ASIA PACIFIC CLEAR

Disclosure Framework

October 2026

INTRODUCTION

Responding Institution:

Asia Pacific Clear Pte. Ltd.

Jurisdiction(s) in which the FMI operates

Singapore

Authority(ies) regulating, supervising or overseeing the FMI:

The Monetary Authority of Singapore

This disclosure is made in October 2026 and can also be found at https://www.asiapacificex.com/. For further information, please contact Asia Pacific Clear at enquiries@asiapacificex.com or 1 Phillip Street, Royal One Phillip #06-00, Singapore 048692.

EXECUTIVE SUMMARY

The objective of this document ("**Disclosure Framework**") is to provide the relevant disclosure to market participants on the methods used by Asia Pacific Clear ("**APEX Clear**" or the "**Clearing House**") to manage the risks it faces as a central counterparty ("**CCP**").

The Disclosure Framework is prepared in accordance with the internationally recognised "Principles for Financial Market Infrastructures" ("**PFMI**") published in April 2012 and developed jointly by the Committee on Payment and Settlement Systems and the Technical Committee of the International Organisation of Securities Commissions. No disclosure is provided with respect to Principles 11 and 24 as they do not apply to CCPs.

APEX Clear is an Approved Clearing House ("**ACH**") under the Securities and Futures Act 2001 of Singapore ("**SFA**") and supervised as such by MAS. As an ACH, APEX Clear is subject to the regulatory requirements for ACH under the SFA and its subsidiary regulations, notices and guidelines.

APEX Clear provides clearing and settlement services for the derivatives products listed by its parent corporation - Asia Pacific Exchange ("**APEX**"), itself an Approved Exchange authorised by the Monetary Authority of Singapore ("**MAS**"). These derivatives products could be in the asset classes of agriculture, energy, petrochemical, metal, foreign exchange, interest rates, bond and stock indices. As on the date of this report, APEX Clear clears and settles commodities, precious metals, foreign exchange and cryptocurrencies futures. APEX Clear's direct participants are its clearing members ("**Clearing Members**"). Its indirect participants include direct and indirect customers of its Clearing Members. These customers may be individual investors or institutional investors.

GENERAL BACKGROUND ON THE FMI

General Description of the FMI and the markets it serves

APEX Clear provides clearing and settlement services for markets operated by APEX. As a CCP, it becomes the buyer to each selling Clearing Member and the seller to each buying Clearing Member for every trade that it clears. For products which are settled via delivery, APEX Clear will also facilitate the process of physical delivery through the collection of relevant documents, margins, etc.

General Organisation of APEX Clear

APEX Clear is a wholly owned subsidiary of APEX, which is an Approved Exchange and an Approved Holding Company under the SFA. APEX in turn is majority owned by Asia Pacific Holdings Pte. Ltd. ("**APH**"), which is also an Approved Holding Company under the SFA. APEX Clear adopts corporate governance practices which conform to the requirements of the Companies Act 1967, SFA and the conditions of the MAS exemption from the Securities and Futures ("**SF**") (Corporate Governance of Approved Exchanges, Approved Clearing Houses, Licensed Trade Repositories and Approved Holding Companies) Regulations 2024.

APEX Clear's Board of Directors provides the strategic direction and leadership for APEX Clear. It also oversees the Board Committees, which serve both APEX and APEX Clear: the Audit Committee, Risk Management Committee[1], the Conflicts Committee, the Nominating Committee, and the Remuneration Committee. The CEO with the support of senior management manages the day-to-day functions of APEX Clear.

Legal and Regulatory Framework

APEX Clear's clearing activities are governed by relevant statutes and regulations under Singapore law. These contain prescriptive requirements on risk management, operational framework and governance requirements amongst other things. The regulatory body for APEX Clear's clearing activities is the MAS.

MAS regulates APEX Clear as an ACH and its parent company, APEX as an Approved Exchange and an Approved Holding Company. APH is also regulated by MAS as an Approved Holding Company. The SFA and the subsidiary regulations provide the legal basis for the regulation of and participation in the clearing activities carried out by APEX Clear.

The relationship between APEX Clear and its Clearing Members is governed by its Clearing Rules, Clearing Procedures (collectively referred to as "**Clearing Rules**") and other contractual arrangements. The Clearing Rules and contractual arrangements set out the rights and obligations between APEX Clear and its participants and are governed by Singapore law. Every Clearing Member agrees to be contractually bound by the Clearing Rules as a result of becoming a Clearing Member.

[1] The Audit and Risk Management Committee will be split into the Audit Committee and Risk Management Committee in accordance with the requirements of the Securities and Futures ("SF") (Corporate Governance of Approved Exchanges, Approved Clearing Houses, Licensed Trade Repositories and Approved Holding Companies) Regulations 2024.

System design and operations

APEX Clear provides real-time clearing services for Clearing Members' proprietary and customer trades. These include daily mark-to-market settlement, post trade management, risk management, collateral management, position management and delivery management.

Prior to 8 November 2021, APEX Clear's clearing platform was built on top of TradeEXPRESS™ clearing solution developed by Nasdaq. With effect from 8 November 2021, APEX Clear has been using a new clearing system ("**Clearing System**") built upon modern technology stack supported by scalable and elastic infrastructure which provides cross-asset clearing services with real-time risk management for Clearing Members.

Clearing Members may access APEX Clear's Clearing System through the following means:

- Programming Interface: Clearing Member can connect their proprietary or third-party back-office system to APEX Clear via Financial Information eXchange protocol. The API provides real-time update on trades and post-trade actions
- Web-based Graphical User Interface: The graphic user interface front end provides Clearing Members with comprehensive view of their accounts, trades, positions and margins. Clearing Members can also manage post-trade actions and collateral transactions through this front end.
- Full suite of reports through Secure File Transfer Protocol ("**SFTP**"): APEX Clear provides full set of reports for reconciliation. They are made available through SFTP.
- Independent Service Providers ("**ISP**"): We also have a range of back office solution providers already integrated with APEX Clear which can provide full set of IT solutions to Clearing Members.

For each given Trading Day, there are 2 routine clearing cycles - 1 intra-day clearing cycle and 1 end-of-day clearing cycle. At each clearing cycle, trades and positions are marked-to-market and margin requirements are re-calculated. Where required, margin calls are issued to the relevant Clearing Member by APEX Clear at the end of each clearing cycle. If APEX Clear makes a margin call against a Clearing Member, it will send debit instructions to the Settlement Bank appointed by the Clearing Member to debit the Clearing Member's account with the Settlement Bank. Settlement Banks must confirm that it will carry out the debit instructions within a stipulated time.

Principle-by-Principle Summary Narrative Disclosure

KC[2]	IOSCO-CPSS PFMI Principles
Principle 1: Legal Basis ***An FMI should have a well-founded, clear, transparent, enforceable legal basis for each material aspect of its activities in all relevant jurisdictions.***	
1.1	*The legal basis should provide a high degree of certainty for each material aspect of an FMI's activities in all relevant jurisdictions.*
	APEX Clear has a well-founded, clear, transparent and enforceable legal basis for each aspect of its activities in all relevant jurisdictions. The legal basis for the activities of APEX Clear consists of three main categories: statutes and regulations; rules and contracts; and common law. APEX Clear is a company incorporated in Singapore and is governed by the constitution of APEX Clear, the Companies Act 1967 and the relevant subsidiary legislation, the SFA and the relevant subsidiary legislation and guidance issued by the MAS. APEX Clear operates in accordance with its Clearing Rules, which is governed by and construed in accordance with the laws of Singapore. The relationship between APEX Clear and its Clearing Members are governed by the Clearing Rules and contractual arrangements, which are governed by Singapore law. Section 67 of the SFA provides that the business rules of an approved clearing house shall be deemed to be, and shall operate as, a binding contract between the approved clearing house and each participant. As such, the Clearing Rules has the effect of a binding contract between the Clearing Members and APEX Clear. Section 68 of the SFA also empowers, *inter alia*, APEX Clear as an ACH to make an application to the Singapore High Court to direct a participant to abide by the Clearing Rules. The Clearing Rules consists of clear and detailed provisions relating to APEX Clear's clearing activities and provide a high degree of certainty for each material aspect, such as: provisions relating to collateral agreements, provisions relating to novation arrangements, provisions relating to the rights, interests and obligations of APEX Clear, Clearing Members and their customers, particularly with respect to default procedures.
1.2	*An FMI should have rules, procedures, and contracts that are clear, understandable, and consistent with relevant laws and regulations.*
	The Clearing Rules are publicly available on the APEX website. Prior to the implementation of any Clearing Rules or contract, APEX Clear carries out the appropriate legal and regulatory analysis to ensure consistency with the relevant laws and regulations. APEX Clear obtains legal advice on the Clearing Rules or contract from external legal counsel when it deems appropriate. APEX Clear will also carry out consultations with

[2] KC refers to the Key Considerations in relation to each PFMI Principle.

KC[2]	***IOSCO-CPSS PFMI Principles***
	the MAS to ensure that it has completed the regulatory processes to the satisfaction of the regulator to implement such Clearing Rules or contract, as and when required. Additionally, and in any event, the Clearing Rules also provide that in the event of conflict, the relevant law or regulation will prevail over the Clearing Rules in the order as set out in Rule 102(i) of the Clearing Rules.
1.3	*An FMI should be able to articulate the legal basis for its activities to relevant authorities, participants, and, where relevant, participants' customers, in a clear and understandable way.*
	The development of the Clearing Rules takes into consideration the concerns and practical realities of the Clearing Members. For instance, APEX Clear carries out consultations and discussions with its Clearing Members to gather feedback in respect of the Clearing Rules. Such exchanges serve to improve the communication channel between APEX Clear and the Clearing Members. Where necessary, APEX Clear will respond to or put out public statements from time to time to clarify and elaborate the legal basis of APEX Clear's activities to the relevant authorities, participants, and, where relevant, participants' customers.
1.4	*An FMI should have rules, procedures, and contracts that are enforceable in all relevant jurisdictions. There should be a high degree of certainty that actions taken by the FMI under such rules and procedures will not be voided, reversed, or subject to stays.*
	APEX Clear's Clearing Rules and contracts are properly executed to make sure that they have contractual force in all relevant jurisdictions. Generally, contractual arrangements entered into between APEX Clear and its Clearing Members are expressly stated to be governed by Singapore law. Section 67 of the SFA provides that APEX Clear's business rules operate as a binding contract between APEX Clear and each participant and APEX Clear is also empowered to apply to the Singapore High Court to direct a participant to abide by those rules. Further, Section 81C of the SFA provides that various actions taken under APEX Clear's business rules will not be made invalid by reason of only inconsistency with any written law or rule of law relating to the distribution of assets of a person on insolvency. The insolvency of a Clearing Member will therefore not disrupt the clearing and settlement of transactions, including any applicable collateral, netting and set-off arrangements.
1.5	*An FMI conducting business in multiple jurisdictions should identify and mitigate the risks arising from any potential conflict of laws across jurisdictions.*
	At present, APEX Clear conducts business solely in Singapore and only with Singapore-incorporated Clearing Members or Singapore branches of overseas banks.

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.***	
2.1	*An FMI should have objectives that place a high priority on the safety and efficiency of the FMI and explicitly support financial stability and other relevant public interest considerations.*
	APEX Clear has governance arrangements that are clear and transparent, promote its safety and efficiency and support the stability of the broader financial system, other relevant public interest considerations and the objectives of relevant stakeholders. The governance structure of APEX Clear promotes the various statutory objectives set out in the SFA, including promoting the provision of safe and efficient clearing facilities and the reduction of systemic risk. In accordance with Section 57 of the SFA, APEX Clear's governance arrangements ensures that it will: (i) not act contrary to the interests of the public when discharging its obligations under the SFA; (ii) have sufficient financial, human and system resources to operate a safe and efficient clearing facility, meet contingencies or disasters, and provide adequate security arrangements; and (iii) appoint and employ fit and proper persons as its Chairman and directors. The Nominating Committee, Remuneration Committee, Audit Committee, Risk Management Committee and Conflicts Committee of APEX carry out these functions for APEX Clear, under the MAS exemption.
2.2	*An FMI should have documented governance arrangements that provide clear and direct lines of responsibility and accountability. These arrangements should be disclosed to owners, relevant authorities, participants, and, at a more general level, the public.*
	APEX Clear's corporate governance arrangements conform to the requirements of the Companies Act 1967 and the conditions of the MAS exemption from the SF (Corporate Governance of Approved Exchanges, Approved Clearing Houses, Licensed Trade Repositories and Approved Holding Companies) Regulations 2024. The Board and Board Committees oversee the business and affairs of APEX Clear, and there are established terms of references for the Board and each Board Committee. These terms of references have been shared with the MAS and are available upon request by relevant authorities, and participants. The Board has further delegated its authority for the day-to-day management of APEX Clear. The CEO, together with the management team, is responsible for implementation of APEX Clear's strategies and the day-to-day operations within the limits and policies that the Board has approved. Such delegations are evidenced in the respective internal control policies endorsed by the Board.
2.3	*The roles and responsibilities of an FMI's board of directors (or equivalent) should be clearly specified, and there should be documented procedures for its functioning, including procedures to identify, address, and manage member conflicts of interest. The board should review both its overall performance and the performance of its individual board members regularly.*

