CONSULTATION PAPER

HKEx CLEARING HOUSE RISK MANAGEMENT REFORM MEASURES

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Hong Kong Exchanges and Clearing Limited
香港交易及結算所有限公司

CONTENTS

EXECUTIVE SUMMARY

1. The 2008 global financial crisis prompted governments, regulators, and financial institutions to, among other things, increase capital adequacy standards and enhance risk management requirements. One area of their focus is clearing houses' acting as central counterparties ("CCPs") such as the three clearing houses at HKEx. The Securities and Futures Commission ("SFC"), similar to overseas regulators, requires that we meet or exceed the evolving international standards for clearing houses, which in some areas are more demanding than our current arrangements.

2. HKEx recognises that as institutions of systemic importance, our clearing houses and the robustness of their risk management measures are crucial to the long term stability and competitiveness of the Hong Kong financial market. HKEx also notes that there are gaps in the current risk management regime in terms of funding adequacy and scalability which require proper attention. In cooperation with the SFC, we have conducted a review of the clearing houses' risk management measures, with particular focus on the stress testing methodologies and the adequacy of clearing houses' financial resources in meeting the role of a CCP.

3. Our review draws reference to the main international standards setting bodies, the Committee on Payment and Settlement Systems ("CPSS") and the Technical Committee of the International Organization of Securities Commissions ("IOSCO"). CPSS and IOSCO comprise the major international securities regulators, central banks and banking regulators. We have also benchmarked against the arrangements of major overseas markets.

4. The main areas of review are:

   a) Our stress testing which serves to measure the financial resources required by the clearing houses; and

   b) The adequacy and mechanics of our collection of margin and financial contributions from Clearing Participants ("CPs") for the funds known as Reserve and Guarantee Funds where risk is pooled.

5. The main proposals in this paper are to:

   a) Revise certain Price Movement assumptions in our stress testing;

   b) Revise Counterparty Default assumption in our stress testing; and

   c) Introduce a standard margin system and a Dynamic Guarantee Fund ("Dynamic GF") in the cash market at HKSCC.

6. Under these proposals, CPs will contribute to the clearing houses at a level that would better reflect the risks associated with their business activities. The main impact of these proposals will be a potential increase in CPs' financial contributions, depending on their overall positions. However, some CPs may benefit as a result of the new proposals. For example, HKSCC CPs which are subject to the additional collateral requirement may find themselves contributing less under the standard margining system during period of relatively low market volatility (such as that experienced by the market from March 2009 to date). In addition, around 90% of SEOCH CPs will enjoy a reduction in Dynamic Reserve Fund ("Dynamic RF") contribution after the revision of certain stress testing assumptions.

7. Recognising the impact of the reform to the market, HKEx proposes to share with the CPs the added burden from the recommended changes. The support from HKEx will be in the form of:

   a) HKSCC Margin Credit;

   b) HKSCC Dynamic GF Credit; and

   c) HKCC Contingent Advance Capital ("HKCC Contingent Advance").

8. HKEx will in parallel set aside additional shareholders' funds to boost its support to the clearing houses' financial resources.

9. HKEx will give reasonable and sufficient lead time to the market to prepare for the necessary changes. We will take into account market readiness in determining the timing of implementation.

10. Further tightening of IOSCO standards, market growth and changing dynamics may require increasing Guarantee Fund ("GF") / Reserve Fund ("RF"). To ensure sustainability and scalability HKEx would like to work with the HKSAR Government and the regulator to consider a Risk Management Fund ("RMF") or pooled margin model.

11. We invite interested parties to express their views and comments on this paper. Respondents should reply to this consultation paper by completing and returning the questionnaire which is available at http://www.hkex.com.hk/eng/newsconsul/mktconsul/Documents/cp201107q.doc on or before 28 October 2011.

12. A consultation conclusions paper will be issued summarising the main points made by the respondents and indicating the way forward.

INTRODUCTION

Background of the Review

13. HKEx has three clearing houses, namely, HKSCC, HKCC and SEOCH. They are known as CCPs undertaking the settlement of trades in the securities and derivatives markets in Hong Kong. In assuming the CCP role, HKEx's clearing houses undertake to manage the risk of counterparty loss arising from CP default.

14. The 2008 global financial crisis and the demise of the "too big to fail" institutions served as a wake up call for governments, regulators, CCPs and financial institutions across different countries to rethink risk and the management of risk. Although Hong Kong's financial markets remained relatively healthy during this financial crisis, lessons were learned from HKEx's peers around the world and from HKEx's own experience.

15. The loss incurred by HKSCC in connection with the defaults of the Lehman Brothers entities in Hong Kong clearly evidenced that HKSCC needs to strengthen its existing risk management measures to address the financial resource support required to meet its CCP role, given the nature and size of the Hong Kong securities market and its regulatory regime and taking into consideration the international standards applicable to CCPs.

16. Other CCPs internationally have reviewed or are reviewing ways of enhancing their risk protection mechanisms. This echoes an increasing support from markets around the globe for CCPs to incentivise their CPs to better manage the risk they bring to the CCPs through enhanced collateral requirement measures and strengthening of their overall financial resources.

17. As a major global financial exchange, HKEx strives to be on a par with or exceed international standards and leading international CCPs in its risk management measures. We have referred to the CPSS-IOSCO Technical Committee Recommendations for Central Counterparties ("2004 IOSCO Recommendations"), and the CPSS-IOSCO Principles for Financial Market Infrastructures Consultative Report issued in March 2011 ("2011 IOSCO Consultative Report"), as well as the established practices of other leading international CCPs[1].

About Clearing Houses' Current Risk Management Framework

18. HKEx's financial resources available to cover a default loss projected under stress testing assumptions ("Projected Loss") due to CP default are built upon three funding blocks:

    a) Margin / additional collateral;

    b) GF / RF; and

    c) HKEx Risk Management Capital ("HKEx RM Capital").

19. Margin, the first layer of financial resources, is designed to protect CCPs against potential exposure arising from the liquidation of defaulting CPs' positions under "normal" market situations[2]. HKCC and SEOCH collect margin daily and on additional ad hoc bases in volatile markets. HKSCC collects additional collateral daily in addition to daily mark-to-market payments as the first line of support but it does not have an established margining mechanism.

[1] Benchmarking against the practices of overseas clearing houses in this consultation paper has been compiled on a best-efforts basis through desktop research of publicly available information. HKEx also makes reference to other non-disclosable information of other clearing houses as it formulates this proposal.

[2] Annex 3 of the 2004 IOSCO Recommendations defines normal market conditions as "*price movements that produce changes in the exposure that are expected to breach margin requirements or other risk control mechanisms only 1% of the time, that is, on average on only one trading day out of 100* ."

Margin and additional collateral pledged by non-defaulting CPs will not be used to cover default losses created by other CPs (i.e. non-pooled).

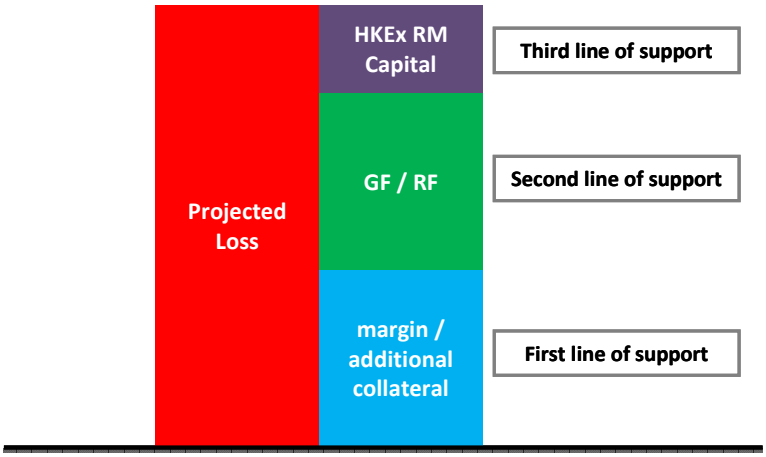
20. HKSCC, HKCC and SEOCH each have their own GF or RF as the second line of support. Contrary to margin, GF and RF are established on a "pooled" basis, i.e. losses created by defaulting CPs can be shared by non-defaulting CPs.

21. The HKEx RM Capital is provided by HKEx to further strengthen the risk management regime of HKEx's clearing houses and to support their roles as CCPs. As the third line of support, this financial resource is available to all three clearing houses.

22. The inter-dependency of the funding components requires that they be sourced from relevant stakeholders in an equitable, balanced and cost efficient manner. The funding components should also be scalable and responsive to market growth and changing market dynamics. At present, the margin of the derivatives clearing houses and additional collateral of HKSCC are funded by CPs and/or their clients, while the GF and RF are made up of contributions from both CPs and the respective clearing houses. The HKEx RM Capital is solely funded by HKEx through setting aside HK$3.1bn of its shareholders' funds.

23. Figure 1 depicts how the Projected Loss is covered by the layered financial resources:

Figure 1: HKEx Clearing Houses' Layers of Financial Resources
(for illustration only and not proportional to the actual amounts involved)



About This Consultation Paper

24. This consultation paper seeks views on the proposed changes to the stress testing assumptions in arriving at the Projected Loss and on specific proposals to establish sufficient financial resources to cover the Projected Loss. Analysis was conducted using market and CP position data for a three-year period of September 2007 through December 2010 ("Reference Period").

25. The last section of this consultation paper presents two additional funding models, i.e. establishment of a RMF and the pooled margin model which HKEx has considered but decided not to propose in this paper. The two models may be explored as a separate exercise as and when appropriate.

PROPOSAL 1:
REVISE HKEx STRESS TESTING ASSUMPTIONS

BACKGROUND

26. Paragraph 4.5.3 of the 2004 IOSCO Recommendations provides that "*stress testing is used by CCPs to assess the adequacy of their financial resources. A CCP assumes extreme market conditions (that is, price changes significantly larger than the normally prevailing levels of volatility), and evaluates the potential losses in individual participants' positions*." Paragraph 4.5.4 states that "*a CCP should make judgments about what constitutes "extreme but plausible" market conditions. The conditions evaluated should include the most volatile periods that have been experienced by the markets for which a CCP provides its services*."

27. More details on the relevant 2004 IOSCO Recommendations, namely, "Recommendation 3: Measurement and management of credit exposures" and "Recommendation 5: Financial resources" are in Appendix I for reference.

28. HKSCC, HKCC and SEOCH conduct daily stress testing against positions[3] of the CPs with reference to the prevailing market prices to determine the Projected Loss on the basis of two key assumptions (1) Price Movement and (2) Counterparty Default.

29. The clearing houses then assess their levels of capital adequacy by comparing the Projected Loss to the financial resources in terms of margin / additional collateral and GF / RF. The HKEx RM Capital will be used as a back-up in situations where a shortfall is observed in the clearing houses. The daily stress testing reveals that there is a regular reliance on the HKEx RM Capital under the current risk management arrangements of the clearing houses. As explained later in this paper, the amount of HKEx RM Capital will be enhanced together with the other proposed changes.

Current Practice

30. The three clearing houses assume the following in conducting stress testing to arrive at the Projected Loss:

    a) **Price Movement:** A Price Movement assumption of ±20% is applied uniformly across key markets of the three clearing houses, implying that closing out transactions would be completed at this market movement in a default situation[4].

    b) **Counterparty Default:** We assume default of the higher of (1) the single largest CP or (2) 30% of loss-making positions. We also assume that no payments or securities deliveries would be made by a defaulting CP to settle its outstanding obligations.

[3] HKSCC combines the long and short unsettled positions across the T+2 settlement period to arrive at the net CNS position. Please refer to Appendix II for current and proposed Projected Loss calculation basis.

[4] The key markets are securities, HSI futures and options, HSCEI futures and options, and stock options. The closing out of securities and futures would be completed at the market movement of ±20% whereas options would be completed at the market movements when their underlying moves by ±20%.

PROPOSAL 1

Revise Price Movement Assumptions

31. We propose to use a set of assumptions based on the most volatile historical price movements for HKSCC and SEOCH, with a modification for HKCC markets:

Table 1: Proposed Price Movement Assumptions

Clearing House	Key Markets	Proposed Price Movement Assumptions	Worst Case Price Movement during the Most Volatile Periods*
HKSCC	Securities (except structured products movement of which will remain unchanged at 100%)	±22%	-21.75% (5 June 1989)
HKCC	HSI futures & options	±20% (plus evaluate ±25%)	+24.8% (29 October 1997)
	HSCEI futures & options	±20%	+15.92% (19 September 2008)
SEOCH	Stock options	±22%	-21.75% (5 June 1989)

** The market crash scenario in 1987 is excluded as the drastic drop of 33% and 44% in HSI & HSI futures markets in 1987 was exacerbated by the closure of Hong Kong markets for four days which is recognised as unlikely to recur in the future. On this basis HKEx and its regulator have agreed on this exclusion.*

32. The current Price Movement assumptions do not reflect the historically extreme market conditions in each individual market as contemplated by the IOSCO standards. Our benchmarking also indicates that major overseas clearing houses generally include the worst historical price movements for different products and markets in their Price Movement assumptions although many do not calculate Projected Loss strictly from the single worst price movement.

33. We have had extensive discussions with the Hong Kong regulator to determine, among other things, the appropriate level of Price Movement assumptions. The SFC is of the view that the Price Movement assumptions should be simple, prudent and objective, while at the same time taking into consideration other factors such as potential market impact and unique market structure. The SFC prefers using the highest historical price movements for the Price Movement assumptions. HKSCC and SEOCH Price Movement assumptions will therefore increase from the current ±20% to ±22%.

34. The regulator and HKEx have arrived at a consensus to keep the Price Movement assumption for HKCC HSI futures and options at the current ±20% level whilst also evaluating the stress testing at the highest historical price movement of ±25% as specified by the IOSCO standards. HKEx will also conduct a review three years after implementation to evaluate the new IOSCO standards which apply. The SFC has also requested that if the HSI futures market experiences extreme volatility and reaches a new high point during this three-year period, the review would have to be brought forward.

35. Although the highest historical price movement for HKCC HSCEI futures is 16%, the regulator has recommended keeping the Price Movement assumption at ±20% based on the following reasons:

    a) The HSCEI futures market, which was launched only in 2003, had not been tested during one of the most volatile periods in the history of Hong Kong's financial market (i.e. during the Asian financial crisis in 1997 and 1998);

    b) In comparison the HSCEI, the underlying index of the HSCEI futures launched in 1994, went through the most volatile periods named above. It can therefore be used as a good and useful reference in assessing the likely volatility of the HSCEI futures market; and

    c) The volatility of the futures contracts in our markets has been consistently higher than those of the underlying indexes. And in view of the uncertainties that the global financial markets will continue to face in the future, the Price Movement assumption should be set at a level higher than the highest historical price movement of HSCEI of 18%.

Revise HKEx Counterparty Default Assumption

36. We propose (1) removing the 30% of loss-making positions from the current assumption; and (2) adopting default of the single largest CP plus the fifth largest CP.

37. The current Counterparty Default assumption based on 30% of the loss-making positions was established prior to the introduction of the IOSCO Recommendations and does not have any connection to any specific industry standards. It is common international practice that the Counterparty Default assumption is determined with reference to the 2004 IOSCO Recommendations which provides that "*A CCP should maintain sufficient financial resources to withstand, at a minimum, a default by the participant to which it has the largest exposure in extreme but plausible market conditions*." We view the 30% Counterparty Default assumption to be obsolete and propose that it be removed.

38. It is worth noting that assuming default of a single largest CP under the current Counterparty Default assumption only meets IOSCO's minimum standard. Paragraph 4.5.2 of the 2004 IOSCO Recommendations provides that "*Planning by a CCP should consider the potential for two or more participants to default in a short time frame, resulting in a combined exposure greater than the single largest exposure*." In fact, some major overseas clearing houses exceed the minimum by including more than the single largest CP. Appendix III sets out a summary of international practices on stress testing assumptions.

