is subject to various ongoing reviews. Ad hoc reviews will be conducted in response to changing regulatory requirements, business needs or

³³ A higher effective margin rate is applied to ChinaClear. Please refer to the description Principle 6: Margin.

developments in the financial markets. Any change to the framework will be subject to the established internal and external approval processes.

Credit Exposure to Settlement Banks

- 4.7 HKSCC has a robust framework to manage its credit risk exposure to its Settlement Banks. The framework covers key areas including eligibility criteria for the appointment of a Settlement Bank, ongoing monitoring of concentration of exposure to Settlement Banks, and regular assessment in ensuring the banks' continual eligibility. Please refer to the description under Principle 9: Money Settlements.

Credit Exposure to Payment System

- 4.8 As an SSS operator and CSD, HKSCC facilitates securities transfers and payment processes using different DVP models for CCASS Participants to choose according to their needs. HKSCC is not exposed to any credit risk in these arrangements.

TOOLS TO MITIGATE CREDIT EXPOSURE TO CPS AND CHINACLEAR

- 4.9 HKSCC uses the following tools to control credit exposure to CPs.

CP Admission Requirements and Regular Risk Scoring Analysis

- 4.10 Currently, licensed corporations and registered institutions under the SFO can be admitted as CPs. A DCP must be a licensed corporation³⁴ while a GCP must be a licensed corporation or a registered institution³⁵. Both licensed corporations and registered institutions are regulated by the SFC while registered institutions are also regulated by HKMA. The SFC and HKMA act as front-line regulators to monitor and supervise the CPs who are licensed corporations and registered institutions while HKSCC is responsible for monitoring CPs' settlement activities and their compliance with the CCASS Rules.
- 4.11 HKSCC sets CP admission requirements to ensure that the risk profile of each CP meets the required standard. HKSCC requires CPs that are licensed corporations to meet the prescribed minimum capital requirements (HK\$3 million for DCPs and HK\$300 million for GCPs or its required liquid capital under the Securities and Futures (Financial Resources) Rules (Cap. 571N of the Laws of Hong Kong) (**FRR**), whichever is the higher). CPs that are registered institutions have to be a Hong Kong dollar note-issuing bank or have a minimum credit rating of A3 or equivalent by a credit rating agency recognised by HKSCC.

³⁴ More specifically, a licensed corporation that is licensed to carry on Type 1 Regulated Activity (Dealing in Securities) under the SFO.

³⁵ More specifically, a registered institution that is registered to carry on Type 1 Regulated Activity (Dealing in Securities) under the SFO.

- 4.12 During the CP admission review process, HKSCC 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. Admitted CPs must comply with the continuing obligations set out in the CCASS Rules.
- 4.13 In addition to the above admission requirements, a CP is required to meet additional eligibility criteria before being accepted to clear and settle China Connect Securities Trades. The criteria include having RMB settlement capabilities and necessary clearing and settlement systems and operational procedures in place to clear China Connect Securities Trades.
- 4.14 HKSCC routinely measures and monitors its current and potential future credit exposures to CPs that are licensed corporations with reference to their monthly financial returns obtained through the SFC. Monthly risk scoring analysis is also conducted based on the Counterparty Risk Ranking Methodology in which each CP is assessed and assigned a risk score based on three key risk factors including financial, non-financial and settlement capability of the CP. The methodology aims to provide HKSCC with a more dynamic risk management tool to monitor CPs more effectively and enhance risk assessment process on imposition of additional risk management measures on the concerned CPs.

DVP Settlement Mechanism

- 4.15 HKSCC releases on-hold securities allocated to buying CPs only after payments are received from them.

Mark-to-Market, Margining and Collection of Collateral in Exchange Trades

- 4.16 To cover its current credit exposure, HKSCC collects Marks for the mark-to-market losses of a CP's open CNS Positions as a result of unfavourable price movements of the underlying stocks prior to settlement. The Marks calculation is processed twice a day (intra-day calculation is scheduled at 11:00 am and day-end calculation at around 8:00 pm) using the latest positions and price information.
- 4.17 HKSCC adopts a value at risk approach to calculate Margin requirements. Margin is used to cover the future exposure between the last Marks calculation and the projected closing-out price under normal market conditions. Margin calculation is conducted daily at around 8:00 pm using the latest positions and price information. Intra-day Margin will be called in advance of two or more consecutive days of holiday in Hong Kong during which major overseas markets are open for trading. In arriving at a CP's Margin requirement, HKSCC may adjust the margin multiplier (**Margin Multiplier**) by reference to the level of risk exposure of the individual CP to HKSCC and such other matters as HKSCC may consider relevant and a margin credit (**Margin Credit**) of up to HK\$5 million is granted to every CP. A CP will only be required to provide Margin for the amount in excess of the Margin Credit.

- 4.18 HKSCC requires a CP to provide Concentration Collateral if the CP holds a net long CNS Position in a high-risk security that exceeds the concentration trigger value of HK\$5 million and two times of its apportioned liquid capital. The amount of Concentration Collateral payable by a CP is equal to its respective net long CNS Position in a high-risk security multiplied by the percentage of daily market volatility of that security that is currently set at 10% by HKSCC. Frequency of calculation for Concentration Collateral is the same as that for Marks.
- 4.19 HKSCC has the right to demand Additional Collateral from any CP as it deems necessary to cover risks arising from the CP's specific business activities, financial condition or internal control environment. These include but are not limited to situations such as holding sizeable CNS Positions relative to the overall market; having a large CNS Position in a security which poses specific risk concern (e.g. low market liquidity); and holding a CNS Position in a security with specific wrong-way risk.
- 4.20 HKSCC performs daily back-testing and monthly sensitivity analysis to assess its margin model performance and margin coverage. The back-testing reveals 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.

Mainland Settlement Deposit and Mainland Security Deposit in China Connect Securities Trades

- 4.21 To cover the credit risk as a result of CP failure to meet its money obligations in respect of the CNS Positions in China Connect Securities, HKSCC collects Mainland Settlement Deposit from CPs. The Mainland Settlement Deposit is calculated for each China Connect Market separately on a daily basis (including intra-day and day-end collection) with reference to the CP's average daily buy turnover and contract value of overdue short positions in China Connect Securities and sell turnover in China Connect Securities for SPSAs in the previous month.
- 4.22 To cover the market risk as a result of potential unfavourable fluctuations of prices in respect of the unsettled stock positions in China Connect Securities of CPs under the CNS System, HKSCC collects Mainland Security Deposit from CPs. The Mainland Security Deposit is calculated for each China Connect Market separately on a monthly basis with reference to the CP's average daily net settlement amount in China Connect Securities in the past six months.
- 4.23 HKSCC performs daily back-testing to assess the overall collateral coverage on CPs with respect to their buy positions on China Connect Securities. The back-testing results reveal that the collateral coverage is satisfactory.
- 4.24 For further details regarding the collection of Mainland Settlement Deposit and Mainland Security Deposit, please refer to the description under Principle 6: Margin.

GF and other Financial Resources

- 4.25 HKSCC maintains a GF to meet its obligations and liabilities as a CCP if losses arising from one or more CP defaults cannot be fully covered by the Marks, Margin and other collateral collected from the defaulting CPs. The GF can also be used as a source of liquid funds to meet any immediate payment obligations of HKSCC in relation to a CP default. The GF comprises CPs' contributions, HKSCC's contributions and interest income of the GF.
- 4.26 CP's GF Contributions comprise a basic component (**Basic Contribution**) and a dynamic component (**Dynamic Contribution**). A review of the size of the GF and corresponding determination of CPs' contributions is conducted monthly and more frequently if appropriate. HKSCC informs CPs the change in the size of the GF after the review via circular.
- 4.27 A CP's Basic Contribution is calculated with reference to the CP's relative share of the total unsettled positions in the market subject to a minimum amount³⁶ with the size of the aggregate Basic Contributions from all CPs amounting to not less than HK\$100 million³⁷.
- 4.28 The total Dynamic Contribution to be collected from all CPs is determined with reference to stress testing results as mentioned below. A CP's Dynamic Contribution is calculated with reference to the CP's relative share of the total unsettled positions in the market. In arriving at a CP's Dynamic Contribution requirement, a dynamic contribution credit (**Dynamic Contribution Credit**) of up to HK\$1 million is granted to every CP. As a result, a CP will only be required to provide Dynamic Contribution for the amount in excess of the Dynamic Contribution Credit.
- 4.29 HKEX currently sets aside HK\$4 billion of shareholders' funds as HKEX Risk Management Capital (**RM Capital**) for the purpose of strengthening the risk management regime of the clearing houses and supporting their roles as CCPs. The Margin Credits and Dynamic Contribution Credits mentioned above are also supported by the RM Capital.
- 4.30 HKSCC uses the following tools to control credit exposure to ChinaClear:

Admission Requirements of China Connect Clearing House

- 4.31 ChinaClear applying to be a China Connect Clearing House must satisfy the following requirements:

³⁶ The minimum Basic Contribution for each DCP is the higher of HK\$50,000 or HK\$50,000 for each trading right held by it. For each GCP, the minimum Basic Contribution required is the higher of HK\$150,000 or the aggregate of HK\$50,000 for each trading right held by the GCP and HK\$50,000 for each Non-clearing Participant (**NCP**) which clears through the GCP.

³⁷ It is pursuant to the Memorandum of Understanding between the SFC and HKEX on matters relating to SFC Oversight, Supervision of Exchange Participants and Market Surveillance, dated 20 February 2001.

- (a) be an ATS provider authorized by the SFC under Section 95 of the SFO;
- (b) be a clearing house duly authorised by relevant regulators in Mainland China to provide securities clearing and settlement services to its participants;
- (c) be of good financial standing and integrity;
- (d) satisfy any regulatory conditions specified by the SFC under the SFO or in relation to its authorization as an ATS provider by the SFC;
- (e) have a valid binding and effective CSD and Clearing Links Agreement with HKSCC; and
- (f) meet all other relevant participation requirements as HKSCC may prescribe from time to time.

