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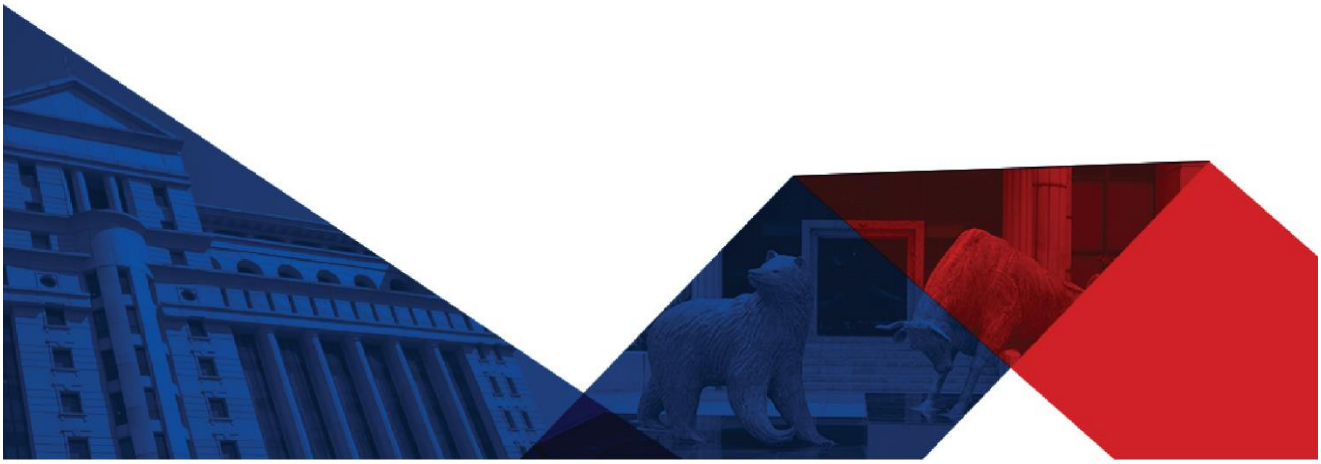
BURSA MALAYSIA SECURITIES CLEARING SDN BHD

PRINCIPLES FOR FINANCIAL MARKET INFRASTRUCTURES DISCLOSURE FRAMEWORK



Responding Institution:

Bursa Malaysia Securities Clearing Sdn. Bhd.

Jurisdiction(s) in which the FMI operates:

Malaysia

Authority regulating, supervising, or overseeing the FMI:

Securities Commission Malaysia

The date of this disclosure is 30 June 2018.

This disclosure can also be found at: http://www.bursamalaysia.com/market/securities/disclosure-framework/bmsc-disclosure-framework/

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Abbreviations:

BCP	Business Continuity Plan
BMDC	Bursa Malaysia Derivatives Clearing Berhad (the derivatives clearing house)
BM Depo	Bursa Malaysia Depository Sdn Bhd (the central depository)
BMS	Bursa Malaysia Securities Berhad
BMSC	Bursa Malaysia Securities Clearing Sdn Bhd (the securities clearing house)
BNM	Bank Negara Malaysia (the Central Bank of Malaysia)
Board	Bursa Malaysia Board of Directors
Bursa Malaysia	Bursa Malaysia Berhad (the exchange holding company)
CCP	Central Counterparty
CGF	Clearing Guarantee Fund
CMF	Central Matching Facility
CMSA	Capital Market and Services Act 2007
CP	Clearing Participants of BMSC
DBT	Direct Business Transaction
DMC	Default Management Committee
DR	Disaster Recovery
EHC	Exchange Holding Company
ECS	Equity Clearing & Settlement system
EOD	End of day
EM	Equities Margin
EMS	Equities Margin System
Group	Bursa Malaysia and its subsidiaries and/or associated companies
ISS	Institutional Settlement Service
ISSBNT	Islamic Selling and Buying Negotiated Transaction
MARC	Malaysian Rating Corporation Berhad
MYR	Malaysian Ringgit
NTCP	Non-Trading Clearing Participants
PFMI	CPSS-IOSCO Principle for Financial Markets Infrastructures
PLC	Public Listed Company
PO	Participating Organisation
RAM	Rating Agency Malaysia
RC	Risk & Compliance Division
RENTAS	Real Time Electronic Transfer of Funds and Securities
RMC	Risk Management Committee
RTO	Recovery Time Objective
SBL	Securities Borrowing and Lending
SBL-CLA	SBL- Central Lending Agency
SBL-NT	SBL-Negotiated Transaction

SC	Securities Commission Malaysia
SCMA	Securities Commission Malaysia Act 1993
SICDA	Securities Industry (Central Depositories) Act 1991
TCP	Trading Clearing Participants of BMSC
TIM	Technology & Information Management

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I. Executive summary

BMSC is a wholly-owned subsidiary of Bursa Malaysia Berhad and is an approved securities clearing house under the Section 38(4) of the CMSA. It was incorporated on 12 November 1983 and is subject to regulatory oversight by the SC. As a clearing house, it provides clearing and settlements functions for settlement of market contracts.

BMSC currently adopts a stringent risk management and financial safeguard standards for the market to minimise the possibility of a default by its CPs. The default waterfall for BMSC includes equities margin and clearing guarantee fund. However, in the event of disciplinary and default situations, BMSC is authorised to take actions pursuant to the BMSC Rules. Please refer to Principle 13 for more information on the Participant-default rules and procedures.

This document aims to provide an overview of the relevant disclosure and explains how BMSC operates, aligned with and observes the Principles for Financial Market Infrastructure ("PFMI") developed by the Committee on Payment and Settlement Systems and the Technical Committee of the International Organization of Securities Commission ("CPSS-IOSCO") as well as the Securities Commission Malaysia's Guidelines on Financial Market Infrastructures.

II. Summary of major changes since the last update of the disclosure

This document is an update to the version dated April 2018, published as recommended by the PFMI and to continuously assist understanding of BMSC's profiles as well as risk management practices. Major change to BMSC's organisation, services, design, rules, markets served and regulatory environment since the last disclosure is summarised below:

- Amendments to the Rules of BMSC in relation to introduction of Islamic Securities Selling and Buying Negotiated Transaction ("ISSBNT") with effect from 18 December 2017 (Please see Principle 1).

III. BMSC Background Information

General description of the FMI and the market it serves

The Malaysian securities market is on T+3 rolling settlement cycle. When securities are purchased, payment and the securities must change hands no later than 3 business days after the trade is executed. BMSC adopts delivery versus payment ("DVP") Model II where the securities are settled on gross basis while funds are settled on net basis. BMSC's role as the CCP is to provide clearing and settlement functions for securities trades that are executed On-Market ("OMT").

There are 2 types of clearing participants registered with BMSC. They are known as Trading Clearing Participant ("TCP") which consists of the stock broking companies and Non-Trading Clearing Participant ("NTCP") mainly comprises of the custodian banks. The main responsibility of the clearing participants is to ensure all trade executed are cleared and settled through BMSC's Fixed Delivery and Settlement System ("FDSS").

As part of the clearing and settlement process, BMSC also monitors failed contract where the seller fails to deliver securities to the Clearing House on settlement day. The monitoring of this function is to ensure failed trade is settled expeditiously. In Malaysia, treatment for OMT failed trade and direct business transaction ("DBT") failed trade are different. Buying-in is executed for OMT failed trade on T+3. Buying-in will normally complete on the day when the buying-in is executed. In an exceptional situation when the buying-in securities is illiquid, the buying-in will continue up to T+8 thereafter outstanding failed trade will be cash settled in lieu of delivery of securities. As for DBT, if the seller failed to deliver the securities on the settlement day, the said transaction will be dropped from the system for settlement. In the event of failed payment by buyer, the securities will be returned to the seller's account.

Please refer to the market statistics on BMS at:
http://www.bursamalaysia.com/market/securities/equities/market-statistics/

General organisation of the FMI

The Board of Directors of BMSC has primary responsibility for the governance and management of the Company. The Term of Reference of BMSC provides that the Board of Directors (Board) of the company shall comprise five (5) Nominee Directors, i.e. two (2) directors of EHC, Chief Executive Officer of EHC and two (2) independent directors.