	The roles and responsibilities of the Board and the Board Committees are clearly set out in its terms of reference. APEX Clear adheres to the requirements on Board composition as set out in the conditions of the MAS exemption from the SF (Corporate Governance of Approved Exchanges, Approved Clearing Houses, Licensed Trade Repositories and Approved Holding Companies) Regulations 2024, where it sets out criteria on independence and minimum number of independent directors in the Board and Board Committees. Through the Conflicts Committee, the Board plays an important role in the management of conflicts of interest. The Conflicts Committee is responsible for (a) reviewing the adequacy of the arrangements within APEX Clear for dealing with any perceived or actual conflict between its regulatory objectives and commercial interests; and (b) carrying out regular reviews of the adequacy of the plans, budget and resources in relation to the regulation and supervision of Clearing Members. Under its terms of reference, the Nominating Committee will make recommendations to the Board on how the Board's performance may be evaluated, propose objective performance criteria, and review the results of the Board's performance evaluation. The Board will then perform an evaluation based on the Nominating Committee's recommendations.
2.4	*The board should contain suitable members with the appropriate skills and incentives to fulfil its multiple roles. This typically requires the inclusion of non-executive board member(s).*
	The compositions of the Board and Board Committees follow their terms of reference, and meets the required number of independent and non-executive members. APEX Clear has 5 Board members, with 4 non-executive directors (including the Chairman). Out of these non-executive directors, 3 are independent directors (including the Chairman). The Board collectively possess skills and competencies in the areas of capital markets, finance, business acumen, management experience, industry knowledge and familiarity with regulatory requirements and risk management. In reviewing an appointment to the Board and any Board Committee, the Nominating Committee will consider various conditions including the candidate's independence in character and judgement, and whether the candidate is a fit and proper person and qualified to hold such office, by taking into consideration their track record, age, experience, capabilities and other relevant experience.
2.5	*The roles and responsibilities of management should be clearly specified. An FMI's management should have the appropriate experience, a mix of skills, and the integrity necessary to discharge their responsibilities for the operation and risk management of the FMI.*
	The management team, led by the CEO, is responsible for implementing the strategies and policies endorsed by the Board and day-to-day operational decisions regarding the management and affairs of APEX Group. The management team comprises members with a deep and broad range of local and international experiences across the exchange and clearing house space, operations and technology, risk management and regulation. The Nominating Committee approves the

	appointment of the key appointment holders, which requires MAS approval: the Chief Executive Officer, Chief Regulatory Officer, Chief Risk Officer and Chief Financial Officer.
2.6	*The board should establish a clear, documented risk-management framework that includes the FMI's risk-tolerance policy, assigns responsibilities and accountability for risk decisions, and addresses decision making in crises and emergencies. Governance arrangements should ensure that the risk-management and internal control functions have sufficient authority, independence, resources, and access to the board.*
	The Risk Management Committee approves APEX Group's risk management framework ("**APEX Group's Risk Management Framework**"), including the strategies for managing clearing and counterparty risks, technology risks, operational and outsourcing risks. The Risk Management Committee is supported by the Chief Risk Officer and the Risk Management Department, while the Audit Committee is supported by the Finance Department. Please refer to Principle 3 for a fuller discussion on APEX Group's Risk Management Framework. The Internal Audit function is an independent outsourced function which has direct and full access to the Board and the Audit Committee.
2.7	*The board should ensure that the FMI's design, rules, overall strategy, and major decisions reflect appropriately the legitimate interests of its direct and indirect participants and other relevant stakeholders. Major decisions should be clearly disclosed to relevant stakeholders and, where there is a broad market impact, the public.*
	In line with the SFA and the APEX rule review procedures, APEX Clear consults its key stakeholders (namely, Clearing Members and market participants) for any changes to its Clearing Rules, and provides at least 15 calendar days for consultation feedback. Feedback received are carefully analysed and responded to, and a summary of the comments received together with the reasons for accepting/rejecting the feedback will be shared with MAS. Once the Clearing Rules have been finalised after public consultation, APEX Clear notifies its Clearing Members via circulars of the effective date of the proposed changes. APEX Clear also engages its participants on a regular basis to discuss and seek feedback on the overall design of our clearing facilities, especially on the operational and technological aspects, to ensure that market needs are taken into consideration.
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.***	
3.1	*An FMI should have risk-management policies, procedures, and systems that enable it to identify, measure, monitor, and manage the range of risks that arise in or are borne by the FMI. Risk-management frameworks should be subject to periodic review.*
	The risks faced by APEX Clear in its clearing activities include credit, liquidity, legal, regulatory, technology, operational, reputation and other risks. These risks may also include default, liquidity and custody risks from its settlement and custodian banks. APEX Clear has in place the APEX Group's Risk Management Framework that includes various policies, procedures and systems to identify, measure, monitor and manage the key risks that arise

	from its exchange and clearing activities. The APEX Group's Risk Management Framework as well as the risk policies and procedures are reviewed at least on an annual basis. The APEX Group's Risk Management Framework incorporates a governance structure that provides Board and Management oversight of its key risks, assigns ownership, roles and responsibilities, as well as independent reporting lines. The Board-level Risk Management Committee exercises independent oversight on APEX Clear's risk strategies and risk appetite, and ensures that effective risk management framework, policies and resources are in place to achieve its business objectives. The Management-level Enterprise Risk Committee reviews and recommends for Risk Management Committee approval, the risk management policies relating to the clearing and counterparty risks, liquidity risks and other material risks that APEX Clear may face including its margining systems and stress testing frameworks, on a periodic basis. The Chief Risk Officer is responsible for overseeing the risk management function of the Clearing House, to ensure that the clearing activities are conducted in a safe and prudent manner. APEX Clear also has in place an organisation structure that supports a "3 lines of defence" model. Reporting to the Chief Risk Officer, the Risk Management Department performs the second line of defence through the setting of risk frameworks, risk policies, risk appetites and risk limits within which every business function must operate. This department is also responsible for the independent review and monitoring of APEX Clear's risk profile on a periodic basis and reporting any significant vulnerabilities and risk issues to Management and the Board.
3.2	*An FMI should provide incentives to participants and, where relevant, their customers to manage and contain the risks they pose to the FMI.*
	Clearing Members and their customers are incentivised to manage and contain the risks that they bring to APEX Clear via the following ways: (i) The membership admission requirements require Clearing Members to have, among other criteria, robust and adequate risk management processes in place and this will be monitored for continued compliance with the Clearing Rules of APEX Clear throughout the lifecycle of the membership. Non-compliance with these rules may subject the Clearing Member to disciplinary actions such as warnings, fines and even expulsion from membership. (ii) The Clearing Rules provide APEX Clear the right to impose additional risk management measures, such as closing out of open positions and imposing additional Special Margins, on Clearing Members that present additional risk concerns, including but not limited to position concentrations, excessive exposures or deteriorating credit worthiness. (iii) APEX Clear provides its Clearing Members with information and tools to manage and contain its risks. Information provided includes matched trades reports, real time data feeds, Standard Portfolio Analysis of Risk ("**SPAN**") files with the current margin and price parameters. Clearing Members also have the ability to set their own pre-trade risk controls and limits to manage and contain its risks.
3.3	*An FMI should regularly review the material risks it bears from and poses to other entities (such as other FMIs, settlement banks, liquidity providers, and service providers) as a result of interdependencies and develop appropriate risk-management tools to address these risks.*

	APEX Clear has a low risk appetite and its risk management processes include taking steps to identify and implement mitigating controls and take appropriate action to deal with risks that are not sufficiently controlled or mitigated. Counterparty risks arising from Clearing Members are covered under APEX Clear's risk policies where the risks of Clearing Member default are covered by its default management as well as contingency funding plans. Such contingency plans are exercised on an annual basis. Counterparty risks arising from Settlement Banks and custodian banks are covered by the Bank Counterparty Policy while counterparty risks arising from service providers is covered under the Outsourcing Policy where business continuity capabilities of the outsourced service providers are assessed. APEX Clear also has a comprehensive Business Continuity Management program covering various scenarios to address business and technology resiliencies. These frameworks, policies and programs are reviewed at least on an annual basis.
3.4	*An FMI should identify scenarios that may potentially prevent it from being able to provide its critical operations and services as a going concern and assess the effectiveness of a full range of options for recovery or orderly wind-down. An FMI should prepare appropriate plans for its recovery or orderly wind-down based on the results of that assessment. Where applicable, an FMI should also provide relevant authorities with the information needed for purposes of resolution planning.*
	APEX Clear has in place policies and contingency plans which are designed to ensure resilience of its business operations, failing which the Recovery and Resolution Plan will be activated. APEX Clear's Recovery and Resolution Plan take into consideration extreme scenarios which may potentially affect it from being able to provide its critical operations and services as a going concern. Scenarios will include systemic risks such as defaults of multiple Clearing Members, as well as general business risks of sustained low trading volumes. These plans are drafted in consultation with MAS and other relevant authorities and shared with potential liquidators if required.
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.***	
4.1	*An FMI should establish a robust framework to manage its credit exposures to its participants and the credit risks arising from its payment, clearing, and settlement processes. Credit exposure may arise from current exposures, potential future exposures, or both.*
	APEX Clear faces credit risks from its Clearing Members and Settlement Banks and has in place various risk policies to manage these risks. The policies cover:

	(i) The admission of financially strong institutions which are CMS license holders or banks licensed in Singapore that have good commercial and financial standing with sufficient financial resources and that meet the admission requirements listed in Chapter 3 of the Clearing Rules. These institutions must have robust and adequate risk management processes, compliance oversight, systems capability, human resources, and internal controls. This ensures that Clearing Members are able to meet their financial obligations to APEX Clear. For Settlement Banks, APEX Clear will only deal with banks with strong credit ratings and regulated by a recognized bank regulator. In addition, there are exposures and concentration limits to curb the exposures to a counterparty bank. This is discussed further in the write-up for Principle 16. (ii) The on-going compliance of Clearing Members with the Clearing Rules on capital adequacy, risk management practices and reporting requirements. (iii) The active management of APEX Clear's credit risks through daily monitoring of clearing risk exposures and risk concentrations, and taking additional risk mitigating measures where necessary. Limits on exposures and concentrations are set up and monitored and these may include Position Limits and Exposure Limits at the product, Individual Participant and Clearing Member levels. (iv) APEX Clear manages credit risks from Clearing Members by requiring them to post Initial Margins (to address potential price movements), Variation Margins (to address actual price movements during the day, also known as Settlement Variation in other Derivatives Clearing Houses), Delivery Margins (to address the additional risks before or during the delivery period) and Special Margins (to address the position concentrations, credit deterioration or liquidity concerns, delivery default, excessive potential stress losses or other concerns to the Clearing House arising from a Customer or a Clearing Member when necessary). (v) APEX Clear maintains a conservative and scalable guaranty fund ("**Guaranty Fund**") to cover its credit exposure to Clearing Members in conditions of extreme market stress. The Guaranty Fund comprises contributions from APEX Clear and Clearing Members and will be used to meet losses in the event of Clearing Member default.
4.2	*An FMI should identify sources of credit risk, routinely measure and monitor credit exposures, and use appropriate risk-management tools to control these risks.*
	The sources of credit risks from its Clearing Counterparties (Clearing Members, Settlement Banks and other Banks) are: (i) <u>Credit Risks from Clearing Members</u> APEX Clear faces current and potential future exposure to its Clearing Members, arising from price movements, in respect of the open positions held by the Clearing Members for themselves or for their Customers. All the credit exposures are measured as the sum of current exposure and potential future exposure (for which initial margins are collected). • Current exposures are marked-to-market while potential future exposures are derived from the historical price movements of the trades, open positions and the margin models. See write-up in Principle 6 for further details. • In addition, APEX Clear also measures potential credit exposures under stressed circumstances by conducting stress testing under extreme but plausible historical and hypothetical scenarios. This is discussed in greater detail in Key Consideration 4.5. APEX Clear's credit exposures are controlled using the following tools:

	• Scheduled and ad-hoc, if necessary, intra-day and end of day valuation and margin cycles to prevent the build-up of losses and exposures. Clearing Members are required to meet the margin calls on their Variation Margins, Initial Margins, Delivery Margins and Special Margins in a timely manner as prescribed by APEX Clear. See write-up in Principle 6 for further details. • APEX Clear monitors on a daily basis the Clearing Members' exposures and position concentration and uses additional risk measures such as Special Margins to manage the concentration exposures. • APEX Clear performs daily stress-tests of Clearing Members' positions against their margin collaterals and other financial contributions to assess the adequacy of their contribution towards the Guaranty Fund. Clearing Members will be asked to increase their contributions to the Guaranty Fund that is commensurate with the risks that they bring to the Clearing House if potential stress losses exceed the sum of their Margin Collateral and Guaranty Fund contributions. (ii) <u>Credit Risks from Settlement Banks and other Banks</u> Credit risks can arise from: • Settlement monies of APEX Clear and Clearing Members; • Deposits placed by APEX Clear with the deposit-taking banks comprising Clearing Members' margin monies and Guaranty Fund contributions as well as APEX Clear's own cash; and • Non-cash collateral placed with custodian banks. APEX Clear's credit exposures to the above counterparty banks are controlled through setting of exposure and concentration limits based on various criteria which include the bank's long term external rating, shareholders' funds and capital ratios.
4.3	*A payment system or SSS should cover its current and, where they exist, potential future exposures to each participant fully with a high degree of confidence using collateral and other equivalent financial resources (see Principle 5 on collateral). In the case of a DNS payment system or DNS SSS in which there is no settlement guarantee but where its participants face credit exposures arising from its payment, clearing, and settlement processes, such an FMI should maintain, at a minimum, sufficient resources to cover the exposures of the two participants and their affiliates that would create the largest aggregate credit exposure in the system.*
	Not Applicable.
4.4	*A CCP should cover its current and potential future exposures to each participant fully with a high degree of confidence using margin and other prefunded financial resources (see Principle 5 on collateral and Principle 6 on margin). In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should maintain additional financial resources to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. All other CCPs should maintain additional financial resources sufficient to cover a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would potentially cause the largest aggregate credit exposure for the CCP in extreme but plausible market conditions. In all cases, a CCP should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount of total financial resources it maintains.*

APEX Clear covers its current and potential future exposure to each participant fully with margins at a high degree of confidence.