Mark-to-Market, Margining and Collection of Collateral in Exchange Trades

4.32 ChinaClear is subject to similar risk management measures applicable to CPs in respect of their Exchange Trades for Shanghai Connect and Shenzhen Connect separately (i.e. Margin, Marks, Concentration Collateral and Additional Collateral), with the following exceptions:

- (a) **No loss sharing with CPs** – Under the risk insulation principle, ChinaClear does not contribute to the HKSCC GF, and is not required to share any default loss of CPs;
- (b) **Longer collateral payment timeline** – Due to ChinaClear’s operational limitations, ChinaClear is not able to meet the normal collateral payment timeline which is currently applied to CPs. One extra business day would be needed for ChinaClear to complete the transfer of the collateral required to meet the imposed risk management measures;
- (c) **Exemption from intra-day collateral** – Similarly, there are operational and practical difficulties for ChinaClear to meet the intra-day collection of Marks, Concentration Collateral and Margin called by HKSCC. Thus, ChinaClear has been exempted from these intra-day payments;
- (d) **Higher margin requirement** – To mitigate the incremental risk due to the gap in risk management measures as described in paragraphs (a) to (c) above, HKSCC has imposed a higher Margin Rate on ChinaClear’s positions in Exchange Trades;
- (e) **Additional Collateral** – ChinaClear is also required to provide Additional Collateral when total collateral on hand is insufficient to cover the assumed closing-out loss of its unsettled positions which are projected under extreme but plausible market conditions; and

- (f) **Collateral Securities** – HKSCC has made it a requirement for ChinaClear to post Collateral Securities with HKSCC to cover all its short positions in Exchange Trades where possible.

CREDIT EXPOSURE TO SETTLEMENT BANKS

- 4.33 HKSCC 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

- 4.34 The sufficiency of the GF and other financial resources is ascertained through stress testing. HKSCC conducts daily stress testing against CPs' unsettled positions taking into consideration the projected risk exposure of the GF and prevailing market conditions. The risk exposure of the GF is assessed with reference to two key assumptions:
- (a) price movements ($\pm 22\%$ ³⁸ for non-structured products and $\pm 100\%$ for structured products in Exchange Trades; and $\pm 10\%$ ³⁹ for China Connect Securities Trades); and
 - (b) default of the single largest CP and the fifth largest CP.
- 4.35 Based on the daily stress testing results, HKSCC will trigger ad-hoc review to demand additional GF Contributions from CPs if the risk exposure of the GF exceeds 80% of the sum of the existing GF size and the aggregate Dynamic Contribution Credit utilized by all CPs for two consecutive business days. HKSCC also re-calculates the required GF Contribution of each CP on the first business day of every month. In both ad-hoc and monthly reviews, a buffer equivalent to 25% of the maximum risk exposure calculated in the preceding one-month period is incorporated in determining the required GF size. The required GF Contribution of each CP is based on its relative share of the total unsettled positions in the market in the relevant period, subject to a minimum required amount as mentioned in paragraph 4.28. HKSCC provides reports to CPs of their required GF Contribution following each monthly and ad hoc review. HKSCC informs the CPs their total required GF Contributions resulting from stress testing via circulars after each review. The required GF Contribution is collected on the third business day following the date of the notification. Stress testing results are reported to HKEX's senior management on a daily basis, to the SFC on a weekly basis, to the Risk Committee and the RMC on a quarterly basis.

³⁸ The $\pm 22\%$ price movement reflects the most volatile historical movement of the Hang Seng Index (HSI). 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 future.

³⁹ The $\pm 10\%$ market movement covers the historical highpoint movements of relevant indices on SSE securities and SZSE securities from their launch dates.

- 4.36 HKSCC 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 and participant default events. This review will be conducted more frequently when the market is unusually volatile, less liquid or when the concentration of positions held by CPs increases significantly. HKSCC performs an annual independent validation of the model.
- 4.37 HKSCC also conducts monthly reverse stress testing to identify the extreme scenarios and market conditions in which the GF and other financial resources would not provide sufficient coverage of tail risk. HKSCC conducts the testing by applying a combination of different extreme price movements and counterparty default scenarios against both hypothetical and actual portfolios of its CPs.

Use of GF and other Financial Resources – the Waterfall

- 4.38 In the event of a CP default, HKSCC will first use the available non-pooled resources, such as Marks, Margin, Mainland Settlement Deposit, Mainland Security Deposit and other forms of collateral collected from the defaulting CP to cover any default loss. Thereafter, HKSCC will apply other financial resources in accordance with CCASS Rules 2507 and 2507A. Please refer to the description under Principle 13: Participant-default Rules and Procedures.

Allocation of Default Losses and Replenishment/Repayment Arrangements

- 4.39 In the event of a CP default where non-defaulting CPs' contributions to the GF are used to cover a default loss under the CCASS Rules, the contributions will be applied to share the default loss on a pro-rata basis by reference to CPs' respective contributions to the GF immediately prior to the default.
- 4.40 After the GF is applied to cover a default loss, HKSCC will require its CPs to replenish the deficiency of their GF Contributions as a result of the application. HKSCC will issue a notice of application to require the non-defaulting CPs to replenish the deficiency. CPs must replenish the deficiency no later than three business days after the date of the notice of application, or within such other time period as may be specified by HKSCC.
- 4.41 A CP can limit its liability to replenish its GF Contributions and to provide additional amounts as its contributions in respect of pending GF applications by submitting a notice to terminate its participation in HKSCC. CPs that do not submit a notice of termination remain liable for any further replenishments or additional amounts. There is no cap on a CP's liability in the absence of it serving a notice of termination.
- 4.42 If a CP's notice of termination is received within three business days after receipt of the notice of application, the aggregate liability of the CP to replenish a deficiency of its GF Contribution and to provide additional amounts as contribution is limited to (a) the

aggregate amount which equals the CP's GF Contribution requirements on the day HKSCC receives the notice of termination; and (b) two times the amount in (a) above.

Recovery of Default Losses

- 4.43 HKSCC has the right to pursue recovery of any default loss incurred through legal proceedings against the defaulting CP. Any recovered amount, net of recovery costs and expenses, may be credited to the GF.
- 4.44 The above arrangements are documented in Chapter 25 of the CCASS Rules.

DEFAULT OF CHINACLEAR

- 4.45 As the national CCP of the Mainland's securities market, ChinaClear operates a comprehensive network of clearing, settlement and stock holding infrastructure. ChinaClear has established a risk management framework and measures that are approved and supervised by the CSRC. The chances of ChinaClear default are considered to be remote. Nonetheless, the following arrangements have been considered for reasons of prudence:
- (a) **China Connect Securities Trades** – If ChinaClear defaults as the host CCP in the Mainland, HKSCC will assist CPs in pursuing their claims against ChinaClear. HKSCC will in good faith, seek recovery of the outstanding stocks and monies from ChinaClear through available legal channels and through ChinaClear's liquidation process, if applicable. HKSCC will in turn distribute the stocks or monies recovered to CPs on a pro-rata basis; and
 - (b) **Exchange Trades** – If ChinaClear fails to meet its settlement obligations in respect of positions in Exchange Trades, HKSCC will consider the circumstances and may declare ChinaClear as a defaulter if the situation warrants. HKSCC will then apply its standard default procedures and execute closing-out of ChinaClear's unsettled positions in Exchange Trades through HKSCC's authorised brokers. Margin and all other collateral (including Collateral Securities) posted by ChinaClear with HKSCC will be used to cover any loss arising from the closing-out process. As ChinaClear does not contribute to the GF, HKSCC will not use the GF to cover any residual closing-out loss with respect to ChinaClear's positions in Exchange Trades.
- 4.46 While it is considered a remote possibility that ChinaClear would fail to meet its obligation due to financial or credit reasons, HKSCC has worked with ChinaClear to develop contingency plans to minimise the chance and impact of any liquidity risk due to temporary operational disruption.
- 4.47 The above arrangements are documented in Chapters 41 and 42 of the CCASS 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 HKSCC limits acceptable collateral to assets with low credit, liquidity and market risk only. HKSCC has defined standards approved by the HKEX Board and the SFC to determine the assets acceptable 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 In respect of Exchange Trades, HKSCC currently accepts cash (HKD, USD and RMB) from CPs to meet their Marks, Concentration Collateral, Additional Collateral and Margin requirements, and cash (HKD) from CPs to meet their requirements to GF Contributions. As for ChinaClear, ChinaClear meets its Marks, Concentration Collateral, Additional Collateral and Margin requirements by cash (RMB). In respect of China Connect Securities Trades, HKSCC currently only accepts cash (RMB) from CPs to meet their Mainland Settlement Deposit and Mainland Security Deposit requirements.
- 5.3 If a CP or ChinaClear has an unsettled short CNS Position, it can deliver the securities underlying the short CNS Position as Collateral Securities. As the risk of the relevant short CNS Position is covered by the Collateral Securities, the relevant short CNS Position is not subject to Marks and will be deducted from Margin calculation. HKSCC has made it a requirement for ChinaClear to post Collateral Securities to cover its short CNS Positions where possible while it is not a requirement for a CP.

VALUATION AND HAIRCUT

- 5.4 HKSCC marks to market all foreign currencies (i.e. USD and RMB) posted as collateral at least once daily. HKSCC uses market data from selected information vendors for the valuation of cash collateral. Where the currency of the collateral is different from the settlement currency of the CNS Positions, haircuts are applied.
- 5.5 In determining the haircut rates, HKSCC calculates the projected volatility of the currency of the posted collateral at a two-tailed confidence interval of 99.7% based on

historical price movements of different time intervals (ranging from seven days to one year depending on the currency) and incorporates a buffer to minimise the need to adjust the rates frequently. The sufficiency of haircuts is further validated by comparing the value-at-risk calculation based on historical and hypothetical stress scenarios and five-year historical data. HKSCC also takes into consideration extreme price movements in assessing the adequacy of the haircut rate for each currency.

- 5.6 HKSCC continuously monitors the volatility of the collateral. HKSCC 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. HKSCC arranges an annual independent validation of the adequacy of the haircut procedures.

CROSS-BORDER (OR FOREIGN) COLLATERAL

- 5.7 HKSCC accepts cash collateral in foreign currencies (i.e. USD and RMB) deposited in banks in Hong Kong, which are selected in accordance with the approved HKSCC standards, to ensure that HKSCC can use the foreign currencies cash collateral in a timely manner.

COLLATERAL MANAGEMENT SYSTEM

- 5.8 HKSCC uses an integrated collateral management system, CCMS, to manage collateral in accordance with the CCASS Rules, CCASS OP and internal procedures.
- 5.9 CCMS performs collateralisation to determine the collateral requirements of CPs, tracks collateral movements and performs valuations. CCMS also facilitates HKSCC and CPs 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 ongoing 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 HKSCC mitigates its current and future credit exposures to CPs and ChinaClear in respect of Exchange Trades by using a combination of Marks, Margin, Concentration Collateral and Additional Collateral. HKSCC also mitigates its credit exposures to CPs in respect of China Connect Securities Trades by using a combination of Mainland Settlement Deposit and Mainland Security Deposit. HKSCC has in place the operational capacity to enforce, and does enforce, the timely calculation and collection of Marks, Margin, Concentration Collateral, Additional Collateral, Mainland Settlement Deposit and Mainland Security Deposit.