39. In Hong Kong, the local regulator considers it appropriate for HKEx to exceed the minimum international standard and suggest the default of an additional "reasonably large CP" in the stress testing calculation. We have arrived at a consensus that default of the fifth largest CP be proposed in addition to the largest CP for stress testing purposes.

ISSUES TO BE CONSIDERED

Possible Higher Future IOSCO Standards

40. CPSS and IOSCO are now reviewing the principles set out in the 2011 IOSCO Consultative Report. The consultation period will end in July 2011 and a final report is expected in 2012. It is broadly expected that more stringent capital adequacy standards and stress testing assumptions will arise in the future. For example, CPSS and IOSCO are contemplating increasing the largest CP default assumption to include either the single largest CP plus affiliates (in terms of stress projected loss) or the two largest CPs and affiliates. They have also removed references to contingent claims against non-defaulting CPs that are allowed as acceptable resources in stress testing under the 2004 IOSCO Recommendations. HKEx's view is these two changes would likely have a very large impact on most clearing houses. The HKEx assumptions may need to be further revised to meet higher industry standards and the requirements of the local regulator in the future.

QUESTIONS FOR RESPONSE

Question 1:

Do you support the proposed revision of the Price Movement assumptions in stress testing? Please provide reasons for your response and include any other suggestions or comments you may have on this question.

Question 2:

Do you support the proposed revision of the Counterparty Default assumption in stress testing? Please provide reasons for your response and include any other suggestions or comments you may have on this question.

PROPOSAL 2:

INTRODUCE MARGINING AND DYNAMIC GUARANTEE FUND IN HKSCC

BACKGROUND

41. HKSCC undertakes the settlement of stock exchange trades and exercised options trades accepted to be settled under the Continuous Net Settlement ("CNS") System in CCASS[5]. If a CP defaults, HKSCC will proceed with its default handling procedures under the CCASS Rules to close out the defaulter's outstanding CNS positions. In this process, HKSCC may suffer losses due to adverse market price movements occurring during the closing-out.

42. To mitigate the risk of default losses, HKSCC has the right under its Rules to require collateral from CPs. In addition, CPs are required to contribute to the HKSCC GF[6], which is established to provide additional safeguards to withstand any residual default loss that exceeds the collateral received from the defaulting CP. However, it has been demonstrated consistently in HKSCC daily stress testing that the protection provided by the current risk management measures cannot adequately withstand the potential losses that HKSCC could incur under the stress scenarios.

Current Practice

Collateralisation

43. HKSCC collects collateral from CPs in the forms of marks, concentration collateral and additional collateral. Marks[7] are calculated based on the mark-to-market losses of a CP's unsettled CNS positions as a result of unfavourable movements of stock prices which have already occurred. HKSCC also requires a CP to provide concentration collateral if the CP holds concentrated positions in securities that are considered to be high risk by HKSCC.

44. HKSCC also has the right to require additional collateral from any CP as it deems necessary to cover risks arising from its specific business activities, financial condition or internal control environment. To protect HKSCC against major default losses, after the collapse of Lehman Brothers Securities Asia Limited ("Lehman") in September 2008, HKSCC imposed additional collateral requirements on selected CPs based on a set of defined criteria. CPs that are subject to the additional collateral requirement usually hold sizeable positions relative to overall market positions and/or their reported liquid capital, or have large positions in illiquid stocks. However, unlike the two derivatives clearing houses of HKEx, HKSCC does not apply an across the board methodology for the assessment of daily additional collateral requirements or margin for the overall securities market.

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[5] CCASS means the Central Clearing and Settlement System established and operated by HKSCC.

[6] Under the CCASS Rules, all CPs are required to contribute to the GF and are obligated to share default losses on a pooled basis. CPs' GF contributions are in proportion to their average daily CNS positions in the previous month subject to a minimum amount.

[7] All CNS positions are marked to the market price twice a day. For intra-day mark-to-market, CPs are required to provide net unfavourable marks that exceed a tolerance limit of HK$5mn to HKSCC as collateral. For day end mark-to-market, CPs are required to provide the net unfavourable marks to HKSCC as collateral.

HKSCC GF

45. HKSCC maintains the GF as the second line of support against the risk of default losses that exceed the amount of collateral received from the defaulting CPs. HKSCC GF currently comprises:

    a) CPs' contributions;

    b) HKSCC's contributions; and

    c) Accumulated income from investment of GF assets.

46. The GF operates on a pooled basis which is common within the CCP industry. Since the establishment of the GF, aggregate CPs' contribution has been maintained at about HK$120mn[8] despite the growth of market turnover by about 30 times since 1992. The aggregate CP contributions to the GF are shared among CPs according to their respective shares of average daily CNS positions in the preceding month, subject to a minimum contribution requirement[9]. This sharing is reviewed monthly and CPs' required contributions are adjusted after each review.

47. In addition, to cope with the increasing size of default risk in a growing securities market, HKSCC has made ad hoc contributions to the GF since 1993 by transferring capital from its retained earnings. These ad hoc contributions by HKSCC amounted to HK$200mn. As at today, the balance of HKSCC's contributions to the GF after offsetting default losses is about HK$120mn.

48. HKSCC's contributions to the GF and the accumulated investment income have been applied to cover losses in two previous CP defaults[10]. Although HKSCC has the right to allocate losses due to CP default to the non-defaulting CPs' contributions, it has not done so in the past.

49. HKSCC invests the cash component of the GF under its investment policy which in turn generates investment income for the GF. HKSCC also pays interest to CPs at prevailing bank saving rate for their contributions in cash that exceed the required minimum cash contribution. The accumulated investment income in the GF as of 31 December 2010 is around HK$5.4mn after being used to offset default losses.

50. Since 2008, the size of the GF has been kept at around HK$245mn. This fund size has been relatively static and is referred to as "Fixed GF" for the rest of this consultation paper.

Order of Application Among the GF Components

51. For residual losses to be recovered from the GF, CCASS Rule 2507 states that payments out of CPs' contributions shall be treated in the following order of priority:

    a) First, defaulting CPs' contributions; and

    b) Then, non-defaulting CPs' contributions on a pro-rata basis.

52. CCASS Rules do not further specify the order of application for the other components of the GF. In the previous default cases, the residual losses were set off against, firstly the defaulters' contributions, then against the GF accumulated investment income, and finally against HKSCC's contributions.

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[8] Aggregate CPs' contribution is set at HK$100mn and is shared among CPs based on their share of average daily CNS positions in the preceding month. However, as there is also a minimum cash contribution requirement per CP, the aggregate CPs' contribution is greater than HK$100mn and the excess is around HK$20mn.

[9] A Direct Clearing Participant's minimum cash GF contribution is HK$50,000 in respect of each trading right held.

[10] The two cases are the defaults of Tai Wah Securities Limited in 2003 where a loss of HK$1.7mn was set off against the GF and Lehman in 2008 where a loss of HK$154.6mn was set off against the GF. As decided by the HKEx Board neither set off was applied to non-defaulting CPs' contributions to the GF.

PROPOSAL 2

53. The collapse of Lehman which resulted in a default loss to HKSCC made it clear that HKSCC needed to strengthen its existing collateral policy and its Fixed GF to address the financial resource support required to meet its CCP role, given the nature and size of the Hong Kong securities market. HKEx notes that in the global financial crisis CCPs performed as designed without any major incidents or bail-outs, unlike many other financial institutions.

54. Benchmarking of international risk management practices shows that major overseas CCPs have adopted scalable risk management measures to support their roles as CCPs. LCH.Clearnet Ltd, LCH.Clearnet SA and Eurex have implemented margining (a non-pooled based measure) to cover reasonably foreseeable default losses in normal market conditions. At least one overseas CCP collects "margin" from its CPs and deposits margin amounts into a default fund that operates on a pooled basis. Many overseas clearing houses also have dynamic default funds (a pooled based measure) to provide additional financial resources to cover excess default losses (please refer to Appendix IV). This "non-pooled upfront margin + pooled default fund" approach is also adopted by HKCC and SEOCH, the two HKEx's derivatives clearing houses.

55. The HKSCC risk management framework, especially the Fixed GF, is not scalable to changing risk levels. To enhance the risk management framework, HKEx proposes to introduce margining and a Dynamic GF in HKSCC. Margining, a non-pooled measure, will be used to cover potential default losses under normal market conditions; while the Dynamic GF, a pooled measure that is scalable, will be used as a second line of support against potential excess losses in extreme but plausible situations.

(I) Introduce Margining at HKSCC

56. As explained in paragraph 43, the calculation of marks only takes into account market factors that have already been realised and reflected in stock prices. Marks are collected from CPs after the market has already moved unfavourably against the CPs' CNS positions. It is a reactive mechanism as it does not provide any protection against risk of unfavourable market movements in the future. Therefore, HKSCC proposes to adopt margining as a measure to safeguard against exposures to future market movements.

57. We propose a volatility based margin measure. A volatility based margin is generally more desirable than measures of a static nature, due to its self-adjusting capability to changes in market volatility. This provides the CCP with the required protection in a similar way as the derivatives market best practices.

58. The proposal for HKSCC was devised after benchmarking the practices of major international clearing houses and backtesting the results using data in the Reference Period. It applies a Value at Risk approach, which is designed to estimate the worst expected losses over a given time interval under normal market conditions at a given confidence level. In the proposed margining model, the required margin will cover such default losses with a high degree of confidence (i.e. 99.73%).

59. The margin requirement from each CP would be determined by the following formula:

Margin Requirement = (Margining Position × Margin Rate) – Margin Credit

60. A CP's Margining Position will be calculated with reference to the composition of its unsettled CNS positions. Please refer to Appendix V for a detailed explanation on the calculation of Margining Positions. In addition, to mitigate cross-currency risk, a CP's Margining Position will be maintained in the original trade currency, with related margin being calculated and collected in that currency.

61. As standardised margining will be relatively new to some HKSCC CPs, for operational and administrative ease, we propose to apply a single Margin Rate to all CNS positions for the calculation of margin requirements. Also, for simplicity, we propose to use the historical movements of HSI as a proxy for the overall market volatility in the determination of the Margin Rate. Appendix VI reflects what the Margin Rates would have been during the Reference Period.

Margin Credit

62. To alleviate the possible financial and operational burden on CPs, HKSCC proposes to grant every HKSCC CP a Margin Credit up to HK$5mn[11]. This proposed Margin Credit will be supported by HKEx's financial resources in the HKEx RM Capital arrangement. As a result, CPs will only be required to provide margin for the amounts in excess of this Margin Credit. With this proposed Margin Credit of HK$5mn and assuming a Margin Rate of 7.5%, a CP with Margining Position ≤HK$66mn will not be required to pay any margin. If a CP defaults and any loss arises, HKSCC will contribute to the shortfall up to the Margin Credit granted.

63. Had the proposed margining model with HK$5mn Margin Credit been implemented in the Reference Period, on average 19% of the CPs (81 out of 435 with Margining Positions), would have been required to provide margin on a given day. The average daily margin that would have been collected during the Reference Period was HK$3.8bn (after deducting HK$0.7bn Margin Credit for the market), which accounted for 84% of the total margin requirement from all CPs if the Margin Credit is not granted. A more detailed market impact analysis of the proposed margining is provided in Appendix VII. HKSCC will review this Margin Credit arrangement from time to time and may consider making adjustments if necessary.

Frequency of Margin Calculation, Collection and Refund

64. Margin calculation, collection and refund will be performed at the end of each business day. In addition, a mandatory intra-day margin ("IDM") calculation and collection (no refund) will be made on the day prior to Hong Kong public holidays that last for more than one calendar day (other than Saturday and Sunday) similar to arrangements at HKCC and SEOCH.

65. Money settlement instructions will be issued at the end of each business day to CPs' designated banks with payment confirmation by 09:30 on the next business day. For IDM calls, money settlement instructions for the collection of additional margin will be issued in the afternoon and settled on the same day.

66. Margin reports will be generated to CPs via CCASS terminals. To facilitate the funding arrangement of CPs, the current broadcast messages for periodic marks provision that are generated at around 14:45, 15:45 and 16:30 each business day will be enhanced to include estimated margin requirement.

67. Margin payment can be made in the forms of cash or bank guarantee, subject to the HKSCC bank guarantee acceptance policy. CPs can also provide Specific Stock Collateral to offset their corresponding Margining Positions for margin calculation.

[11] The Margin Credit granted to a CP will be the lower of the CP's margin requirement or HK$5mn.

(II) Introduce HKSCC Dynamic GF

68. To make the GF scalable to changes in risk exposures, we propose to add the Dynamic GF to the Fixed GF. The size of the Dynamic GF would be determined from the daily stress testing performed by HKSCC. It is designed to cover any residual Projected Loss under the stress testing assumptions after deducting the margin collected from the CPs assumed to default in the stress scenario, and the amount of the Fixed GF. It can be represented by the following formula:

Dynamic GF = Projected Loss – Defaulting CPs' Margin[12] – Fixed GF

69. Unlike the Fixed GF, there is no ceiling on the size of the proposed Dynamic GF. Conceptually, the required size of the Dynamic GF as determined above should be contributed by CPs according to their respective shares of the risk in the market. To approximate a CP's risk level, a "GF Position" is calculated with reference to the composition of the CP's daily CNS obligations. Also, a "Market GF Position" will be calculated by aggregating the GF Positions of all CPs. The following summarises a CP's contribution requirement to the Dynamic GF:

A CP's Dynamic GF Requirement	=	The CP's share of average daily Market GF Position in the preceding month x Dynamic GF Size	-	Dynamic GF Credit (proposed HK$1mn[13])

70. An example illustrating the calculation mechanism of the Dynamic GF can be found in Appendix VIII.

Dynamic GF Credit

71. HKEx recognises that the introduction of Dynamic GF will inevitably have working capital impact on CPs. To lighten the possible financial burden on HKSCC's CPs, it is proposed that a Dynamic GF Credit of HK$1mn be granted to each CP. This proposed Dynamic GF Credit will be supported by HKEx's financial resources in the HKEx RM Capital arrangement.

72. Had the proposed HK$1mn Dynamic GF Credit arrangement been adopted in the Reference Period, on average 22% of the CPs (101 out of 456) would have been required to contribute to the Dynamic GF on a given day. The average Dynamic GF contributions collected from the securities market would have been about HK$1.1bn (after deducting HK$0.2bn Dynamic GF Credit for the market). This amount was equivalent to about 86% of the required size of the Dynamic GF in the Reference Period, with the remaining 14% borne by HKEx through the Dynamic GF Credit arrangement.

73. A detailed market impact analysis of the proposed Dynamic GF is provided in Appendix IX. The level of Dynamic GF Credit will be subject to review by HKSCC from time to time, and will be revised if necessary to adapt to changing market conditions.

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[12] If additional collateral other than margin is collected from a CP, the additional collateral will also be deducted for the purpose of determining the Dynamic GF size.

[13] The Dynamic GF Credit amount is the lower of the CP's share of average daily Market GF Position in the preceding month x Dynamic GF Size or HK$1mn. Hence a CP's Dynamic GF requirement cannot be less than zero.

74. In the event of default resulting in the Dynamic GF being applied, the amount applied from the Dynamic GF will be shared among the non-defaulting CPs and HKEx. This sharing will be made on a pro rata basis with reference to the non-defaulting CPs' Dynamic GF contributions, and the Dynamic GF Credits granted by HKEx. CPs and HKEx will be required to replenish their respective shares of any amounts applied in order to maintain the Dynamic GF at the required level.

Frequency of GF Review, Collection and Refund of CPs' GF Contributions

75. Monthly review of CPs' required contributions to the GF will be conducted. Ad hoc review will also be conducted if considered necessary by HKSCC in response to changing market conditions.

76. Currently, the monthly review of the Fixed GF is conducted on the 5th business day of the month, with collection and refund performed on the 12th business day. We propose to advance the review day to the 1st business day of each month, with collection and refund made on the 4th business day.

Notification of CPs' GF Requirements

77. There will be no change to the current notification arrangement. CPs' GF statements containing their respective contribution requirement will be prepared after each GF review. The statements will be available for downloading by the respective CPs via their CCASS Terminals. Broadcast messages will also be made to remind CPs that the updated GF statements are available.