(i) Margins (more details can be found in the write-up in Principle 6):

- The Initial Margin is to protect APEX Clear against the counterparty credit risk from a Clearing Member based on normal market conditions and it is set at single-tailed confidence level of at least 99%.
- The Delivery Margin is to protect APEX Clear against the risk of a Delivery Default for the physically deliverable futures contracts and it is set to cover the risks due to:
  - delivery effect (where there is increasing price volatility before and during the delivery period);
  - seasoning effect (some futures contract months have higher price volatility than other months);
  - length of delivery period; and
  - other concerns relating to the delivery process.
- SPAN Margin Methodology for Initial Margin and Delivery Margin: APEX Clear uses the SPAN margin system to determine the Initial Margin and Delivery Margin for each Position Account (also known as a marginable portfolio).
- Variation Margin is collected to prevent accumulation of unrealized losses / exposures between Clearing Members and APEX Clear, and to ensure that collateral remains sufficient in view of future price movements of the open positions.
- Special Margins may be imposed to mitigate other risk concerns such as position concentration, liquidity, credit deterioration, large exposures.
- Margins are collected in Cash only and readily accessible when required.

(ii) Guaranty Fund:

APEX Clear Guaranty Fund includes prefunded financial resources in the form of cash and cash equivalents.

- APEX Clear Guaranty Fund size is measured against the potential losses arising from simultaneous defaults of the Largest Loss Group (Clearing Member group which has the largest group potential losses) as well as the 2 financially weakest Clearing Members. APEX Clear conducts daily stress testing of its Clearing Members' outstanding positions and assesses the sufficiency of the Guaranty Fund.
- The Guaranty Fund comprises of APEX Clear's minimum contribution of US$2 million, and Clearing Member's minimum contribution of US$500,000 each.
- Guaranty Fund is scalable as risk increases in the clearing systems.
- APEX's contribution forms a significant portion (>25%) of the Guaranty Fund (skin-in-the-game) and at least 15% of it is in the first tier of resources. While a Clearing Member's minimum contribution is US$500,000, the Clearing Member may be required to top up its Guaranty Fund contribution when its risk exposures increase and its potential stress loss exceeds the sum of its own Margin Collateral and its Guaranty Fund contribution.
- In the case of potential losses greater than the Guaranty Fund size, APEX Clear will increase its own contribution to the Guaranty Fund and / or request for additional contributions from Clearing Members.

(iii) Risk profiling and systemic importance in multiple jurisdictions:

APEX Clear is a Clearing House with its activities primarily conducted in Singapore. APEX Clear clears products such as commodities, precious metals, foreign exchange and

	cryptocurrencies futures. Therefore, APEX Clear is not systemically important in multiple jurisdictions. (iv) <u>Supporting Rationale and Appropriate Governance Arrangements Relating to Total Financial Resources:</u> APEX's Clearing Risk Management Framework which outlines all the risk measures and controls including margining and stress test on the adequacy of Guaranty Fund are endorsed by its Enterprise Risk Committee and approved by its Board-level Risk Management Committee. The framework is reviewed annually and updated when necessary. APEX Clear is required to comply with the capital requirements imposed by MAS which includes APEX Clear's Guaranty Fund contributions. As an Approved Clearing House, APEX Clear is required to observe the requirements of Regulation 25 of the SF (Clearing Facilities) Regulations 2013 regarding the investment of margin collateral. Collateral belonging to customers of Clearing Members are held in statutory trust accounts with settlement or custodian banks and accorded protection should APEX Clear become insolvent. Provisions relating to margin and collateral requirements are published in the Clearing Rules, which are available to the public on the APEX website.
4.5	*A CCP should determine the amount and regularly test the sufficiency of its total financial resources available in the event of a default or multiple defaults in extreme but plausible market conditions through rigorous stress testing. A CCP should have clear procedures to report the results of its stress tests to appropriate decision makers at the CCP and to use these results to evaluate the adequacy of and adjust its total financial resources. Stress tests should be performed daily using standard and predetermined parameters and assumptions. On at least a monthly basis, a CCP should perform a comprehensive and thorough analysis of stress testing scenarios, models, and underlying parameters and assumptions used to ensure they are appropriate for determining the CCP's required level of default protection in light of current and evolving market conditions. A CCP should perform this analysis of stress testing more frequently when the products cleared or markets served display high volatility, become less liquid, or when the size or concentration of positions held by a CCP's participants increases significantly. A full validation of a CCP's risk-management model should be performed at least annually.*
	<u>Stress Test</u> APEX Clear conducts, on a daily basis, stress tests to determine whether the Guaranty Fund is adequate to meet potential stress losses. In compliance with regulatory requirements, APEX Clear's Guaranty Fund is calculated to be sufficient to cover the potential financial losses that may arise from a simultaneous default of the Largest Loss Clearing Member Group and 2 Financially Weakest Clearing Members. APEX Clear's stress testing framework contains historical volatilities and hypothetical scenarios, which are extreme but plausible, to ensure that APEX Clear has sufficient financial resources in its Guaranty Fund under stressed market conditions. The stress test results and the adequacy of APEX's Guaranty Fund resources are reported to Management and the Risk Management Committee regularly. <u>Review and validation</u> APEX Clear performs a review of its stress testing scenarios, and underlying parameters and assumptions on a monthly basis, with approval from the Chief Risk Officer. In addition, APEX Clear will perform periodic validations of risk models. These validation are performed by an

	independent party, separate from those who design, implement and operate the risk models, subject to approval by the Board-level Risk Management Committee.
4.6	*In conducting stress testing, a CCP should consider the effect of a wide range of relevant stress scenarios in terms of both defaulters' positions and possible price changes in liquidation periods. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions.*
	The stress test scenarios employed by APEX Clear in its assessment of the sufficiency of Guaranty Fund size are relevant, extreme and plausible. These scenarios are conservative to include not only relevant peak historical volatilities but also hypothetical scenarios that cover for risks which have not been exhibited in history but could emerge in future. APEX Clear's historical scenarios draw on major systemic market events, including the COVID-19 Pandemic (2019/2020), negative oil prices (2020), Global Financial Crisis (2007/2008), the Lehman Brothers collapse (2008), the U.S. downgrade (2011), the Euro debt crisis (2011). APEX Clear also includes hypothetical stress tests to cater to the possibilities that are not covered in historical scenarios. As the market evolves, new risk factors may gain prominence and lead to increased volatility.
4.7	*An FMI should establish explicit rules and procedures that address fully any credit losses it may face as a result of any individual or combined default among its participants with respect to any of their obligations to the FMI. These rules and procedures should address how potentially uncovered credit losses would be allocated, including the repayment of any funds an FMI may borrow from liquidity providers. These rules and procedures should also indicate the FMI's process to replenish any financial resources that the FMI may employ during a stress event, so that the FMI can continue to operate in a safe and sound manner.*
	<u>Loss Allocation for a Default</u> The Clearing Rules defines the order of utilisation of APEX Clear's financial resources (see Clearing Rule 804). Any losses not covered by defaulting Clearing Member's margins will be allocated to the Guaranty Fund. See Principle 13, Key Consideration 1 for the order in which the Guaranty Fund will be applied. <u>Replenishment of Financial Resources</u> If the Guaranty Fund is used, it would be replenished before such time specified by the Clearing House.
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.***	
5.1	*An FMI should generally limit the assets it (routinely) accepts as collateral to those with low credit, liquidity, and market risks.*

	At present, APEX Clear only accepts cash as collateral from its Clearing Members. Acceptable cash collaterals are freely-traded currencies, presently limited to Singapore Dollar (SGD), U.S. Dollar (USD), Japanese Yen (JPY) and offshore Chinese Renminbi (CNH). As the business expands, APEX Clear may decide to accept non-cash collateral in the future, subject to satisfying the necessary regulatory processes in relation to the haircut methodologies before implementation.
5.2	*An FMI should establish prudent valuation practices and develop haircuts that are regularly tested and take into account stressed market conditions.*
	At present, APEX Clear only has cross-currency haircut as it only accepts cash as collateral. In the future when non-cash collaterals are accepted, APEX Clear will perform daily revaluation of such collateral using reliable market data sources. For margin collateral, a cross-currency haircut is applied when collateral in one currency is used to cover exposures denominated in another currency. Cross-currency haircuts are determined through a volatility-based approach. The haircut for each currency pair will be based on the 99.95th percentile price decline over a one-day holding period, evaluated on a historical sampling period of a minimum of 10 years, which includes stress periods. As the business expands, APEX Clear may accept other non-cash collateral and would apply prudent haircuts on such collateral, subject to satisfying the necessary regulatory processes in relation to the haircut methodologies before implementation. Haircut rates are back tested daily and reviewed on a quarterly basis or more frequently when adverse news surface. Haircut rates will be adjusted if the current rates are insufficient to cover the daily price movements. APEX Clear publishes the list of acceptable collateral and the applicable haircuts and limits on its website.
5.3	*In order to reduce the need for procyclical adjustments, an FMI should establish stable and conservative haircuts that are calibrated to include periods of stressed market conditions, to the extent practicable and prudent.*
	APEX Clear's haircut rates are designed to be conservative, prudent and stable. They are to cover extreme price movements observed during periods of stressed market conditions, thus minimizing the need for procyclical adjustments.
5.4	*An FMI should avoid concentrated holdings of certain assets where this would significantly impair the ability to liquidate such assets quickly without significant adverse price effects.*
	APEX Clear only accepts cash as the collateral at the current stage. In the future, when APEX decides to accept other collaterals, it would impose absolute and relative limits to prevent undue concentration in any particular asset class and to avoid excess concentration in any specific security or end-creditor.
5.5	*An FMI that accepts cross-border collateral should mitigate the risks associated with its use and ensure that the collateral can be used in a timely manner.*

	APEX Clear presently only accepts cash denominated in SGD, USD, JPY and CNH as collateral, which are deposited into bank accounts in Singapore. In the future, when APEX Clear decides to accept cross-border collateral, legal due diligence would be conducted to ensure proper recognition of APEX Clear's rights and claims to the collateral posted and to allow cross-border collaterals to be used in a timely manner. APEX Clear would also conduct legal due diligence to ensure that there are no impediments to perfecting APEX's legal interests in the cross-border collateral in that relevant foreign jurisdiction and to the enforceability of APEX Clear's collateral arrangements.
5.6	*An FMI should use a collateral management system that is well-designed and operationally flexible.*
	APEX Clear provides Clearing Members with access to its Clearing System for managing collateral placed with APEX Clear. APEX Clear uses its Clearing System to monitor and manage collateral haircut rates, acceptance criteria, collateral requirement calculations and mark-to-market activities. APEX Clear's Clearing System supports regular reporting and the submission of electronic transaction requests. All Clearing Members have access to APEX Clear's Clearing System to submit their deposit and withdrawal requests for collateral. All requests submitted by Clearing Members before the processing cut-off time are for value the same business day unless they are for a forward value date. APEX Clear's Clearing System keeps records of collateral posted by each Clearing Member. During clearing cycles, these records are interfaced to the margin call system to determine the sufficiency of collateral. If a margin call is issued, collateral records in APEX Clear's Clearing System will be updated. In addition to the functionalities listed above, the monitoring of concentration limits in APEX Clear's Clearing System is automated. Revisions to haircuts and/or concentration limits can be easily implemented. As part of the daily risk control procedure, APEX Clear conducts back-testing to verify that the risk model is performing properly.
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	*A CCP should have a margin system that establishes margin levels commensurate with the risks and particular attributes of each product, portfolio, and market it serves.*
	APEX Clear imposes 4 types of Margins: Variation Margin (also known as Settlement Variation), Initial Margin, Delivery Margin and Special Margin.

	APEX Clear computes the Initial Margin and Delivery Margin for each marginable portfolio using the SPAN[3] margin system developed by Chicago Mercantile Exchange. APEX Clear has developed models to determine the various SPAN margin parameters and these margin parameters are reviewed on a monthly or ad-hoc basis. APEX Clear performs either net or gross margining depending on whether the accounts are Individual or Omnibus accounts. APEX Clear segregates the positions as well as the margins of each Clearing Member into two Clearing Member Units – Proprietary and Customer. The total margin requirement for each Clearing Member Unit is the sum of (i) the Initial Margins and Delivery Margins of every Position Account in that Clearing Member Unit (computed by SPAN), (ii) the Variation Margins, resulting from the mark-to-market losses; and (iii) Special Margins that may be imposed due to additional risk concerns including price limit, position concentration, large exposure, delivery, liquidity and credit concerns of a Clearing Member or a Customer. APEX Clear performs the mark-to-market on every trade against the fixing price or Daily Settlement Price ("**DSP**") during each Clearing Cycle. Presently, APEX Clear performs 2 routine Clearing Cycles per day, one for the end-of-day and one intraday. In times of high market volatility, APEX Clear can also perform ad-hoc mark-to-markets to determine the shortfalls in margins. Margin Calls will be issued to Clearing Members for their shortfalls when their Collaterals are not enough to cover their required Margins. The intraday margin cycle serves to reduce any accumulation of losses built up throughout the trading sessions.
6.2	*A CCP should have a reliable source of timely price data for its margin system. A CCP should also have procedures and sound valuation models for addressing circumstances in which pricing data are not readily available or reliable.*
	APEX Clear sets the DSP for the mark-to-market process and margin computation, during the end-of-day Clearing Cycle, in accordance to the DSP setting methodologies below: (i) In relation to a futures contract that is considered liquid: • Closing Price established by a Pre-Closing Routine at the end of each Trading Day; • The Volume-Weighted Average of the Traded Prices within a time window before the end of the Trading Day; • The Average of the high and low Traded Prices within a time window before the end of the Trading Day; • The Average of best bid and best ask of order book at the end of the Trading Day. (ii) In relation to a futures contract that is considered not liquid: • Calendar spread, where the DSP of such futures contract will be derived from another futures contract that is considered liquid, by adding the previous Trading Day's price

[3] Chicago Mercantile Exchange developed SPAN margin methodology, which evaluates overall portfolio risk by calculating the worst possible loss that a portfolio of derivative and physical instruments might reasonably incur over a specified time period (typically one trading day). This is done by computing the gains and losses the portfolio would incur under different market conditions.
At the core of the methodology is the SPAN risk array, a set of numeric values that indicate how a futures contract will gain or lose value under various conditions. Each condition is called a risk scenario. The numeric value for each risk scenario represents the gain or loss that the futures contract will experience for a particular combination of price (or underlying price) change, volatility change, and decrease in time to expiration.