MARKS

- 6.2 HKSCC collects Marks for the mark-to-market losses of a CP's or ChinaClear's⁴⁰ open CNS Positions as a result of unfavourable price movements of the underlying stocks prior to settlement. The collected Marks reflect the current exposure resulting from changes in market prices of its CNS Positions.

MARGIN

- 6.3 HKSCC adopts a value at risk approach to calculate Margin requirements. HKSCC calculates and collects Margin from CPs and ChinaClear⁴¹ at least once daily to cover the potential future exposure between the last Marks calculation and the projected closing-out price under normal market conditions. The Margin requirement is determined by the following formula:

$$\text{Margin Requirement} = (\text{Margining Position} \times \text{Margin Rate} \times \text{Margin Multiplier}) - \text{Margin Credit}$$

Margining Position (Margining Position)

- 6.4 To calculate a CP's or ChinaClear's Margining Position, its CNS Positions of the same security are netted across different settlement days to arrive at a cross-day net long or net short CNS Position for each security. The CNS Positions of all securities that are cross-day net long are then aggregated to arrive at the total net long CNS Position.

⁴⁰ Marks is calculated and collected separately from ChinaClear in respect of its CNS Positions in Exchange Trades under Shanghai Connect and Shenzhen Connect.

⁴¹ Margin is calculated and collected separately from ChinaClear in respect of its CNS Positions in Exchange Trades under Shanghai Connect and Shenzhen Connect.

Similarly, the CNS Positions of all securities that are cross-day net short are aggregated to arrive at the total net short CNS Position. The Margining Position for the CP or ChinaClear will be the higher of the total net long CNS Position or the net short CNS Position. Short CNS Positions covered by Collateral Securities will be deducted from the Margining Position for Margin calculation. HKSCC does not allow Margin offset across net CNS Positions of different securities.

Benchmark Margin Rate (Benchmark Rate)

6.5 HKSCC determines the Benchmark Rate with reference to the projected volatility of daily closing of the Hang Seng Index (**HSI**) at a two-tailed confidence interval of 99.73% (three standard deviations) using an exponentially weighted moving average model⁴² with reference to a historical data period of 90 days. A one-day close-out period is assumed in the model for CPs whereas a two-day close-out period is assumed for ChinaClear. This adjustment is to cover the incremental risks resulting from the extra one day ChinaClear needs to transfer the required collateral to HKSCC. For further details on the assumed close-out period of ChinaClear, please refer to the description in paragraph 6.13 below.

Margin Rate (Margin Rate)

- 6.6 HKSCC determines the final Margin Rate based on the Benchmark Rate with a cushion of 10% and subject to a minimum Margin Rate of 5%.
- 6.7 HKSCC reviews the Margin Rate monthly to keep track of changes in market volatility. In addition to monthly reviews, HKSCC conducts daily reviews and will increase the Margin Rate if it is found to be less than the Benchmark Rate. HKSCC 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 Rate. HKSCC informs CPs of any change to the Margin Rate via circulars.
- 6.8 To compensate for ChinaClear's non-participation in the HKSCC GF and the incremental risks resulting from the extra one day needed to transfer the required collateral to HKSCC, Additional Collateral and a higher Margin Rate is charged from ChinaClear. HKSCC informs ChinaClear of any change to the Margin Rate separately.

Margin Multiplier

6.9 HKSCC applies a standard Margin Multiplier of one time to the unsettled stock positions of a CP or ChinaClear in Margin calculation. HKSCC may adjust the Margin Multiplier of a CP by reference to its risk exposure posed to HKSCC and such other matters as HKSCC may consider relevant.

⁴² A model used to project volatility based on historical data with more weight being placed on more recent ones.

Margin Credit

- 6.10 In arriving at a CP's Margin requirement, a Margin Credit of up to HK\$5 million is granted to every CP. As a result, a CP is only required to provide Margin for the amount in excess of the Margin Credit. No Margin Credit is granted to ChinaClear.

ASSESSMENT AND SETTLEMENT OF MARKS/MARGIN REQUIREMENTS

- 6.11 Marks requirements⁴³ for a CP are assessed twice daily: (a) intra-day assessment at 11:00 am; and (b) day-end assessment at around 8:00 pm. A CP will be required to pay for intra-day Marks on the excess amount when the CP's Marks requirement in intra-day assessment exceeds the tolerance limit of up to HK\$5 million. Margin requirements are assessed once daily at around 8:00 pm. CPs assessed with Marks and/or Margin requirements are required to fulfil such obligations (Marks and Margin requirements net of lodged collateral) by 2:00 pm on the same business day and 9:30 am on the following business day for intra-day and day-end requirements respectively.
- 6.12 In addition, intra-day Margin will be called from a CP in advance of two or more consecutive days of holiday in Hong Kong during which major overseas markets are open for trading. During a half trading day, intra-day Margin requirements will be assessed at 11:00 am and collected by 2:00 pm together with intra-day Marks. During a normal trading day, intra-day Margin requirements will be assessed at 2:00 pm and collected by 8:00 pm on the same business day, together with the money obligations arising from the settled CNS Positions.
- 6.13 Due to ChinaClear's operational limitations, ChinaClear is not able to meet the normal collateral payment timeline which is currently applied to CPs. One extra business day would be needed for ChinaClear to complete the transfer of the collateral required to meet the imposed risk management measures. Similarly, there are operational and practical difficulties for ChinaClear to meet the intra-day collection of Marks and Margin called by HKSCC. Thus, ChinaClear has been exempted from these intra-day payments. To manage the above additional risk, a two-day close-out period assumption is adopted to calculate the Margin Rate applicable to ChinaClear.

CONCENTRATION COLLATERAL

- 6.14 For an Eligible Security which HKSCC considers as a high-risk security, HKSCC may require a CP and ChinaClear⁴⁴ to provide on demand Concentration Collateral if (a) the CP's or ChinaClear's concentration percentage in that Eligible Security exceeds the

⁴³ HKSCC will collect Marks in full amount from CPs whose net CNS Positions exceed four times of their respective liquid capital. Otherwise, HKSCC will only collect the amount that exceeds the CPs' respective internal "credit limit" (i.e. the amount equivalent to their Basic Contribution).

⁴⁴ Concentration Collateral is calculated and collected separately from ChinaClear in respect of its CNS Positions in Exchange Trades under Shanghai Connect and Shenzhen Connect.

concentration trigger percentage determined by HKSCC from time to time; and (b) the value of the CP's or ChinaClear's net long CNS Position in that Eligible Security exceeds the concentration trigger value determined by HKSCC from time to time.

- 6.15 An Eligible Security is considered as high risk if its daily market volatility exceeds a level set by HKSCC, currently at 10%. The amount of Concentration Collateral payable by a CP and ChinaClear is equal to their respective net long CNS Position in a high-risk security multiplied by the percentage of daily market volatility of that security determined by HKSCC from time to time. Frequency of calculation and collection for CPs' Concentration Collateral is the same as that for Marks. Due to operational and practical difficulties for ChinaClear to meet the intra-day collection of Concentration Collateral, ChinaClear has been exempted from intra-day Concentration Collateral payments.

ADDITIONAL COLLATERAL

- 6.16 HKSCC has the right to demand Additional Collateral from a CP to cover risks arising from its specific business activities, financial condition, internal control environment or other risk factors that are deemed to be relevant. These include but are not limited to situations like:
- (a) holding sizeable positions relative to the overall market and/or its reported liquid capital;
 - (b) having a large CNS Position in a security which poses specific risk concerns (e.g. low market liquidity);
 - (c) holding a CNS Position in a security with specific wrong-way risk; or
 - (d) being identified to be risky based on the Counterparty Risk Ranking Methodology. Under this methodology, each CP is assessed and assigned with a risk score based on three key risk factors, namely financial risk factor, settlement risk factor and non-financial risk factor.
- 6.17 Additional Collateral is demanded on an ad hoc basis and collected from a CP within a time period specified by HKSCC.
- 6.18 Due to the non-participation in HKSCC GF, ChinaClear is required to provide Additional Collateral to make its collateral requirement sufficient to cover the assumed closing-out loss of its unsettled positions which are projected under extreme but plausible market conditions. Additional Collateral is calculated and collected separately from ChinaClear in respect of its CNS Positions in Exchange Trades under Shanghai Connect and Shenzhen Connect.

MAINLAND SETTLEMENT DEPOSIT

- 6.19 HKSCC collects Mainland Settlement Deposit from a CP that participates in the trading of China Connect Securities. This is to cover the credit risk as a result of a CP's failure to meet its money obligations in respect of the CNS Positions in China Connect Securities. The Mainland Settlement Deposit requirement is calculated separately for each China Connect Market based on 20% of a CP's average daily buy turnover and contract value of overdue short positions in China Connect Securities and sell turnover in China Connect Securities for SPSAs in the previous month. This requirement is determined on a daily basis and any shortfall in Mainland Settlement Deposit is collected via day-end Direct Debit Instruction. Refunds on excesses in Mainland Settlement Deposit are made on daily basis starting from the day ChinaClear conducts its collection or refund of the relevant deposit from or to HKSCC after its monthly review in respective China Connect Markets to the last business day of that month via day-end Direct Credit Instruction.
- 6.20 In addition, a CP shall pay the intra-day Mainland Settlement Deposit to HKSCC by 2:00 pm on the same day when such intra-day shortfall amount of all China Connect Markets exceeds the tolerance limit of RMB 5 million.

MAINLAND SECURITY DEPOSIT

- 6.21 HKSCC collects Mainland Security Deposit from a CP who participates in trading of China Connect Securities to cover the market risk as a result of potential unfavourable fluctuations of prices in respect of the unsettled stock positions in China Connect Securities of CPs under the CNS System. The Mainland Security Deposit requirement is calculated based on 16.4% for Shanghai market and 18.5% for Shenzhen market of the CP's average daily net settlement amount in China Connect Securities in the past six months, subject to a minimum amount of RMB 200,000 for Shanghai and Shenzhen Connect as a whole. The Mainland Security Deposit requirement is determined monthly on the last calendar day of each month and any shortfall is collected on the first business day of each month by day-end Direct Debit Instruction. Refunds of excess amounts are made as soon as practicable after ChinaClear conducts its collection or refund of the relevant deposit from or to HKSCC after its monthly review in respective China Connect Markets via day-end Direct Credit Instruction.