MSC adopts the Governance Model of the Group where it is supported by various board committees namely, the Risk Management Committee ("RMC"), Audit Committee ("AC"), Nomination and Remuneration Committee ("NRC"), Regulatory and Conflicts Committee ("RACC"), Market Participants Committee ("MPC") and Appeals Committee ("APC"). The Terms of Reference of the Board Committees are available at Bursa Malaysia website http://www.bursamalaysia.com/corporate/about-us/corporate-governance/terms-of-reference/board-of-directors.

Legal and regulatory framework

BMSC, as an approved clearing house under the CMSA, is subject to regulatory oversight by the SC. BMSC's operations as a CCP is governed by the market contract it has with its participants. All CPs enter into the market contracts as principal regardless of whether they are acting on behalf of a client

or not. The law and relevant rules governing the clearing and settlement activities in the securities markets are the CMSA, the Rules of BMSC, the Rules of BMS and the contract between BMSC and its Clearing Participants.

Please refer to Principle 1 for the legal basis for each material aspect of BMSC's activities.

System design and operations

BMSC operates the Equity Clearing & Settlement ("ECS") system which clears and settles securities trades that are executed on the Exchange. The description of the clearing and settlement process are mentioned below. Besides the ECS, BMSC also operates Institutional Settlement Service ("ISS") and Central Matching Facility ("CMF").

Clearing & Settlement Process

Trades that are transacted on the Exchange on any given day will settle on a T+3 settlement cycle. At the start of the day, by 8:30 a.m. trades that failed to be delivered will be sent to the Trading System for the buying-in process to begin. Buying-in is instituted against a defaulting participant that failed to deliver securities on the settlement day (T+3). Failed trades are generally very small, which is less than half a percent of the total volume traded.

The exchange of securities and money settlement processes are completed by 10:00 a.m. daily. Essentially for securities movement, the book entry between the seller's and buyer's accounts are debited and credited by 10:00 a.m. Money settlement process will also be completed by 10:00 a.m. where the buying participant will make payment to the Clearing House, and the Clearing House will also make payment to the selling participant by 10:00 a.m. daily.

In addition to the above, the Clearing House has in place an optional service which allows institutional investors to clear and settle their trades directly with the Clearing House. This is performed through the ISS facility where settlement instructions are created between the participants to move securities and funds for settlement of trades on T+3. Participants will upload post trade settlement instructions through an automated system between T+1 and T+2 before settlement takes place on T+3. With the introduction of ISS, participants can handle a higher number of pre-matched transactions and facilitate turnaround trades between market participants, minimising settlement risks and facilitating straight through processing.

IV. Disclosure of 24 principles for BMSC

Principle-by-principle summary narrative 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.***	
Summary narrative	The high degree of certainty in the legal framework for the relevant material aspects of the BMSC's activities stems from the clear and unambiguous law, rules and contractual arrangements between BMSC and its CPs. The legal framework governing BMSC's activities consists of the CMSA, BMSC Rules, BMS Rules as well as the contractual agreement between BMSC and its participants. In addition, certain aspects relating to the activities of BMSC are governed by the provisions of the Evidence Act 1950 ("EA"), the Digital Signature Act 1997 ("DSA"), the Contracts Act 1950 and the SCMA. The legal basis (and consequently, the legal certainty) for each of the key aspects of BMSC's activities is properly provided in the following manner: (a) Finality: The BMSC Rules bind the CPs to the market contracts in the system and all settlements are deemed final and irrevocable. In addition, the CMSA provides protection from insolvency proceedings impacting BMSC's default procedures. The BMSC Rules specify insolvency of a CP as a circumstance upon which a default would be triggered. (b) Netting: Pursuant to the BMSC Rules, BMSC may set off any amount due from a CP to BMSC against any amount due from BMSC to the CP. (c) Dematerialisation: Sections 14 and 17 of the SICDA requires all securities to be dematerialised in an approved central depository. BM Depo is an approved central depository under SICDA and all securities transfers handled by BMSC are with respect to securities dematerialised in the BM Depo. (d) Novation: The BMSC Rules describe the novation process and the point of novation as the moment when the market contract is accepted by BMSC. (e) SBL & Islamic Securities Selling and Buying - Negotiated Transaction ("ISSBNT"): SBL was introduced in 2007 based on the guidelines for SBL issued by the SC. Chapter 7 of the BMSC Rules describes the process of the SBL-CLA, the rights and

	responsibilities of the two parties and BMSC. There are separate master agreements entered into between the borrowers and BMSC and the lenders and BMSC. These agreements also include specific terms and conditions, including the manner in which approved collateral for margin shall be pledged with BMSC. Pursuant to the BMSC Rules, in the event of a default, BMSC has the power to liquidate the collateral of the CP held by BMSC and set off the amounts realised against any loss incurred by BMSC in liquidating or novating the rights and obligations under the open contracts of the CP in default. In the case of SBL-NT and ISSBNT, BMSC does not have a direct role. The SBL agreement and ISSBNT agreement are handled between the two parties outside of the BMSC framework. Chapters 8 and 9 of the BMSC Rules provide a framework for the SBL-NT & ISSBNT processes respectively, and very clearly articulate that BMSC is not a party to the transaction. (f) Default handling procedures: The BMSC Rules specify the default handling procedures - the events that constitute default and the rights of BMSC in the event of a default by a CP including the handling of open contracts and any pending settlements. The CMSA protects the implementation of the default procedures from any interference from the implementation of any insolvency procedures on the concerned participant. (g) Applicability of the BMSC Rules: The BMSC Rules are binding on the CPs by virtue of the contractual relationship between the parties. (h) Legal protection for electronic payment: The DSA provides the legal framework for the use of electronic signatures. An electronic payment made is binding based on the contractual relationship between the operator of a payment system and its participants. The EA recognises a document produced by a computer as evidence in a court of law. (i) Regulation and oversight of BMSC: BMSC is an approved securities clearing house under the Section 38(4) of the CMSA and is subject to regulatory oversight by the SC. The SC's role to supervise and monitor the activities of any clearing house is stipulated in section 15(1)(f) of the SCMA. (j) Other aspects: Aspects relating to the collection of margins, the settlement process, the establishment of the clearing guarantee fund, the delivery procedures and the financial requirements for participants as described in the BMSC Rules. (k) Relevant jurisdictions: BMSC is incorporated in Malaysia as a 100% subsidiary of Bursa Malaysia and the participants of BMSC, including foreign institutions, are subject to Malaysian laws. Consequently, the relevant jurisdiction is only Malaysia.

	The BMSC Rules are approved by the SC except for rule changes which are editorial or consequential in nature that have been specifically exempted from the SC's approval. BMSC has a process to seek external legal opinions where necessary, to ensure the enforceability of the relevant rule or contract. These processes ensure that the BMSC Rules are clear, understandable, enforceable and consistent with the Malaysian legal framework. Additionally, section 43 of the CMSA provides that the settlement of a market contract in accordance with the BMSC Rules and the proceedings/actions taken by BMSC in relation to the same, take precedence over the laws of insolvency. The rule-making process is a robust one, involving benchmarking analysis, review and consultation to ensure that BMSC arrives at balanced and proportionate rules. Specifically, the rules are formulated based on a multi-tiered internal process which includes: (a) consideration of the regulatory objectives to be achieved, concerns to be addressed and the implications of the proposed rule; (b) benchmarking the rules to those of other more developed markets so that the rules are on par with international standards, where applicable; (c) consultation with the relevant stakeholders, including market participants and at times the public to ensure that the rules are clear, practical and are aligned with stakeholders' expectations; (d) scrutiny of the rules by legally qualified staff and for all rule amendments, senior management and chief regulatory officer will review or approve the rule amendments through a management regulatory committee; (e) for major rule amendments, approval is also required by a board regulatory committee, comprising Bursa Malaysia 's board members who are professionals and market experts from the various related fields of the capital market; and (f) approval of the SC for all rule changes except for those that are specifically exempted from the SC's approval, for example, amendments that are editorial or consequential in nature. The BMSC Rules are publicly available at the Bursa Malaysia website: www.bursamalaysia.com. In addition, all CPs are notified of any amendments to the rules via circulars. The operational procedures are readily accessible by the participants of BMSC via eRAPID, a web-based solution to facilitate electronic transmission of circulars containing these operational procedures as well as other notices addressed to the participants.