	differential (i.e. calendar spread) between such futures contract and the other futures contract to the current Trading Day's DSP of the other futures contract; • The last-traded price of such futures contract; • The theoretical price using the price of such futures contract's Underlying and such other parameters as the Clearing House may deem appropriate; • A price derived from such reference market as may be determined by the Clearing House; • A price derived from the prices contributed by the Clearing House's appointed price panel, which shall comprise persons who are independent from each other and are familiar with the market conditions for the Underlying of such futures contract; • A price derived from the prices on relevant markets as collected and published by independent market data vendors; or • The previous Trading Day's DSP for such futures contract. (iii) In relation to a perpetual futures contract: • The daily fixing price of the Underlying Index; • A spot price derived from the real-time prices of the Underlying Index; • A price derived from the prices on relevant markets as collected and published by independent market data vendors; • A price derived from the Last Traded Price; or The theoretical price using the price of such futures contract's Underlying and such other parameters as the Clearing House may deem appropriate; The above methodologies mainly utilise the traded prices in APEX to determine the DSP, while some of the steps are used to ensure that the DSP reflects the current and relevant market conditions even though the futures contracts may not be actively traded.
6.3	*A CCP should adopt initial margin models and parameters that are risk-based and generate margin requirements sufficient to cover its potential future exposure to participants in the interval between the last margin collection and the close out of positions following a participant default. Initial margin should meet an established single-tailed confidence level of at least 99 percent with respect to the estimated distribution of future exposure. For a CCP that calculates margin at the portfolio level, this requirement applies to each portfolio's distribution of future exposure. For a CCP that calculates margin at more-granular levels, such as at the subportfolio level or by product, the requirement must be met for the corresponding distributions of future exposure. The model should (a) use a conservative estimate of the time horizons for the effective hedging or close out of the particular types of products cleared by the CCP (including in stressed market conditions), (b) have an appropriate method for measuring credit exposure that accounts for relevant product risk factors and portfolio effects across products, and (c) to the extent practicable and prudent, limit the need for destabilising, procyclical changes.*
	APEX Clear sets all the margin parameters at the product level using a historical volatility based margin model. The model would be set to cover the price movements at one-tailed confidence level of at least 99%. The look-back periods to compute the historical volatility could be 3, 6, or 12 months or 5 years. The liquidation period (close out period) for a futures contract is set based on an estimation of the number of days the positions can be liquidated during stressed market conditions. APEX Clear calculates the initial margins and delivery margins at the portfolio (position account) level by using SPAN margin methodology, which makes use of various margin

	parameters, price scanning, volatility scanning, intra-commodity spread charges and intra-commodity spread credits. These parameters would be also based on historical volatility based margin models. In addition, APEX Clear constantly monitors the markets to identify any significant market events that might affect the market volatility.
6.4	*A CCP should mark participant positions to market and collect variation margin at least daily to limit the build-up of current exposures. A CCP should have the authority and operational capacity to make intraday margin calls and payments, both scheduled and unscheduled, to participants.*
	APEX Clear determines the DSP for all the futures contracts cleared by APEX Clear. The DSP methodology is mainly based on the market prices and under exceptional circumstances, APEX Clear may use other markets' prices or market participants' quotations as reference to reflect the fair market values. All the trades and open positions are marked to market two times daily against the market prices (for the intraday cycles) or the DSP (for the end-of-day cycle) to prevent the build-up of price risks. APEX Clear collects the variation margins (net losses) in the customer or proprietary Clearing Member Unit of each Clearing Member. Under Clearing Rule 406.4 Variation Margin, Clearing Members have to meet the margin calls as instructed by APEX Clear. In the Clearing Procedures, APEX Clear specifies that Clearing Members should meet the margin calls either on the same day or the next business day (for the end-of-day cycle or the cycle after night trading). APEX Clear may also make ad-hoc margin calls when the market is volatile.
6.5	*In calculating margin requirements, a CCP may allow offsets or reductions in required margin across products that it clears or between products that it and another CCP clear, if the risk of one product is significantly and reliably correlated with the risk of the other product. Where two or more CCPs are authorised to offer cross-margining, they must have appropriate safeguards and harmonised overall risk-management systems.*
	For an Individual account (position account) belonging a single beneficial owner, APEX Clear allows the margin offset between the different futures contracts of the same product or between the futures contracts of different products that are significantly and reliably correlated. APEX Clear practices "gross margining" for omnibus accounts (position accounts), i.e. within the customer or house member unit of a Clearing Member, there is no margin offset between the positions belonging to two different accounts (position accounts). APEX Clear does not offer cross-margining arrangements with other central counterparties.
6.6	*A CCP should analyse and monitor its model performance and overall margin coverage by conducting rigorous daily backtesting and at least monthly, and more-frequent where appropriate, sensitivity analysis. A CCP should regularly conduct an assessment of the theoretical and empirical properties of its margin model for all products it clears. In conducting sensitivity analysis of the model's coverage, a CCP should take into account a wide range of parameters and assumptions that reflect possible market conditions, including the most-volatile periods that have been experienced by the markets it serves and extreme changes in the correlations between prices.*

	APEX Clear conducts daily back-testing against realised market movement for a product as well as a given portfolio to ensure that its margining methodology is robust. APEX Clear also reviews margins regularly as well as perform ad-hoc reviews during stressed market conditions. APEX Clear also tests the price correlations between products under stressed periods. APEX Clear performs sensitivity analysis monthly for margin setting on products in terms of margin requirements. Through the analysis, APEX Clear is able to identify the impact to margins under stressed market conditions.
6.7	*A CCP should regularly review and validate its margin system.*
	APEX Clear reviews its margining methodology at least annually or when there are significant market developments or changes in trading patterns. The review: (i) Includes daily back-testing the actual profit/loss outcomes against the theoretical level at the product level, as well as actual portfolio profit & loss against portfolio margin requirements; (ii) Examines the theoretical properties of the margin parameters; (iii) Assesses both historical and foreseeable future conditions, which also includes the recent stress periods after the previous review; and (iv) Examines the adequacy of the underlying model assumptions with respect to the composition of Clearing Members' portfolios, the risk characteristics of the existing and new products, and the changes in market structure. APEX Clear will enhance or change the methodology if necessary.
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.***	
7.1	*An FMI should have a robust framework to manage its liquidity risks from its participants, settlement banks, nostro agents, custodian banks, liquidity providers, and other entities.*
	The APEX Group's Risk Management Framework includes a Liquidity Risk Management Policy for the management of liquidity risks arising from its participants, Settlement Banks, custodian banks, liquidity providers, and other entities. As APEX Clear keeps its margin monies in cash or cash equivalents, operational liquidity risks are insignificant. The main liquidity risks affecting APEX Clear are thus default liquidity risks arising from default of its Clearing Member or settlement / custodian banks. APEX Clear collects margin collateral and Guaranty Fund contributions from its Clearing Members, and has also implemented bank exposure as well as concentration limits to mitigate these default liquidity risks. In addition, APEX Clear is also liaising with various global / local banks for committed bank credit lines in line with its growth in business activities to increase its qualifying liquid resources. The Liquidity Risk Management Policy is reviewed annually.

7.2	*An FMI should have effective operational and analytical tools to identify, measure, and monitor its settlement and funding flows on an ongoing and timely basis, including its use of intraday liquidity.*
	APEX Clear performs its routine clearing cycle 2 times a day, once intraday and once at end of day, where positions will be marked to market and margin calls may be issued to its Clearing Members to top up any shortfall in margin requirements. If necessary, APEX Clear can also perform ad-hoc valuations and margin calls during periods of high volatilities. This ensures that margins are collected promptly and losses are not accumulated. APEX Clear also performs daily credit and liquidity stress tests to check that the Guaranty Fund as well as its qualifying liquid resources remains sufficient to cover the potential losses that may arise from identified contingency events, a defaulting Clearing Member's open positions or default of a non-participant. APEX Clear's Clearing System provides data on the amount of excess margins that Clearing Members have with APEX Clear that may potentially be withdrawn the next day. APEX Clear ensures that there are sufficient liquid assets on hand to meet this potential withdrawal on a daily basis. APEX Clear has arrangements with its Settlement Banks for them to provide confirmations to APEX Clear within pre-agreed timelines. Confirmations provide assurance of any fund flows in APEX Clear's account in real time as well as reconciliation of balances between APEX Clear's bank accounts and system records. APEX Clear will monitor the settlement and funding flows on an ongoing and timely basis.
7.3	*A payment system or SSS, including one employing a DNS mechanism, should maintain sufficient liquid resources in all relevant currencies to effect same-day settlement, and where appropriate intraday or multiday settlement, of payment obligations with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation in extreme but plausible market conditions.*
	Not Applicable.
7.4	*A CCP should maintain sufficient liquid resources in all relevant currencies to settle securities-related payments, make required variation margin payments, and meet other payment obligations on time with a high degree of confidence under a wide range of potential stress scenarios that should include, but not be limited to, the default of the participant and its affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions. In addition, a CCP that is involved in activities with a more-complex risk profile or that is systemically important in multiple jurisdictions should consider maintaining additional liquidity resources sufficient to cover a wider range of potential stress scenarios that should include, but not be limited to, the default of the two participants and their affiliates that would generate the largest aggregate payment obligation to the CCP in extreme but plausible market conditions.*
	APEX Clear monitors and manages its liquidity requirements and resources through its Liquidity Risk Management Policy. APEX Clear's stress test scenario is targeted towards covering the simultaneous default of its largest loss group as well as its 2 financially weakest Clearing Members. APEX Clear

	maintains its margin monies in cash and cash equivalents and also seek to increase bank credit lines as contingency funding sources. Hence, it is able to meet payment obligations on time with a high degree of confidence, including under a wide range of potential stress scenarios.
7.5	*For the purpose of meeting its minimum liquid resource requirement, an FMI's qualifying liquid resources in each currency include cash at the central bank of issue and at creditworthy commercial banks, committed lines of credit, committed foreign exchange swaps, and committed repos, as well as highly marketable collateral held in custody and investments that are readily available and convertible into cash with prearranged and highly reliable funding arrangements, even in extreme but plausible market conditions. If an FMI has access to routine credit at the central bank of issue, the FMI may count such access as part of the minimum requirement to the extent it has collateral that is eligible for pledging to (or for conducting other appropriate forms of transactions with) the relevant central bank. All such resources should be available when needed.*
	APEX Clear's qualifying liquid resources can include margin monies, Guaranty Fund contributions as well as committed bank credit lines. Currently, APEX Clear maintains the margin monies and Guaranty Fund contributions in cash and cash equivalents. APEX Clear also monitors the daily excess margins levels to ensure that it has sufficient funds to meet unexpected liquidity requirements. Direct debit mandates between Clearing Members, Settlement Banks and APEX Clear are in place to ensure the smooth debiting of funds directly from Clearing Members' accounts to meet the margin requirements.
7.6	*An FMI may supplement its qualifying liquid resources with other forms of liquid resources. If the FMI does so, then these liquid resources should be in the form of assets that are likely to be saleable or acceptable as collateral for lines of credit, swaps, or repos on an ad hoc basis following a default, even if this cannot be reliably prearranged or guaranteed in extreme market conditions. Even if an FMI does not have access to routine central bank credit, it should still take account of what collateral is typically accepted by the relevant central bank, as such assets may be more likely to be liquid in stressed circumstances. An FMI should not assume the availability of emergency central bank credit as a part of its liquidity plan.*
	APEX Clear invests its capital funds in high quality liquid assets such as short tenure bank deposits. When the need arises, APEX Clear will be able to quickly liquidate deposits, if it has invested in any, to raise additional liquid resources.
7.7	*An FMI should obtain a high degree of confidence, through rigorous due diligence, that each provider of its minimum required qualifying liquid resources, whether a participant of the FMI or an external party, has sufficient information to understand and to manage its associated liquidity risks, and that it has the capacity to perform as required under its commitment. Where relevant to assessing a liquidity provider's performance reliability with respect to a particular currency, a liquidity provider's potential access to credit from the central bank of issue may be taken into account. An FMI should regularly test its procedures for accessing its liquid resources at a liquidity provider.*
	APEX Clear maintains its margin monies and Guaranty Fund contributions in cash or cash equivalents. APEX Clear has in place a Bank Counterparty Policy that specifies the stringent admission criteria for counterparty banks. This policy also specifies limits for exposure and concentration for these counterparty banks. APEX Clear has established banking

	relationships with several local and global banks, to ensure access to major foreign currencies. APEX Clear will test its loan drawdown availabilities with its liquidity providers periodically.
7.8	*An FMI with access to central bank accounts, payment services, or securities services should use these services, where practical, to enhance its management of liquidity risk.*
	Not applicable as APEX Clear has no access to central bank accounts, payment services or securities services.
7.9	*An FMI should determine the amount and regularly test the sufficiency of its liquid resources through rigorous stress testing. An FMI should have clear procedures to report the results of its stress tests to appropriate decision makers at the FMI and to use these results to evaluate the adequacy of and adjust its liquidity risk-management framework. In conducting stress testing, an FMI should consider a wide range of relevant scenarios. Scenarios should include relevant peak historic price volatilities, shifts in other market factors such as price determinants and yield curves, multiple defaults over various time horizons, simultaneous pressures in funding and asset markets, and a spectrum of forward-looking stress scenarios in a variety of extreme but plausible market conditions. Scenarios should also take into account the design and operation of the FMI, include all entities that might pose material liquidity risks to the FMI (such as settlement banks, nostro agents, custodian banks, liquidity providers, and linked FMIs), and where appropriate, cover a multiday period. In all cases, an FMI should document its supporting rationale for, and should have appropriate governance arrangements relating to, the amount and form of total liquid resources it maintains.*
	APEX Clear performs daily credit and liquidity stress testing to estimate the amount of liquidity required to cover a Clearing Member and / or a non-participant default. Stress test scenarios are relevant, extreme and plausible, and consider the historical and hypothetical possibilities. Stress test results are reported to the Risk Management Committee on a quarterly basis. In the event where stress test results show that the Guaranty Fund is insufficient, the shortfall will be covered through calling for additional contributions from the Clearing Members. Other than a Clearing Member default, the other significant default liquidity risk is from Settlement / Custodian Bank default and this is managed by APEX Clear's Bank Counterparty Policy.
7.10	*An FMI should establish explicit rules and procedures that enable the FMI to effect same-day and, where appropriate, intraday and multiday settlement of payment obligations on time following any individual or combined default among its participants. These rules and procedures should address unforeseen and potentially uncovered liquidity shortfalls and should aim to avoid unwinding, revoking, or delaying the same-day settlement of payment obligations. These rules and procedures should also indicate the FMI's process to replenish any liquidity resources it may employ during a stress event, so that it can continue to operate in a safe and sound manner.*
	APEX Clear performs 2 routine clearing cycles daily, one intraday and one end of day. As part of its default management plan, APEX Clear is able to issue intraday and multiday margin calls to its participants. APEX Clear may also suspend clearing access, restrict further accumulation of positions, advise Clearing Members to wind down positions as well as suspend any excess margin withdrawals. The relatively simple product scope enables positions to be closed out quickly. In the event of a default, the Guaranty Fund will be replenished through contributions from both APEX Clear and the Clearing Members to the appropriate levels.