Form of GF Contributions

78. There will be no change to the acceptable forms of GF contributions. Both Fixed GF and Dynamic GF will be denominated in Hong Kong dollar. Except for the minimum cash contributions required for the Fixed GF, CPs can meet their remaining GF contribution requirements (Fixed GF or Dynamic GF) either in cash or bank guarantee, subject to the HKSCC bank guarantee acceptance policy. Other collaterals may be considered when there is sufficient demand.

Order of Application

79. The revised order of application of the different financial resources available to cover default losses is included in Appendix X. The revised order reflects the added protection resulting from the adoption of the proposed margining and Dynamic GF.

ISSUES TO BE CONSIDERED

80. We recognise that the proposed risk management enhancements will impact the market in a number of ways. We have prepared an assessment in Appendices XI and XII that analyses the possible financial impact on both the aggregate market level as well as on individual CPs. We would also like to assist consideration of these impacts by outlining below some key issues. We welcome input on these points.

HKSCC Margining

81. Issues related to margining in HKSCC include:

    a) **Additional working capital:** To meet the proposed margin requirements, additional working capital may be required. However, even though all CPs with outstanding CNS positions are theoretically subject to margin requirements, the proposed Margin Credit arrangement would greatly reduce the number of margin paying CPs to only about 19% of the total number of CPs.

    b) **Funding in foreign currency:** The proposed arrangement requires that margin be payable in the denominated currency of the CNS positions. A CP that holds CNS positions in foreign currencies, e.g. RMB, would require funding in the respective currencies to meet its margin payments.

HKSCC Dynamic GF

82. Issues related to the HKSCC Dynamic GF include:

    a) **Additional liquid capital:** We understand from the SFC that CPs' contributions to the GF (unlike margin) are not classified as a form of liquid capital under the Securities and Futures (Financial Resources) Rules ("FRR") in the Securities and Futures Ordinance. Absent a change by the SFC of its FRR, CPs may, depending on their current excess levels of liquid capital, if any, need more capital to meet their Dynamic GF and liquid capital requirements. HKEx has asked the SFC to allow GF contributions to be counted as liquid capital, alongside the practices of some overseas markets (e.g. US and Singapore) where deposits to default funds are classified as acceptable liquid capital.

    b) **Shortened time to settle GF contribution payment:** With the proposed change in collection and refund schedule, CPs would have three business days as opposed to seven business days to pay their GF contribution obligations.

QUESTIONS FOR RESPONSE

Question 3:

Do you agree with the proposed margining arrangements at HKSCC? Please provide reasons for your response and include any other suggestions or comments you may have on this question.

Question 4:

Do you agree with the proposed Dynamic GF model at HKSCC? Please provide reasons for your response and include any other suggestions or comments you may have on this question.

PROPOSAL 3:
REVISE HKCC RESERVE FUND CALCULATION

BACKGROUND

83. The HKCC RF operates on a dynamic and scalable basis broadly similar to the SEOCH RF, but contrasts with the HKSCC Fixed GF. The RF provides resources for HKCC in meeting its obligations as a CCP in the event that the losses arising from one or more CPs' default cannot be fully covered by the defaulting CPs' margin.

Current Practice

84. HKCC RF comprises a fixed component and a dynamic component:

    a) **Fixed RF:** It comprises[14] (1) CPs' fixed contribution in the amount of HK$297mn; (2) clearing house contribution of HK$120mn; and (3) accumulated investment income of HK$224mn.

    b) **Dynamic RF:** Also known as HKCC Participant Additional Deposits[15], it is scalable to reflect clearing house exposure to counterparty risk. On each trading day, HKCC estimates the size of the RF required to cover market risks and determines whether any additional Dynamic RF would be required from HKCC CPs, taking into consideration the risk exposure of the RF and the prevailing market conditions. Under the current rules, CPs are responsible for paying 100% of the Dynamic RF which is calculated with the stress testing assumption that 30% of loss-making positions default. HKEx contributes to the RF fixed portion and backs up the RF with its HK$3.1bn HKEx RM Capital to cover the portion of the single largest CP's Projected Loss in excess of that determined under the 30% assumed default rate.

85. The level of Dynamic RF required to be contributed by HKCC CPs is a function of Projected Loss, margin of the CPs assumed to default and Fixed RF:

Dynamic RF = Projected Loss – Defaulting CPs' Margin – Fixed RF

    a) **Projected Loss:** As discussed in PROPOSAL 1 of this paper, Projected Loss is calculated based on the Price Movement and Counterparty Default assumptions. Any changes in these assumptions will affect the level of Projected Loss which will in turn affect the size of Dynamic RF.

    b) **Defaulting CPs' margin and collateral ("Collateral assumption"):** HKCC currently assumes that it is able to collect, and give credit in its daily RF calculation to, collateral lodged by CPs with HKCC or required by HKCC. This collateral includes clearing house margin, excess funds and amounts assumed to have been received from a certain number of defaulting CPs following IDM calls and prior to default.

[14] Amount as of 31 December 2010.

[15] Chapter VII – the Reserve Fund of the Rules of HKCC and Chapter 4 – Reserve Fund Contribution of the Clearing House Procedures for Futures/Options Contracts Traded on the Automated Trading System of the Exchange ("HKATS") refers.

PROPOSAL 3

Revise Stress Testing Assumptions

86. Table 2 summarises the proposed changes to stress testing assumptions for HKCC:

Table 2: Proposed Changes to HKCC Stress Testing Assumptions

Stress Testing Assumptions	Current	Proposed
Price Movement	• ±20% for HSI futures & options • ±20% for HSCEI futures & options	• Unchanged • Also evaluate at ±25% for HSI futures & options
Counterparty Default	• Higher of largest CP or 30% of loss-making positions	• Largest + 5th largest CPs • Remove 30% default rate
Collateral	• Count collateral assumed to have been received following IDM calls in daily RF calculation	• Exclude assumed credits given to IDM from daily RF calculation

87. Proposed changes in Price Movement and Counterparty Default assumptions are discussed under PROPOSAL 1.

88. As for the Collateral assumption, HKEx recommends removing the assumed IDM credits from stress testing. Although the 2004 IOSCO Recommendations allow the counting of financial resources from contingent claims on non-defaulting CPs as long as these claims can be reliably drawn on when needed, it is difficult to predict reliably whether collateral after an IDM call could be collected ahead of an assumed CP default. Therefore, the proposal will align HKCC stress testing more closely with IOSCO Recommendations.

89. We analysed the Dynamic RF collectible from HKCC CPs after adoption of the revised stress testing assumptions based on the Reference Period. The results indicate that the average Dynamic RF would have increased by about three times from HK$409mn to HK$1,378mn after adopting the proposed changes. The Dynamic RF would have increased from HK$1,827mn to HK$6,364mn on the day with the largest increase in the Dynamic RF.

Introduce HKCC Contingent Advance

90. In recognition of the substantial increase in Dynamic RF collectible due to the proposed stress testing changes, a number of measures have been considered to reduce market impact. These include:

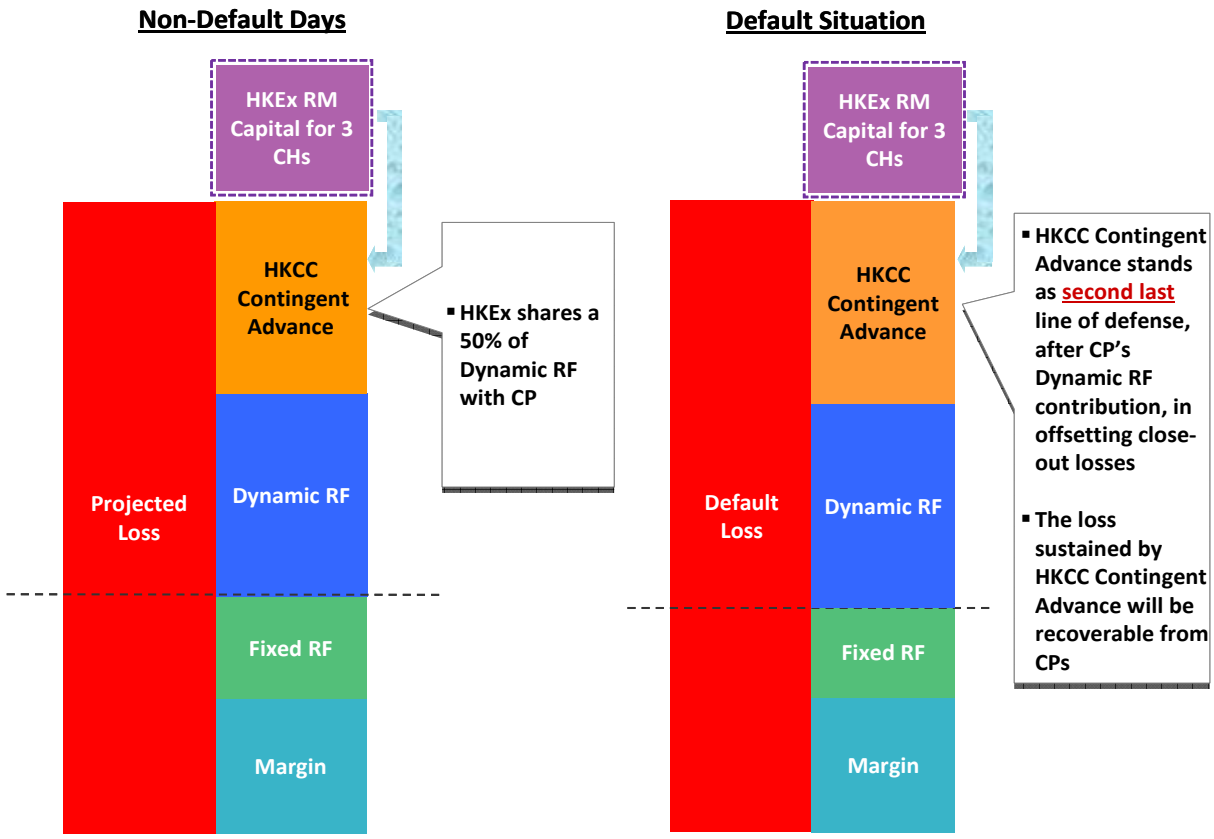
a) **Replenishment Right ("RR") as a financial resource:** HKEx has considered RR on the basis that the 2004 IOSCO Recommendations allow the counting of RR as part of the funding resources in stress testing and because several major clearing houses rely heavily on RR. However, the 2011 IOSCO Consultative Report no longer mentions that RR can be counted (without offering any explanation in the report), and the SFC would not agree to HKEx relying on RR in stress testing at the clearing houses.

b) **RMF contributed by the SFC, HKEx and market:** RMF is a financial resource that can gradually be built up to support the stress testing at the three clearing houses especially with market growth and also if future IOSCO Recommendations results in higher funding

requirements. The RMF discussion with the regulator is still at a preliminary stage. Further details on this topic can be found in paragraphs 107 to 111.

c) **HKCC Contingent Advance:** In view of the above, as an immediate measure to alleviate CPs' burden, we propose HKCC Contingent Advance through which HKCC shares 50% of daily Dynamic RF collectible with CPs. This represents a potential HKCC Contingent Advance obligation which CPs are liable to pay upon default situation. The exhibit below provides a graphical illustration of the HKCC Contingent Advance model.

Figure 2: Illustration of HKCC Contingent Advance Model
(for illustration only and not proportional to actual amounts involved)

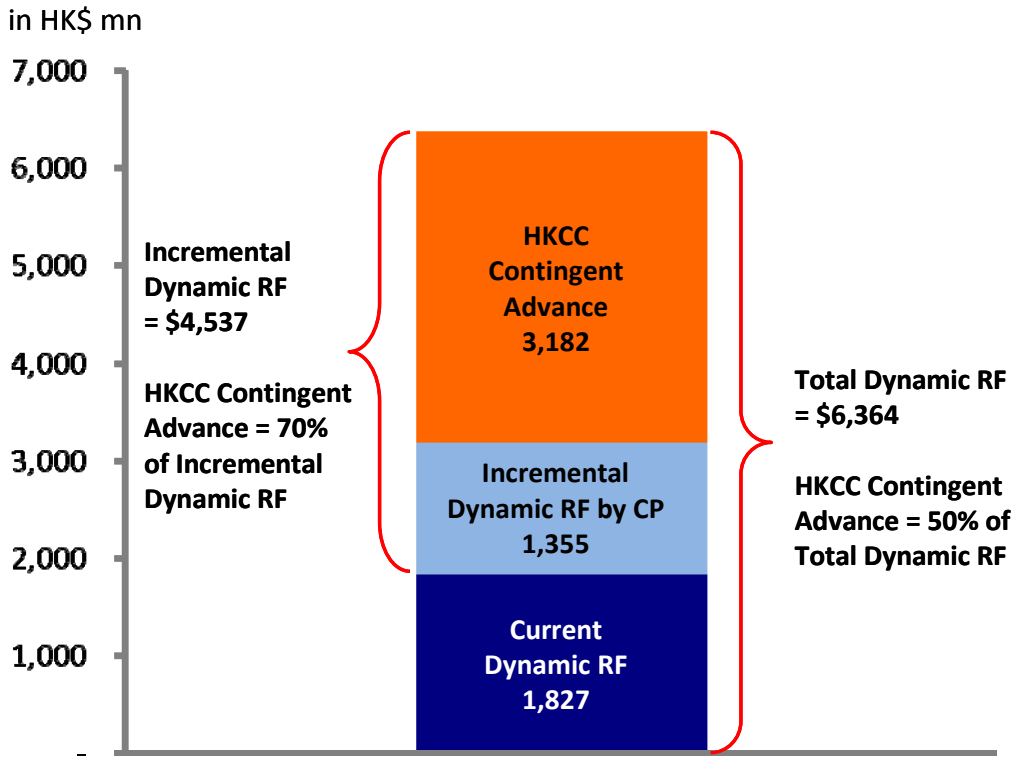


91. The Dynamic RF collectible from CPs with HKCC Contingent Advance support is calculated as follows:

Dynamic RF collectible = 50% x (Projected Loss – Defaulting CPs' Margin – Fixed RF)

92. By sharing half of the total Dynamic RF, the HKCC Contingent Advance would in effect shoulder more than half of the incremental Dynamic RF which CPs would otherwise be liable to contribute. Taking the example of Figure 3, the total Dynamic RF collectible (without HKCC Contingent Advance) would have been HK$6,364mn and the incremental Dynamic RF after applying the proposed stress testing assumptions would have been HK$4,537mn. A HKCC Contingent Advance of HK$3,182mn, in this example, is equivalent to 70% of the incremental Dynamic RF. CPs' share of the incremental Dynamic RF is therefore 30% only.

Figure 3: Effect of HKCC Contingent Advance in Reducing CPs' Dynamic RF Contribution



93. Similar to the Dynamic GF Credit for HKSCC, the HKCC Contingent Advance would be supported by HKEx RM Capital (currently in the form of HK$3.1bn shareholders' funds set aside and shared by the three clearing houses). Due to the increased commitment that would be required of HKCC under the HKCC Contingent Advance model, HKEx will set aside an additional HK$900mn from its shareholders' funds as HKEx RM Capital, increasing the total to HK$4bn. The arrangement will be disclosed in the notes to HKEx's financial statements and is not expected to impact HKEx's profit attributable to shareholders.

94. The HKCC Contingent Advance would stand as the second last line of support and would be utilised after the defaulting CPs' margin and Dynamic RF contributions, the Fixed RF and non-defaulting CPs' Dynamic RF contributions. Unlike HKSCC Margin Credit and Dynamic GF Credit, however, non-defaulting CPs will be responsible for the HKCC Contingent Advance amount in case of default. Each non-defaulting CP will be obligated to further contribute in line with the replenishment arrangement given the nature of HKCC Contingent Advance is essentially the same as the Dynamic RF contribution. The revised order of application of HKCC financial resources, taking into account of HKCC Contingent Advance, is set out in Appendix XIII for reference. We will review this HKCC Contingent Advance arrangement from time to time and may consider making adjustments if necessary.