PRICE DATA FOR MARKS, MARGIN AND COLLATERAL CALCULATIONS

- 6.22 HKSCC receives real-time price data and closing price files from SEHK in respect of Exchange Trades. These are used for calculating Marks, Margin, Concentration Collateral, and Additional Collateral. The calculations of Mainland Settlement Deposit and Mainland Security Deposit do not require the use of price data in respect of China Connect Securities Trades. During trading hours, the real-time price data will be stored in CCASS on a trade-by-trade basis. HKSCC uses the latest traded prices stored in

CCASS for calculations when the real-time price data or closing price file is not readily available.

BACK-TESTING AND SENSITIVITY ANALYSIS OF THE MARGINING MODEL

- 6.23 In respect of Exchange Trades, HKSCC conducts daily Margin back-testing to test (a) Margin coverage by comparing the Margin Rate with the actual daily HSI movement; and (b) sufficiency of collateral requirements imposed on selected CPs of different sizes and ChinaClear by comparing the simulated closing-out losses with the total Marks, Margin, Concentration Collateral and Additional Collateral requirements.
- 6.24 HKSCC 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 a longer closing-out period or 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 CP increases significantly.
- 6.25 In respect of China Connect Securities Trades, HKSCC conducts daily back testing to assess the overall collateral coverage on CPs with respect to their buy positions on China Connect Securities.
- 6.26 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.
- 6.27 HKSCC 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 HKSCC's liquidity risks are as follows:

- (a) **Default of CPs** – as a CCP, HKSCC is exposed to liquidity risk primarily in relation to the funding of the defaulting CP's money settlement obligations and/or 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 HKSCC also faces the risk of a default of these liquidity provider(s);
- (c) **Operational or financial failure of Settlement Bank(s)/custodian bank(s)** – HKSCC also faces liquidity risks related to the inability to meet the release of surplus Margin and GF collateral of CPs and/or use buying CPs' cash prepayment to settle its money settlement obligations to selling CPs due to failure of Settlement Bank(s)/custodian bank(s). HKSCC also takes into account the liquidity risk associated with the default of any entity that takes on multiple roles, e.g. where a Settlement Bank is also a CCASS Participant and/or liquidity provider;
- (d) **Illiquidity of investments or collateral** – HKEX's Investment Policy aims to ensure that investment portfolios are sufficiently liquid at all times. This is described in greater detail under Principle 16: Custody and Investment Risks; and
- (e) **Failure of cross-border money transfer** – under Shanghai and Shenzhen Connect, ChinaClear and HKSCC have become special clearing participants of each other. Liquidity risk arises if there is any failure of cross-border money transfers due to technical issues or severe weather conditions (i.e. typhoon or black rainstorm) such that HKSCC could not transfer the settlement amount to ChinaClear or vice versa.

7.2 HKSCC, as an SSS operator, facilitates securities transfers and payment processes using different DVP models for CCASS Participants to choose according to their needs. HKSCC is not a counterparty in providing these services and is not exposed to any liquidity risk in the arrangements.

LIQUID RESOURCES

- 7.3 As the liquidity requirement of HKSCC is managed together with those of HKCC and SEOCH by HKEX at the HKEX Group level. HKEX compares the availability of respective funds against the liquidity requirement of HKSCC, HKCC and SEOCH on a daily basis when making investment decisions. Adjustments to the maturities of the funds invested will be made where necessary.
- 7.4 HKSCC invests margin fund, GF and HKSCC's corporate fund only in assets with low credit, market and liquidity risks in accordance with the Investment Policy. The Investment Policy also sets out minimum liquidity requirements on investments and a concentration limit for each counterparty to ensure that HKSCC has sufficient liquid resources to meet projected and stressed funding requirements.
- 7.5 To mitigate issues relating to counterparty concentration, a cap is set on the total amount of the margin funds, GF, reserve funds and corporate funds of HKEX Group, including HKSCC, that can be deposited with any one of its counterparties including the systemically important HKD note-issuing banks.
- 7.6 In addition to using the Marks, Margin, Mainland Settlement Deposit, Mainland Security Deposit, collateral, GF and HKSCC corporate fund on hand, HKEX may draw on its own corporate funds (including the RM Capital) and liquidity facilities to address the liquidity needs of HKSCC. HKEX 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 three currencies, namely HKD, USD and RMB from selected liquidity providers. In a CP default situation, these facilities, together with the defaulting CP's Marks, Margin, Mainland Settlement Deposit, Mainland Security Deposit, collateral, the GF, HKSCC 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 billion are also available in case of need, but do not count as liquidity pursuant to the PFMI.
- 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 The liquidity requirement required for each relevant currency in relation to HKSCC CP 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 look-back 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 the HKEX Group level and the results are monitored at least monthly.

- 7.9 The Cash & Derivatives Clearing Risk Management Department reports the liquidity stress testing results to HKSCC's senior management and the SFC on a daily basis. On a monthly basis, the Cash & Derivatives 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, CP 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 CPs increases significantly. HKSCC performs an annual independent validation of the model.

CONTINGENCY ARRANGEMENT FOR UNCOVERED LIQUIDITY SHORTFALLS

HKSCC's Obligations as CCP under Market Contracts

- 7.10 Under CCASS Rule 3307, to the extent that the aggregate of funds or assets available to HKSCC are insufficient to meet its obligations to CPs and ChinaClear under Market Contracts, each CP or ChinaClear is only entitled to receive payment pro-rata to the amount due to it as compared to the amount due to all CPs and ChinaClear. HKSCC 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 HKSCC's obligations under Market Contracts to deliver Eligible Securities or a particular currency to CPs and ChinaClear, CCASS Rule 3307 states that if HKSCC determines that it is not possible or reasonably practicable to deliver the Eligible Securities or currency it may make money compensation or pay in different currency in whole or in part to the relevant CPs and ChinaClear in such amount as HKSCC may determine to be fair and reasonable.

Replenishment of Liquid Resources

- 7.11 For the replenishment of the GF, 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 HKSCC acts as (a) the CCP to clear and settle Exchange Trades and China Connect Securities Trades by novating and replacing them with Market Contracts for settlement under the CNS System; and (b) an SSS operator to effect securities transfers between CCASS Participants within CCASS.
- (a) **Settlement under the CNS System:** once HKSCC accepts an Exchange Trade or China Connect Securities Trade to be settled under the CNS System in accordance with the CCASS Rules and CCASS OP, such trade or transaction is irrevocable. HKSCC effects securities settlement on T+2 for Exchange Trades and on T-day for China Connect Securities Trades, and securities will be credited into the receiving CP's or ChinaClear's stock accounts in CCASS. Title and property over such securities are put on-hold, and passed only when the receiving CPs' or ChinaClear' payment obligations are confirmed good via intra-day or day-end money settlement, in any case no later than (a) 8:00 pm on the settlement day for Exchange Trades; and (b) 12:00 noon on T+1 for China Connect Securities; and
- (b) **Securities transfers:** HKSCC provides services for the transfer of securities among CCASS Participants via FOP or DVP⁴⁵ as specified by CCASS Participants in their SIs. Settlement is final when securities are transferred in accordance with the CCASS Rules and CCASS OP. HKSCC does not act as a CCP for these services.

SECURITIES SETTLEMENTS/TRANSFERS

- 8.2 All securities settlements and transfers are effected through book-entry transfers between stock accounts of CCASS Participants in CCASS by two methods, namely (i) inputting of DIs⁴⁶; and (ii) scheduled BSRs⁴⁷.

⁴⁵ CCASS Participants can opt to conduct their Securities Transfers under three settlement methods, namely FOP, DVP, RDP as mentioned in Section III of this document. RDP settlement is currently not available to China Connect Securities. HKSCC plans to provide RDP settlement for China Connect Securities in due course.

⁴⁶ Use of DIs to settle SI positions in China Connect Securities is only available after the completion of the 2nd CNS BSR for China Connect Securities.

⁴⁷ BSRs are processed by CCASS automatically as scheduled four times on each settlement day for settlement of Exchange Trades and SIs on SEHK Securities at around 10:30 am, 12:00 noon, 2:00 pm and 3:45 pm. BSRs for China Connect Securities are processed by CCASS automatically on each settlement day as scheduled (a) two times for settlement under CNS System at around 5:30 pm and 7:00 pm; and (b) four times for SIs, at around 5:30 pm, 6:15 pm, 7:00 pm and 7:45 pm.

MONEY SETTLEMENTS

- 8.3 HKSCC conducts money settlements in three currencies (i.e. HKD, RMB and USD) with CCASS Participants through the RTGS systems operated by HKICL. HKSCC sends money settlement instructions to HKICL for settlement before the end of the settlement day except for those RMB DVP SIs in China Connect Securities, where one or both of the CCASS Participants' Designated Banks do not support the same day night settlement, and for HKD or USD DVP SIs in China Connect Securities, money settlement is confirmed on the next business day under which CCASS Participants' Designated Banks perform debits/credits of CCASS Participants' bank accounts on the settlement day for same day value and issue payment confirmation to HKSCC no later than 9:30 am on the business day following the settlement day. HKSCC also provides intra-day money settlement for securities settlements/transfers via the RTGS systems.
- 8.4 The points at which settlement of obligations in CCASS become final are stipulated in the CCASS Rules and CCASS OP, which are made pursuant to the provisions of the SFO and publicly available on the HKEX website. The SFO together with the CCASS Rules and CCASS OP protect the settlement of Market Contracts processed by HKSCC from the proceedings related to insolvency or bankruptcy. Furthermore, the PSSVFO⁴⁸ provides statutory backing to the finality of money settlement made through the RTGS systems of HKICL by protecting the settlement finality from insolvency law or any other laws.

⁴⁸ The PSSVFO establishes a statutory regime for the HKMA to designate and oversee clearing and settlement systems, and provides statutory backing to the finality of settlement for transactions made through systems designated under the Ordinance by protecting the settlement finality from insolvency laws or any other laws. Further details on the PSSVFO can be found on the HKMA website at <http://www.hkma.gov.hk/eng/key-functions/banking-stability/oversight.shtml>.