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	*An FMI's rules and procedures should clearly define the point at which settlement is final.*
	The points of settlement finality for daily clearing and physical delivery are stated in the Clearing Rules and Contract Specifications: For daily clearing, the settlement is final when relevant payment or receipt of funds, which are related to daily mark-to-market and margin call thereof, deposit or withdrawal of cash collateral, have been completed. The settlement finality of the payment or receipt of funds is when the Clearing House receives the confirmation message from the relevant Settlement Bank. The collection and payment processes are covered in the respective contractual agreements with each Settlement Bank to ensure they conform to the Clearing Rules. For physical delivery, settlement is final when the legal title to the commodities has been transferred or the buyer acknowledges the receipt of all the documents stipulated in the relevant Contract Specifications and the value of the futures contract has been paid.
8.2	*An FMI should complete final settlement no later than the end of the value date, and preferably intraday or in real time, to reduce settlement risk. An LVPS or SSS should consider adopting RTGS or multiple-batch processing during the settlement day.*
	APEX Clear's operations, clearing and settlement processes are designed to provide for the final settlement of cash collateral no later than the end of the value date. For payment or receipt of funds involving Settlement Banks, APEX Clear requires the Settlement Banks to carry out APEX Clear's cash transaction instructions no later than the stipulated timings on the stated value date.
8.3	*An FMI should clearly define the point after which unsettled payments, transfer instructions, or other obligations may not be revoked by a participant.*
	Sections 8 and 9 of the Clearing Procedures clearly provide for the point after which unsettled payments, transfer instructions or other obligations may not be revoked by the Clearing Member.
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 risk arising from the use of commercial bank money.***	
9.1	*An FMI should conduct its money settlements in central bank money, where practical and available, to avoid credit and liquidity risks.*
	APEX Clear uses the Clearing Members' money deposited with commercial banks for money settlement and the currencies used are SGD, USD, JYP and CNH.

	As provided for in the Clearing Rules, for money settlement with APEX Clear, each Clearing Member is required to appoint a commercial bank which is approved by APEX Clear as a Settlement Bank. Each Clearing Member and APEX Clear shall maintain accounts with the appointed Settlement Bank and all money settlements are conducted intra-bank between the each Clearing Member's account and APEX Clear's account.
9.2	*If central bank money is not used, an FMI should conduct its money settlements using a settlement asset with little or no credit or liquidity risk.*
	To minimize credit and liquidity risks, commercial banks are only approved by APEX Clear as a Settlement Bank if they meet the admission criteria, as described in Key Consideration 9.3 below, set out by APEX Clear in the APEX Bank Counterparty Policy. The currencies that APEX clear accepts for margin are easily available and exchangeable, broadly acceptable and useable. There is very limited credit or liquidity risk for settlement of these currencies.
9.3	*If an FMI settles in commercial bank money, it should monitor, manage, and limit its credit and liquidity risks arising from the commercial settlement banks. In particular, an FMI should establish and monitor adherence to strict criteria for its settlement banks that take account of, among other things, their regulation and supervision, creditworthiness, capitalisation, access to liquidity, and operational reliability. An FMI should also monitor and manage the concentration of credit and liquidity exposures to its commercial settlement banks.*
	APEX Clear has in place a Bank Counterparty Policy to manage the admission criteria for Settlement Banks. Under APEX Clear's strict criteria, the bank must have, among others: • Long term external rating of at least investment grade by Moody's, Fitch or S&P • Its place of incorporation in Singapore or it is a Qualifying Full Bank of a reputable foreign bank, and employs accounting practices, safekeeping procedures and internal controls designed to protect deposits • Sufficient Shareholders' funds acceptable to APEX Clear • Be licensed and supervised by the MAS under the Banking Act of Singapore • Ready and ample access to liquidity from the market place • Good operational reliability APEX Clear sets exposure and concentration limits, based on the bank's external ratings, to minimize its concentration to any particular bank, while balancing the benefits of risk diversification against the benefits of pooling resources at a small number of banks. APEX Clear will also monitor adverse news concerning its Settlement Banks so that it can take prompt action to mitigate its credit and liquidity risks.
9.4	*If an FMI conducts money settlements on its own books, it should minimise and strictly control its credit and liquidity risks.*
	Not applicable, as APEX Clear does not conduct money settlement on its own books.
9.5	*An FMI's legal agreements with any settlement banks should state clearly when transfers on the books of individual settlement banks are expected to occur, that transfers are to be final when effected, and that funds received should be transferable as soon as possible, at a*

	minimum by the end of the day and ideally intraday, in order to enable the FMI and its participants to manage credit and liquidity risks.
	APEX Clear sets out the payment and settlement processes clearly in the respective contractual agreements with its appointed Settlement Banks. Under each agreement, the time at which the transfers on the books of the Settlement Bank should occur is clearly stated and all such transfers are final and irrevocable.
Principle 10: Physical deliveries ***An FMI should clearly state its obligations with respect to the delivery of physical instruments or commodities and should identify, monitor, and manage the risks associated with such physical deliveries.***	
10.1	*An FMI's rules should clearly state its obligations with respect to the delivery of physical instruments or commodities.*
	The Clearing Rules and respective Contract Specifications set out the delivery mechanisms and the respective obligations of APEX Clear and all participants in a delivery process. Example: Palm Olein Contract In this physically delivered futures contract, APEX Clear acts as a central counterparty and collects delivery margins, monitors each step of the delivery process, and facilitates the fulfilment towards a smooth delivery by the seller to the buyer. The Contract Specifications sets out clearly, amongst other things, the quality and quantity specifications of the cargo, the timelines for exchanges of notices between the buyer and seller, the readiness of vessel and loading times, the amount of delivery margins to be collected, the mechanism of dispute resolutions, and the amount of compensation should there be a delivery default. Under the Contract Specifications, any successfully matched seller or buyer has the option to elect an Alternative Delivery Procedure ("**ADP**"), by which both parties agree bilaterally to diligently fulfil their respective delivery obligations without the involvement of APEX Clear. The seller and buyer will manage these deliveries themselves directly under any terms and conditions that they have negotiated otherwise. In choosing the ADP delivery process, the seller and buyer indemnify APEX Clear from all obligations and responsibilities related to such delivery under the Contract Specifications. If the buyer and seller choose to execute an Exchange of Futures for Physical ("**EFP**") procedure, APEX Clear shall be released from the obligations in relation to delivery under the Contract Specifications and the Clearing Rules, and the Seller and the Buyer as may be prescribed shall jointly and severally indemnify the Clearing House against any liability, costs, or expenses that may incur for any reason as a result of the execution, delivery, or performance of any agreement reached between the Buyer and the Seller. Note: APEX currently does not have any active physical deliveries.
10.2	*An FMI should identify, monitor, and manage the risks and costs associated with the storage and delivery of physical instruments or commodities.*
	In designing the delivery process, APEX Clear will take into consideration the various risks and costs associated with the physical storage and delivery of the commodities. To manage the costs involved in the delivery process, APEX Clear seeks to reduce the costs borne by the

	participants by taking into consideration additional factors in the matching process of buyers and sellers, besides the quantity, so as to achieve a minimum systematic delivery costs for the delivery processes. Additionally, APEX Clear conducts product seminars and closely guides its Clearing Members who are involved in the physical delivery process. Example: Palm Olein Contract Under the Contract Specifications for Palm Olein Contract, APEX Clear does not bear the risk and cost associated with the storage or delivery of the commodity as the underlying is delivered in free-on-board terms. Any risks and costs in relation to storage or handling of oil before the oil passing the manifold of Buyer's vessel are borne by the Seller, while any subsequent risks and costs shall be borne by the Buyer. To manage the risks involved in the delivery process, APEX Clear, after careful assessments and selection, has provided a list of accredited Port Tank Installations, Approved Refinery Delivery Points, Approved Suppliers, Approved Surveyors so as to ensure reliable supplies of products and continuously monitored handling processes. Meanwhile, the mechanisms to resolve quality/quantity disputes, etc. form part of the futures contract. For example, if the Seller does not deliver the commodity or the delivered commodity does not meet the quality as specified in the Contract Specifications, the buyer and/or seller can seek arbitration based on APEX Clear's Clearing Rules and Contract Specifications. To minimise the delivery costs, APEX Clear undertook additional considerations including the seller's nominated port of loading, the buyer's preferred port of loading, the preferred choices in the loading window, etc. Note: APEX currently does not have any active physical deliveries.
Principle 11: Central securities depositories *Not applicable. APEX Clear is not a central securities depository.*	
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	*An FMI that is an exchange-of-value settlement system should eliminate principal risk by ensuring that the final settlement of one obligation occurs if and only if the final settlement of the linked obligation also occurs, regardless of whether the FMI settles on a gross or net basis and when finality occurs.*
	APEX Clear eliminates principal risk with respect to the delivery of physically-deliverable futures contracts by calling in the payment for delivery from buyer and the required documentation from the seller before any transfer is executed.
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.***	

13.1	*An FMI should have default rules and procedures that enable the FMI to continue to meet its obligations in the event of a participant default and that address the replenishment of resources following a default.*
	APEX Clear's Clearing Rules and Default Management Plan provide details on APEX Clear's Default Management procedures. They allow APEX Clear to take timely action to minimize any default losses as well as to manage liquidity issues in the event of a Clearing Member default. APEX Clear's Default Management Plan includes daily monitoring to identify any potential default related events by the Clearing Members. In the event of such a breach by a Clearing Member, and to minimize the impact of the potential default on APEX Clear and the other Clearing Members, APEX Clear will take swift action including activating an Incident Response Team ("**IRT**") comprising senior staff from the Risk Management, Legal, Regulatory & Compliance, Finance, Global Markets Strategy, Technology and Operations functions to perform closer monitoring of the affected Clearing Member, suspending the Clearing Member from adding new risks and withdrawing excess margins, etc. APEX Clear's Crisis Management Team ("**CMT**"), which is made up of the Chief Executive Officer of APEX, Chief Executive Officer of the Clearing House and the Chief Regulatory Officer of APEX Group, will assess the findings and recommendations of the IRT and where necessary, declare an event of default. As part of its Default Management Plan, APEX Clear may carry out actions in accordance with its Clearing Procedures including to activate the IRT to assist the defaulting Clearing Member, suspend the defaulting Clearing Member's access to all APEX systems, reject pending trades and freeze all assets of the defaulting Clearing Member, as well as to transfer and / or close out open positions of the defaulting Clearing Member. To protect the Clearing House from the potential losses of a Clearing Member default, APEX Clear collects margins from its Clearing Members on their open positions. At the same time, APEX Clear itself contributes to and also collects from its Clearing Members Guaranty Fund contributions which will be utilised in the following manner in the event of a Clearing Member default: (i) any monies, assets or Collateral held in any account of or in respect of the Defaulting Clearing Member (including the proceeds of the Security Deposits of the Defaulting Clearing Member), provided that where such monies, securities or collateral relate to any Customer Position the application shall only be carried out if the conditions in Clearing Rule 406.1(s) are met; (ii) up to 60% of APEX Clear's mandatory contribution to the Guaranty Fund; (iii) up to USD500,000 in Security Deposit from each non-defaulting Clearing Member, provided that any application of the Security Deposits of non-defaulting Clearing Members shall be in equal amounts across all non-defaulting Clearing Members; (iv) up to 40% of APEX Clear's mandatory contribution to the Guaranty Fund; (v) all remaining Security Deposits (if any) of the non-defaulting Clearing Members as contributed on the date of Declared Default; (vi) all remaining balance of APEX Clear's contribution to the Guaranty Fund (if any); and (vii) any other monies or other assets available to the Clearing House. Clearing Rule 805(c) allows APEX to require its Clearing Members to replenish their respective Guaranty Fund contributions that have been utilised in the default.