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.***	
Summary narrative	BMSC is a wholly-owned subsidiary of Bursa Malaysia which is an approved EHC under Section 14 of the CMSA. Bursa Malaysia is also a PLC on the Stock Exchange and as a PLC, it is required to comply with the corporate governance practices as stipulated under the Main Market Listing Requirements of the Stock Exchange. As an EHC, Bursa Malaysia's objectives are reflective of its duties and responsibilities under the CMSA amongst others, to ensure there are orderly, clear and efficient clearing and settlement arrangements for any transaction in securities cleared or settled through the facilities of its subsidiary that is an approved clearing house (i.e. the BMSC). The CMSA also requires Bursa Malaysia to ensure prudent risk management of its business and operations, and it shall prioritize public interest over its commercial business interests. In this respect, the objectives of BMSC as an approved clearing house are similar, and the same are documented in its Constitution. BMSC has specific responsibilities under the CMSA to have at all times, sufficient financial, human and other resources in carrying out its business, to ensure it has adequately and properly equipped premises, competent personnel and automated system with adequate capacity, security arrangements and facilities to meet emergencies. The governance arrangement within the Group is as set out in the Bursa Malaysia Governance Model Document which is available on its website. The Governance Model sets out clear and direct lines of responsibility and accountability of the Board of Bursa Malaysia, the Board Governance Committees for the Group (i.e. AC, RMC and NRC) and the Board Regulatory Committees for the Group (i.e. RACC, MPC and APC). The role, responsibilities, the structure and processes of the Board of BMSC are set out in its Board Charter and Terms of Reference. The Board of BMSC has fiduciary responsibility for the financial health and business sustainability of the Company. The current Board of BMSC comprises five (5) Nominee Directors i.e. two (2) directors of EHC, CEO of EHC and two (2) independent directors. The profile of the current Board of BMSC is available at the Bursa Malaysia website. The Board Charter provides the detailed roles and responsibilities of the Board of BMSC. The specific responsibilities of the Independent Directors and the management of conflict of interest are also specified therein.

	Each year a board performance evaluation is carried out by the NRC for Bursa Malaysia Board, and the scope of this exercise is extended to BMSC Board as a functional Board of a subsidiary within the Group. Every three years an external consultant is engaged to conduct this evaluation. For the intervening two years, the company secretary carries out the review. The review exercise encompasses the evaluation of the Board's performance as a whole, performance of the Committees, individual directors and the Chairman as well as a review of the Board's size, composition, mix of skills/experience/qualities and training/development needs. The NRC co-ordinates this review and presents the findings to the Board of Bursa Malaysia. The interest of shareholders, users and the public are addressed through the balanced Board structure at Bursa Malaysia. The NRC has conducted rigorous review on the membership classification for the Board of BMSC and further reviewed the suitability of Bursa Malaysia directors and external independent individuals, to sit on the Board of BMSC as Nominee Directors of Bursa Malaysia, taking into consideration the securities industry experience, knowledge and expertise to enable their contribution to the development and growth of business and operations. The recruitment process for all senior positions includes interviews with the senior management, the CEO and a Cut-e Online and Virtual assessment. In addition, detailed reference checks are conducted. The CMSA requires Bursa Malaysia to ensure that the staff has the requisite knowledge; the same is also assessed by the SC. Bursa Malaysia has incorporated this into its Human Resources policies and ensures that all the senior management staff has all the requisite skills. Bursa Malaysia also attempts to maintain a pool of internal candidates in the ratio of 1:2 for all senior and critical positions. There is a well-established performance evaluation process against Key Performance Indicators for all employees. The performance of the CEO is assessed by the Board and that of the senior management by the NRC in consultation with the CEO. The performance evaluation process is used to guide the career growth and if need be any termination. A clear and documented Enterprise Risk Management (“ERM”) framework at the Group level is used to identify and monitor the specific business risk for each business entity. The Risk & Compliance division ensures that Bursa Malaysia has an effective framework and ability to manage all risks as a fully integrated part of the organisation including its subsidiaries. Risk & Compliance reports to the RMC. Internal Audit division is independent from all other functions within the Group and reports directly to the Audit Committee.

	Bursa Malaysia adopts a consultative and inclusive approach to take into account the interest of its participants and other relevant stakeholders in its decision making in relation to its design, rules, overall strategy and major decisions. Prior to initiating changes to its system, services, operations and rules, Bursa Malaysia conducts consultation with its participants and other related users of the system and services. Further, any proposed amendments to rules are subject to the SC's approval. In practice, all major rules amendment submission to the SC for approval requires Bursa Malaysia to obtain feedback from the industry and other relevant users via a consultation process. All rules and amendments are publicly available at the Bursa Malaysia's website. Operational procedures for clearing and depository participants are disseminated to all clearing and depository participants via circulars.
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.***	
Summary narrative	The types of risk that can arise in BMSC are: (a) credit and liquidity risks arising from its role as the CCP for the securities market and also as lender under the SBL-CLA model. (b) operational reliability risks that could prevent it from discharging its responsibility as a CCP. (c) The general business risks for the Bursa subsidiaries including BMSC are to a large extent subsumed in the overall business risk for the Group, as BMSC is a 100% subsidiary of the Bursa Malaysia. Each business owner is responsible for identifying the risks their business processes are exposed to, measuring and monitoring the risk indicators and identifying risk management measures and implementing them. The RMC of the board reviews the risk management aspects every quarter and tables all important developments and plans to the board. The internal audit team also reviews the adequacy of the risk management measures periodically. The Group has put in place an established risk management framework for managing risks affecting its business and operations which are aligned with the ISO 31000:2009 Risk Management – Principles and Guidelines and the IOSCO – PFMI as validated by an external consultant in 2017. The Group's risk management framework is embedded in the Enterprise Risk Management and Principles & Framework ("ERMPF") document which is applicable to all the business entities within the Group such as BMSC. With the establishment of the risk management

	framework, the accountability, authority and responsibilities of the relevant parties in the Group for managing risk, including implementing and maintaining the risk management process as well as ensuring the adequacy, effectiveness and efficiency of any controls have been clearly outlined. Within the framework, there is an established and structured process for the identification, assessment, communication, monitoring as well as continual review of risks and effectiveness of risk mitigation strategies and controls at the divisional and enterprise levels. The analysis and evaluation of Bursa Malaysia's risks are guided by the approved risk criteria. At the Group level, the Risk & Compliance division is comprised of three key departments namely Enterprise Risk Management, Business Continuity Management and Compliance Management. The objective of the set up was to consolidate the risk management and compliance functions across the Group to provide a holistic and integrated view of risk management and compliance at the enterprise wide level. The Enterprise Risk Management department covers four risk management units namely Operational Risk, Financial Risk (including credit and liquidity risk), Strategic Risk and Legal & Regulatory Risk. The RMC reviews the risk management aspects every quarter and tables all important developments and plans to the Board. In addition, the Internal Audit team reviews the adequacy of the risk management measures periodically. The Risk & Compliance division also conducts continual review of the risk management framework and process for improvement and ensure that they remain relevant to the Group. The rules of Bursa Malaysia clearly explain the requirements and responsibilities of the participants, and also the responsibilities of the Bursa Malaysia subsidiaries. Bursa Malaysia has established a group approach to supervise the ongoing compliance of the participants to the requirements of the BMSC. The Participants Supervision Department of the Bursa Malaysia is entrusted with the responsibility for managing this. The supervision approach is a combination of off-site supervision and on-site inspections. As part of the off-site supervision - weekly, monthly and annual submission of various financial indicators and data is required. BMSC has identified the following entities that could pose material risks to it, i.e., participants, BM Depo, settlement banks and banks where the BMSC maintains its funds. BMSC leverages on Participant Supervision to manage the risks arising from the participants. The BM subsidiaries have established a methodology for selecting its banking partners, settlement banks and also the banks whose bank guarantees and letter of credit

	it accepts. A combination of financial indicators like capital adequacy ratios, credit rating and operational services provided is used as part of this methodology. In addition, it has established bank-wise concentration limits for the various services it uses. BMSC uses the BM Depo for securities transfers and also for maintaining the securities collateral it collects for the SBL-CLA and also the loaned securities. Bursa Malaysia has a crisis management framework. This framework has identified four broad categories of scenarios that could significantly impair its operations namely, data errors, system downtimes, participant failures and operational lapses. There are various measures implemented to mitigate these risks. A key component of the risk management measure related to the system risk is to institute BCP and periodically test and revise them based on new development and the test findings. BMSC has constituted a CGF which is intended to cover the default of 2 participants with the largest and fifth largest position. In the unlikely event of large scale participant defaults, BMSC is equipped with an established set of rules and procedures to manage such defaults. To further strengthen such safeguards, the Group has already initiated the development of a Recovery Plan ("RP") to recover from uncovered losses and liquidity shortfall which aligns with the global standard of the "Recovery of financial market infrastructures" as set out by the IOSCO. The RP covers the exposures of BMSC and complements with the existing IOSCO - PFMI which are observed by the BMSC. This will only serve to increase the resiliency and robustness of BMSC's existing risk management standards to withstand any eventuality of disorderly failure which can lead to severe systemic market disruptions. In addition, the RP provides a foundation for the establishment of a Resolution Plan to be initiated by the regulator to provide a comprehensive resolution in the unlikely event of a failed recovery process to ensure that critical services can continue to be offered to the market participants.