95. As illustrated in Table 3, the amount of CPs' Dynamic RF collectible would have reached HK$3,182mn for HKCC stress testing during the Reference Period, which is equivalent to the maximum HKEx support in the form of HKCC Contingent Advance. With HKCC Contingent Advance support, CPs' Dynamic RF collectible would have increased from HK$409mn to HK$689mn on average. As seen in Table 4, although the amount of Dynamic RF collectible would have still increased in 63% of the time, the magnitude of increase would have been partially absorbed by HKCC Contingent Advance. In 11% of the time, CPs would have paid less than their current amount of RF. More details on the CP impact are provided in Appendices XII and XIV.

Table 3: Impact on CP Dynamic RF Collectible

CP Dynamic RF Collectible		**Proposed without HKCC Contingent Advance (in HK$ mn)**	**Proposed with HKCC Contingent Advance (in HK$ mn)**
Market	Average	1,378	689
	Maximum	6,364	3,182

Table 4: Distribution of Change in CP Dynamic RF Collectible

Change in CP Dynamic RF Collectible	**Number of Days**	**% of Total Days**
Increase	519	63%
No Change	212	26%
Decrease	89	11%
Total	**820**	**100%**

ISSUES TO BE CONSIDERED

Align RF Replenishment Arrangements

96. As mentioned, the RF is available to offset close-out losses in a default and non-defaulting CPs would need to replenish the amount applied. Under HKCC Rule 707, in the event that all resources of the RF are exhausted, HKCC may demand payment from every CP in the form of an emergency levy. Unlike the replenishment arrangements of HKSCC and SEOCH, the liability of each HKCC CP to the emergency levy is uncertain because no reference is made in the HKCC Rules to specify an amount or limitation, and payments are not refundable once collected. HKCC plans to take the opportunity to replace the emergency levy with a replenishment arrangement similar to that of HKSCC and SEOCH. Each HKCC CP will be obligated to make further contribution requested by the clearing house, in addition to the existing RF contribution requirement and potential HKCC Contingent Advance obligation, for an amount up to two times such amount from the date the resignation request is submitted.

Count RF Contribution as Liquid Capital

97. Under the FRR Cap 571N Section 28, "*a licenced corporation shall include in its liquid assets… cash deposited with… clearing house, other than… contributions it has made to the Guarantee Fund or Reserve Fund.…*" Since RF contributions cannot be counted as liquid capital, it is possible that CPs need to arrange for additional financial resources to meet the liquid capital requirement as a result of an increase in Dynamic RF requirement. As mentioned in PROPOSAL 2, HKEx has asked the SFC to allow GF / RF contributions to be counted as liquid capital, alongside the practices of some overseas markets. This arrangement, if approved, will benefit CPs of all three clearing houses.

QUESTIONS FOR RESPONSE

Question 5:

Do you support the proposed revisions to the HKCC Collateral assumption? Please provide reasons for your response and include any other suggestions or comments you may have on this question.

Question 6:

Do you support the use of HKCC Contingent Advance in relieving burden of CPs? Please provide reasons for your response and include any other suggestions or comments you may have on this question.

Question 7:

What is your view on allowing RF contribution to be counted as liquid capital? Will this help your company in terms of reducing liquid capital funding burden?

PROPOSAL 4:
REVISE SEOCH RESERVE FUND CALCULATION

BACKGROUND

98. The SEOCH RF operates on a similar loss-sharing principle as that of HKSCC and HKCC, although the details differ. The RF provides resources to assist SEOCH in meeting its obligations as a CCP in the event that the losses arising from CP default cannot be fully covered by the defaulting CPs' margin. Its level is tied to stress testing as discussed under PROPOSAL 1.

Current Practice

99. SEOCH RF comprises a fixed component and a dynamic component:

    a) **Fixed RF:** It comprises[16] (1) CPs' fixed contribution in the amount of HK$123mn; and (2) accumulated investment income of HK$111mn.

    b) **Dynamic RF:** Also known as Variable Contribution[17] in SEOCH, it is scalable to reflect clearing house exposure to counterparty risk. The operation and triggering mechanisms of SEOCH's Dynamic RF are similar to that of HKCC.

100. The level of Dynamic RF required to be contributed by SEOCH CPs is a function of Projected Loss, margin of the CPs assumed to default and Fixed RF:

Dynamic RF = Projected Loss – Defaulting CPs' Margin – Fixed RF

    a) **Projected Loss:** As discussed in PROPOSAL 1 of this paper, Projected Loss is calculated based on the Price Movement and Counterparty Default assumptions. Any changes in these assumptions will affect the level of Projected Loss which will in turn affect the size of Dynamic RF.

    b) **Defaulting CP's margin and Collateral assumption:** SEOCH currently does not give credit to much of the collateral on-hand such as risk margin deposit and surplus funds which can be reliably drawn upon when needed, and excludes these funds from its RF calculation. SEOCH currently only gives credit for mark-to-market margins on-hand in its RF calculation.

[16] Amount as of 31 December 2010.

[17] Chapter 4 – SEOCH Participants' Obligations of the Options Clearing Rules of SEOCH and Chapter 11 – Reserve Fund of the Operational Clearing Procedures for Options Trading Exchange Participants of SEOCH refers.

PROPOSAL 4

Revise Stress Testing Assumptions

101. The table below summarises the proposed changes for SEOCH. Proposed changes in Price Movement and Counterparty Default assumptions are covered under PROPOSAL 1.

Table 5: Proposed Changes to SEOCH Stress Testing Assumptions

Stress Testing Assumptions	Current	Proposed
Price Movement	• ±20% for stock options	• ±22% for stock options
Counterparty Default	• Higher of largest CP or 30% of loss-making positions	• Largest + 5th largest CPs • Remove 30% default rate
Collateral	• No credit given to risk margin deposit and surplus funds in daily RF calculation	• Credit will be given to risk margin deposit and surplus funds in daily RF calculation

102. As for the Collateral assumption, we propose to align with the practice of HKCC and give credit to risk margin deposit and surplus funds in daily RF calculation. We consider the current practice excessively conservative: it is not required under the 2004 IOSCO Recommendations and appears to be unprecedented among overseas clearing houses. The proposed change is expected to benefit the market with an overall reduction in SEOCH CPs' RF collectible.

103. The revised order of application of SEOCH, aligned with HKSCC and HKCC, is set out in Appendix XV for reference.

104. As demonstrated in Tables 6 and 7, the proposed changes in stress testing would bring about an average reduction of HK$202mn Dynamic RF collectible from the market as a whole. In 87% of the time, SEOCH CPs would need to contribute less Dynamic RF, with savings amounting to as much as HK$1,323mn. Although in some occasions the market would need to contribute more Dynamic RF after adoption of the new stress testing assumptions, the magnitude and frequency of such increase are much lower. More details on the CP impact are provided in Appendices XII and XVI.

Table 6: Impact on CP Dynamic RF Collectible

CP Dynamic RF Collectible		Current (in HK$ mn)	Proposed (in HK$ mn)
Market	Average	560	358
	Maximum	2,462	1,631

Table 7: Distribution of Change in CP Dynamic RF Collectible

Change in CP Dynamic RF Collectible	Number of Days	% of Total Days
Increase	89	11%
No Change	18	2%
Decrease	713	87%
Total	**820**	**100%**

105. As the amount of a CP's RF contribution affects its replenishment obligations and level of liquid capital, the proposal should reduce overall CPs' replenishment obligations and improve the level of liquid capital with everything else being equal.

ISSUES TO BE CONSIDERED

HKEx Funding Support for SEOCH CPs

106. Under the proposals in this paper, new funding support is proposed to HKSCC CPs in the form of Margin Credits and Dynamic GF Credits and to relevant HKCC CPs in the form of HKCC Contingent Advance. At HKSCC, the new margining and Dynamic GF proposals are expected to require significantly higher CP contribution. At HKCC, the proposed change in stress testing assumptions would similarly increase CPs' Dynamic RF obligations. The SEOCH proposal, on the other hand, would bring about an initial favourable overall market impact most of the time. For these reasons, at this stage we are not proposing any new financial support from HKEx to SEOCH CPs beyond the HKEx RM Capital supporting all three clearing houses. Nonetheless we will explore the possibility of an early implementation of the SEOCH proposal ahead of other proposals in this paper. Over time and depending on the development of the RMF (discussed in OTHER CONSIDERATIONS section) and any future changes to the IOSCO Recommendations, HKEx would revisit this matter to ensure a fair distribution on HKEx support among the clearing houses and CPs.

QUESTIONS FOR RESPONSE

Question 8:

Do you support the proposed revisions to the SEOCH Collateral assumption? Please provide reasons for your response and include any other suggestions or comments you may have on this question.

OTHER CONSIDERATIONS:

RISK MANAGEMENT FUND AND POOLED MARGIN MODEL

Risk Management Fund ("RMF")

107. Future tightening of IOSCO standards, growth in market turnover or other changes in market dynamics may require increasing amounts of GF / RF to balance Projected Loss from stress testing. To ensure long term sustainability and scalability of funding to support these changes and to mitigate any higher funding requirements for CPs that may detract from the markets' competitiveness, we are keen to work with the HKSAR Government and the regulator in establishing a RMF which is funded by the SFC, HKEx and the market in equal proportion. The model is based on the principle that all key stakeholders, including the market players, the CCP and the regulator will support the stability of the securities and derivatives markets.

108. On the contribution from the market, the preliminary thinking is to introduce a risk management levy in the securities and derivatives markets. Under this model, a small rate or amount could be levied on the trading transactions in the respective markets. At the same time, HKEx and the SFC would match the risk management levy collected from the market with corresponding contributions. The fund might be ring-fenced and used solely for the purpose of providing financial resources to strengthen risk management of the clearing houses.

109. The SFC and HKEx would conduct assessment of sufficiency on a regular basis including with reference to our stress testing. Depending on the prevailing market conditions and financial resources requirement against the Projected Loss, the SFC and HKEx could decide to suspend the collection of risk management levy and the corresponding SFC / HKEx contributions.

110. We note that in the past both the Stock Exchange of Hong Kong and the SFC contributed significant amounts to bolster the assets of the Investor Compensation Fund. In addition, a market transaction levy was imposed by law to add further resources and this levy was later suspended when sufficient amounts had been collected. Similar mechanism may be resumed or followed for purpose of the RMF.

111. The RMF does not form part of the proposed measures at this time. HKEx will continue to work with the stakeholders on the feasibility of the RMF.

Pooled Margin Model

112. The proposals to secure adequate financial resources set out in this consultation paper are based on a "non-pooled upfront margin + pooled default fund" approach. Some other major overseas clearing houses adopt a similar model, while others differ including in relation to margin and default fund.

113. HKEx notes that at least one overseas CCP applies a pooled margin model in which upfront margin from CPs are pooled as contributions to the default fund and are subject to loss sharing in the case of a CP default. This pooled margin model benefits CPs by not requiring them to contribute separately to a default fund but increases the risk that non-defaulting CPs may have to share in paying for a default loss. A pooled margin model might not be appropriate for margins related to clients' futures and options positions at HKCC and SEOCH.

114. HKEx does not recommend a pooled margin model, because we believe the proposals in this paper provide adequate financial resources and strike the appropriate balance among CPs and

HKEx. Notwithstanding the above, HKEx will keep in view developments in the markets, IOSCO and with the RMF and would not rule out the possibility of revisiting a pooled margin model in the future should market conditions and circumstances warrant.

HOW TO RESPOND TO THE CONSULTATION PAPER

1. HKEx invites market participants and other interested parties to submit written comments on matters discussed in this paper on or before 28 October 2011.

2. Persons wishing to submit comments should, where applicable, provide details of any organisation which they represent. Responses should be made by completing and returning the questionnaire on this subject (a softcopy in word format is available at http://www.hkex.com.hk/eng/newsconsul/mktconsul/Documents/cp201107q.doc by one of the following methods:

By mail or hand delivery to	Corporate Communications Department Hong Kong Exchanges and Clearing Limited 12th Floor, One International Finance Centre 1 Harbour View Street Central Hong Kong **Re: Consultation Paper on HKEx Clearing House Risk Management Reform Measures**
By fax to	(852) 2524-0149
By e-mail to	response@hkex.com.hk Please mark in the subject line: **Re: Consultation Paper on HKEx Clearing House Risk Management Reform Measures**

3. HKEx's submission enquiry hotline is (852) 2840-3844.

4. The names of persons who submit comments on this consultation paper together with the whole or part of their submissions may be disclosed to members of the public. Respondents who do not wish their names to be published should indicate so clearly on their submissions. HKEx's policy on handling personal data is set out in Appendix XVII.

APPENDIX I:

EXTRACTS OF 2004 CPSS-IOSCO TECHNICAL COMMITTEE RECOMMENDATIONS FOR CENTRAL COUNTERPARTIES

Recommendation 3: Measurement and management of credit exposures

"A CCP should measure its credit exposures to its participants at least once a day. Through margin requirements, other risk control mechanisms or a combination of both, a CCP should limit its exposures to potential losses from defaults by its participants in normal market conditions so that the operations of the CCP would not be disrupted and non-defaulting participants would not be exposed to losses that they cannot anticipate or control.

4.3.1 To manage its counterparty credit exposures to its participants effectively, a CCP must be able to measure those exposures. A CCP can ascertain its current credit exposure to each participant by marking each participant's outstanding contracts to current market prices and (to the extent permitted by a CCP's rules and supported by law) netting any gains against any losses. A CCP faces the risk that the participants' exposures can change as a result of changes in prices, in positions, or both. Adverse price movements can rapidly increase exposures to participants.[9] Furthermore, participants may rapidly build their positions through new trading, although some markets impose trading limits or position limits that reduce this risk.

4.3.2 A CCP thus should recalculate its exposures to its participants frequently, based on timely information on market prices and on the size and concentration of positions, to ensure that its estimates of those exposures are accurate. How frequently a CCP must recalculate its exposures to participants depends on the volatility of prices in the markets it serves and the potential for participants to quickly build large positions in those markets. The latter depends on the liquidity of the markets and on whether the markets set and enforce trading limits or position limits. Nevertheless, a CCP should measure its exposures at least once a day and should have the operational ability to measure its exposures on an intraday basis, either routinely or at a minimum when specified thresholds are breached (for example, when market price changes exceed prespecified thresholds or when one or more participants build up large positions during the day).

4.3.3 A CCP should be able not only to measure its exposures to its participants but also to take actions as necessary based on the results of those measurements. As discussed in Recommendation 5, a CCP should maintain sufficient financial resources to ensure that it continues to meet its obligations when due, even in the event of a default by the participant with the largest exposure in extreme but plausible market conditions. Without some mechanism to limit its potential exposures, a CCP would not be able to meet that requirement unless it were able to augment its financial resources very rapidly. But augmenting resources might well prove difficult in the circumstances that would generate a need for those additional resources. A CCP also should ensure that defaults by participants in normal market conditions would not result in losses that would disrupt the operations of the CCP or non-defaulting participants. Some CCPs mutualise losses from a default by reliance on the resources of non-defaulting participants. These non-defaulting participants could be exposed to significant risks that they themselves cannot control in the absence of some mechanism for a CCP to limit its uncollateralised credit exposures to its participants.

IOSCO Footnote [9] Price limits and trading halts may delay the adjustment of market prices but there is little evidence that they can reduce the ultimate size of adjustments that occur once trading resumes.

4.3.4 To facilitate meeting Recommendation 5 and to prevent disruption in the operation of a CCP or its non-defaulting participants, this recommendation requires a CCP to have mechanisms designed to limit its exposures to its participants so that, in closing out any participant's positions in normal market conditions, non-defaulting participants would not be exposed to losses that they cannot anticipate or control. This recommendation does not in any way limit a CCP's ability to use its financial resources, as discussed in Recommendation 5, or to implement its default procedures, as described in Recommendation 6.