13.2	*An FMI should be well prepared to implement its default rules and procedures, including any appropriate discretionary procedures provided for in its rules.*
	APEX Clear's Default Management Plan serves as a guideline and response plan when dealing with a Clearing Member default. These procedures are also further enhanced through regular drills with Clearing Members as well as internal exercises which will enable APEX Clear's Senior Management and staff to familiarise themselves with the necessary steps and be well prepared to handle an actual default situation.
13.3	*An FMI should publicly disclose key aspects of its default rules and procedures.*
	The key aspects of APEX Clear's Default Management Plan are set out in section 12 of the Clearing Procedures which is also available on the APEX website.
13.4	*An FMI should involve its participants and other stakeholders in the testing and review of the FMI's default procedures, including any close-out procedures. Such testing and review should be conducted at least annually or following material changes to the rules and procedures to ensure that they are practical and effective.*
	APEX Clear will conduct annual drills enhance its Default Management Plan, to test the preparedness of the Incident Response and Crisis Management Teams, to identify any issues for resolution, and to enhance technological capabilities. Where appropriate, Clearing Members and other stakeholders may also participate in these exercises. When there are material changes to the rules and procedures relating to default management, consultation with Clearing Members will be performed and feedback on the changes received will be reviewed.
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	*A CCP should, at a minimum, have segregation and portability arrangements that effectively protect a participant's customers' positions and related collateral from the default or insolvency of that participant. If the CCP additionally offers protection of such customer positions and collateral against the concurrent default of the participant and a fellow customer, the CCP should take steps to ensure that such protection is effective.*
	In accordance with Regulation 23 of the SF (Clearing Facilities) Regulations 2013, APEX Clear segregates customers' collateral from Clearing Members' collateral and APEX Clear's own assets. Customer collateral will be protected from the default of Clearing Members as well as any insolvency of APEX Clear. At present, APEX Clear does not offer individually segregated accounts at customer level and all customer collateral are commingled in multiple omnibus bank accounts and accounted for on a per Clearing Member basis. Under the Clearing Rules, positions and/or collateral may be transferred from the books of a Defaulting Clearing Member to one or more surviving Clearing Members or otherwise be liquidated. APEX Clear allows Customers to choose another Clearing Member to transfer their positions to in the event of a default of their existing Clearing Member. The transfer of the positions will be done provided that:

	(i) Identity of Customer is known to APEX Clear; (ii) Customer positions are identified; (iii) Receiving Clearing Members are agreeable to the transfer; (iv) Defaulting Clearing Member or its liquidator is agreeable to the transfer; and (v) APEX Clear is satisfied with the financial health and viability of the receiving Clearing Members. Under APEX Clear's Default Management Plan, a customer is given 24 hours to indicate to APEX Clear its intention to port its positions to an alternative Clearing Member, failing which APEX Clear will liquidate the positions. Upon transfer of the positions to the alternative Clearing Member, the alternative Clearing Member will deposit the required collateral with APEX Clear and collect initial margins from the customer.
14.2	*A CCP should employ an account structure that enables it readily to identify positions of a participant's customers and to segregate related collateral. A CCP should maintain customer positions and collateral in individual customer accounts or in omnibus customer accounts.*
	Clearing Members are expected to maintain individual accounts for each disclosed customer or omnibus accounts for a group of undisclosed customers in APEX Clear's clearing system. Customer positions and the required collateral are clearly identified in such individual accounts. In all cases, customer positions and collateral are clearly identified and segregated from the Clearing Members' positions and collateral as well as APEX Clear's own funds. APEX Clear further holds Customers' collateral in trust for the benefit of Customers and in accordance with regulation 23 of the SF (Clearing Facilities) Regulations 2013. Reconciliation of Customers' positions and assets at participant level is done on a daily basis.
14.3	*A CCP should structure its portability arrangements in a way that makes it highly likely that the positions and collateral of a defaulting participant's customers will be transferred to one or more other participants.*
	APEX Clear's Clearing Rules and Default Management Plan allow positions and collateral of a defaulting Clearing Member's customers to be transferred to one or more surviving Clearing Members provided that conditions previously mentioned are fulfilled. APEX Clear will also obtain the consent of the receiving Clearing Members before effecting the transfers. This will help APEX Clear enhance the efficiency of the portability arrangement in the event of a Clearing Member default situation.
14.4	*A CCP should disclose its rules, policies, and procedures relating to the segregation and portability of a participant's customers' positions and related collateral. In particular, the CCP should disclose whether customer collateral is protected on an individual or omnibus basis. In addition, a CCP should disclose any constraints, such as legal or operational constraints, that may impair its ability to segregate or port a participant's customers' positions and related collateral.*
	APEX Clear's segregation and portability arrangements are contained in Clearing Rule 415 as well as in the Clearing Procedures which are available on APEX Clear's website. Customer collateral will be protected from the default of Clearing Members as well as any insolvency of APEX Clear. At present, APEX Clear does not offer individually segregated accounts at the customer level and all customer collateral will be commingled in multiple omnibus bank accounts and accounted for on a per Clearing Member basis. This account structure is clearly

	detailed in APEX Clear's Clearing Rules and Procedures. Clearing Members can also access APEX Clear's clearing system to view the amount of collateral balance held in their accounts.
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.***	
15.1	*An FMI should have robust management and control systems to identify, monitor, and manage general business risks, including losses from poor execution of business strategy, negative cash flows, or unexpected and excessively large operating expenses.*
	The Board and management team of APEX Clear comprise of individuals equipped with extensive knowledge of and experience in the industry, including strong track record in establishing robust corporate governance and controls framework. Their skills and expertise will assist APEX Clear in identifying, monitoring and managing its general business risks. The following committees provide strong governance over the general business risks faced by APEX Group, including APEX Clear. **Board of Directors ("Board")** The Board is primarily responsible and accountable for putting in place the necessary risk management frameworks in APEX Group. The Board also delegates such responsibilities to the Risk Management Committee, which in turn delegates certain responsibilities and authorities to the management. **Audit Committee ("AC")** The AC is a board level committee independent from the management and business relationships with APEX Group. The responsibilities of the committee include: (i) independent oversight of the management and control of APEX Group's internal and external audit functions, including reviewing the scope and results of audit carried out, and the independence and objectivity of internal and external auditors; (ii) review regular audit reports on the status of compliance with APEX Group's risk and control policies; (iii) review APEX Group's audit plans and processes, internal control systems and compliance with regulatory requirements; (iv) oversight of the integrity of APEX Group's financial reporting. **Risk Management Committee ("RMC")** The RMC is a board-level committee independent from the management and business relationships with APEX Group. The responsibilities of the committee include: (i) independent oversight and guidance to APEX Group's risk management frameworks; (ii) review, recommend, or approve the types and levels of risk consistent with the APEX Group's key risks and risk appetite.; (iii) review, recommend or approve effective risk management frameworks, policies, systems, resources and risk limits that are consistent with APEX Group's key risks and risk appetite;

	(iv) recommend appropriate capital management framework, clearing fund structure as well as APEX Clear's contribution to the clearing fund; and (v) recommend appropriate and adequate long term technology strategy roadmap. **Conflicts Committee** The Conflicts Committee is responsible for: (i) reviewing the adequacy of the arrangements within APEX Group for dealing with any perceived or actual conflict between its regulatory objectives and commercial interests; and (ii) carrying out regular reviews of the adequacy of the plans, budget and resources in relation to the regulation and supervision of Clearing Members. **Enterprise Risk Committee** The Enterprise Risk Committee, led by the CEO, is a management level committee responsible and accountable for implementing the required risk management frameworks and for managing risk at APEX Clear. The Enterprise Risk Committee provides strong senior management oversight and resolution on risk management issues encountered in the daily course of APEX Clear's business operations. The CEO and Enterprise Risk Committee are also responsible to review and endorse key risk management policies before submission to the RMC for approval.
15.2	*An FMI should hold liquid net assets funded by equity (such as common stock, disclosed reserves, or other retained earnings) so that it can continue operations and services as a going concern if it incurs general business losses. The amount of liquid net assets funded by equity an FMI should hold should be determined by its general business risk profile and the length of time required to achieve a recovery or orderly wind-down, as appropriate, of its critical operations and services if such action is taken.*
	APEX Clear holds liquid net assets funded by equity mainly in the form of cash and cash equivalents deposited with reputable banks with investment grade credit ratings. APEX Clear also maintains liquid funds to meet at least six months of current operating expenses. APEX Clear also ensures that it meets the capital adequacy requirements by MAS to meet its operational, investment and general counterparty risks. With these controls in place, APEX Clear is able to meet its immediate liabilities and to implement its recovery or orderly wind-down plan of its critical operations and services if such action is taken.
15.3	*An FMI should maintain a viable recovery or orderly wind-down plan and should hold sufficient liquid net assets funded by equity to implement this plan. At a minimum, an FMI should hold liquid net assets funded by equity equal to at least six months of current operating expenses. These assets are in addition to resources held to cover participant defaults or other risks covered under the financial resources principles. However, equity held under international risk-based capital standards can be included where relevant and appropriate to avoid duplicate capital requirements.*
	APEX Clear maintains liquid net assets funded by equity equal to at least six months of current operating expenses as well as a Recovery and Resolution Plan to ensure a viable recovery or orderly wind-down. This recovery and orderly wind-down plan continues to be enhanced in line with its actual operational experience, and will be reviewed annually.

15.4	*Assets held to cover general business risk should be of high quality and sufficiently liquid in order to allow the FMI to meet its current and projected operating expenses under a range of scenarios, including in adverse market conditions.*
	APEX Clear's share capital is largely maintained in current accounts and fixed deposits with bank counterparties of investment grade credit rating. These banks are also regulated by the MAS. APEX Clear may also consider investing in Singapore government bonds which are of AAA credit rating, at a later point in time. Cash deposited in current accounts and fixed deposits, and Singapore Government bonds are regarded as high quality and liquid assets.
15.5	*An FMI should maintain a viable plan for raising additional equity should its equity fall close to or below the amount needed. This plan should be approved by the board of directors and updated regularly.*
	The initial share capital injected into APEX Clear is intended to cover its operating requirements for a medium term of at least 5 years. The capital plan is reviewed regularly at the Board meetings, and should the need arise for raising additional equity, the plan will be approved by the Board.
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	*An FMI should hold its own and its participants' assets at supervised and regulated entities that have robust accounting practices, safekeeping procedures, and internal controls that fully protect these assets.*
	APEX Clear's Bank Counterparty Policy sets a framework to ensure that it only deals with banks of investment grade credit rating. On top of which, the banks must be regulated or supervised by reputable and competent regulators. APEX Clear sets its bank counterparty limit based on the long term credit rating by Moody's, Fitch or S&P. The long- term credit rating is used for its easy distinction between Prime (AAA), High Grade (Aa), Upper Medium Grade (A) and Lower Medium Grade (BBB). To manage concentration risks, APEX Clear sets tiered absolute and relative counterparty bank limits based on each bank's long term credit rating by Moody's, Fitch or S&P and monitors the changes of credit rating and news update of each bank counterparty on a regular basis. To address the concern on sound accounting practices, safekeeping procedures and internal controls that fully protect APEX Clear and APEX Clear's Clearing Members and its Clearing Member customers' assets, APEX Clear will only deal with bank counterparty which practices IFRS or Singapore FRS, and inclusion of clauses in the bilateral agreement between APEX Clear and custodian banks to ensure that deposited assets are segregated from the bank and its other customers' assets. APEX Clear will also request for periodic statements from the bank (at least monthly), to reconcile with APEX Clear's books and records. APEX Clear will also conduct bi-annual

	verification with external auditor to ensure the existence of assets deposited with the custodian banks.
16.2	*An FMI should have prompt access to its assets and the assets provided by participants, when required.*
	APEX Clear holds all of its assets and assets provided by participants in cash or cash equivalent. <u>APEX Clear's own monies</u> APEX Clear's own monies will be placed in current accounts or fixed deposits only. Current accounts are fully liquid and are used to meet APEX Clear's day-to-day payment obligations and any operating expenses. Fixed deposits will be negotiated with flexibility to allow withdrawal after meeting the notice period imposed by the bank at commercial terms. APEX Clear may invest in low risk financial instruments (i.e. bonds) which are highly liquid and readily accessible. Investments in financial instruments are subject to approval from the investment committee per the APEX Investment Policy. <u>Clearing Members' monies and customers' monies</u> 100% of the monies collected will be deposited in banks regulated by MAS. APEX Clear will be able to tap the monies as permitted by law and/or the APEX Clear Rules, if required.
16.3	*An FMI should evaluate and understand its exposures to its custodian banks, taking into account the full scope of its relationships with each.*
	APEX Clear does not currently have any custodian banks, as we only accept cash collateral. Should APEX Clear decide to accept non-cash collaterals, APEX Clear will have appropriate policies in place to evaluate and monitor its exposures to its custodian banks.
16.4	*An FMI's investment strategy should be consistent with its overall risk-management strategy and fully disclosed to its participants, and investments should be secured by, or be claims on, high-quality obligors. These investments should allow for quick liquidation with little, if any, adverse price effect.*
	APEX Clear places great emphasis on the protection of shareholders' interest and all margin collaterals received from its Clearing Members and the Clearing Members' customers. APEX Clear adopts a prudent investment strategy which requires the Investment Committee to approve all investment proposals. Cash collateral received by APEX Clear are placed in current accounts with banks, and we have no immediate plans to invest them. Should we decide to do so, APEX Clear will only invest in the permissible assets stipulated under Regulation 25 of the SF (Clearing Facilities) Regulations 2013. APEX Clear only deposits its cash and monies received from Clearing Members and their customers in banks regulated by MAS or in banks regulated by other competent central banks/monetary authorities in jurisdictions with low country risk. These monies will only be deposited in current accounts or fixed deposits. Both are available for prompt withdrawals if need be. APEX Clear has also implemented a Bank Counterparty Policy to ensure risk exposure to each bank counterparty remains within the established concentration limit.