Principle 4: Credit risk ***An FMI should effectively measure, monitor, and manage its credit exposures to participants and those arising from its payment, clearing, and settlement processes. An FMI should maintain sufficient financial resources to cover its credit exposure to each participant fully with a high degree of confidence. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure to the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure to the CCP in extreme but plausible market conditions.***	
Summary narrative	Through its primary function as a CCP, BMSC is exposed to both current and potential future exposure arising from the principle relationship established with their clearing participants. Current exposure arises from fluctuations in market value of open positions between the CCP and clearing participants. In contrast, potential future exposure arises from potential fluctuations in the market value of defaulting participant's open positions until the positions are closed out, transferred or fully hedged following a default event. In addition to credit exposure inherent in clearing activity, BMSC is also exposed to credit risk of commercial banks where funds of clearing participants and the CCPs are deposited. BMSC has instituted a framework for managing its credit risk that comprises of the equities margin daily and intraday requirement; CGF contribution by TCPs and BMSC; stringent financial requirements; and finally, clear and enforceable default rules. The sources of credit risk for BMSC stem from its role as a CCP. As a CCP, BMSC is responsible to settle all novated contracts, even in the event of one of more participants failing to honour their side of the contract. BMSC credit exposure to clearing participants is primarily mitigated by collection of margin to address both current exposure and potential futures exposure. In order to prevent the accumulation of losses, BMSC requires all TCPs to provide collateral for equities margin requirement which is calculated at end of each business day as well as during intraday. The collection of equities margin is a critical tool available to the BMSC to mitigate potential future exposure. In line with the concept of "defaulter pays", the equities margin collected should be sufficient to cover potential fluctuations in the market value of a defaulting participant's outstanding settlement exposure following an event of default until they are fully closed out.

	BMSC has established the sequence of using the available resources for handling participant defaults. The waterfall structure is as follow: (i) Equities margin of the defaulting participant; (ii) Defaulting participant's contribution to the CGF; (iii) Clearing House's contribution to the CGF (25% of the CGF fund size) and contributions of the non-defaulting participants; and (iv) Additional contribution of the Clearing House (60% of the CGF fund size). The contribution of the clearing participants to the CGF comprised of a minimum fixed contribution by each clearing participant (RM 10,000) and a variable contribution. The adequacy of the CGF is reviewed quarterly or as and when needed and additional contributions can be called for by the BMSC. Failure to honour request for additional contribution is treated as a default and default procedures could be invoked against the erring participant. The CGF is currently set at RM 100 million, with 15% of it coming from the TCPs; 85% from BMSC. In the event of a default by TCP, where CGF is being exhausted, TCPs are required to replenish the CGF in accordance with BMSC Rules to make good the shortfall. A daily stress test on the adequacy of the CGF is conducted, with the objective to ensure that there is sufficient financial resources for the Clearing House to cover default of two participants, i.e. the largest and fifth largest default exposure. Regular updates are also provided to the senior management, RMC and SC where applicable. The results of the stress tests are analysed by the risk management team to assess adequacy of the resources. It is also reported to the senior management and RMC. The result is also shared with the SC on quarterly basis which will be followed by a discussion, if required. In addition, the reverse stress test is also performed in order to identify sensible market conditions in which the entire waterfall resources available to CCP may be insufficient to cover the potential exposure. It is a separate but complementary analysis to the regular stress test performed. BMSC has established a procedure to stress test its exposures in extreme but plausible market conditions taking into account various historical extreme scenario and hypothetical stress scenarios. The parameters used to stress test are: (a) Latest outstanding positions of participants; (b) Latest financial resources of TCP held by the CCP; (c) Pre-defined stress scenarios, including both historical extreme and hypothetical /forward-looking scenarios; and (d) Latest price movement in the market.

	The scenario for stress testing is reviewed at least once monthly and a full model review is conducted annually. This stress test model is also validated annually by an independent party. In the event the CGF stress test simulated exposure beyond the CGF fund size for 10 business days, BMSC may review the exposure and propose for increase in the fund size. Increase in CGF fund size is subject to approval by the SC. The CCP Rules outline the right of BMSC to require its participants to promptly replenish the CGF that are exhausted during a stress event.
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.***	
Summary narrative	The accepted collateral for BMSC is cash ("MYR"), Stand-By Letter of Credit ("SBLC") and component stock of FBM100. BMSC does not accept cross border collateral and lodgement of shares of related companies by participants in meeting margin requirement to mitigate wrong-way risk. A feasibility study will be conducted for acceptance of new collaterals based on requests from the participants. The criteria used by BMSC in accepting the collaterals are: (a) ability to accurately determine the price; (b) low volatility; and (c) availability of secondary market for disposal of the collateral. BMSC's margin system is designed to compute collateral value for margin coverage taking into consideration the appropriate haircut and latest mark to market prices. The collateral records are maintained electronically within the BMSC's system and managed by the BMSC staff, in accordance to a set of operating procedures. Taking into consideration the possible stressed market conditions, a 30% haircut is applied on value of equities collateral. This is the daily price limit, i.e. the largest possible movement in a single stock in one day. For SBLC, no haircut is applied currently as the value is quoted in the settlement currency. BMSC has established concentration limits for securities and SBLC lodged as collateral for margin. The adherence to the collateral limit is monitored on a daily basis.

	For currency mismatch, a haircut is imposed on collateral valuation to mitigate foreign exchange risk. The currency haircut rates are monitored daily and back tested on monthly basis. The model is assessed on annual basis to review model performance on adequacy and efficiency. Model is also validated by independent party on annual basis.
Principle 6: Margin ***A CCP should cover its exposure to its participants for all products through an effective margin system that is risk-based and regularly reviewed.***	
Summary narrative	BMSC introduced EM on 20 June 2016. The equities margin system is designed to compute EM requirement for each TCP based on their respective portfolio's net exposure over 3-days settlement cycle, taking into consideration the concentration risk and variation margin. The EMS is designed to receive settlement data from the clearing system and price data from the Bursa Malaysia system for the computation of margin requirement and valuation of collateral. In addition to EM computation, the EMS also performed collateral management function which includes collateral valuation, haircut management, deposit and withdrawal. The EM Framework adopted by BMSC consists of advance, variation and additional margin. The objective of the advance margin is to cover potential losses arising during liquidation of TCP's portfolio over the close-out period in the event of a default. Advance Margin is calculated based on the outstanding trades for each TCP by netting all Mark-to-Market ("MTM") value, across 3 settlement days, and multiplied with the stipulated margin rate. Margin rate is derived from the volatility of FTSE Bursa Malaysia EMAS Index ("EMAS") and FTSE Bursa Malaysia ACE Index ("ACE"). Average volatility of the two indices with look-back period of 120-day is used to compute the Value-at-Risk ("VaR") figure with 99% confidence level. The two VaR numbers will be weighted by market capitalisation of both indices to arrive at a benchmark margin rate. Additional margin is also required to mitigate the concentration risk of the TCPs' portfolio and exposure arising from any unsettled position. The minimum margin rate is set at 2%. Every TCP's margin requirement is computed twice daily, once at mid-day and another one at market close. TCPs will be required to make good the shortfall if the gross margin requirement is greater than existing collateral held by BMSC. The EM is prescribed in the settlement currency, i.e. for settlement exposure in MYR, it will be prescribed in MYR while settlement exposure in USD will require EM in USD. Notwithstanding the calculated gross margin requirement, all TCPs are required to maintain a minimum collateral of RM 250,000 in cash with BMSC. TCPs are allowed to also pledge