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, HKSCC conducts money settlements in HKD, RMB and USD with CCASS Participants through the RTGS systems operated by HKICL. The settlement finality and irrevocability of the payments settled through the RTGS systems are protected by the PSSVFO. In Hong Kong, only HKD is settled in central bank money across the books of the HKMA. The other two currencies, RMB and USD, are settled through the books of two commercial banks, (a) BOCHK is appointed by the People's Bank of China as the RMB Clearing Bank; and (b) HSBC is appointed by the HKMA as the USD Settlement Institution. Because HKSCC does not have direct access to the RTGS systems, it has appointed five Hong Kong licensed banks as its Settlement Banks to process CCASS money transactions through the RTGS systems. Some CCASS Participants are banks with direct access to central bank money and HKSCC's Settlement Banks settle with those CCASS Participants in central bank money for HKD. Most CCASS Participants do not have direct access to central bank money and HKSCC's Settlement Banks settle with their appointed Designated Banks in central bank money for HKD.
- 9.2 To manage the credit and liquidity risk exposure to the funds held or processed by its Settlement Banks, HKSCC applies criteria in selecting its Settlement Banks. Each appointed Settlement Bank must be a HKMA licensed bank, with a minimum credit rating of A3 or equivalent or be a HKD note-issuing bank, and with proven operational capability and reliability, such as the ability to meet CCASS's payment cut-off schedules.
- 9.3 HKSCC 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. HKSCC also monitors and manages the concentration of exposure to Settlement Banks periodically. The liquidity stress testing described under Principle 7: Liquidity Risk includes scenarios for the failure of HKSCC Settlement Banks.

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.

HKSCC effects all securities settlement and transfers through book-entry form in CCASS. Accordingly, Principle 10: Physical Deliveries is not applicable.

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.

- 11.1 The CCASS Rules and CCASS OP govern the deposits, withdrawals, custody and transfers of Eligible Securities by CCASS Participants, as well as their rights to the Eligible Securities deposited into CCASS.
- 11.2 As a CSD, HKSCC provides different types of stock accounts in CCASS to facilitate CCASS Participants to separately identify their customers' securities deposited in CCASS from their own. HKSCC also provides SPSAs to facilitate investors meeting pre-trade checking requirement for China Connect Securities and at the same time maintaining compliance with their asset segregation requirements. HKSCC provides various on-line enquiry functions and reports, via CCASS, to CCASS Participants to reconcile their depository, settlement and transfer activities and stock balances kept in CCASS.
- 11.3 HKSCC applies explicit procedures to manage the creation and deletion of securities in CCASS. Proper documentation and authorisation are required for any creation and deletion of securities via deposit and withdrawal. HKSCC prohibits overdraft or debit balances in the stock accounts of CCASS Participants. It ensures that Eligible Securities are available in CCASS Participants' stock accounts before effecting any securities withdrawal, settlement or transfer instruction.
- 11.4 Eligible Securities issued in physical form that are deposited into CCASS are re-registered into the HKSCC Nominees name and HKSCC immobilises the physical certificates in its vaults. Eligible Securities held in CCASS are treated as fungible and are not earmarked for a particular CCASS Participant or transaction although HKSCC keeps records of the CCASS Participant that is responsible for depositing particular securities into CCASS. This enables HKSCC to hold the corresponding CCASS Participant responsible should defects be discovered with the deposited securities. In case the deposited share certificates are found to be defective during the re-registration process, HKSCC requires the responsible depositing CCASS Participant to replace the securities and to provide cash collateral immediately before the replacements are completed. HKSCC effects securities transfers in book-entry form in CCASS. HKSCC has a tariff structure to promote immobilisation of securities. Physical deposit of Eligible Securities into CCASS is free of charge while physical withdrawal from CCASS is subject to charges.

- 11.5 To ensure that securities records in CCASS are complete and accurate, HKSCC:
- (a) performs a daily reconciliation of the total number of shares held by all CCASS Participants in CCASS against HKSCC's total shareholdings for each Eligible Security;
 - (b) designates an independent control team of HKSCC to perform daily counts of all physical certificates of selected Eligible Securities kept in the vault to ensure that both physical certificates and book-entry records of the selected Eligible Securities tally;
 - (c) checks its shareholdings against the share registrar's records on each record day announced by the issuer to ensure that its shareholding of the security recorded in the register of members sufficiently covers the CCASS record;
 - (d) credits share entitlements to CCASS Participants' stock accounts after receiving the same from the share registrar or ChinaClear;
 - (e) only credits China Connect Securities to CCCPs' stock accounts for settlement of China Connect Securities Trades after receiving the same from ChinaClear; and
 - (f) HKEX's Internal Audit Department conducts a review of physical certificate count once a year and a depository audit at least once every three years covering the key controls for ensuring the accuracy and completeness of the physical certificate records.

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 As a CCP, HKSCC eliminates principal risks arising from settlement of Market Contracts by putting on-hold the 'title' over securities to be delivered to the long CPs or ChinaClear until HKSCC is satisfied that all payments by the CPs or ChinaClear are confirmed good. HKSCC minimises the length of time between the blocking of securities, the settling of cash and the subsequent release and delivery of the blocked securities providing an intra-day payment arrangement. CPs and ChinaClear can elect to receive⁴⁹/pay the settlement money intra-day after they deliver/receive the securities to/from HKSCC. In addition, to ensure availability of securities and maintain a minimum required level of funds for the settlement of China Connect Securities Trades, HKSCC conducts pre-trade shareholding checking and collects Mainland Settlement Deposit and the contribution to Mainland Security Deposit (non-mutualised portion) from CCCPs. HKSCC settles the securities leg of each CNS Position individually and settles all money legs of settled CNS Positions on a net basis. This DVP settlement mechanism is referred to as Model 2 in the PFMI.
- 12.2 As an SSS operator, HKSCC effects securities transfers in accordance with the settlement methods agreed between the CCASS Participants concerned, which may be free-of-payment or involve payments as follows:
- (a) **RDP settlement** – HKSCC puts on-hold securities in the delivering CCASS Participant's stock account before the receiving CCASS Participant completes its payment on the settlement day. Actual securities transfer only occurs upon the transfer of the associated funds by effecting intra-day payments via the RTGS systems of HKICL. This RDP settlement mechanism is referred to as Model 1 in the PFMI; and
 - (b) **general DVP settlement** – HKSCC transfers securities from the delivering CCASS Participant's stock account individually to the receiving CCASS Participant's stock account in batches throughout the settlement day, while the transfer of the associated payments, also on a transaction-by-transaction basis, takes place no later than the end of the settlement day (except that money settlement of some DVP SIs in China Connect Securities is confirmed on next business day, please refer to the description under paragraph 8.3) via the Interbank Settlement Runs of HKICL. This general DVP settlement mechanism is similar to Model 2 in the PFMI, but with gross settlement of money transfers instead.

⁴⁹ Intra-day payment arrangement is not available to CCCPs with short positions in China Connect Securities Trades. HKSCC will conduct money settlement with them on T+1 at the latest at around 12:30 pm.

12.3 HKSCC describes the settlement mechanisms, including the timing of finality, for settling of Market Contracts and securities transfers, including the payment obligations, in the CCASS Rules and CCASS OP. In addition, rules of HKICL describe the money settlement arrangements via HKICL's RTGS systems and Interbank Settlement Runs.

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 CCASS 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 CCASS Rule 3701, an Event of Default includes, among other things:
- (a) a CP's failure to meet any payment obligations due to HKSCC;
 - (b) when ChinaClear, in its capacity as a Clearing Agency Participant, fails to meet any payment obligations due to HKSCC in respect of Exchange Trades;
 - (c) insolvency proceedings involving a CP or ChinaClear;
 - (d) when a CP ceases to be a licensed corporation licensed or a registered institution registered to carry on Type 1 (i.e. dealing in securities) regulated activities under the SFO; and
 - (e) when ChinaClear, in its capacity as a China Connect Clearing House under the CSD and Clearing Links, defaults in any delivery or payment obligations to HKSCC under the CSD and Clearing Links.
- 13.2 If a CP or ChinaClear commits an Event of Default, HKSCC may declare the defaulting CP or ChinaClear as a defaulter under CCASS Rule 3702 and, in its absolute discretion, take certain remedial actions, including:
- (a) close out the unsettled positions of the defaulting CP or ChinaClear;
 - (b) sell or apply collateral of the defaulting CP or ChinaClear; and
 - (c) exercise rights of set-off against the defaulting CP or ChinaClear.

DEFAULT PROCEDURES

- 13.3 HKSCC has appointed selected Exchange Participants as authorised brokers to facilitate the closing-out of the open CNS Positions of a defaulting CP or ChinaClear. The detailed procedures were agreed with all authorised brokers when they were appointed, and are rehearsed on an annual basis. HKSCC 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 HKSCC has also established internal procedures which set out the roles and responsibilities of the key stakeholders in handling an Event of Default. These procedures also specify the communication procedures with internal and external parties such as the HKEX Board, HKSCC Board, Risk Committee, RMC, SFC and market participants. They are reviewed and tested with the relevant stakeholders regularly and on an as needed basis. As HKSCC treats each CP as “principal” and not as agent as set out in CCASS Rule 402, no direct contractual relationships exist between HKSCC and CPs’ clients, and at this time the default procedures do not extend to cover the defaulting CP’s obligations to its clients.
- 13.5 As set out in CCASS Rule 4205, ChinaClear, in its capacity as a Clearing Agency Participant, must clear and settle Exchange Trades of its participants. No direct contractual relationships exist between HKSCC and ChinaClear’s participants. At this time the default procedures do not extend to cover obligations under ChinaClear’s default to its participants.
- 13.6 A defaulting CP or ChinaClear may fail to deliver securities to settle its short CNS Positions or fail to pay for its long CNS Positions. In closing-out the open CNS Positions of a defaulter, HKSCC may need to buy in securities in the market that the defaulter has failed to deliver, such that on-ward delivery can be made to the CPs with long CNS Positions. For CNS Positions a defaulter has failed to pay for, HKSCC is obligated to pay the trade prices to the selling CPs, and HKSCC will sell out the securities allocated to the defaulter in the market⁵⁰. In the process, HKSCC may face liquidity needs and a risk of loss due to adverse price movements between trade prices and closing-out prices.