4.3.5 The most common mechanism to protect against the potential losses arising from a participant default is a requirement that participants post margin commensurate with the risk of their positions;[10] margin posted by a defaulter would be used prior to other financial resources in covering losses (Recommendation 6). Many CCPs also control the accumulation of exposures by requiring frequent (often daily or intraday) settlement of gains and losses through cash payments. In effect, the margin requirements seek to ensure that in normal market conditions losses from closing out a defaulting participant's positions would be covered by the margin posted by the defaulting participant. In derivatives markets and other markets where contracts have long durations or are inherently leveraged, risk-based margin requirements are an essential tool for a CCP to limit credit exposures effectively (see Recommendation 4). A CCP that employs risk-based margin requirements that observe Recommendation 4 should be considered to observe the second key issue of this recommendation requiring risk control mechanisms to limit a CCP's exposures.

4.3.6 Some CCPs in cash markets that are characterised by a relatively short, fixed-period settlement cycle (ie T+1, T+2 or T+3) employ risk control mechanisms other than margin requirements to accomplish the same ends. Trading limits or position limits may be used by the markets for which a CCP clears to control the build-up of positions.[11] A CCP providing counterparty services for short-dated contracts may rely on an analysis of historical price movements, its ability (or that of the market for which it clears) to limit the build-up of positions, and its rules and resources to demonstrate that its operations would not be disrupted and non-defaulting participants would not be exposed to losses they cannot anticipate or control. Non-defaulting participants' resources may be included in this analysis, provided that any allocation of losses to non-defaulting participants is subject to absolute limits or is otherwise controllable by the non-defaulting participants. Whatever the combination of risk-mitigating mechanisms used, a CCP not employing risk-based margining would need to demonstrate that its approach is robust to sudden changes in prices or increases in the size of positions in the markets for which it clears."

IOSCO Footnote [10] As discussed in Section 3 and Recommendation 4, some CCPs use different terminology to describe the risk management tool referred to here as margin requirements.

IOSCO Footnote [11] In both derivatives and cash markets, a combination of measures may be used. Position limits are also used in derivatives markets as an additional risk-mitigating measure, while some cash markets may also apply margin to complement position limits or other controls.

Recommendation 5: Financial resources

"A CCP should maintain sufficient financial resources to withstand, at a minimum, a default by the participant to which it has the largest exposure in extreme but plausible market conditions.

4.5.1 Although risk management tools (notably a CCP's participation requirements) are designed to ensure that defaults are unlikely, a CCP should nonetheless plan for the possibility of a default occurring. In that event, a CCP has an obligation to continue to make payments to non-defaulting participants on time. It should maintain financial resources both to provide it with liquidity to make timely payments in the short term and to enable it to cover the losses that result from defaults.

4.5.2 Assessing the adequacy of resources can be difficult because it rests on assumptions about which participant or participants default and about market conditions at the time of the default. Many CCPs focus on a default by the participant to which the CCP has the largest exposure in the market scenarios under consideration.[14] This should be viewed as a minimum standard in a CCP's evaluation of its resources. However, market conditions that typically accompany a default put pressures on other participants (particularly related group members or affiliates), and a default itself tends to heighten market volatility, further contributing to stresses. Planning by a CCP should consider the potential for two or more participants to default in a short time frame, resulting in a combined exposure greater than the single largest exposure.

4.5.3 Stress testing is used by CCPs to assess the adequacy of their financial resources.[15] A CCP assumes extreme market conditions (that is, price changes significantly larger than the normally prevailing levels of volatility), and evaluates the potential losses in individual participants' positions. Stress testing provides insights into several aspects of the financial resources the CCP may need. The largest debit from such a test helps a CCP evaluate its potential liquidity needs. Calculations taking into account the resources of the potential defaulter that are available to a CCP (margins, clearing fund contributions or other assets) provide perspective on the potential size of the losses that a CCP might face. Other stress tests may consider the distribution of positions between the participant and its customers in evaluating potential losses.

4.5.4 The relevant stress tests will differ from one CCP to another and, for a given CCP, over time. Typically, a CCP will conduct a range of stress tests. These tests should reflect a CCP's product mix and other risk management choices. Key elements of stress testing are the market conditions and default scenarios assumed and the frequency with which the tests are conducted. A CCP should make judgments about what constitutes "extreme but plausible" market conditions. The conditions evaluated should include the most volatile periods that have been experienced by the markets for which a CCP provides its services. A CCP also should evaluate the losses that would result if levels of volatility observed in related products were also experienced in its products (this is particularly relevant when a CCP begins clearing a new product) and if the usual patterns of correlations in prices among its products changed. CCPs conduct multiple types of stress tests. Tests to check the adequacy of resources in the event of a default in extreme market conditions should be performed monthly, and more frequently when markets are unusually volatile or less liquid or when the size or

IOSCO Footnote [14] This recommendation focuses on the largest potential exposure of a CCP, regardless of whether that exposure arises in a participant's account or in the account of a participant's customer. In assessing the adequacy of resources, however, an individual CCP's analysis will need to take into account the source of the default if that affects the financial resources available to cover losses.

IOSCO Footnote [15] Stress testing is also conducted to help a CCP understand the risks it is assuming and potential ways to mitigate those risks.

4.5.4 (continued) concentrations of positions held by its participants increase significantly. In addition, comprehensive stress tests involving a full validation of model parameters and assumptions and reconsideration of appropriate stress scenarios should be conducted at least annually.[16]

4.5.5 Based upon the stress testing process, a CCP should reach a judgment about the adequacy of its resources. A CCP should provide its participants and authorities specific information about its assumptions related to the number and size of participants that default and the market conditions at the time of default in coming to this judgment. A CCP should have clear policies for the actions it would take if stress testing indicates that its resources are not likely to be adequate either for meeting liquidity demands or for covering an exposure resulting from default. The actions that a CCP might take will vary, but the ultimate effect must be either to reduce the potential exposure of the CCP or to increase the resources of the CCP. These policies should be made available to a CCP's participants and its authorities.

4.5.6 The financial resources available to a CCP can take a variety of forms. For many CCPs, some assets that they require participants to post can only be used to cover losses arising from that participant's default.[17] Other financial resources are available to cover losses arising from any participant's default. Many CCPs require participants to post assets in a clearing fund that can be used in the event of a default by any participant.[18] CCPs generally have their own capital and retained earnings from operations. Resources can include contingent claims on non-defaulting participants, parent organisations, or insurers. For example, a CCP's rules may require non-defaulting participants to provide additional funds to it in the event of default. The parents of some CCPs provide a guarantee, and other CCPs obtain default insurance that covers a certain amount of losses after a deductible has been met.

4.5.7 The availability of these financial resources and their liquidity vary. When margin is held, it should be readily available and liquid (Recommendation 4). A CCP's clearing funds, own capital, or retained earnings are under its immediate control, but they generally are invested and may not be immediately available. Insurance contracts, parental guarantees or rights to call for funds from non-defaulting participants are often available only after specific conditions are met. In assessing the adequacy of its financial resources, a CCP should consider the availability and liquidity of the assets it holds, as well as possible concentration risk.

4.5.8 A CCP should include only those resources that it can reliably draw on in the event of a default in evaluating the adequacy of its resources. For example, possible payouts from insurance contracts should be counted only if there is high degree of certainty that the terms of the contracts would be payable in the event of a default. The precise circumstances under which a CCP can draw upon any resources that require conditions to be met should be carefully evaluated in judging their contribution to the overall adequacy of resources.

IOSCO Footnote [16] CCPs conduct different types of stress tests, some of which are conducted weekly or even daily. Such stress tests are often mechanical, evaluating positions at higher confidence intervals for price movements, for example. This standard for the monthly and the comprehensive annual stress tests is considerably more demanding than these routine risk management activities.

IOSCO Footnote [17] Some CCPs also enter into cross-margining agreements that enable a CCP to access a defaulting participant's assets at another CCP in certain circumstances.

IOSCO Footnote [18] See Section 3 for a discussion of the differing terminology with respect to financial resources used by CCPs.

4.5.9 Even if there is assurance that a CCP can draw on resources in a default, some types of financial resources are subject to potential losses in value. Haircuts should be applied to these resources to reflect potential volatility in their market values resulting from price, credit and liquidity risk. Only the value subject to the appropriate haircuts should be counted as part of the financial resources of a CCP.

4.5.10 Rules of a CCP should expressly set out the situations in which specific resources can be used. For purposes of assessing observance of this recommendation, financial resources should be counted only if a CCP's rules do not permit them to be used to cover its normal operating losses or to cover losses from other activities in which it is engaged. If a CCP serves multiple markets (either in the same jurisdiction or multiple jurisdictions), the CCP's ability to use resources supplied by participants in one market to cover losses from a default in another market should be clear to all participants. (A CCP's design of its stress tests also should take into account the extent to which resources are pooled across markets.)

4.5.11 Because a function of the financial resources of a CCP is to enable it to face immediate liquidity demands, a CCP should obtain credit lines that allow it to borrow against resources that are not immediately available. These credit lines should be committed and subject only to presentment.[19] The presence of such credit lines is an important consideration in assessing the adequacy of a CCP's resources from a liquidity perspective.

4.5.12 A CCP should have a clear and transparent method for determining participants' contributions to its financial resources that reinforces incentives for participants to manage the risk that they pose for the CCP. Generally such incentives involve a system in which contributions are linked to the riskiness of participants' activity as measured by margin posted, by size of positions or sometimes by stress testing results. A CCP also should establish rules that address replenishing resources following a default. These rules typically set out responsibilities and expected contributions before a participant can cease participation."

IOSCO Footnote [19] The credit lines should not contain material adverse change clauses.

APPENDIX II:

HKSCC CLEARING PARTICIPANT REFERENCE POSITIONS FOR STRESS TESTING

(A) Reference Positions for Stress Testing

Under the proposal, a CP's reference positions for stress testing will comprise of (1) CP's total cross-day net long / short CNS positions and (2) net settlement obligation payable by CP. The difference between the reference positions under current and proposed arrangements is shown in the table below:

Table 1: Comparison of reference positions under current and proposed arrangements

	Current	**Proposed**
Net CNS positions	Netting in same stock by each trading day	Same as Current
	Cross-day netting in same stock	Same as Current
	Cross-stock netting among different stocks	NO cross-stock netting among different stocks
Net settlement obligation payable by CP	Net payable of CNS settlement on settlement day from CP's Money Ledger Settlement Account	

The net CNS positions under the current arrangement is a cross-day cross-stock net CNS position while that under the proposed arrangement is a cross-day net CNS position without cross-stock netting.

(B) Numerical Example

Step 1: Determine total cross-day net long / short CNS positions for stress testing

Assuming there are only five CPs having net CNS positions in two stocks on two trade days. Same as under current arrangement, positions in foreign currencies will be converted into Hong Kong dollar equivalent.

Table 2: CNS positions on each trading day[18]

Trade day	**Stock**	**CP 1**		**CP 2**		**CP 3**		**CP 4**		**CP5**	
		Long	**Short**	**Long**	**Short**	**Long**	**Short**	**Long**	**Short**	**Long**	**Short**
		(in HK$ mn)									
T-1	A	(100)			300		100		100	(50)	
	B		100		250		200		250	(60)	
T	A	(200)		(100)		(500)			200	(70)	
	B	(60)		(200)			200		300	(80)	

[18] For simplicity, assume all CNS positions due for settlement are settled on settlement day, i.e. there are no overdue CNS positions.

Table 3: Net CNS positions under current and proposed arrangements

	CP 1	CP 2	CP 3	CP4	CP5
Current arrangement	**(in HK$ mn)**				
- Cross-day cross-stock net CNS positions	(260)	250	0	850	(260)
Proposed arrangement					
- Total cross-day net long CNS position for stress testing	(300)	0	(400)	0	(260)
- Total cross-day net short CNS position for stress testing	40	250	400	850	0

As a result of no cross-stock netting, each CP would have two total cross-day net CNS positions: a total cross-day net long CNS position and a total cross-day net short CNS position.

Step 2: Determine net settlement obligation payable by CP

Another component in the reference position for stress testing is the net settlement obligation payable by CP. Assuming the CPs have the following net settlement obligations payable:

Table 4: Net settlement obligation payable by CP

	CP 1	CP 2	CP 3	CP 4	CP 5
	(in HK$ mn)				
Net money position (payable) / receivable	200	(300)	(100)	(600)	(150)
Offsetting credits posted to CP's Money Ledger Settlement Account[19]	-	100	-	-	100
Net settlement obligation payable	**0**[20]	**(200)**	**(100)**	**(600)**	**(50)**

Step 3: Determine reference positions for stress testing under proposed arrangement

Each CP would have two reference positions for stress testing, one for estimating the long positions risk and one for short positions risk:

a) For long positions risk = Total cross-day net long CNS position plus net settlement obligation payable by the CP

b) For short positions risk = Total cross-day net short CNS position

[19] Credit balances from other Money Ledger Accounts are allowed to offset debit balance in Settlement Account in arriving at the amount of net settlement obligation payable by a CP.

[20] Net money position receivable amount will be disregarded in arriving at the reference position for stress testing.

Table 5: Summary of reference positions for stress testing

CP	For long positions risk			For short positions risk
	Total cross-day net long CNS position (a)	**Net settlement obligation payable (b)**	**Reference position (c)=(a)+(b)**	**Reference position = Total cross-day net short CNS position**
	(in HK$ mn)			
CP 1	(300)	0	(300)	40
CP 2	0	(200)	(200)	250
CP 3	(400)	(100)	(500)	400
CP 4	0	(600)	(600)	850
CP 5	(260)	(50)	(310)	0
		Overall market	**(1,910)**	**1,540**

APPENDIX III:
INTERNATIONAL BENCHMARKING OF STRESS TESTING ASSUMPTIONS[21]

	HKSCC (Proposed)	HKCC (Proposed)	SEOCH (Proposed)	CCP1	CCP2	CCP3
Price Movement Assumption	**±22%** Stocks except structured products which will remain unchanged at 100%	**±20%** HSI futures & options, evaluate at ±25% **±20%** HSCEI futures & options	**±22%** Stock options	Around 80 scenarios – historical (events such as 1987 stock market crash) and theoretical	Stress parameters reflective of abnormal market conditions	• 1.5 (individual derivatives) / 2 (index) times the margin parameters (second largest price movement during past 12 months scaled up with number of assumed liquidation days) • A minimum is applied to specific index products at highest historical price movement (covering two-day stock market fall in 1987 of ~12%)
Counterparty Default Assumption	Largest CP and fifth largest CP			Higher of: • Largest CP and other CPs from the same financial group and five least creditworthy CPs or • Second and third largest CPs (plus other CPs from the same financial group)	Single largest CP	Two largest CPs

[21] Benchmarking group comprises major international clearing houses in America, Europe and Asia Pacific.

	CCP4	CCP5	CCP6	CCP7	CCP8	CCP9
Price Movement Assumption	Largest market moves (e.g. 1987 Stock Market Crash)	Public information not available	Worst historical observations	• 99 scenarios of individual stocks, sectors and index moves • Covers one-in-30 year event occurrence	• 30 scenarios for the four major contracts • Single asset scenarios: one-in-30 year event • Multi-asset scenarios: one-in-100 year events	Historical price movements (last 20 years)
Counterparty Default Assumption	At least two largest CPs	Higher of[22]: • Single largest CP group or • Two randomly selected CP groups	Public information not available	Single largest CP	Single largest CP	Multiple CPs (including Largest CP)

[22] Proposed assumption from the CCP's website as of 20 June 2011.

APPENDIX IV:

INTERNATIONAL BENCHMARKING OF DYNAMIC DEFAULT FUND ARRANGEMENTS

The following overseas clearing houses maintain a dynamic default fund:

America	**CME**
	NSCC
	OCC
Europe	**Eurex**
	LCH.Clearnet Ltd
	LCH.Clearnet SA
Asia Pacific	**HKSCC (Proposed)**
	HKCC
	SEOCH
	CDP
	JSCC
	SGX-DC

The default funds maintained by ASX Clear and ASX Clear (Futures) are not dynamic in nature.