	Standby Letter of Credit or approved shares to meet EM requirement in excess of the RM 250,000. There is no minimum requirement for USD margin requirement. Adequacy of margin rates is back tested daily and reviewed on monthly basis. Sensitivity analysis on model parameters is carried out on monthly basis. The EM framework is validated by an independent party annually. An operational procedure detailing the margin methodology is shared with all participants. The procedure also specifies the cut off times for daily margin deposit and withdrawal.
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.***	
Summary narrative	BMSC liquidity risk management takes into accounts its potential payment obligations and its current resources and it aims to ensure availability of sufficient liquidity to cover any calls for withdrawal of excess margin and the default of the two TCPs. The liquidity management framework effectively assists BMSC to measure, monitor, and manage its liquidity risk. BMSC conducts liquidity needs assessment on a daily basis, in accordance to methodology set out in the framework. The assessment includes the following information: the settlement positions; financial resources available; current investment placements; and, CGF stress test result with simulated potential default. The results from the daily stress tests for credit risks are used to determine the potential size of defaults that the BMSC might need to honour and whether the available liquid resources is adequate to cover the exposure. Results of the test are shared with senior management and RMC on a periodic basis. BMSC liquidity stress test takes into account the potential credit exposure from default by two TCPs. Amongst others, the stress scenarios for the stress test also include failure of liquidity provider, failure of settlement banks and wrong-way risk. In addition, reverse stress test is performed to identify stress scenarios in which the entire liquid resources available to BMSC may be insufficient to meet its settlement needs. BMSC's resources available for use to meet liquidity requirements are primarily the cash balances and intraday credit facilities. The adequacy of this resources is assessed through

	daily liquidity test. Supplemental resources are not taken into consideration of the daily liquidity assessment. BMSC routinely monitors the concentration of exposure and financial condition of the banks with which it places its resources for and avails intra-day credit facilities to ensure they have the capacity to perform on its commitment on an on-going basis. The procedure to access intraday facilities is well tested as BMSC regularly uses the facility to mitigate timing gap between settlement and investment maturity. BMSC has no access to liquidity facility from the BNM. The liquidity risk management methodology is reviewed once a year and the cash-out ratio for liquidity test is reviewed on a quarterly basis.
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.***	
Summary narrative	BMSC conducts a T+3 rolling settlement. Fund pay-ins are received into BMSC's accounts maintained either at BNM or any of the designated settlement banks. The fund pay-outs by BMSC are made into the Clearing Participants' accounts maintained either at BNM or any of the designated banks approved by BMSC. The securities movement are managed by BM Depo under the instructions of the BMSC. The pay-in schedule for the funds leg is 10:00 a.m. on all settlement days. The BMSC Rule 5.3(d)(i) specify that remittances and deposits paid by the CPs to the Clearing House shall be in immediate available funds. The BMSC Rules 5.1B states that the clearing house can instruct debit and credit of the depository account of the buyer and seller, and that these transfers are final, however title over the securities passed only when the buyers pay-in obligation is completed. The BMSC Rule 5.7a sets out that the title passes upon full payment. If the buyer defaults in his payment obligations, then as a consequence, BMSC can take action to sell the securities and recoup the losses. The enforceability of this rule is protected by section 53(3) of the CMSA which states that notwithstanding any other provision of law, where any transfer of securities is processed by the central depository to or from a securities account, no title in such securities shall pass to a depositor except as provided under the rules of the approved clearing house.

	The daily settlements are completed at 10:00 a.m. and are deemed final once the funds are credited. Pay-ins for any call for funds for additional contribution to the CGF is also processed with immediate finality. The BMS Rules 8.08 specify that matched orders cannot be cancelled. These are further reinforced by the BMSC Rules. All trades that are matched on T day must be settled on T+3 by the brokers. Under the ISS arrangement where settlement instruction is generated, settlement will be redirected to indirect participant (NTCP - custodian bank). At any time prior to settlement by 6:45 p.m. on T+2, brokers and indirect participants can delete/cancel an ISS instruction. There is no impact on the trade contract that is due for settlement on T+3. It merely means that the NTCP does not intend to use ISS for its trade settlement. When instruction is deleted, the trade will settle directly with the contracting brokers on T+3 instead (BMSC Rule A5.3(c)). The BMSC Rules clearly define the point at which settlement is final and this has the backing of the CMSA and hence is protected at the level of law. Final settlement is achieved in real-time.
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.***	
Summary narrative	BMSC uses cash account opened with BNM for funds settlement between BMSC and the Clearing Participants since 8 January 2018. The fund settlement takes place through RENTAS, a system which is operated by Payments Network Malaysia Sdn Bhd ("PayNet"), which is a subsidiary of BNM. PayNet was previously known as Malaysian Electronic Clearing Corporation Sdn. Bhd. ("MyClear"). Settlement risk is further mitigated in settlement process between BMSC and the Clearing Participants as RENTAS system facilitates payments between BMSC and the Clearing Participants on a real-time basis with finality and vice versa for receipts. BMSC uses both Central Bank and private settlement bank model for fund settlement. BMSC allows participants to choose any bank for settlement upon approval by BMSC. BMSC has established specific criteria for choosing settlement banks as follows: (a) Licensed commercial banks approved by BNM; (b) Provide online banking system or platform; (c) Provide intraday overdraft facility; (d) Must be able to comply with BMSC's payment cut-off time; and

	(e) Must have good credit standing - minimum of A for Rating Agency Malaysia ("RAM") and BBB and C for Standard & Poor's ("S&P") Issuer Credit Rating and Bank Fundamental Strength Rating respectively. The TCPs and NTCPs are required to credit any payments due to BMSC into BMSC's cash account opened with BNM or the designated accounts maintained with appointed Clearing Banks, and BMSC to credit any payments due to the TCPs and NTCPs in their cash accounts maintained at BNM or designated accounts maintained with the appointed Clearing Banks or any designated accounts with a bank other than the Clearing Banks approved by BMSC.
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.***	
Summary narrative	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.***	
Summary narrative	Not applicable
Principle 12: Exchange-of-value settlement systems ***If an FMI settles transactions that involve the settlement of two linked obligations (for example securities or foreign exchange transactions) it should eliminate principal risk by conditioning the final settlement of one obligation upon the final settlement of the other.***	
Summary narrative	BMSC uses delivery versus payment ("DVP") Model II. The funds leg is settled on a net basis at 10:00 a.m. on all settlement days. The securities leg is settled in gross 1 to 2 hours before 10:00 a.m. for the trades that are participating in the Fixed Delivery and Settlement System ("FDSS") settlement and just before 10:00 a.m. for the trades being settled in the ISS settlement mode. The BMSC Rules deem all the funds and securities transfer done by BMSC are final, however, the title for the securities passes to the buyer only when the funds leg is completed. This is achieved by BM Depo places a freeze on all securities transfer on all days until 10.00 a.m. to ensure that transferred securities cannot be withdrawn or transferred until the funds leg is done. The only exception is with respect to transfers related

	to a force buy-in initiated by the BMSC to cover a buyer default. However, the BMS Rule 7.07 empowers the market participant to block his client from transacting on securities if they have not met their settlement obligations.
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.***	
Summary narrative	The BMSC Rules details what constitutes a default and process for handling defaults. The BMSC Rule 4.1 lists among others non-payment of any dues to BMSC, declaration of insolvency, cancellation of license by the SC or failure to meet the financial requirements specified by BMSC as constituting a default. The BMSC Rule 4.2 gives a wide range of powers to BMSC to handle defaults. There is a defined default waterfall for use of financial resources in the event of TCP's default. The BMSC Rules provide the powers to BMSC to use the CGF in the event of default of a participant, in the following sequence: usage of the failing participant's contribution first, followed by BMSC's contribution and contribution of the other non-defaulting participants on pro-rata basis, and lastly BMSC's resources. The BMSC retains the claims from the defaulting TCP for any sums used from the CGF. In addition, the BMSC Rules pertaining to CGF provides the power to seek replenishment of the CGF. The actions that can be taken by BMSC for handling defaults are: (i) settle all novated contracts and compute the net dues/surplus (ii) if there are dues from the TCP then BMSC can use all the TCP's resources which includes the clawback of any securities, equities margin and CGF (iii) if there is a surplus then the properties in lien can be released Section 43 of the CMSA provides for the default proceeding by the clearing house to take precedence over the Law of Insolvency. Default drills are conducted annually with TCPs to assess its readiness in managing default management procedure which includes: (a) to test the BMSC's default procedures with a broker and other relevant departments within BMSC; (b) to identify the market participant's relevant CSD accounts of the affected T+3 purchase trades; and (c) the claw back of securities and other recovery procedures required.