TOTAL AVAILABLE RESOURCES AND DEFAULT WATERFALL

- 13.7 In the process of closing out the open CNS Positions of the defaulting CP, HKSCC would have access to:
- (a) Marks, Margin, Mainland Settlement Deposit, Mainland Security Deposit and other collateral from the defaulter and in the event that was insufficient;
 - (b) the waterfall of resources described below including the GF; and
 - (c) various liquid resources maintained by HKEX, including committed credit facilities, made available by HKEX to HKSCC (Please refer to the description under Principle 7: Liquidity Risk for further information).

⁵⁰ Securities will be allocated to buying CPs on settlement day but put on hold until payment is received. If such a CP defaults prior to payment of the securities allocated, the on-hold securities will be sold by HKSCC as part of the closing-out procedures. Proceeds from selling the on-hold securities will be used to cover losses arising from the default.

- 13.8 In the process of closing out the open CNS Positions of ChinaClear under default, HKSCC uses its Marks, Margin and other collateral to cover any losses arising from the process. HKSCC will not use GF to cover any residual closing-out loss in the event of ChinaClear's default.
- 13.9 Under CCASS Rules 2507 and 2507A, the order of application of the GF is as follows:
- (a) GF Contributions (including Basic Contribution and Dynamic Contribution) of the defaulting CP;
 - (b) Dynamic Contribution Credit and Margin Credit granted to the defaulting CP;
 - (c) GF accumulated interest income;
 - (d) the resources of HKSCC appropriated to the GF;
 - (e) the Basic Contributions made by all non-defaulting CPs; and
 - (f) the Dynamic Contributions and Dynamic Contribution Credits of all non-defaulting CPs on a pro-rata basis.

ALLOCATION OF DEFAULT LOSSES AND REPLENISHMENT/REPAYMENT ARRANGEMENTS

- 13.10 In the event of a CP default where non-defaulting CPs' contributions to the GF 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 CPs' respective contributions to the GF immediately prior to the default. HKSCC will require its participants to replenish the deficiency of their GF Contributions as a result of such application within three business days or such other time period as may be specified by HKSCC. Please refer to the description under Principle 4: Credit Risk for further information.
- 13.11 In the event of ChinaClear default as the host CCP in China Connect Securities Trades, HKSCC has limited its obligations to CPs by CCASS Rule 4107 (xi). HKSCC will assist CPs in pursuing their claims against ChinaClear. HKSCC will in good faith, seek recovery of the outstanding stocks and monies from ChinaClear through available legal channels and through ChinaClear's liquidation process, if applicable. HKSCC will in turn distribute the stocks or monies recovered to CPs on a pro-rata basis.

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 funds by all licensed corporations and registered institutions including the CPs. Compliance with these requirements is assessed as part of the routine market intermediaries' supervision program conducted by the SFC and HKMA. Article 13 of the CSRC's special provisions on Shanghai and Shenzhen Connect lays out the requirements for registering SEHK Securities acquired by Mainland investors in the securities account opened by ChinaClear with HKSCC.
- 14.2 HKSCC operates a principal-based clearing model and is not obliged to recognize any rights or interests of the CP's clients and ChinaClear's participants. As the CCP, HKSCC settles Market Contracts with CPs and ChinaClear as principal over a two-day settlement period and treats all collateral provided by CPs and ChinaClear as their own. As mentioned, HKSCC keeps securities deliveries on-hold until money settlement is completed on T+2 and T+1 in respect of Exchange Trades and China Connect Securities Trades respectively.
- 14.3 HKSCC provides CCASS Participants with facilities to open various stock segregated accounts to facilitate the recording of their house and clients' stock holdings and their compliance with relevant provisions of the SFO (please see paragraph 14.4), but has no direct contractual relationship with any client of CCASS Participants. Clients' securities in CCASS are freely portable via transfer to other CPs.
- 14.4 HKSCC provides two stock accounts to ChinaClear for Shanghai Connect and Shenzhen Connect separately to keep the aggregate shareholdings of SEHK Securities for Mainland investors in omnibus basis. HKSCC has no direct contractual relationship with any ChinaClear participants or Mainland investors. ChinaClear records Mainland investors' interests in their respective stock accounts with ChinaClear in accordance with its rules and procedures.

ACCOUNT STRUCTURE

- 14.5 Exchange Trades and China Connect Securities Trades settled on a net basis under the CNS System are not ear-marked in the trading or clearing systems as being house trades or client trades. CPs and ChinaClear are liable to HKSCC as principal, and not as agent. HKSCC provides each CP with one stock clearing account for the settlement of Exchange Trades and China Connect Securities Trades, and one collateral account in CCMS for recording and managing Marks, Margin, Mainland Settlement Deposit, Mainland Security Deposit and other collateral collected, while ChinaClear are provided

with two stock clearing accounts and two collateral accounts for Shanghai Connect and Shenzhen Connect.

- 14.6 The SFO requires CPs 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 CP's records.
- 14.7 To facilitate CCASS Participants to separately identify and handle their proprietary and clients' securities holdings, HKSCC provides multiple stock segregated accounts to CCASS Participants for holding of clients' securities. CCASS Participants can hold clients' securities on an omnibus basis or provide a stock segregated account to one or more specific clients. HKSCC also provides a "stock segregated account with statement" service, whereby HKSCC sends copies of the account movements and statements to a third party such as a client as instructed by the CCASS Participant. HKSCC also admits individuals and corporate investors as IPs, to allow them to safe keep their beneficially owned securities holdings in CCASS directly. HKSCC provides one stock account to ChinaClear for each of Shanghai Connect and Shenzhen Connect to separately hold Mainland investors' SEHK Securities in omnibus basis. HKSCC does not have a proprietary interest in securities deposited in the stock segregated accounts.

PORTABILITY ARRANGEMENTS

- 14.8 Except for securities put on hold by HKSCC awaiting settlement from a CP, or posted by a CP to HKSCC as collateral, a CP can transfer securities among any of its own securities accounts and with the accounts of other CPs through various settlement services provided by CCASS. In the event of a CP default, securities put on hold and collateral collected from the defaulting CP will be used if necessary to cover any default loss.
- 14.9 In the event of ChinaClear default, securities put on hold and collateral collected from ChinaClear will be used if necessary to cover any default loss.

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 HKSCC uses the HKEX Group's ERM framework to identify, monitor and manage all material risks including its general business risk. The ERM framework requires the identification of internal and external factors that could impair HKSCC's financial position, an evaluation of their impacts and the likelihood of occurrence. HKSCC establishes and implements key financial and internal controls and plans to mitigate, eliminate, monitor, and manage the risks.
- 15.2 HKSCC has identified external and internal factors that pose business risks to HKSCC, 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 HKSCC;
 - (b) market conditions and the pace of development of offshore RMB denominated products, a developing market segment in which HKSCC expects to have a competitive advantage;
 - (c) the effectiveness of HKSCC's business strategy;
 - (d) operational issues that may impact HKSCC'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 HKSCC, 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, HKSCC maintains at all times net current assets⁵¹ 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 HKSCC meet the regulatory requirements for an RCH under the PFMI⁵².
- 15.5 HKSCC's capital would be its main defense against various potential business losses. In the event of potential capital inadequacy due to business loss HKSCC would look to recapitalise to recover operations. HKEX, as a listed company, could inject additional capital into HKSCC and potentially raise capital via the capital markets if needed.
- 15.6 In the event that HKSCC 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 HKSCC. This would involve, among other things, pursuing amounts due from defaulting CPs, and returning securities to CPs.

⁵¹ The calculation of the net current assets excludes those being set aside for risk management purposes, such as HKSCC's contribution to the GF.

⁵² 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 HKSCC has a comprehensive framework to manage its custody and investment risks. HKSCC only appoints custodians with accounting practices, safekeeping procedures and internal controls that ensure optimal protection of the assets being placed with them. HKSCC invests its own assets under a conservative investment strategy described below.

CUSTODY OF ASSETS

- 16.2 HKSCC holds its assets and CCASS Participants' assets under its control with supervised and regulated low credit risk entities with a minimum credit rating of A3 (Moody's) or above, in bank and securities accounts in the name of HKSCC. Currently, HKSCC holds:

- (a) cash assets with selected banks in Hong Kong and Mainland China;
- (b) exchange fund notes (**EFNs**) and government bonds issued by the HKSAR Government (**Government Bonds**) and CMU instruments (**CMU Instruments**) with the Central Moneymarkets Unit (**CMU**) of the HKMA;
- (c) US securities listed/traded on SEHK (**US Securities**) with The Depository Trust Company (**DTC**), a registered clearing agency with the US Securities and Exchange Commission; and
- (d) China Connect Securities traded through Shanghai and Shenzhen Connect with ChinaClear, a central securities depository in Mainland China which is regulated by the CSRC.

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

INVESTMENT STRATEGY

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

- (a) **Risk management** – investments are diversified and in high-quality assets to minimise the risks. All investments are subject to limits and appropriate risk controls;
- (b) **Preservation of capital** – safety of principal is one of the priority principles of the Investment Policy. Investments are undertaken in a manner that seeks to ensure the preservation of capital;
- (c) **Liquidity** – investment portfolios have to be sufficiently liquid at all times and liquidity management is tightly controlled on a daily basis; and
- (d) **Return** – return on investments should be optimised at the approved risk tolerance of the HKEX Group.

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 HKSCC's cash assets as deposits⁵³ in banks in Hong Kong. HKSCC can withdraw these deposits promptly and with same-day availability subject to the banks' customary notice periods. HKSCC 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, credit ratings of A3 (Moody's) or above and operational efficiency, endorsed by the IAC and approved by the HKEX Board.

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

⁵³ Currently, HKEX 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 HKSCC's operational risk management framework consists of the following elements:

- (a) **ERM framework** – HKSCC applies HKEX Group's ERM 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. HKSCC establishes and implements key controls and treatment plans to mitigate, eliminate, monitor, or manage the risks; and
- (b) **MCP** – HKSCC has developed and maintains MCPs, which set out the contingency and recovery procedures following a disruption to HKSCC's critical functions, under specific contingency scenarios. HKSCC's MCPs aim 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 MCPs, HKSCC took into account interdependencies and external links with CCASS Participants, other FMIs and third-party service providers, such as HKICL, Settlement Banks and communications network suppliers. The MCPs address 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. The MCPs set out escalation and reporting procedures with various stakeholders, including the HKEX Board, RMC, HKSCC Board, regulators, CCASS Participants, linked FMIs, third-party service providers and market participants, where appropriate.

17.3 HKSCC 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 HKSCC's primary production sites, in order to minimise any impact to CCASS Participants and the market in case of contingency.