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.***	
17.1	*An FMI should establish a robust operational risk-management framework with appropriate systems, policies, procedures, and controls to identify, monitor, and manage operational risks.*
	APEX Group, which includes APEX Clear, has in place the APEX Group's Risk Management Framework to identify, monitor and manage APEX Group's key enterprise risks which includes operational risk, technology risk as well as business resilience. Operational risk includes risks arising from inadequate or failed internal processes and procedures, human errors as well as disruptions arising from external events. Such framework also includes an Operational Risk Management Policy that facilitates the control and mitigation of operational risks. APEX Group manages operational risks through establishing policies and procedures and controls to ensure safe operations. All departments are also expected to provide a monthly return on the operational errors that were committed during the month and the action plans put in place to prevent recurrence. APEX Group also has in place business resilience measures where the Business Continuity Management strategies, policies and procedures ensure continuity of critical operations in the event of major disruptions. The Technology Risk Management Framework addresses technology related risks by establishing and enforcing policies, processes and controls for the areas as follows: (i) IT security policies covering risk management in network security, anti-virus, patch management, accounts, privilege and passwords controls, cryptography standards, business and office terminal access controls, data centre security controls, refresh and disposal of storage media, etc. (ii) Service management policies and procedures covering change management, incident management, problem management, system capacity management, data backups, disaster recovery ("**DR**") and contingency plans to ensure the quality and high availability of APEX Group's services. (iii) IT project management and system development lifecycle frameworks to manage the risks in IT project life cycle covering project initialising, planning, executing, controlling and closing phases. (iv) Information Classification and Handling Guidelines covering proper classification and protection of confidential/highly sensitive data. (v) Management of third party services to address exposures to technology risks that may affect the confidentiality, integrity and availability of the IT systems and data at the third party.
17.2	*An FMI's board of directors should clearly define the roles and responsibilities for addressing operational risk and should endorse the FMI's operational risk-management framework. Systems, operational policies, procedures, and controls should be reviewed, audited, and tested periodically and after significant changes.*

	The Risk Management Committee (RMC) is a board level committee independent from the management and business relationships with APEX Group. It is comprised of the various individuals from the board of directors and its responsibilities to the board include the following: (i) independent oversight and guidance to APEX Group's risk management frameworks; (ii) review, recommend, or approve the types and levels of risk that APEX Group undertakes to achieve its business objectives, including operational risks; (iii) review, recommend or approve effective risk management frameworks, policies, systems, resources and risk limits that are consistent with APEX Group's key risks and risk appetite. The Audit Committee (AC) is responsible for reviewing the APEX Group's audit plans and processes, internal control systems and compliance with regulatory requirements. APEX Group's risk management frameworks, policies and procedures, systems and controls are subjected to at least annual review or whenever there are material changes. They will also be subjected to internal audits based on the approved audit mandates and plans as well as regular external audits and regulatory inspections. APEX Clear also conducts regular testing of its clearing systems with its Clearing Members for the purpose of testing new system connectivity as well as to test the resiliency of its systems, staff availability, operational processes in the event of technological and/or operational disruptions.
17.3	*An FMI should have clearly defined operational reliability objectives and should have policies in place that are designed to achieve those objectives.*
	APEX Clear has in place the following policies and controls to ensure operational reliability: (i) IT incident management and response plan that categorises incidents by severity and specifies the recovery time objectives for APEX Clear's critical systems. (ii) IT System Change Management Policy that was established to ensure that all changes are analysed, recorded, tested and approved to minimize the potential impacts to existing systems – APEX Clear has set up segregated development, simulation and production environments. Major changes to production, such as launching of new systems or services, upgrades of existing system feature or components, are first deployed at the development environment for internal or third party testing. Next, such changes are deployed to the simulation environment for testing by market participants for a stipulated period, which period depends on the complexity of the changes. Thereafter and only after such changes pass all required tests and stabilize in the simulation environment, such changes will be implemented to the production environment. Additionally, APEX Clear ensures that a roll-back plan shall always be in place to enable such changes to be rolled back when necessary. (iii) IT problem management, root cause analysis and tracking mechanisms are in place to mitigate the risks of recurring incidents and ultimately reduce the likelihood and impact of any disruptions or service downtime. (iv) APEX Clear establishes the operating model with tiered roles for IT operations. The Operation Team focuses on system monitoring, issue identification, prompt handling and escalation. IT second-line technical specialists focus on problem diagnosis, root cause analysis and ultimate solutions. (v) APEX Clear is hosted in the Cloud environment, across multiple Availability Zones ("AZ") for redundancy. Additionally, APEX hosts two physical connection points in Singapore data centres which network traffic are wired to the Cloud environment. The

	two data centres are geographically separated and provided by two different outsourced service providers, which are certified as Tier III data centres with stringent access controls and real-time environment monitoring. The power supply, network service and other core facilities are redundantly deployed to prevent single points of failure. (vi) Our clearing system is built with high-availability design. Rigorous tests including user acceptance test, stress test, destructive test and industry-wide test were conducted before system go-live. The clearing system is redundantly deployed in the Cloud environment across multiple AZ in hot-warm mode, with real-time data synchronisation via dedicated lines. When primary AZ is disrupted, alternative AZ can take over almost immediately from IT infrastructure perspective. (vii) Regular backup is performed for core systems and data. Offsite storage is in place. DR Plan is developed and tested together with market participants on an annual basis.
17.4	*An FMI should ensure that it has scalable capacity adequate to handle increasing stress volumes and to achieve its service-level objectives.*
	APEX Clear has established an IT System Capacity Management Policy to ensure adequate scalable capacity to handle increasing stress volumes and to achieve our service level objectives. APEX Clear performs capacity assessment for every new system or significant changes to existing system, in addition to the regular annual review of IT system capacity planning. Prior to the IT system acquisition, a thorough projected five-year volume assessment is performed based on the nature of its intended operations, industry status quo and trends, experience in China as well as international markets. The estimated maximum capacity and threshold for IT systems is then set to ensure that adequate resources are in place to cater for peak volume. The key considerations for capacity management are: (i) Stress testing: Stringent stress testing shall be performed before deployment of IT devices and applications, so as to ensure that the IT resource is able to fulfil the capacity requirements. (ii) Capacity monitoring: Adequacy of system capacity is monitored on an ongoing basis. Alerts and events are generated when capacity thresholds are breached. Capacity metrics are established and trend analysis is performed to predict growth. (iii) Capacity upgrade: Once the system capacity reaches or is predicted to reach the pre-set threshold, capacity upgrade will be considered and planned in order to eliminate the potential impact on services.
17.5	*An FMI should have comprehensive physical and information security policies that address all potential vulnerabilities and threats.*
	<u>Data Centre Physical Security</u> In the course of selecting data centre vendors in Singapore, APEX Clear infrastructure team conducted site visits and a thorough design assessment over the data centres from four vendors. Outsourced Service Provider Audit Report and Threat, Vulnerability and Risk Assessment reports of the data centres were obtained and assessed. Both primary and DR data centres are certified as Tier III data centres , equipped with mandatory facilities in place, such as access controls, real-time monitoring, and redundant power supply and network connections provided by different ISPs.

	Other than the access controls implemented by the data centre vendors, stringent access control policies and procedures of APEX Clear are also enforced. Non-data centre staff must obtain permission before access is granted. Visitors shall be accompanied by authorised staff during their onsite visit. Information Security Policies and Procedures APEX Clear has established IT security policies mitigating technology risks and providing feasible measures to prevent or detect these risks, including: (i) Cyber security: Connectivity between business applications of APEX Clear and Clearing Members/customers are via dedicated lease lines. Security applications such as firewalls and Intrusion Prevention System are in place to detect and manage malicious activities and network traffic. There is also network segregation for critical and non-critical systems to minimise the impact in the event of cyber-attacks. (ii) Security Information and Event Management system is established to monitor the security events in APEX Clear. (iii) Anti-virus: APEX Clear adopts anti-virus software products to prevent, detect, and eliminate computer viruses. (iv) Patch Management: Security patches are assessed, tested and applied on a timely basis to remediate vulnerabilities. (v) Accounts and privileges: System and role-based user access accounts are reviewed periodically to ensure that the accounts are valid and appropriate user access is granted. We adhere to the "least-privilege" principle in accounts and privilege creation. User accounts that are no longer in use will be disabled or removed. (vi) Information classifications and handling: APEX Clear data and information are classified and protected based on the Information Classification and Handling Guidelines.
17.6	*An FMI should have a business continuity plan that addresses events posing a significant risk of disrupting operations, including events that could cause a wide-scale or major disruption. The plan should incorporate the use of a secondary site and should be designed to ensure that critical information technology (IT) systems can resume operations within two hours following disruptive events. The plan should be designed to enable the FMI to complete settlement by the end of the day of the disruption, even in case of extreme circumstances. The FMI should regularly test these arrangements.*
	APEX Clear has various business continuity plans to manage physical, technological and financial events that can disrupt its business operations, including wide scale or major disruptive events. Existing plans include IT incident management and response plans, DR procedures, default management plans. IT plans include ensuring that data is synchronised through maintaining hot-hot or hot-warm backup and recovery between the primary and secondary data centres. APEX Clear has also established a Default Management Plan to manage financial disruptions such as a Clearing Member default situation. This will ensure that it is able to continue to perform its role as a CCP and fulfil its obligations in the event of a Clearing Member default. APEX Clear also has in place other specific response plans for physical disruption scenarios such as pandemic, terrorist attacks to add to its portfolio of response plans. In the worst case scenario, APEX Clear's Crisis Management Plan will set out the procedures for responding to emergency crisis situations including stakeholder notification and crisis communications. APEX Clear's portfolio of response plans will be subjected to annual review and regular testing.

	APEX Group has two data centres, which are certified as Tier III data centres and managed by two different vendors locally, with stringent access controls, real-time environment monitoring, redundant power supply and telecommunication facilities. The core applications of APEX and APEX Clear, including trading system, clearing system, surveillance system and SWIFT Alliance Lite2 are all well designed systems with no single-point-of-failure nodes, which are also redundantly deployed at multiple AZ in the Cloud environment and run in hot-hot mode to achieve high availability at system level. Meanwhile, data at primary data centre are replicated to DR site on a real-time basis. When primary data centre is disrupted, DR data centre can take over almost immediately from IT infrastructure perspective. DR Plan is developed, reviewed and tested on a regular basis. Roles and responsibilities, master recovery task list, and relevant escalation and decision-making procedures are documented in the said plan. Recovery Time Objective and Recover Point Objective of the core systems, and Service Recovery Time Objectives are defined and validated on an annual basis, in accordance with the Business Impact Analysis process. APEX organises industry-wide DR exercise on a regular basis, which includes various scenarios like system disruption, component failure, power supply failure, etc. External market participants are involved in the DR exercise to ensure the services will be recovered quickly in case of disruptions.
17.7	*An FMI should identify, monitor, and manage the risks that key participants, other FMIs, and service and utility providers might pose to its operations. In addition, an FMI should identify, monitor, and manage the risks its operations might pose to other FMIs.*
	As covered in Key Consideration 17.6, APEX Clear has in place various response plans to manage and mitigate the risks of disruptive events. In addition, APEX Clear has also established various controls and policies to manage its risks arising from other participants, FMIs, and service and utility providers. The Member Supervision team monitors its Clearing Members and has the authority to conduct onsite visits and inspections on its Clearing Members to assess the adequacy of their risk management systems and internal controls. APEX Clear's Outsourcing Policy, Vendor Management Policy, Contract Review and Process Policy, and Technology Risk Management Framework, manages the risks arising from service providers and vendors. At present, APEX Clear does not have any linkages with other FMIs. APEX Clear's primary market participants include Clearing Members, trading members, market data vendors and a wide variety of end clients. APEX Clear has measures to prevent, mitigate and control the technology risks that may arise from and be posed to the participants, including: (i) All transactions between APEX Clear and participants are through dedicated lease lines without any exposure to public internet to secure the data exchanges. (ii) Participants access to APEX's and APEX Clear's trading and clearing systems via native API developed, tested, and released by APEX and APEX Clear. We have set up a simulation environment for participants' on-boarding process. Interface conformance tests covering each and every of the interfaces in the APIs are mandatory for market participants that intend to access our trading and clearing systems. (iii) APEX Clear organises industry-wide contingency exercise on a regular basis, which might include scenarios like system disruption, data centre failure, etc. The bilateral contingency response mechanism is established to ensure that both parties can collaborate in a timely manner if any emergency events occur. (iv) Before any material changes are migrated to the production environment, APEX Clear shall assess and minimise the potential impacts to other participants' systems. The

	changes shall be deployed to the simulation environment first and tested by participants for a stipulated period. The changes shall not be migrated to production should there be any issues detected in the test. (v) Audit utilities such as application logs, operations record, monitoring toolkits in IT applications are enabled to trace the interactions between APEX Clear and its participants, all of which will be kept in accordance with the regulatory requirements.
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.***	
18.1	*An FMI should allow for fair and open access to its services, including by direct and, where relevant, indirect participants and other FMIs, based on reasonable risk-related participation requirements.*
	APEX Clear admits two classes of Clearing Members: (i) General Clearing Members that are permitted to clear and settle their own trades and trades of their customers. (ii) Special Clearing Members that are permitted to clear and settle trades of their customers only. APEX Clear has established stringent admission requirements and continuing obligations for Clearing Members. These requirements are objective, risk-based and allow for fair and open access to its services. These requirements are publicly disclosed in the Clearing Rules on APEX's website. Clearing Rule 303 sets out the overall eligibility and conditions for admission of Clearing Members. Specifically: (i) Rule 303.1 lays out the general requirements; (ii) Rule 303.2 sets out the capital requirements; (iii) Rule 303.3 sets out the financial resource requirements; (iv) Rule 303.4 sets out the general rules relating to capital and financial resources requirements. Clearing Rule 304 sets out the Security Deposit required from each Clearing Member. Additionally, APEX Clear does not impose restrictions on: (i) the clientele of Clearing Members or their profiles, subject to regulatory requirements; (ii) the number of Clearing Members it intends to admit; nor (iii) the minimum transaction volume on Clearing Members.
18.2	*An FMI's participation requirements should be justified in terms of the safety and efficiency of the FMI and the markets it serves, be tailored to and commensurate with the FMI's specific risks, and be publicly disclosed. Subject to maintaining acceptable risk control standards, an FMI should endeavour to set requirements that have the least-restrictive impact on access that circumstances permit.*
	<u>Justification and rationale of participation criteria</u> APEX Clear's participation requirements are risk-based and fair, and does not have any undue restrictive criteria. Our participation requirements are benchmarked to other approved clearing