APPENDIX V:

MECHANISM OF THE PROPOSED HKSCC MARGINING

(A) Margining Formula

1. The margin requirement from each CP would be determined by the following formula:

Margin Requirement = (Margining Position × Margin Rate) – Margin Credit

(B) Margining Position

2. "Margining Position" is defined as the higher of the total cross-day net long or total cross-day net short CNS position at the end of each business day. To calculate a CP's Margining Position, its outstanding CNS positions will first be segregated by securities. Positions of individual securities are then netted across the respective settlement days to arrive at a cross-day net long or net short CNS position for those securities. Then, securities positions with cross-day net long are aggregated to arrive at the total net long CNS position. Similarly, securities positions with cross-day net short are aggregated to arrive at the total net short CNS position. The Margining Position for the CP will be the higher of the total net long CNS position or the net short CNS position.

3. Consistent with the current arrangements for marks calculation, the Margining Position

   a) includes exercised options trades transferred from SEOCH to HKSCC for settlement under the CNS System; but
   b) excludes short CNS positions covered by Specific Stock Collateral[23].

(C) Margin Rate

4. The Margin Rate is determined with reference to a "Benchmark Rate" according to the following:

Margin Rate = Benchmark Rate + Cushion of 10%; subject to a minimum of 5% *Example: If Benchmark Rate is 6%, then Margin Rate = 6% × (1+ 0.1) = 6.6%*

5. The Benchmark Rate is in turn determined by using a statistical model based on key parameters that are consistent with those applied in HKCC and SEOCH as follows:

Method	Exponentially Weighted Moving Average
Volatility	Change on daily closing of Hang Seng Index ("HSI") based on historical data for the past 90 trading days.
Confidence interval	3 standard deviation of the volatility function (i.e. 99.73%)

6. HSI volatility will be used as a proxy for the overall market volatility in the above calculation. We recognise that volatility of individual securities will be different from that of HSI. However, we consider that using HSI as a market volatility proxy presents a

[23] Specific Stock Collateral refers to the security provided by a CP to HKSCC to cover its short CNS positions in the respective securities.

reasonable compromise between simplicity and accuracy especially during the introduction of this relatively new measure to the securities market. HKSCC will assess the appropriateness of this arrangement from time to time and will make further refinements if necessary.

Review of Margin Rate

7. The Margin Rate will be reviewed and updated on a monthly basis. Margin Rate will be updated on the 1st business day of each month based on the Benchmark Rate determined on the 7th business day before the end of the preceding month. Circular will be issued to inform the market of the revised Margin Rate at least three business days before the effective date.

Ad Hoc Adjustment

8. To ensure that the current Margin Rate does not have major deviation from current market volatility, daily review of Benchmark Rate will also be performed. When the current Margin Rate is below the daily calculated Benchmark Rate, HKSCC will make ad hoc adjustment as shown in the following example:

Day	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Margin Rate	5%	5%	5%	5%	5%	6.16%	6.16%
Benchmark Rate	4.7%	4.8%	5.6%	5.8%	6.0%	5.9%	6.1%

Benchmark Rate > Margin Rate

Notify the market of Margin Rate change

Effective day of Margin Rate change

In this example, the Benchmark Rate is higher than the current Margin Rate on Day 3 which triggered an ad hoc Margin Rate adjustment. The revised Margin Rate will be the Benchmark Rate on Day 3 plus a 10% cushion, i.e. 5.6% × (1 + 0.1) = 6.16%. HKSCC will notify the market of the ad hoc Margin Rate adjustment via circular on the next business day (Day 4). The adjusted Margin Rate will be then effective two business days after notification to the market (i.e. Day 6).

9. A 10% cushion is added to the Benchmark Rate in the Margin Rate calculation. This serves as a buffer to avoid the administrative burden for both HKSCC and CPs in managing frequent ad hoc Margin Rate adjustments within a month.

Below is an example of how a CP's margin requirement is calculated:

Table 1: Computation of Daily Net CNS Position On T-1 Day

	(1)	(2)	(3) = (1 + 2)
Stock	**Buy Trades on T-1 day** **Quantity: long** **Value: (long)**	**Sell Trades on T-1 day** **Quantity: (short)** **Value: short**	**Daily Net CNS Position on T-1 day** **Quantity: long / (short)** **Value: (long) / short**
A	2,500 HK$(400,000)	(2,000) HK$300,000	500 HK$(100,000)
B	22,000 HK$(600,000)	(32,000) HK$800,000	(10,000) HK$200,000
C	35,000 HK$(900,000)	(15,000) HK$400,000	20,000 HK$(500,000)
D	2,000,000 HK$(50,000,000)	(5,000,000) HK$130,000,000	(3,000,000) HK$80,000,000

Table 2: Computation of Cross-day Net CNS Position

	(a)	(b)	(c)	(d) = (a + b + c)
Stock	**Daily Net CNS Position on T day** **Quantity: long / (short)** **Value: (long) / short**	**Daily Net CNS Position on T-1 day** **Quantity: long / (short)** **Value: (long) / short**	**Overdue CNS Position** **Quantity: long / (short)** **Value: (long) / short**	**Cross-day Net CNS Position** **Quantity: long / (short)** **Value: (long) / short**
A	(450,000) HK$90,000,000	500 HK$(100,000)	-	(449,500) HK$89,900,000
B	(23,000) HK$500,000	(10,000) HK$200,000	5,000 HK$(90,000)	(28,000) HK$610,000*
C	15,000 HK$(400,000)	20,000 HK$(500,000)	(50) HK$100,000	34,950 HK$(800,000)
D	3,500,000 HK$(95,000,000)	(3,000,000) HK$80,000,000	-	500,000 HK$(15,000,000)
E	100,000 USD(300,000)	-	-	100,000 USD(300,000)

* The short CNS position in stock B has been covered by Specific Stock Collateral and is therefore excluded from calculation of Margining Position.

Table 3: Computation of Margin Requirement for Positions in Hong Kong Dollar

(e) Total cross-day net long CNS position	HK$15,800,000
(f) Total cross-day net short CNS position	HK$89,900,000
(g) Margining Position (Higher of e and f)	**HK$89,900,000**
(h) Margin Rate	7%
(i) Margin Requirement before Margin Credit (i) = (g × h)	HK$6,293,000
(j) Less Margin Credit	HK$(4,873,157)[#]
(k) Margin payable	HK$1,419,843[##]

Table 4: Computation of Margin Requirement for Positions in US Dollar

(l) Total cross-day net long CNS position	USD300,000
(m) Total cross-day net short CNS position	-
(n) Margining Position (Higher of l and m)	**USD300,000**
(o) Margin Rate	7%
(p) Margin Requirement before Margin Credit (p) = (n × o)	USD21,000
(q) Less Margin Credit	USD(16,262)[#]
(r) Margin payable	USD4,738[###]

[#] Margin Credit will be applied pro-rata to the margin requirements in all currencies calculated in Hong Kong dollar equivalent. Assuming the exchange rate for USD/HKD is 7.8, margin requirement for US dollar position is USD21,000 x 7.8 = 163,800 in HK$ equivalent.

Hence the Margin Credit for HKD positions:
= HK$5,000,000 x [HK$6,293,000 / (HK$6,293,000 + HK$163,800)]
= HK$4,873,157
Margin Credit for USD positions:
= HK$5,000,000 x [HK$163,800 / (HK$6,293,000 + HK$163,800)]
= HK$126,843 or USD16,262

[##] 50% of the margin payable (i.e. HK$709,921.5) must be paid by cash in Hong Kong dollar and the balance could be covered by cash in Hong Kong dollar or other collateral such as bank guarantee, cash in US dollar or Renminbi.

[###] 50% of the margin payable (i.e. USD2,369) must be paid by cash in US dollar and the balance could be covered by cash in US dollar and other collateral such as bank guarantee, cash in Hong Kong dollar or Renminbi.

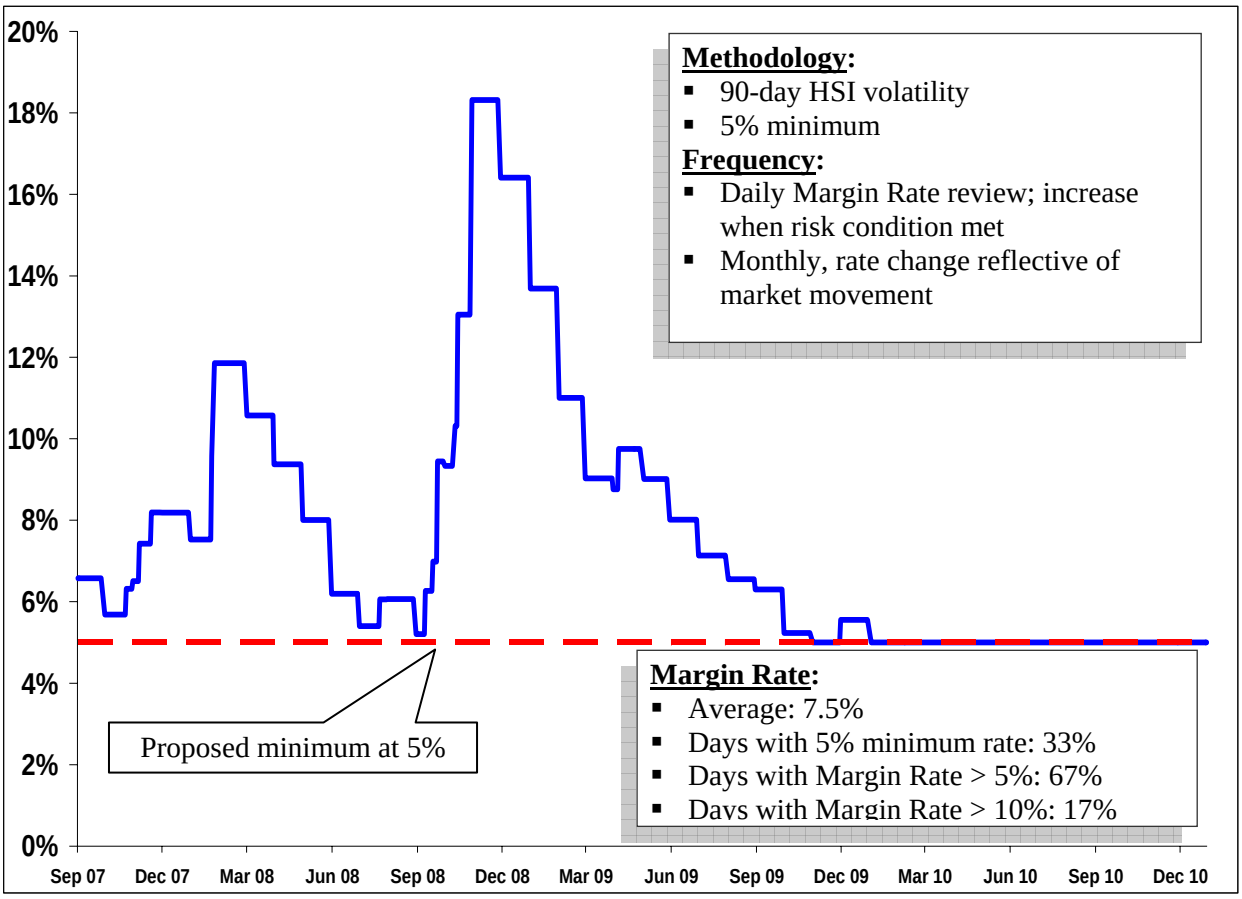
Table 5: Total Margin Payable on T day

Margin Payable in Hong Kong dollar	**HK$1,419,843**
Margin Payable in US dollar	**USD4,738**

APPENDIX VI:

RECOMPUTED MARGIN RATES UNDER THE PROPOSED HKSCC MODEL

During the Reference Period, the Margin Rate would have ranged from 5% to 18.3%[24], with an average of 7.5%.



[24] The wide range of Margin Rates is a result of the occurrences of many significant market events during the Reference Period that led to unprecedented levels of volatility.

APPENDIX VII:

MARKET IMPACT ANALYSIS OF THE PROPOSED HKSCC MARGINING

(I) Market Impact Based on Proposed Assumptions

a) Market Total and Average Daily of Margin Requirement during the Reference Period

Margin Requirement	Current[25] (in HK$ mn)	Proposed[26] (in HK$ mn)
Market Total	0 – 7,262	1,040 – 10,742
Average Daily	2,389	3,769

b) Change in Margin Requirement during the Reference Period

Change in Margin Requirement (in HK$ mn)	
Maximum Single Day Increment	↑ 10,742
Maximum Single Day Decrement	↓ 2,745[27]
Average Daily	↑ 1,381

c) Distribution of Change in Margin Requirement during the Reference Period

Change in Margin Requirement (in HK$ mn)	Number of Days	% of Total Days
> 9,000 (Maximum increment: 10,742)	6	0.7%
> 4,000 to 9,000	179	21.8%
> 1,000 to 4,000	182	22.2%
= 0 to 1,000	77	9.4%
<0 to -1,200	107	13.0%
< -1,200 to -1,600	193	23.6%
< -1,600 to -2,000	60	7.3%
< -2,000 (Minimum decrement: -2,745)	16	2.0%
Total	**820**	**100.0%**

Reference Period: Three-year period from September 2007 to December 2010

[25] Current amounts represent the post-Lehman additional collateral which HKSCC did not start to collect until September 2008. If the dates before imposition of post-Lehman additional collateral are excluded, the range of Market Total and the Average Daily would be HK$688mn to HK$7,262mn and HK$3,454 mn respectively.

[26] The proposed collectible amount is arrived at after deducting Margin Credit

[27] Decrement represents a lower collectible amount under the proposal than the current post-Lehman additional collateral.

(II) Individual CP Impact Based on Proposed Assumptions

a) Distribution of Change in Margin Requirement on 11 February 2008 (date with maximum change in requirement during the Reference Period)

Change in Margin Requirement (in HK$ mn)	Number of CPs	% of Total CPs
> 700 (Maximum increment: 727)	1	0.2%
> 600 to 700	1	0.2%
> 500 to 600	1	0.2%
> 400 to 500	4	0.9%
> 300 to 400	7	1.6%
> 200 to 300	6	1.3%
> 150 to 200	0	0.0%
> 100 to 150	10	2.2%
> 50 to 100	15	3.4%
> 10 to 50	28	6.3%
> 5 to 10	10	2.2%
> 1 to 5	26	5.8%
> 0 to 1	9	2.0%
= 0	331	73.7%
Total	**449**	**100.0%**

b) Distribution of Average Daily Change in Margin Requirement during the Reference Period

Change in Margin Requirement (in HK$ mn)	Number of CPs	% of Total CPs
> 200 (Maximum increment: 217)	1	0.2%
> 100 to 200	2	0.4%
> 50 to 100	6	1.2%
> 20 to 50	15	3.0%
> 10 to 20	22	4.4%
> 0 to 10	204	40.5%
= 0	238	47.3%
< 0 to -10	8	1.6%
< -10 (Minimum decrement: -24)	7	1.4%
Total	**503**	**100.0%**

Reference Period: Three-year period from September 2007 to December 2010

APPENDIX VIII:

MECHANISM OF THE PROPOSED HKSCC DYNAMIC GUARANTEE FUND

(A) GF Size after Introduction of HKSCC Dynamic GF

With the introduction of the Dynamic GF, the GF will be made up of two components.

GF = Fixed GF + Dynamic GF

The adequacy of GF size will be assessed daily and review of CPs' required contribution will be conducted on a monthly basis, ad hoc review may be made from time to time if HKSCC determines that circumstances require it. The required GF size for the monthly adjustment will be the largest daily stressed GF size from the daily assessment in the preceding month.