Production data of CCASS is replicated to the system in the secondary backup site for business operations in real-time. In case of an emergency situation, the CCASS system 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 HKSCC reviews the MCPs on an annual basis or more frequently as required. In the annual MCP review exercise, HKSCC conducts business impact analysis to identify critical business processes, internal and external resources and dependencies to support those business processes. HKSCC assesses the impacts in case of disruptions and develops measures to manage the disruptions. HKSCC agrees with other FMIs and third-party service providers, such as HKICL and Settlement Banks, the contingency procedures in case of failure of CCASS or their systems. These are included in the agreements with them.
- 17.5 HKSCC 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. CCASS Participants are invited to participate in the drills where appropriate. HKSCC also provides continuous operational training to CCASS Participants, and conducts market rehearsals with CCASS Participants to test the operational flows, contingency and fallback plans before the rollout of major system changes.
- 17.6 In addition, HKSCC participates in the Market Wide Rehearsal coordinated by the HKSAR Government which provides an opportunity to rehearse our responses to high impact issues with cross-market implications. HKSCC also participates in drills of other FMIs and service providers when needed. HKSCC will also participate in the drills of the linked CCP, ChinaClear.

OPERATIONAL RELIABILITY OBJECTIVES AND CAPACITY SCALABILITY

- 17.7 The operational reliability objectives of HKSCC are defined in the service agreements with its third-party service providers, HKSCC's MCPs, 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 HKSCC's CCASS system has scalability and load balancing features that allow it to support higher volumes by upgrading and expanding hardware without significant architectural changes. The system capacity 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 (**ITD**) measures the system capacity utilisation on a daily basis and conducts a system capacity review at least semi-annually.

The ITD 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. The ITD 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 HKSCC 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 Information Security and Business Continuity Department, which is independent of ITD, 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 HKSCC has established a set of objectives, risk-based and transparent eligibility requirements for different categories of CCASS Participants, to access its services fairly and openly, including:
- (a) a DCP must be an Exchange Participant with a minimum liquid capital requirement of HK\$3 million;
 - (b) a GCP must be either (i) an Exchange Participant with a minimum liquid capital not less than HK\$300 million or its required liquid capital under the FRR, whichever is higher; or (ii) a registered institution which is registered to carry on Type 1 regulated activities under the SFO with a minimum credit rating of A3 or equivalent by a credit rating agency recognised by HKSCC or being a Hong Kong dollar note-issuing bank;
 - (c) a Clearing Agency Participant must be a body recognised and regulated in Hong Kong by the SFC or in an overseas jurisdiction by a governmental body or an equivalent authority in respect of its business in operating the central securities clearing and settlement system and/or the central securities depository system;
 - (d) a Custodian Participant must be an authorised institution under the BO, a trust company registered under the Trustee Ordinance (Cap. 29 of the Laws of Hong Kong), a licensed corporation under the SFO not being an Exchange Participant, or the HKMA;
 - (e) a Stock Lender Participant must have an established stock lending business in Eligible Securities in Hong Kong or demonstrate the financial and operational capacity to establish and operate such stock lending business;
 - (f) a Stock Pledgee Participant must be an authorised institution under the BO or a licensed money lender under the Money Lenders Ordinance (Cap. 163 of the Laws of Hong Kong); and
 - (g) an IP must be either (i) an individual aged eighteen or above, holding a Hong Kong Identity Card or Macau SAR Resident Identity Card; or (ii) a company incorporated in Hong Kong or other jurisdiction that HKSCC may approve from time to time.
- 18.2 HKSCC applies different financial requirements to different categories of CCASS Participants based on the services received from, and the potential risks posed to,

HKSCC. HKSCC sets a higher minimum GF Basic Contribution level for a GCP as compared to a DCP. In addition to good financial standing, HKSCC also 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 CCASS Participant are stipulated in the CCASS Rules, which are publicly available on the HKEX website. CCASS Participants must comply with the CCASS Rules and CCASS OP in force from time to time, and must continue to comply on an ongoing basis with the criteria for admission.
- 18.4 HKSCC monitors the ongoing compliance of CCASS Participants with their participation requirements. HKSCC has also defined and publicly disclosed the CCASS Rules and CCASS OP for facilitating the suspension and orderly exit of a CCASS Participant that breaches or no longer meets the participation requirements. HKSCC, as a CCP, also monitors CPs' ongoing financial standing through periodic reviews of regulatory reports submitted, such as the monthly financial returns obtained through the SFC. All CCASS Participants are required to notify HKSCC upon the happening of any event that may affect their risk profile, such as bankruptcy, breach of rules and regulations, etc. Please refer to Principle 4: Credit Risk for the Counterparty Risk Ranking Methodology.
- 18.5 HKSCC 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 CCASS Rules is subject to the approvals of the HKSCC Board and SFC.

SUSPENSION AND TERMINATION OF CCASS PARTICIPATION

- 18.6 As set out in the CCASS Rules, where a CCASS Participant breaches or no longer meets the participation requirements, HKSCC may take disciplinary action or summary disciplinary action against that CCASS Participant, including suspension from participation in CCASS. HKSCC may terminate the participation of a CCASS Participant forthwith by notice under certain circumstances, such as in the event of the bankruptcy, liquidation or winding-up of a CCASS Participant. The suspension or termination of a CCASS Participant does not affect any of its rights or liabilities arising out of matters which occurred prior to suspension or termination and for the purpose of settlement of any such rights or liabilities, HKSCC may continue to treat the CCASS Participant as such. Where a CCASS Participant's participation in CCASS has been suspended or terminated, HKSCC will as soon as practicable notify other CCASS Participants (other than IPs), the SFC, and (where applicable) SEHK of the suspension or termination.

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 HKSCC supports tiered participation arrangements through the offering of a third-party clearing service. A GCP can clear on behalf of an Exchange Participant who is not a CP (i.e. NCP).
- 19.2 HKSCC 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. Chapter 40 of the CCASS Rules govern the clearing arrangement between a GCP and an NCP. A GCP can clear and settle Exchange Trades and China Connect Securities Trades of an NCP on condition that there is in place a valid, binding and effective clearing agreement between the GCP and the NCP. Under CCASS Rule 4002, the GCP is required to inform HKSCC after signing a clearing agreement with the NCP. Further, according to CCASS Rule 4003, a GCP shall forthwith notify HKSCC of any changes to any of its clearing agreements upon changes being made. CCASS Rule 4003 also empowers HKSCC to require a GCP to provide information concerning its NCPs, including but not limited to, financial positions, NCPs' underlying client information or any other information or documents as HKSCC may demand, upon request.

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 and is responsible for the regulatory oversight and the monitoring of risk management activities including sending to HKEX relevant risk monitoring information on the NCPs, such as a risky broker list, where applicable. In addition, NCPs which are Exchange Participants are required to comply with the rules of SEHK.
- 19.4 HKSCC 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. HKSCC sets higher admission requirements for GCPs in terms of minimum liquid capital level and Basic Contribution to the GF. Please refer to the description under Principle 4: Credit Risk. In addition, HKSCC performs regular risk scoring analysis to assess the financial, non-financial and settlement capability of the GCPs based on the Counterparty Risk Ranking Methodology described under Principle 4: Credit Risk.

- 19.5 HKSCC 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 CCASS on a daily basis to list the projected breakdowns of CNS Positions and related Marks and Margin requirements of each of the NCPs of a GCP. In addition, for HKSCC's risk assessment purposes, HKSCC 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, HKSCC may impose additional risk management measures on a GCP, including but not limited to, requiring and collecting additional collateral when necessary.
- 19.6 HKSCC has established internal operating procedures to facilitate the switching of its NCPs to a new GCP during a GCP default and transferring of the NCPs' holdings to that GCP. NCPs of the defaulting GCP, without appointing a new GCP, will not be able to clear their Exchange Trades and China Connect Securities Trades in HKSCC.

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, HKSCC has five links with other FMIs, namely:

- (a) a CSD and CCP link with ChinaClear, to facilitate the clearing and settlement of trades executed on SSE, SZSE and SEHK through Shanghai and Shenzhen Connect; and provide depository and nominee services to Hong Kong and international investors in respect of China Connect Securities;
- (b) a CSD link with ChinaClear, to support the conversion of Shenzhen B-shares⁵⁴ to H-shares⁵⁵ and provide custody and nominee functions for the relevant H-shares to Mainland investors;
- (c) a CSD link with CMU of the HKMA, to safe keep EFNs, Government Bonds and CMU Instruments, such as RMB bonds issued by the Ministry of Finance of the People's Republic of China, on behalf of CCASS Participants;
- (d) a CSD link with DTC, to safe keep US Securities on behalf of CCASS Participants; and
- (e) a CCP link with SEOCH, to facilitate the clearing and settlement of the underlying securities of stock options contracts in CCASS.

20.2 HKSCC has put in place appropriate measures to identify, monitor and manage link-related risks in these FMI links. HKSCC has signed agreements with ChinaClear, CMU, DTC and SEOCH respectively to define the rights, obligations and liabilities of each party, governing laws and jurisdiction, etc.

20.3 In establishing the links, HKSCC has conducted legal assessments to ensure the enforceability of the rights and interests of HKSCC, particularly in those assets kept in the accounts with ChinaClear, CMU and DTC. Moreover, HKSCC 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. HKSCC 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 HKSCC's policies and standards.

⁵⁴ Shenzhen B-shares refer to foreign capital shares denominated in RMB, which are approved by the CSRC to be traded on the Shenzhen Stock Exchange in HKD.

⁵⁵ H-shares refer to shares in those companies incorporated in Mainland China and whose shares are approved by the CSRC to be traded on SEHK in Hong Kong.

CSD LINKS

- 20.4 ChinaClear is admitted as a clearing agency participant in CCASS. ChinaClear is bound by the CCASS Rules, CCASS OP and agreement signed between HKSCC and ChinaClear. The obligations and liabilities of ChinaClear and HKSCC are defined in the agreement.
- 20.5 CMU is the issuer CSD for EFNs, Government Bonds and CMU Instruments. 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. HKSCC 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.
- 20.6 DTC is the issuer CSD for US Securities. All operations of DTC are governed by the rules and procedures of DTC, and the laws of the State of New York, US. DTC is under the supervision of the Securities and Exchange Commission in the US. HKSCC is admitted by DTC as a DTC participant to operate a custody account in accordance with the rules and procedures of DTC.