	Rule 2.11 of BMSC Rules direct the CPs to maintain sufficient detail of all transactions and other matters relating to any of its activities and/or related to such activities in any of the services or facilities made available to the CPs by the BMSC. In the event of participant's default, BMSC has the powers to access all the relevant systems and book of accounts of the defaulting participant, to facilitate clearing house's default action. In addition, BMSC has developed a Default Management Procedure which clearly articulates the roles and responsibilities of various stakeholders and the procedures to handle CP's default and the setting up of Default Management Committee ("DMC"). In the event of default, DMC will carry out the following: (a) To declare a default; (b) To deliberate the appropriate actions to be taken by BMSC; (c) To manage communication with other stakeholders. The relevant rules and procedures are posted at Bursa Malaysia website and are also available to the TCPs through the eRapid system. Any changes to the rules and procedures are distributed by way of circulars through the eRapid system.
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.***	
Summary narrative	Section 111 of the CMSA requires all client assets collected by participants to be held in a trust account. The securities accounts of clients are held in BM Depo at the beneficial owner level and hence provides for full segregation. BMSC treats the collateral as that of the TCP, and as such does not have any portability arrangements in place. BMSC relies on the portability arrangements of BM Depo with respect to securities. The BM Depo Rules Part V Rule 25.04 provides for BM Depo to assist in porting client positions from a defaulting participant to another willing participant and also facilitate participants that can accept clients of defaulting participants. BMSC does not manage client funds and securities, these are managed by the participants. The CMSA and the BMSC Rules require participants to ensure segregation of client funds, securities and collaterals. Compliance to this is verified as part of the internal supervision arrangements of the Bursa Malaysia.

	BM Depo holds securities accounts at beneficial owner level and provides for portability of securities of a client from one participant to another. BMSC relies on this for segregation and portability of securities positions. BMSC collects collateral only from the borrowers of securities in the SBL-CLA model. In the case of the SBL-CLA model, the borrower enters into the transaction as a principal and the collateral placed is held in the borrower's name. SBL activity is a regulated activity with very clear set of situations in which securities can be borrowed. Since collaterals are only collected in the course of SBL and not for regular securities settlement, the absence of an account structure and procedures to facilitate segregation and portability is not an issue of concern. The BMSC Rules and SBL Guidelines are available at the Bursa Malaysia and SC websites respectively.
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.***	
Summary narrative	Bursa Malaysia is guided by the ERMPF and the Enterprise Risk Management Process & Guidelines ("ERMPG") documents to identify, assess, control, monitor and report key risks under the ERM framework which also cover General Business Risks. The oversight, responsibilities and accountability of the risk management process are defined by Bursa's risk governance structure where key risks are managed by the three lines of defense comprising the line managers, risk management and internal audit. These risks are regularly reported to the management of Bursa Malaysia, the Management and Risk Audit Committee ("MRAC"), the RMC and the Board. Among others, the review of the annual business plan which include strategic planning and annual budgeting plays a significant role in the management of both internal and external General Business Risks of Bursa Malaysia. The risk areas relating to General Business Risks under the ERM framework include: (a) The administration and operation of the Group as a business enterprise which could impair the business of Bursa Malaysia; (b) Potential risks which could adversely affect Bursa Malaysia's revenue, significant increase in expenses or loss charges against capital;

	(c) Business impairment resulting in adverse reputational effects; (d) Poor execution of business strategy; (e) Fluctuations in macroeconomic and market activities; (f) Ineffective talent management; (g) Lack of technology and product innovation; (h) Legal and regulatory changes to the business landscape. In addition, Bursa Malaysia monitors the general business risk on its financial position for its subsidiaries including BMSC to ensure quality and sufficient liquid net assets are maintained to meet its obligations. On a stand-alone basis, BMSC maintains liquid net assets to cover at least 6 months of its forecast operating expenses. These funds are held in bank deposits with pre-approved financial institutions ("FIs"). These assets can be easily liquidated in adverse market conditions at very little loss of value. The adequacies of the liquid funds are reviewed on a quarterly basis. BMSC's investment policy and practices are further explained in Principle 16 below. As a wholly owned subsidiary of Bursa Malaysia, BMSC is required by the CMSA to ensure orderly arrangements for the clearing and settlement of the securities transacted on BMS. In the event BMSC cannot continue as a viable entity, then Bursa Malaysia, as the parent company, is ultimately responsible for ensuring alternative arrangements are implemented and BMSC is smoothly wound down. That said, however, there is no explicit plan to handle such a scenario as explained earlier in Principle 3.
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.***	
Summary narrative	Bursa Group is guided by the principal objective to invest CCP members' funds and clearing funds in highly liquid, short term investments with high credit standing and low market risk. This is to ensure timely access to funds at all times. Under Bursa Group's Investment Policy, BMSC is only allowed to invest in deposits or placements with pre-approved financial institutions that meet strict credit requirements (and within the counterparty limits), money market and fixed income instruments that meet Bursa's stringent credit parameters, and securities issued by or guaranteed by Malaysian government or the Malaysian Central Bank. For investments of the CGF (BMSC and participants' contributions) and participants' other funds (i.e. deposits, cash margin collateral etc), BMSC remains conservative by investing only in deposits with pre-approved financial institutions ("FIs"). For BMSC's own assets,

	around 64% are invested in deposits with pre-approved FIs and the remaining 36% are invested in fixed income securities. All investments are MYR-denominated, with the FIs being incorporated in Malaysia and supervised by BNM. BMSC has prompt access to these assets. The investment policy sets out stringent credit parameters for approved FIs, and the single counterparty exposure limit in each FI. There is no significant exposure to a single FI, as BMSC adheres to the exposure limits which aim to spread out exposures to multiple counterparties. In addition, the list of approved banks and exposure limits are reviewed at least, on an annual basis or as and when required (e.g. in adverse financial condition). BMSC is only permitted to invest in fixed income securities with a minimum rating of 'AA3' as rated by RAM, or the equivalent rating by MARC.
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.***	
Summary narrative	RC Division of Bursa Malaysia has established an ERMPF which was designed based on ISO 31000:2009. One of the risk categories classified in the ERMPF is the Operational Risk which is defined as risks arising from deficiencies in information systems or internal processes, human errors, management failures, or disruptions from external events that could result in the reduction, deterioration, or breakdown of services provided by Bursa Malaysia and its subsidiaries. The ERMPF is supported by the Enterprise Risk Management Process & Guidelines ("ERMPG"). The ERMPG serves to guide the Group in identifying, monitoring and managing the risks it faces in the course of achieving its operations, strategic and business objectives. In the contexts of operational risk, the risk assessment process involves identifying major processes, measuring risk events in terms of likelihood of occurrence and impact and management of current mitigation controls that are in place and action plans if needed. The ERMPF which was approved by the Board defines the roles and responsibilities of the relevant parties including the Board, the RMC and the Management, respectively for managing risks and implementing risk management processes, and ensuring the adequacy and effectiveness of risk mitigation controls. The Board have tasked the RMC with the responsibility of ensuring that the risk management framework of the Group operates