(B) Daily Assessment of GF Size

The daily stressed GF size and the daily stressed Dynamic GF size will be determined as follows:

Daily Stressed GF Size
= Daily Projected Loss calculated based on proposed Price Movement and Counterparty Default assumptions
Less:
Margin of the Defaulting CPs under the proposed Counterparty Default assumption

Daily Stressed Dynamic GF Size = Daily Stressed GF Size – Fixed GF

(C) GF Positions

Currently, a CP's daily GF Position is its cross-stock cross-day net CNS positions. Going forward, a CP's daily GF Position will be its daily higher of total cross-day net long CNS position plus net settlement obligation payable by the CP or total cross-day net short CNS position. The market's GF Position is the sum of all CP's daily GF Position.

(D) CPs' Fixed GF Contribution

Other than a change in calculation of a CP's daily GF Position, there is no change to the Fixed GF size calculation or sharing among CPs. The aggregate CPs' contributions in the Fixed GF will remain at around HK$100mn and the minimum cash contribution per CP will be the same as current.

(E) CPs' Dynamic GF Contribution

The required Dynamic GF size will be the largest daily stressed GF size in the preceding month less the Fixed GF size. The amount of individual CP's Dynamic GF contribution required will be determined by reference to its share of average daily GF Positions in the preceding month less Dynamic GF Credit.

A CP's Dynamic GF Contribution requirement	=	The CP's share of average daily Market GF Position in the preceding month x Dynamic GF Size	–	Dynamic GF Credit

(F) Numerical Example

The mechanism in determining a CP's Dynamic GF Requirement at a monthly review is as follows:

Step 1: Determine required GF size

Assuming Projected Loss, margins of defaulting CPs and Fixed GF for each business day in December 2010 were as listed in columns (a) to (c) in the table below. The daily stressed Dynamic GF size would be calculated as in column (d). The required GF Size for January 2011 would be HK$2,000mn in column (e), being the largest daily stressed GF size in the preceding month, December 2010.

Table 1: Required GF size (in HK$ mn)

Date	Projected Loss	Margin of Defaulting CPs	Fixed GF	Daily Stressed Dynamic GF size	Daily Stressed GF size
	(a)	(b)	(c)	(d)=(a)-(b)-(c)	(e)=(c)+(d)
1/12/2010	1,400	300	245	855	1,100
2/12/2010	1,400	300	245	855	1,100
3/12/2010	1,500	300	245	955	1,200
6/12/2010	1,400	300	245	855	1,100
7/12/2010	1,200	300	245	655	900
8/12/2010	1,300	300	245	755	1,000
9/12/2010	1,400	300	245	855	1,100
10/12/2010	2,500	500	245	***1,755***	***2,000***
13/12/2010	1,200	300	245	655	900
14/12/2010	1,000	200	245	555	800
15/12/2010	1,300	300	245	755	1,000
16/12/2010	1,800	400	245	1,155	1,400
17/12/2010	1,600	300	245	1,055	1,300
20/12/2010	1,200	300	245	655	900
21/12/2010	1,200	300	245	655	900
22/12/2010	1,200	300	245	655	900
23/12/2010	1,000	200	245	555	800
24/12/2010	1,100	200	245	655	900
28/12/2010	1,200	300	245	655	900
29/12/2010	800	200	245	355	600
30/12/2010	900	200	245	455	700
31/12/2010	1,200	300	245	655	900

Step 2: Determine CPs' Dynamic GF requirement

Assuming the Fixed GF is HK$245mn for January 2011 and the Dynamic GF Credit is HK$1mn. The required Dynamic GF size for January 2011 would be HK$1,755mn (HK$2,000mn – HK$245mn). For simplicity, also assume there were only five CPs with different average daily GF Positions during December 2010. These five CPs' Dynamic GF requirements in January 2011 would be as follows:

Table 2: CPs' Dynamic GF requirement (in HK$)

CP	Average Daily GF Position in December 2010 (a)	Share of Average Daily GF Position in December 2010 (b)	Dynamic GF Requirement Before Deducting Dynamic GF Credit (c)=(b) x Dynamic GF Size	Dynamic GF Requirement (d)=(c)-Dynamic GF Credit (subject to a minimum of 0)
CP 1	-	0.00%	-	-
CP 2	32,000,000	0.04%	702,000	-
CP 3	20,688,000,000	25.86%	453,843,000	452,843,000
CP 4	22,400,000,000	28.00%	491,400,000	490,400,000
CP 5	36,880,000,000	46.10%	809,055,000	808,055,000
Total	**80,000,000,000**	**100.00%**	**1,755,000,000**	**1,751,298,000**

CPs' Dynamic GF contributions can be settled by cash in Hong Kong dollar or bank guarantee in Hong Kong dollar, subject to the HKSCC bank guarantee acceptance policy.

APPENDIX IX:

MARKET IMPACT ANALYSIS OF THE PROPOSED HKSCC DYNAMIC GUARANTEE FUND

(I) Market Impact Based on Proposed Assumptions

a) Market Total and Average Daily of Dynamic GF Collectible during the Reference Period

Dynamic GF Collectible[28] (in HK$ mn)	
Market Total	68 – 2,316
Average Daily	1,129

b) Distribution of Dynamic GF Collectible during the Reference Period

Dynamic GF Collectible (in HK$ mn)	**Number of Days**	**% of Total Days**
> 2,200 (Maximum: 2,316)	22	2.7%
> 2,000 to 2,200	37	4.5%
> 1,800 to 2,000	41	5.0%
> 1,600 to 1,800	21	2.5%
> 1,400 to 1,600	67	8.2%
> 1,200 to 1,400	143	17.4%
> 1,000 to 1,200	185	22.6%
> 800 to 1,000	149	18.2%
> 600 to 800	54	6.6%
> 400 to 600	21	2.5%
> 200 to 400	41	5.0%
> 0 to 200	39	4.8%
Total	**820**	**100.0%**

Reference Period: Three-year period from September 2007 to December 2010

[28] The Dynamic GF Collectible amount is arrived at after deducting Dynamic GF Credit.

(II) Individual CP Impact Based on Proposed Assumptions

a) Distribution of Dynamic GF Collectible in November 2007 monthly review (month with maximum requirement during the Reference Period)

Dynamic GF Collectible (in HK$ mn)	Number of CPs	% of Total CP
> 100 (Maximum: 139)	3	0.7%
> 90 to 100	4	0.9%
> 80 to 90	2	0.5%
> 70 to 80	2	0.5%
> 60 to 70	1	0.2%
> 50 to 60	5	1.1%
> 40 to 50	5	1.1%
> 30 to 40	1	0.2%
> 20 to 30	9	2.0%
> 10 to 20	18	4.0%
> 8 to 10	2	0.5%
> 5 to 8	9	2.0%
> 3 to 5	15	3.4%
> 1 to 3	30	6.7%
> 0.5 to 1	15	3.4%
> 0 to 0.5	33	7.4%
= 0	291	65.4%
Total	**445**	**100.0%**

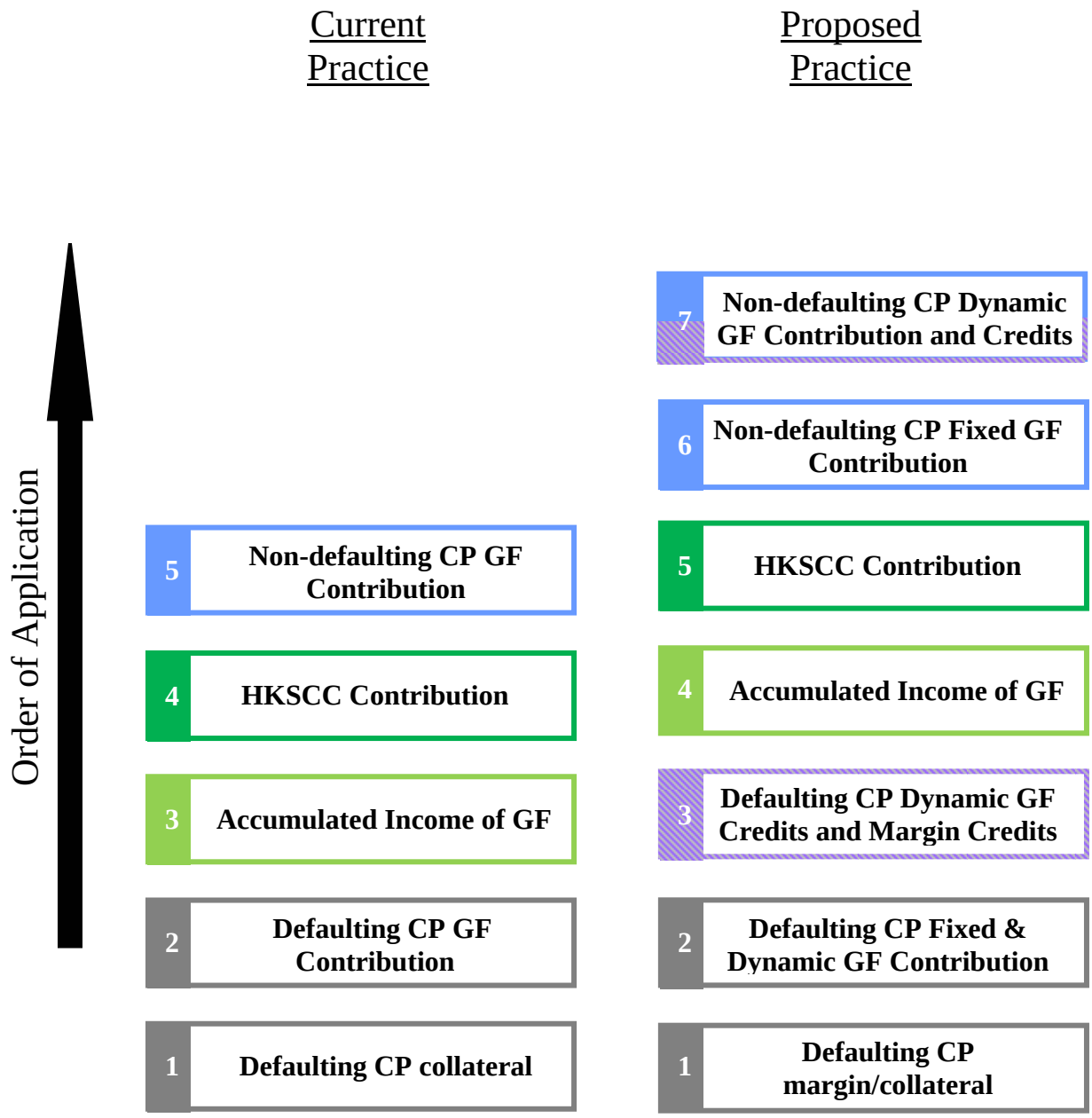
b) Distribution of Average Daily Dynamic GF Collectible during the Reference Period

Dynamic GF Collectible (in HK$ mn)	Number of CPs	% of Total CPs
> 60 (Maximum: 65)	2	0.4%
> 50 to 60	3	0.6%
> 40 to 50	6	1.2%
> 30 to 40	3	0.6%
> 20 to 30	7	1.4%
> 10 to 20	7	1.4%
> 8 to 10	3	0.6%
> 5 to 8	16	3.2%
> 3 to 5	7	1.4%
> 1 to 3	34	6.7%
> 0.5 to 1	13	2.6%
> 0 to 0.5	120	23.8%
= 0	282	56.1%
Total	**503**	**100.0%**

Reference Period: Three-year period from September 2007 to December 2010

APPENDIX X:

ORDER OF APPLICATION OF HKSCC FINANCIAL RESOURCES



Notes:

1. The HKEx RM Capital is currently available to all three clearing houses when all other financial resources are depleted. It will also be used to support the HKSCC Margin Credits and Dynamic GF Credits and HKCC Contingent Advance under this proposal.
2. Other risk transfer instruments (subject to the terms and conditions) may be used to support any of the GF layers except for defaulting CP contribution.
3. In the event of default resulting in the Dynamic GF being applied, the amount applied from the Dynamic GF will be shared among the non-defaulting CPs and HKEx. This sharing will be made on a pro rata basis with reference to the non-defaulting CPs' Dynamic GF contributions, and the Dynamic GF Credits granted by HKEx. CPs and HKEx will be required to replenish their respective shares of any amounts applied in order to maintain the Dynamic GF at the required level.

APPENDIX XI:

ANALYSIS OF COMBINED IMPACT OF THE PROPOSED HKSCC MARGINING AND DYNAMIC GUARANTEE FUND

(I) Market Impact Based on Proposed Assumptions

a) Market Total and Average Daily of Margin and Dynamic GF Collectible during the Reference Period

Margin and Dynamic GF Collectible	Current[29] (in HK$ mn)	Proposed[30] (in HK$ mn)
Market Total	0 – 7,262	1,975 – 12,118
Average Daily	2,389	4,898

b) Change in Margin and Dynamic GF Collectible during the Reference Period

Change in Margin and Dynamic GF Collectible (in HK$ mn)	
Maximum Single Day Increment	↑ 12,113
Maximum Single Day Decrement	↓ 1,610[31]
Average Daily	↑ 2,509

[29] Current amounts represent the post-Lehman additional collateral which HKSCC did not start to collect until September 2008. If the dates before imposition of post-Lehman additional collateral are excluded, the range of Market Total and the Average Daily would be HK$688mn to HK$7,262mn and HK$3,454 mn respectively.

[30] The proposed collectible amount is arrived at after deducting Margin Credit and Dynamic GF Credit.

[31] Decrement represents a lower collectible amount under the proposal than the current post-Lehman additional collateral.

c) Distribution of Change in Margin and Dynamic GF Collectible during the Reference Period

Change in Margin and Dynamic GF Collectible (in HK$ mn)	Number of Days	% of Total Days
> 11,000 (Maximum increment: 12,113)	3	0.4%
> 9,000 to 11,000	31	3.8%
> 7,000 to 9,000	83	10.1%
> 5,000 to 7,000	68	8.3%
> 3,000 to 5,000	107	13.1%
> 1,000 to 3,000	137	16.7%
> 800 to 1,000	21	2.6%
> 600 to 800	29	3.5%
> 400 to 600	33	4.0%
> 200 to 400	40	4.9%
> 0 to 200	41	5.0%
= 0	0	0.0%
< 0 to -200	60	7.3%
< -200 to -400	67	8.2%
< -400 to -600	52	6.3%
< -600 to -800	32	3.9%
< -800 to -1,000	9	1.1%
< -1,000 to -1,200	4	0.5%
< -1,200 to -1,400	1	0.1%
< -1,400 to -1,600	1	0.1%
< -1,600 (Maximum decrement: -1,610)	1	0.1%
Total	**820**	**100.0%**

Reference Period: Three-year period from September 2007 to December 2010

(II) Individual CP Impact Based on Proposed Assumptions

a) Distribution of Change in Margin and Dynamic GF Collectible on 30 November 2007 (date with maximum change during the Reference Period)

Change in Margin and Dynamic GF Collectible (in HK$ mn)	Number of CPs	% of Total CPs
> 700 (Maximum increment: 726)	1	0.2%
> 500 to 700	6	1.4%
> 300 to 500	7	1.6%
> 100 to 300	16	3.6%
> 50 to 100	11	2.5%
> 10 to 50	38	8.5%
> 5 to 10	12	2.7%
> 0 to 5	67	14.8%
= 0	287	64.7%
Total	**445**	**100.0%**