CCP LINK

- 20.7 HKSCC has one link with another CCP, SEOCH. SEOCH is admitted as a clearing agency participant in CCASS. SEOCH is bound by the CCASS Rules, CCASS OP and agreement signed between HKSCC and SEOCH. The obligations and liabilities of SEOCH and HKSCC are defined in the agreement.

CSD AND CCP LINKS UNDER SHANGHAI AND SHENZHEN CONNECT

- 20.8 HKSCC is admitted as a participant of ChinaClear for the clearing and settlement of China Connect Securities Trades that are executed through Shanghai and Shenzhen Connect with ChinaClear in accordance with the rules and procedures of ChinaClear and the CSD and Clearing Links Agreement. HKSCC clears and settles the Market Contracts arising from the China Connect Securities Trades with CCCPs and provides depository, nominee and other related services in respect of China Connect Securities in accordance with the CCASS Rules and CCASS OP.
- 20.9 ChinaClear is a clearing agency participant approved by HKSCC as a China Connect Clearing House for the clearing and settlement of trades in SEHK Securities that are executed through Shanghai and Shenzhen Connect with HKSCC in accordance with the CCASS Rules, CCASS OP and the CSD and Clearing Links Agreement.
- 20.10 As a participant of each other, both HKSCC and ChinaClear are bound by the rules, procedures and the participant agreement of each other as well as the CSD and Clearing Links Agreement signed between HKSCC and ChinaClear.

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 HKSCC provides efficient and effective services which serve the needs of CCASS Participants and the securities market of Hong Kong. HKSCC 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, HKSCC takes into account (a) the needs of the local market and environment; (b) the needs of the many overseas users of the securities market in Hong Kong; and (c) the requirements of international standards and practices. HKSCC conducts soft consultations with relevant market participants and industry groups and solicits the views of the Clearing Consultative Panel on HKSCC's proposals before they are finalised. For major changes to the policies, clearing and settlement arrangement, operating structure, and regime that would affect HKSCC and CCASS Participants, HKSCC also conducts public consultations⁵⁶ to seek views directly from the stakeholders.

OBJECTIVES

- 21.3 As an RCH, HKSCC has several specific statutory duties and responsibilities as stipulated in the SFO. In summary, the objectives of HKSCC 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 CCASS Rules and CCASS OP 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 HKSCC'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, CCASS Participants can submit suggestions and feedback to HKSCC via hotlines and emails.

⁵⁶ HKEX has conducted public consultations on the implementation of risk management reform measures, introduction of T+2 finality for CCASS money settlement and implementation of a scripless securities market in Hong Kong.

- 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 Board. The board, 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 Committee⁵⁷ and HKEX Board.

⁵⁷ 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 HKSCC uses internationally accepted communication procedures and protocols for exchanging messages across systems to facilitate efficient clearing and settlement arrangements. CCASS Participants (other than IPs) can access CCASS via the Securities and Derivatives Network (SDNet) using TCP/IP protocol. Any personal computer with supported versions of Microsoft Windows and Internet Explorer browser is able to access all CCASS functions. HKSCC facilitates the straight-through-processing of CCASS Participants' operations by allowing access to CCASS via Participant Gateways (**PG**) through Participant Supplied Systems (PSS). PG has the following communication features:
- (a) PSS communicates with CCASS through PG using Java-based application programming interfaces provided by HKSCC; and
 - (b) PG communicates with CCASS via Hypertext Transfer Protocol (HTTP) protocol over Secure Sockets Layer (SSL).
- 22.2 HKSCC adopts international communication standards on reference data and messaging format, including:
- (a) International Securities Identification Number (ISIN) codes are used to identify securities in addition to local stock codes;
 - (b) Bank Identification Codes (BIC) where available are used to identify CCASS Participants who are financial institutions;
 - (c) three-byte ISO currency codes are used to represent currencies in CCASS; and
 - (d) industrial standard ISO 15022 is followed in formatting PG messages.

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 HKSCC's CCASS Rules and CCASS OP contain the details of clearing and settlement, book-entry transfer, custody, risk management, default and contingency arrangements, rights and obligations of HKSCC and CCASS Participants, etc. Service fees, charges and other material costs incurred by CCASS Participants are also set out in the CCASS Rules and CCASS OP, including the rates, calculation methods, timing of debit and any concession where applicable. The CCASS Rules and CCASS OP are written in plain English, and are available to CCASS Participants and the public via the HKEX website. Chinese versions⁵⁸ of the CCASS Rules and CCASS OP are also publicly available on the HKEX website.
- 23.2 Any amendment to the CCASS Rules and CCASS OP is subject to the approval of the SFC. HKSCC notifies CCASS Participants of proposed changes to the CCASS Rules and CCASS OP and the effective dates of the approved amendments via circulars which are also publicly available on the HKEX website.

DISCLOSURE

- 23.3 HKSCC operates transparently, and provides sufficient information for CCASS Participants and other interested parties to identify and evaluate the risks associated with using HKSCC's services and facilities. HKSCC makes the following information publicly available on the HKEX website:
- (a) the CCASS Rules and CCASS OP, including CCASS 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 and rainstorms;

⁵⁸ 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.

- (d) CCASS Terminal User Guide, including details of CCASS design and operations, description of CCASS reports and data files, report data file formats and PG message specifications; and
 - (e) circulars and briefing materials for major projects.
- 23.4 HKSCC organises regular training classes to help CCASS Participants and potential applicants to understand the CCASS operations and risk management arrangements. Where appropriate, HKSCC holds briefing sessions, seminars and informal meetings with CCASS Participants to facilitate their understanding of new initiatives (e.g. Shanghai and Shenzhen Connect, risk management reform measures, system infrastructure and related requirements) and the associated risk management measures. CCASS Participants and other interested parties can also call dedicated hotlines and send emails to HKSCC if they have any questions.
- 23.5 Currently, HKSCC publishes the following periodic transaction data through the HKEX website:
- (a) average daily Exchange Trades, SIs and ISIs processed in CCASS (including number of shares, number and value of trades/transactions and their respective percentage of market turnover);
 - (b) average daily netting efficiency of Exchange Trades to be settled under the CNS System (including number of shares and transaction value);
 - (c) settlement efficiency of CNS Positions;
 - (d) average daily deposit and withdrawal transactions (including number of shares, number and value of transactions); and
 - (e) securities under CCASS custody (including number of shares, market value and the respective percentage of issued shares/market capitalisation of admitted securities).
- 23.6 As a CSD, HKSCC holds custody of shares for CCASS Participants. For market transparency, HKSCC, through the HKEX website, provides a CCASS Shareholding Search to allow the public to search the details of CCASS shareholdings, including the number of shares held in a Hong Kong-listed company or China Connect Security on a specified date in the past year.
- 23.7 Please refer to *Chapter 5 - List of Publicly Available Resources on the HKEX Website*, for a list of publicly available resources about HKSCC.
- 23.8 HKSCC publishes quantitative disclosure documents on HKEX website in accordance with the guidelines set forth in the “Public quantitative disclosure standards for central counterparties” released by CPMI-IOSCO in February 2015.

23.9 HKSCC 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 HKSCC is not a TR, 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/eng/prod/clr/sec_clrsett/secclgsettservice.htm)
- 2 Clearing arrangement for CPs
(http://www.hkex.com.hk/eng/market/clr/secclr/clrarng_hksccl/ClrArrangeHKSCCPart.htm)
- 3 Risk management framework
(http://www.hkex.com.hk/eng/market/rm/rm_ccrm/cmrm_indexpage.htm)
- 4 Fees schedule
(http://www.hkex.com.hk/eng/market/clr/secclr/feeschedule_hksccl/CCASSfees.htm)
- 5 Clearing and settlement arrangements during typhoons and rainstorms
(http://www.hkex.com.hk/eng/market/typhoons/typhoon_situation.htm)
- 6 Clearing and settlement statistics
(<http://www.hkex.com.hk/eng/stat/clearstat/secclrsettstat/statistic16.1.htm>)
- 7 CCASS Shareholdings Search
(http://www.hkexnews.hk/sdw/search/search_sdw.asp)

LEGAL AND REGULATORY INFORMATION

- 8 The CCASS Rules, CCASS OP and relevant updates
(<http://www.hkex.com.hk/eng/rulesreg/clearrules/clearinghouserules.htm>)
- 9 Circulars
(<http://www.hkex.com.hk/eng/market/partcir/hksccl/hksccl.htm>)
- 10 PFMI disclosure document
(<http://www.hkex.com.hk/eng/market/clr/SpecialTopics/PFMI.htm>)

GOVERNANCE ARRANGEMENTS

- 11 Organisational structure of the HKEX Group
(http://www.hkexgroup.com/-/media/HKEX-Group-Site/Hr/org_chart.pdf)
- 12 Corporate governance of the HKEX Group
(http://www.hkexgroup.com/Corporate-Governance?sc_lang=en)

- 13 List of directors of HKEX
(http://www.hkexgroup.com/About-HKEX/Organisation/Board-and-Committees/Board?sc_lang=en)
- 14 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)
- 15 List of directors of HKSCC
(http://www.hkexgroup.com/About-HKEX/Organisation/Principal-Subsidiaries/List-of-Directors?sc_lang=en)
- 16 List of members of HKSCC's committees
(http://www.hkexgroup.com/About-HKEX/Organisation/Principal-Subsidiaries/Committees?sc_lang=en)
- 17 Terms of reference of the HKSCC Board and its committees
(http://www.hkexgroup.com/About-HKEX/Organisation/Principal-Subsidiaries/Terms-of-Reference?sc_lang=en)

PARTICIPANTSHIP

- 18 List of CCASS Participants (other than IPs)
(http://www.hkex.com.hk/eng/plw/plw_search.asp?selectType=SC)
- 19 Admission requirements for CCASS Participants – DCPs and GCPs
(http://www.hkex.com.hk/eng/market/hkex_part/criteria/AdmissionCriteria_HKSCC.htm)
- 20 Application information of CCASS Participants – DCPs and GCPs
(http://www.hkex.com.hk/eng/market/hkex_part/criteria/partapp/table_form_1.htm)

CLEARING AND SETTLEMENT SYSTEM – CCASS

- 21 System information and user guides
(<http://www.hkex.com.hk/eng/market/clr/secclr/ccass3/ccass3.htm>)

SHANGHAI AND SHENZHEN CONNECT WEBPAGE

- 22 Shanghai and Shenzhen Connect information and statistics
(<http://www.hkex.com.hk/eng/csm/index.htm>)