	effectively. Periodically, the Board will receive updates from the RMC on the progress and assessment of risk management of the Group. To further strengthen the operational risk spectrum of Bursa Malaysia, the following 2 frameworks were established in February 2018: (a) Operational Risk Framework which introduces: i. A common definition and risk categories to enable a uniform understanding and consistent approach of managing operational risk across the Group; ii. A governance and oversight structure for operational risk; iii. Roles and responsibilities including reporting lines; iv. A sound operational risk management approach and process by introducing methodologies/tools and techniques to perform risks assessment/ analysis/ treatment/ monitoring and reporting in a structured, systematic and consistent manner; and v. Effective communication to cultivate operational risk awareness building. (b) Cyber Security Risk Management Framework i. To create a common approach for addressing cyber security within Bursa Malaysia; and ii. To ensure cyber security risks are properly managed throughout Bursa Malaysia. BMSC performs equities clearing and settlement functions through ECS. Henceforth, the operational reliability objectives of the BMSC is dependable on the performance of the ECS. The ECS is adequately equipped to support the securities clearing and settlement process. The ECS is being maintained regularly to ensure a high degree of security, performance, operational reliability and scalable capacity. This is achieved through IT initiatives undertaken by Bursa Malaysia's Technology & Information Management Division ("TIM") together with the ongoing support and maintenance arrangements with IT vendors. For instance, the performance of the ECS is measured and monitored at its average and peak CPU utilisation level, whereas its capacity is observed via its average and maximum daily trade transactions processing. Based on total securities trading volume done by Bursa Malaysia over the last few years, the ECS was able to sufficiently meet the scalable capacity adequacy to handle increasing volumes and its service-level objectives. There was no breach on the capacity limits of the ECS. To ensure the reliability and availability of the ECS, the following controls are in place:

	(a) Incident Management and Problem Management procedures are available. All incidents are centrally logged into the Enterprise Service Management system and categorised by priority. Incidents are escalated to relevant IT support teams and respective vendors with 24/7 support service for resolution. (b) All major components of ECS are in cluster mode at the main site and it has redundant servers at Bursa Malaysia DR Site. This is to cater for high availability and reliability of the system. (c) Performance of the system is monitored using specific monitoring tools which have alert capabilities to trigger alarms in the event that thresholds are being breached. (d) Quality assurance of the changes to the system undergoes testing by vendors and internal users. For critical and major changes, an industry wide mock testing is conducted with the market participants. (e) Change management process is in place where all changes to the system are centrally logged to the Enterprise Service Management system, managed and assessed in respect of impact and risk of the change to the system. Audit engagements and independent reviews are carried out by the Internal Audit ("IA") on operational systems, processes, policies and procedures based on an annual audit plan approved by the Audit Committee. All key operational areas and processes are audited within a cycle of 3 years with higher frequency of coverage depending its criticality and IA risk-assessment. Using a risk-based audit approach, IA assesses the selected areas under the audit scope in relation to effective mitigation of risk exposures, compliance towards the approved policies and procedures and relevant laws and regulations as well as improvement to the overall internal control system. As part of the risk-based audit plan, IA also conducts system readiness reviews to ensure that due process has been complied with prior to the implementation or launch of significant systems development and enhancement projects. Post implementation reviews are also conducted after a predefined period to assess the realised benefits of the implemented significant systems and projects. In relation to physical and information security control and policies in addressing the confidentiality, integrity, availability and potential vulnerabilities and threats of BMSC and ECS, several policies and controls have been implemented by TIM. These policies and controls encompass the following: 1. Bursa Malaysia Information Security Policy and Standards • Bursa Malaysia Information Security Policy ("BMISP") • Bursa Malaysia Information Security Standards ("BMISS")

	2. Information Security Management System ("ISMS") Bursa Malaysia is certified with ISMS - ISO 27001:2013 for Equity Clearing & Settlement Services. Bursa Malaysia has invested and put in place tools and mechanisms to enhance the cyber resilience capabilities to anticipate, withstand, contain and rapidly recover from a cyber incident with the objective of limiting the escalating risks that cyber threats pose to Bursa Malaysia and its stakeholders. Amongst the controls that have been put in place are: (a) Vulnerability assessment and penetration test conducted to identify security vulnerabilities in system and appropriate remedial actions taken to address any weaknesses. (b) Firewall and network intrusion prevention system in place to monitor, detect and mitigate malicious activity or suspicious traffic on the network. (c) Anti-virus software implemented for all desktops, servers, email exchange and gateway. (d) Information leakage control to avoid unauthorised access and data leakage. The cyber security core functions and controls are reviewed and assessed to observe with the Guidance on Cyber Resilience for Financial Market Infrastructures issued by IOSCO as well as to comply with the Guidelines on Management of Cyber Risk issued by the SC. In relation to BMSC having a business continuity plan, a secondary site, and RTO within 2 hours following disruption, the following are put in place: - **1. Business Continuity Plan ("BCP")** The overall approach is geared towards to ensure adequate back-up arrangements for all critical office facilities and system components; online data replication from the main site to the DR site and data back-ups to ensure no data loss; and, developing business continuity procedures and testing them periodically. The failure of the critical system components is mitigated with clustering and redundant systems/infrastructure facilities at Bursa Malaysia's main site, hence minimising the needs to failover to Bursa Malaysia's DR site/systems. The systems at Bursa Malaysia's DR site are capable of running all functionalities that are currently available at main site. **2. Alternate Site and Backup Systems and Office Facilities** The Group's back-up systems and office facilities are housed in its own DR site in Kuala Lumpur which is away from the main site. These two different sites are provisioned

from different power sub-stations and different telecom exchanges for electricity supply and telecommunication services respectively, to mitigate the risk of concurrent impact to both sites. The DR site is having adequate capacity and as part of the annual BCP testing has been found to be capable of handling the operations for a sustained period of time.

3. BCP and Testing

The Group has a comprehensive group wide BCP plan. The BCP is tested annually with the participation of all stakeholders with target RTOs of 2 to 4 hours. The BCP test includes participation of the BMSC participants, they are required to connect to the Bursa Malaysia's DR site and verify their ability to conduct their usual services and also the integrity of their data. Appropriate recalibration of the BCP are made and if required these are re-tested. Procedures in the BCP for mitigating business interruption risks are tested at least once a year. These procedures are also subjected to external audits by the SC and the appointed external auditor of Bursa Malaysia.

4. BMSC's Workflow and Recovery Time Window

BMSC's securities (post trade functions) settlement is on T+3 market day and the business (production) hours are from 8:45 a.m. to 6:45 p.m. from Monday to Friday. The EOD batch processes for the ECS are from 9:30 p.m. to 11:30 p.m. After the EOD processes, the settlement details files are successfully generated and sent to the participants and the settlement instructions are sent to the settlement banks for execution by 10:00 a.m. on the settlement day. In the event of ECS disruption before or during the EOD processes and after ECS recovery, BMSC could extend the production hours and delay the EOD processes accordingly so long as the EOD processes can be completed at around 8:00 a.m. on the settlement day. This gives BMSC a window of 8.5 hours or more for recovery, resumption and execution of EOD processes where applicable.

5. RTO and BCP Test Results

Both the securities trading and clearing & settlement systems are classified as critical systems with RTO of 3 hours and 2 hours respectively. The recovery time achieved for a start of day failure scenario excluding staff mobilisation and traveling time to DR site for the securities trading and clearing & settlement systems for year 2017 BCP tests were 16 minutes and 40 minutes respectively.