	houses operating in Singapore, in terms of capital and financial resources, licensing status, contributions to the Guaranty Fund, sufficiency of human and technology resources, etc. They are applied consistently for all applicants in the same category of Clearing Membership. Least restrictive access Membership criteria are either risk-based or are derived from regulatory requirements imposed on APEX Clear or licensed entities, which are necessary for the safety and security of APEX Clear and its participants. Review of criteria are conducted on an ad hoc basis, as and when the market environment and regulations require. Disclosure of criteria The participation requirements are publicly disclosed in the APEX Clear's Clearing Rules on the APEX website, and have undergone consultation with Clearing Members and the public.
18.3	*An FMI should monitor compliance with its participation requirements on an ongoing basis and have clearly defined and publicly disclosed procedures for facilitating the suspension and orderly exit of a participant that breaches, or no longer meets, the participation requirements.*
	APEX Clear monitors compliance of its Clearing Members with its participation requirements in the following ways: (i) Quarterly financial reporting of compliance with capital and financial resources requirements; (ii) Annual audited financial statements and auditor's report on internal controls; (iii) On-site inspections, scheduled on a risk-based approach; (iv) Routine reports to the Risk Management and IT Operations Departments on risk-related and operational matters; (v) Obligations on Clearing Members to report matters of concern to APEX Clear, including if they should fail to meet any participation requirement (Clearing Rule 306); (vi) Other reporting requirements as stated under APEX Clear's Clearing Procedures Chapters 14 and 16. Provisions for suspension and termination of a Clearing Member are set out in Clearing Rule 309. The procedures and rights of APEX Clear following a default of a Clearing Member are prescribed in Clearing Rules 802 to 804. Disciplinary and enforcement actions are covered in Chapter 7 of the Clearing Rules. Specifically, Rule 711 sets out the sanctions and powers of the disciplinary power on a Clearing Member that has breached any Clearing Rule, which includes the following: (i) Rule 711(a)(9) – restrict, suspend or terminate access to the Clearing House; (ii) Rule 711(a)(10) – suspend any or all privileges of membership; (iii) Rule 711(a)(11) – terminate membership in the clearing house.
Principle 19: Tiered participation arrangements ***An FMI should identify, monitor, and manage the material risks to the FMI arising from tiered participation arrangements.***	

19.1	*An FMI should ensure that its rules, procedures, and agreements allow it to gather basic information about indirect participation in order to identify, monitor, and manage any material risks to the FMI arising from such tiered participation arrangements.*
	APEX Clear's direct participants are the Clearing Members, who are CMS license holders or banks licensed in Singapore. Indirect participants are the customers of those Clearing Members, who could be other broker-dealers, banks, asset management companies, hedge funds, proprietary traders as well as other non-financial corporate entities or individuals. If the customer of a Clearing Member is itself a broker-dealer, there could be further indirect participants who are customers of the broker-dealer. The Clearing Rules permit APEX Clear to gather information on indirect participants. Such information collected are kept confidential in accordance with APEX Clear's policy on confidentiality. All Clearing Members must disclose the identity of all account holders in order to set up the position accounts. For omnibus accounts, APEX Clear has the right to request for the Clearing Member to provide information of the sub-account holders. Clearing Members are also required to submit end of day position reports of all its accounts, when necessary. The information allows APEX Clear to identify the proportion of activity and significant volumes and trades contributed by direct participants and indirect participants. To manage the risks arising from tiered participation arrangements, APEX Clear will also monitor Clearing Members' customer on-boarding and risk management practices (including credit monitoring, margin call processes, pre-trade controls, etc.) through the combination of off-site reviews of their quarterly and annual returns, onsite visits and inspections.
19.2	*An FMI should identify material dependencies between direct and indirect participants that might affect the FMI.*
	Clearing Members are required to have adequate business continuity arrangements, both as part of their licensing requirements as well as under the Clearing Rules. Clearing Members are obligated under the Clearing Rules to participate business continuity drills conducted by APEX Clear from time to time.
19.3	*An FMI should identify indirect participants responsible for a significant proportion of transactions processed by the FMI and indirect participants whose transaction volumes or values are large relative to the capacity of the direct participants through which they access the FMI in order to manage the risks arising from these transactions.*
	As discussed in Key Consideration 19.1, through the regular collection of information from Clearing Members, APEX Clear will be able to identify the proportion of activity and significant volumes and trades contributed by direct participants and indirect participants. There are other measures in place to monitor and manage the risks arising from tiered participation arrangements, such as the position limits (set at individual account level) and the exposure limits (set at Clearing Member level).
19.4	*An FMI should regularly review risks arising from tiered participation arrangements and should take mitigating action when appropriate.*
	APEX Clear's rules, controls, and procedures allows it to gather information and identify risks that may arise from tiered participation arrangements on a regular basis. When the risk

	becomes a concern, APEX Clear may impose restrictions on the Clearing Member in accordance with our risk management policies.
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	*Before entering into a link arrangement and on an ongoing basis once the link is established, an FMI should identify, monitor, and manage all potential sources of risk arising from the link arrangement. Link arrangements should be designed such that each FMI is able to observe the other principles in this report.*
	APEX Clear does not have any link arrangements with another FMI.
20.2	*A link should have a well-founded legal basis, in all relevant jurisdictions, that supports its design and provides adequate protection to the FMIs involved in the link.*
	APEX Clear does not have any link arrangements with another FMI.
20.3	*Linked CSDs should measure, monitor, and manage the credit and liquidity risks arising from each other. Any credit extensions between CSDs should be covered fully with high-quality collateral and be subject to limits.*
	Not applicable. APEX Clear is not a CSD and does not have any links with any CSD.
20.4	*Provisional transfers of securities between linked CSDs should be prohibited or, at a minimum, the retransfer of provisionally transferred securities should be prohibited prior to the transfer becoming final.*
	Not applicable. APEX Clear is not a CSD and does not have any links with any CSD.
20.5	*An investor CSD should only establish a link with an issuer CSD if the arrangement provides a high level of protection for the rights of the investor CSD's participants.*
	Not applicable. APEX Clear is not a CSD and does not have any links with any CSD.
20.6	*An investor CSD that uses an intermediary to operate a link with an issuer CSD should measure, monitor, and manage the additional risks (including custody, credit, legal, and operational risks) arising from the use of the intermediary.*
	Not applicable. APEX Clear is not a CSD and does not have any links with any CSD.
20.7	*Before entering into a link with another CCP, a CCP should identify and manage the potential spill-over effects from the default of the linked CCP. If a link has three or more CCPs, each CCP should identify, assess, and manage the risks of the collective link arrangement.*
	Not applicable. APEX Clear does not have any link with another CCP.

20.8	*Each CCP in a CCP link arrangement should be able to cover, at least on a daily basis, its current and potential future exposures to the linked CCP and its participants, if any, fully with a high degree of confidence without reducing the CCP's ability to fulfil its obligations to its own participants at any time.*
	Not applicable. APEX Clear does not have any link with another CCP.
20.9	*A TR should carefully assess the additional operational risks related to its links to ensure the scalability and reliability of IT and related resources.*
	Not applicable. APEX Clear is not a Trade Repository.
Principle 21: Efficiency and effectiveness ***An FMI should be efficient and effective in meeting the requirements of its participants and the markets it serves.***	
21.1	*An FMI should be designed to meet the needs of its participants and the markets it serves, in particular, with regard to choice of a clearing and settlement arrangement; operating structure; scope of products cleared, settled, or recorded; and use of technology and procedures.*
	APEX Clear takes a proactive approach in understanding the needs of its participants by engaging them through meetings and discussions to gather feedback on topics such as its Clearing Rules, clearing and settlement processes, new products and system development. Through these sessions, APEX Clear is able to establish and maintain close working relationships with its market participants, which in turn helps APEX Clear better understand the needs and requirements of its participants and at the same time, apprise its participants on the Clearing House's operational processes, new product development, etc. Market participants' feedback is taken into account to refine our rules, processes and development of a new product or service. Material changes to Clearing Rules and launch of new futures contracts are subject to a public consultation process. Feedback from the public consultation is reviewed and where appropriate, incorporated in the revised Clearing Rules or Contract Specifications. APEX Clear learns from the international derivatives experiences and practices in order to build a well-functioning and capital-efficient business model, and keeps itself apprised of the development of global market trends and technological advancements so that its business model is able to meet the evolving needs of the industry.
21.2	*An FMI should have clearly defined goals and objectives that are measurable and achievable, such as in the areas of minimum service levels, risk-management expectations, and business priorities.*
	APEX Clear's goals and objectives are to ensure the safety and soundness of the Clearing House as well as the transparency and efficiency of the market. To manage its risks effectively and comprehensively, APEX Clear has in place the overarching APEX Group's Risk Management Framework to facilitate effective risk discovery and ensure sufficient capital to cover these risks. Risks are managed within the levels and limits approved by the Board / Risk Management Committee, and a comprehensive framework of policies and procedures are

	established for the identification, assessment, measurement, monitoring, control and reporting of present and potential financial and non-financial risks. Through rigorous testing of its clearing facility and constant review of its operational processes, APEX Clear is able to provide market participants with a robust clearing facility to support post-trade administration, clearing and settlement, and risk management services.
21.3	*An FMI should have established mechanisms for the regular review of its efficiency and effectiveness.*
	APEX Clear staff maintain close communication with its market participants to facilitate regular feedback on its business and operations. Where necessary, APEX Clear will also appoint an independent vendor to carry out market survey on specific topics, consult industry and academic experts, and conduct research on best practices in international derivatives markets to ensure that its operations is efficient and effective.
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	*An FMI should use, or at a minimum accommodate, internationally accepted communication procedures and standards.*
	APEX Clear's Clearing System implements a subset of FIX (Financial Information eXchange) protocol for Clearing Members to interact with the Clearing House and receive real-time trade and position data. FIX is an internationally recognised industry-standard messaging protocol used by vendors to automate clearing transaction processing, which helps establish the effective integration between Clearing Members' back office systems and APEX Clear's Clearing System. To facilitate efficient payment, settlement and recording, APEX Clear uses the widely accepted and internationally utilised Society for Worldwide Interbank Financial Telecommunication for messaging of payment transactions via Settlement Banks. The internationally recognised Bank Identifier Codes is used to identify counterparties. The exchange of files and reports between APEX Clear and Clearing Members are via SFTP over secured private leased line, which is a widely used protocol globally. These files and reports contain information related to clearing, settlement and collateral management data for Clearing Members to integrate with their back-office systems and to perform clearing operations with APEX Clear.
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.***	

23.1	*An FMI should adopt clear and comprehensive rules and procedures that are fully disclosed to participants. Relevant rules and key procedures should also be publicly disclosed.*
	APEX Clear's Clearing Rules are fully disclosed and published on the APEX website. The key obligations and procedures binding APEX Clear and its Clearing Members are set out in the Clearing Rules. Other information relating to clearing such as risk management (e.g. default management, margin methodology, etc.) and Contract Specifications are publicly available on the same website. Circulars and Regulatory Notices relating to Clearing Rules are also made available on the website. When APEX Clear develops or amends its Clearing Rules, a public consultation is carried out (unless the changes have limited impact). The public consultation process gives market participants a preview of the upcoming changes and allows them to provide their feedback before they are finalised. Prior to the changes to the Clearing Rules, Clearing Members will be given the appropriate notification.
23.2	*An FMI should disclose clear descriptions of the system's design and operations, as well as the FMI's and participants' rights and obligations, so that participants can assess the risks they would incur by participating in the FMI.*
	Each Clearing Member executes an Electronic User Agreement which sets out the terms and conditions for connecting to APEX Clear's systems. During the Clearing Member on-boarding process, APEX Clear works with each potential Clearing Member to explain the system's design and operations, connectivity requirements, and conduct conformance tests. The rights of Clearing Members and participants are set out in the Clearing Rules, Contract Specifications and/or Delivery Procedures, which are accessible on the APEX website. Clearing Members also receive regular clearing reports and margin reports that show their exposures and margin liability to APEX Clear.
23.3	*An FMI should provide all necessary and appropriate documentation and training to facilitate participants' understanding of the FMI's rules and procedures and the risks they face from participating in the FMI.*
	APEX Clear's Clearing Rules have undergone a public consultation process prior to coming into effect and are publicly available to all participants. When there are new developments or amendments to the Clearing Rules, it will also go through a public consultation exercise, unless the changes are not material. Through the public consultation exercises, participants are able to understand the rules and procedures and identify any potential risks they face from being a Clearing Member. APEX Clear also interacts with potential Clearing Members to help them become familiar with APEX Clear's processes, systems and requirements. Further training on specific areas are provided upon request. When there are changes to APEX Clear's processes, systems and requirements, workshops, seminars or dialogue sessions may be conducted to educate Clearing Members on the changes. Additionally, APEX Clear offers support to existing Clearing Members through dedicated contact points in relation to their participation on APEX Clear.

23.4	*An FMI should publicly disclose its fees at the level of individual services it offers as well as its policies on any available discounts. The FMI should provide clear descriptions of priced services for comparability purposes.*
	APEX Clear's fees are publicly available on its website and Clearing Members are notified of any changes to such fees by Circulars.
23.5	*An FMI should complete regularly and disclose publicly responses to the CPSS-IOSCO Disclosure framework for financial market infrastructures. An FMI also should, at a minimum, disclose basic data on transaction volumes and values.*
	APEX Clear aims to review and disclose publicly its responses to the CPSS-IOSCO Disclosure Framework every 2 years. In addition, quantitative data which contain transaction volumes and values are updated every quarter on a one quarter lag basis, according to the CPMI-IOSCO Quantitative Disclosure Framework. These disclosures are publicly available on APEX website.
Principle 24: Disclosure of market data by trade repositories *Not applicable. APEX Clear is not a trade repository.*	