Market Participant's DR Site, BCP and Testing

	In addressing the risks of key participants may pose to its operations, Bursa Malaysia requires all market participants to maintain robust BCP and this is ascertained as part of the ongoing supervision activities which includes onsite audits of the DR sites of the participants. The participants are also required to participate in the BCP tests of the Bursa Malaysia. As part of the BCP testing, the Bursa Malaysia's treasury processing and cash settlement unit which deals with the settlement bank including the ones which are liquidity providers, checks its ability to function from the DR site. The ability to provide online banking facilities is one of the criteria used to select settlement banks and banks that provide liquidity support.
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.***	
Summary narrative	Criteria and requirements for participation are set out in the BMSC Rules which are made available at the Bursa Malaysia website. BMSC has two types of membership: (a) TCP who are brokers (Participating Organisations of BMS); and (b) NTCP who are essentially custodians (banks, companies authorised or licensed to engage in investment business, statutory organisation). General admission criteria include the following: (a) financial integrity; (b) absence of convictions or civil liabilities; (c) competence; (d) good reputation and character; (e) efficiency and honesty; (f) scope of authorization under any laws of Malaysia, or by a regulatory authority in Malaysia; (g) operational capability, including adequately trained personnel, data processing capacity and suitable premises; and (h) minimum financial requirement as may be prescribed by BMSC. Minimum financial requirements: (a) For TCPs, the financial requirements are as per that for a PO in the BMS rules. (b) For NTCP, it is required to have a paid-up capital of not less than RM 2 million unless it is a statutory organisation or authority of Malaysia or any state of Malaysia. Participants related fees for both TCP and NTCP:

	(a) Admission fee: RM 10,000. (b) Annual fee: RM 5,000. All TCP and NTCP need to be members of BM Depo, as all client accounts are tied to a TCP and where relevant, a NTCP. Applicant for TCP of BMSC is required to undergo a readiness audit before being allowed admission. NTCP is not subjected to a readiness assessment as they are either licensed financial institutions or statutory organisation or authority. Bursa Malaysia monitors ongoing compliance of participants. There is a section at Bursa Malaysia that handles this function. The participants of the exchanges, the clearing houses and the depository are all subject to the same process. Bursa Malaysia uses a combination of off-site supervision based on periodic submissions and on-site inspections in order to ensure that its participants comply with the rules. On-site inspection frequency is guided by a risk-based profile of each participant. Participants with a higher risk profile are audited more frequently and thematic/limited scope inspections are carried out when the need arises. The scope of the on-site and off-site supervision activities include, among others, verifying participants' ability to meet payment obligations and ensuring that appropriate policies and procedures are in place for the areas of risk management, governance, compliance, human resources, internal audit and security of IT systems. The compliance head of a PO is required to report any violation of rules to the BMS to the Exchange. All the POs are required to report their capital adequacy ratio, liquidity position, analysis of client positions, profit and loss statement and compliance to the clients' trust requirement on a periodic basis. In addition, there are reporting requirements related to proprietary positions, errors and under-margining for SBL by their clients. These reporting requirements are stipulated in the directives for the POs which are publicly available at the Bursa Malaysia website. BMSC has adequate powers to ensure it is able to smoothly handle the exit of a participant. The rules 2.12 and 2.14 of the BMSC Rules require a participant to provide at least 30 days' notice and gives discretionary powers to BMSC to reject the request if it could pose problems to the orderly functioning of the clearing house. In addition, these rules provide BMSC powers to place specific restrictions on the participant in the intervening period to ensure BMSC can smoothly process the request for termination.

Principle 19: Tiered participation arrangements ***An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.***	
Summary narrative	Not applicable.
Principle 20: FMI links ***An FMI that establishes a link with one or more FMIs should identify, monitor, and manage link related risks.***	
Summary narrative	As a CCP, BMSC does not have link arrangements with other FMIs. The only link BMSC has is with BM Depo for settlement of securities and depositing equity collaterals collected from the TCPs. BMSC and BM Depo are institutions that have been created in accordance to the provisions in the CMSA and SICDA respectively. These are also supervised and overseen by the SC. In addition, BMSC and BM Depo are the group institutions and are subject to the group governance model.
Principle 21: Efficiency and effectiveness ***An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.***	
Summary narrative	BMSC assesses the effectiveness in meeting the requirements of its participants through various engagements. Industry and/or public consultation is conducted prior to introduction of any changes to Rules and/or product offering and launching. There is also a formal engagement in the form of Securities Market Operations Committee ("SMOC") that includes members of the Exchange / Clearing House / Depository and participants. The committee meets regularly to discuss market related matters. The operations of the SMOC is governed by clear Terms of Reference. The goals of BMSC include: (a) To process, execute and complete all clearing and settlement activities in a timely manner, in accordance with the prescribed procedures, rules, guidelines and directives. (b) To provide an efficient, reliable and stable clearing and settlement infrastructure. (c) To ensure adequate risk management measures, including monitoring participant's ability to meet their settlement obligations, effective handling of default and adequacy of financial resources. In addition, BMSC has identified and established targets for key operational indicators: (a) Time taken to complete trade processing; (b) Adherence to payment cut-off times; and (c) System availability.

	There are key performance indicators ("KPIs") established for tracking achievement of these objectives both at the organisation and individual levels. BMSC also performs a post implementation review for any new initiatives, which involves consultation with the participants. This requirement adheres to SC's guidelines for any new initiatives/projects approved by the SC. The review report is tabled to the management for their acknowledgement.
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.***	
Summary narrative	BMSC uses a proprietary message format. However, the system interfaces use the industry standard protocols like TCP/IP. BMSC clears and settles securities market transactions in Malaysia and for this purpose, BMSC uses proprietary message formats for exchanging of securities transfer instructions with BM Depo and for receipt of ISS confirmations from the NTCPs. The other interactions with the participants are through system screens, and industry standard protocols.
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 and fees and other material costs they incur by participant in the FMI. All relevant rules and key procedures should be publicly disclosed.***	
Summary narrative	BMSC has clear and comprehensive rules to govern the participants, complemented by operational procedures. The rule-making process is a robust one, involving benchmarking, analysis, review and consultation to ensure that BMSC arrives at balanced and proportionate rules. Specifically, the rules are formulated based on a multi-tiered internal process which includes: (a) consideration of the regulatory objectives to be achieved, concerns to be addressed and the implications of the proposed rule; (b) benchmarking the rules to those of other more developed markets so that the rules are on par with international standards, where applicable; (c) consultation with the relevant stakeholders including market participants and at times the public to ensure that the rules are clear, practical and are aligned with stakeholders' expectations;

	(d) scrutiny of the rules by legally qualified staff and for all rule amendments, senior management and chief regulatory officer will review or approve the rule amendments through a management regulatory committee; (e) for major rule amendments, approval is also required by a board regulatory committee, comprising Bursa Malaysia Berhad's board members who are professionals and market experts from the various related fields of the capital market; and (f) approval of the SC for all rule changes except for those that are specifically exempted from the SC's approval, for example amendments that are editorial or consequential in nature. The BMSC Rules are publicly available at the Bursa Malaysia website: www.bursamalaysia.com. In addition, all participants are notified of any amendments to the rules via circulars through eRapid system. The operational procedures are also readily accessible by the participants of BMSC via eRAPID, a web-based solution to facilitate electronic transmission of circulars containing operational procedures as well as other notices addressed to the participants. These operational procedures are not publicly available. The participants are provided with network connectivity file specifications and message specifications for system connectivity and interface requirements. Technical documents on the system processes and designs are sent to participants through circulars. The fees and charges are provided to all new participants and changes are notified through circulars. Bursa Malaysia currently discloses quantitative data on performance of BMDC, financial condition and resources to the SC on a quarterly basis. All new participants are provided with requisite training to ensure they have the requisite knowledge of the systems, processes and rules. The ongoing supervision activities are used to identify if there are any gaps in the knowledge relating to process and rules. Based on discussions with the participant a suitable course of action is determined, which could include additional training. If need be, training will be provided to participants on areas that the participants feel they require refresher.

Principle 24: Disclosure of market data by trade repositories ***A trade repository should provide timely and accurate data to relevant authorities and the public in line with their respective needs.***	
Summary narrative	Not applicable.

V. List of publicly available resources

Relevant information pertaining to BMSC can be found at
http://www.bursamalaysia.com/market/securities/

Links to documents referenced within this Disclosure Framework are below:

Capital Markets and Services Act 2007
http://www.sc.com.my/capital-markets-and-services-act-2007/
Corporate governance model
http://www.bursamalaysia.com/corporate/about-us/corporate-governance/governance-model/
Securities: Rules of Bursa Malaysia Securities
http://www.bursamalaysia.com/market/regulation/rules/bursa-malaysia-rules/securities/rules-of-bursa-malaysia-securities
Securities: Rules of Bursa Malaysia Securities Clearing
http://www.bursamalaysia.com/market/regulation/rules/bursa-malaysia-rules/securities/rules-of-bursa-malaysia-securities-clearing
Information on transaction cost
http://www.bursamalaysia.com/market/products-services/transaction-costs-fees-and-charges/
Market statistics
http://www.bursamalaysia.com/market/securities/equities/market-statistics/