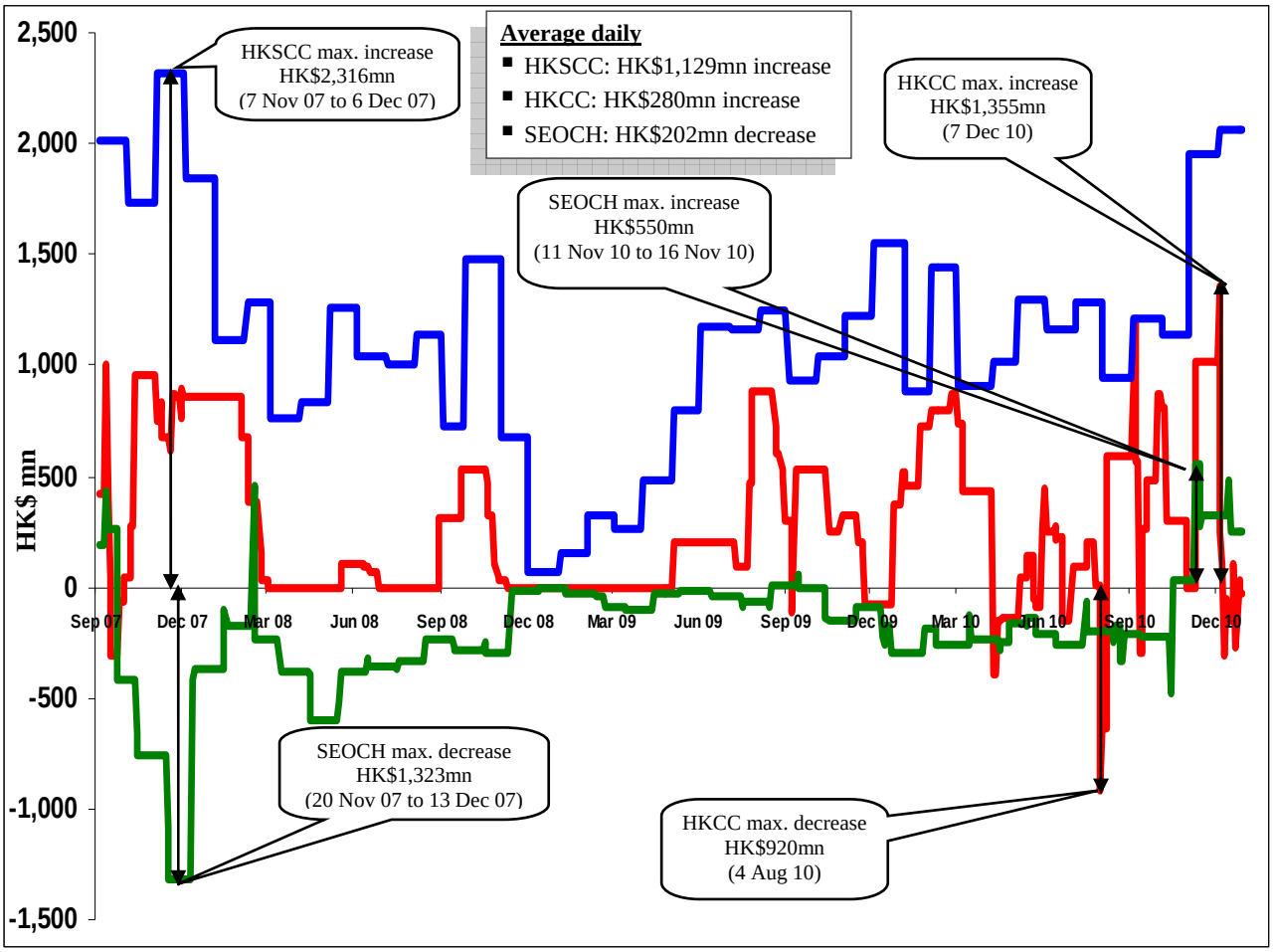
b) Distribution of Average Daily Change in Margin and Dynamic GF Collectible during the Reference Period

Change in Margin and Dynamic GF Collectible (in HK$ mn)	Number of CPs	% of Total CPs
> 200 (Maximum increment: 280)	1	0.2%
> 100 to 200	5	1.0%
> 50 to 100	9	1.8%
> 10 to 50	43	8.5%
> 5 to 10	30	6.0%
> 3 to 5	18	3.6%
> 1 to 3	62	12.3%
> 0 to 1	98	19.5%
= 0	230	45.7%
< 0 to -5	4	0.8%
< -5 (Maximum decrement: -8)	3	0.6%
Total	**503**	**100.0%**

Reference Period: Three-year period from September 2007 to December 2010

APPENDIX XII:

IMPACT ON CLEARING PARTICIPANT DYNAMIC GUARANTEE FUND / RESERVE FUND COLLECTIBLE

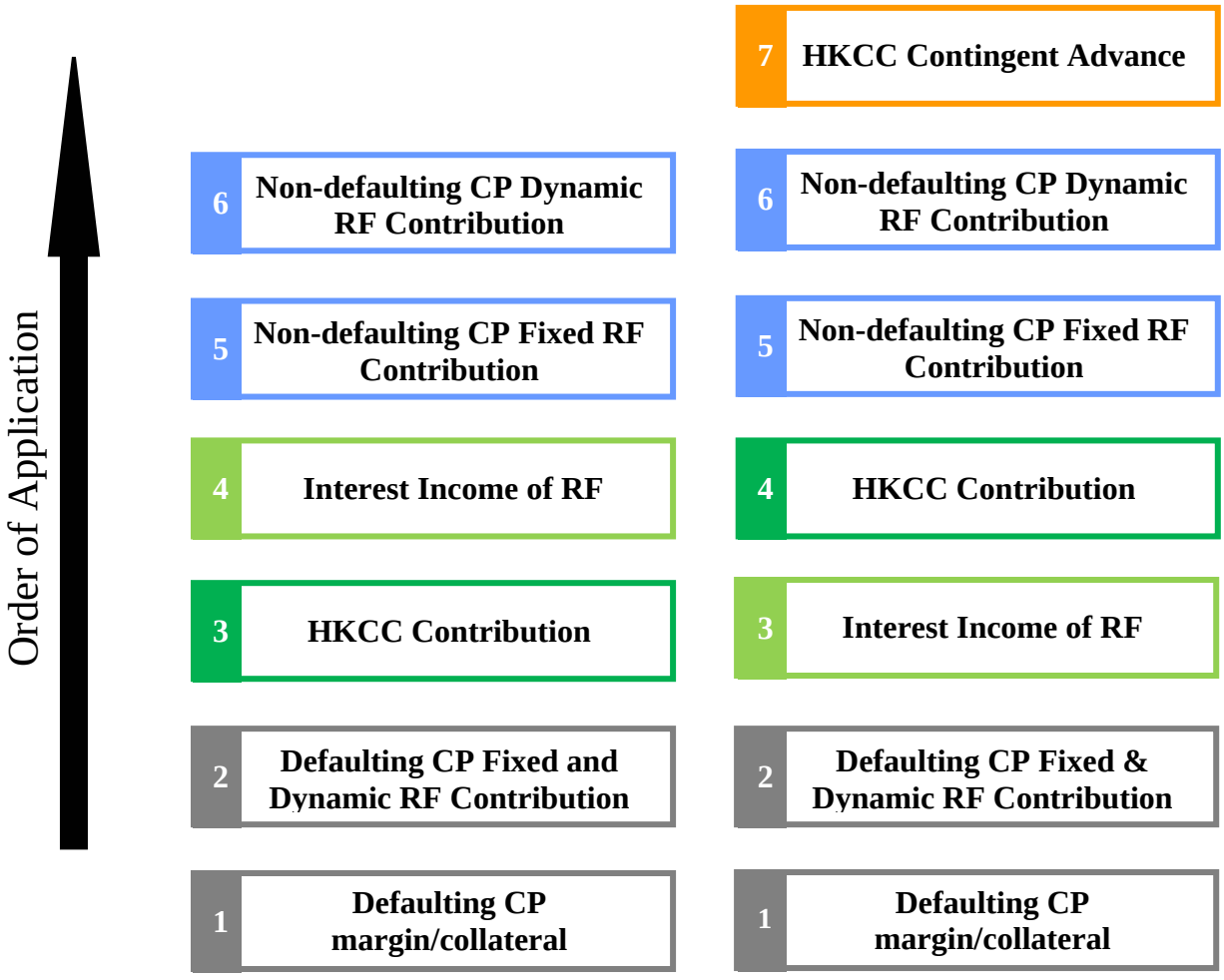


HKSCC CP Dynamic GF Collectible (after HK$1mn Dynamic GF Credit) (Range from HK$68mn to HK$2,316mn)
Change in HKCC CP Dynamic RF Collectible (Range from -HK$920mn to HK$1,355mn)
Change in SEOCH CP Dynamic RF Collectible (Range from -HK$1,323mn to HK$550mn)

Note: For three-year period from September 2007 to December 2010

APPENDIX XIII:

ORDER OF APPLICATION OF HKCC FINANCIAL RESOURCES



Notes:

1. The HKEx RM Capital is currently available to all three clearing houses when all other financial resources are depleted. It will also be used to support the HKSCC Margin Credits and Dynamic GF Credits and HKCC Contingent Advance under this proposal.
2. Other risk transfer instruments (subject to the terms and conditions) may be used to support any of the RF layers except for defaulting CP contribution under the proposed practice.

APPENDIX XIV:

IMPACT ON HKCC CLEARING PARTICIPANT DYNAMIC RESERVE FUND COLLECTIBLE

(I) Market Impact Based on Proposed Assumptions

a) Market Total and Average Daily of Dynamic RF Collectible during the Reference Period

Dynamic RF Collectible	Current (in HK$ mn)	Proposed (in HK$ mn)
Market Total	0 – 2,167	0 – 3,182
Average Daily	409	689

b) Change in Dynamic RF Collectible during the Reference Period

Change in Dynamic RF Collectible (in HK$ mn)	
Maximum Single Day Increment	↑ 1,355
Maximum Single Day Decrement	↓ 920
Average Daily	↑ 280

c) Distribution of Change in Dynamic RF Collectible during the Reference Period

Change in Dynamic RF Collectible (in HK$ mn)	Number of Days	% of Total Days
> 1,000 (Maximum increment: 1,355)	20	2.4%
> 500 to 1,000	208	25.4%
> 200 to 500	154	18.8%
> 0 to 200	137	16.7%
= 0	212	25.8%
< 0 to -200	71	8.7%
< -200 to -500	14	1.7%
<-500 (Maximum decrement: -920)	4	0.5%
Total	**820**	**100.0%**

Reference Period: Three-year period from September 2007 to December 2010

(II) Individual CP Impact Based on Proposed Assumptions

a) Distribution of Change in Dynamic RF Collectible on 7 December 2010 (date with maximum change during the Reference Period)

Change in Dynamic RF Collectible (in HK$ mn)	Number of CPs	% of Total CPs
> 200 (Maximum increment: 218)	1	0.6%
> 150 to 200	2	1.2%
> 100 to 150	1	0.6%
> 50 to 100	4	2.5%
> 10 to 50	15	9.3%
> 5 to 10	5	3.1%
> 1 to 5	26	16.2%
> 0.5 to 1	17	10.6%
> 0 to 0.5	62	38.5%
= 0	28	17.4%
Total	**161**	**100.0%**

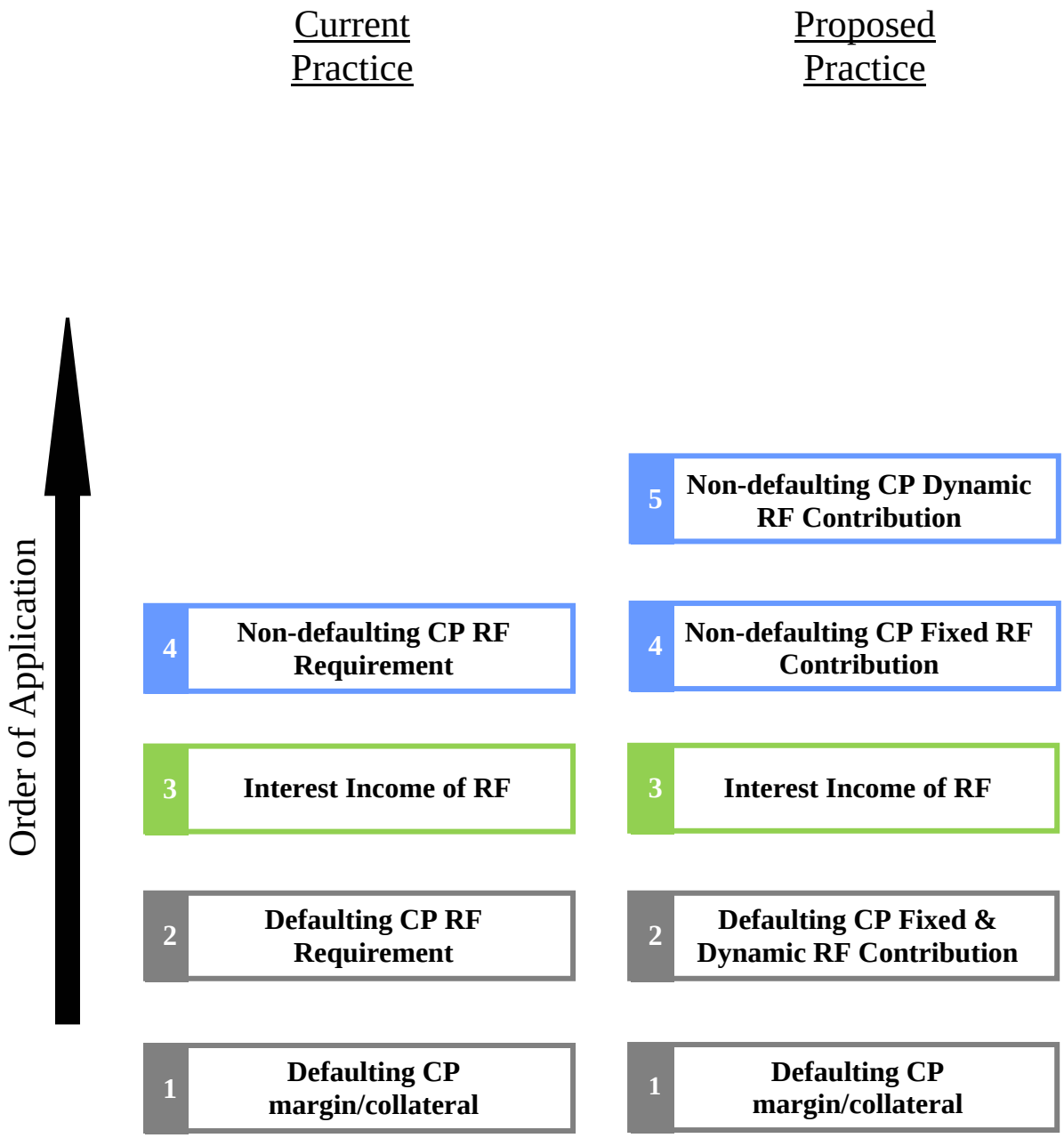
b) Distribution of Average Daily Change in Dynamic RF Collectible during the Reference Period

Change in Dynamic RF Collectible (in HK$ mn)	Number of CPs	% of Total CPs
> 20 (Maximum increment: 25)	3	1.8%
> 10 to 20	9	5.4%
> 5 to 10	4	2.4%
> 1 to 5	13	7.8%
> 0.5 to 1	8	4.8%
> 0.1 to 0.5	36	21.7%
> 0 to 0.1	68	41.0%
= 0	19	11.5%
< 0 (Maximum decrement: -0.002)	6	3.6%
Total	**166**	**100.0%**

Reference Period: Three-year period from September 2007 to December 2010

APPENDIX XV:

ORDER OF APPLICATION OF SEOCH FINANCIAL RESOURCES



Notes:

1. The HKEx RM Capital is currently available to all three clearing houses when all other financial resources are depleted. It will also be used to support the HKSCC Margin Credits and Dynamic GF Credits and HKCC Contingent Advance under this proposal.
2. Other risk transfer instruments (subject to the terms and conditions) may be used to support any of the RF layers except for defaulting CP contribution under the proposed practice.

APPENDIX XVI:

IMPACT ON SEOCH CLEARING PARTICIPANT DYNAMIC RESERVE FUND COLLECTIBLE

(I) Market Impact Based on Proposed Assumptions

a) Market Total and Average Daily of Dynamic RF Collectible during the Reference Period

Dynamic RF Collectible	Current (in HK$ mn)	Proposed (in HK$ mn)
Market Total	0 – 2,462	0 – 1,631
Average Daily	560	358

b) Change in Dynamic RF Collectible during the Reference Period

Change in Dynamic RF Collectible (in HK$ mn)	
Maximum Single Day Increment	↑ 550
Maximum Single Day Decrement	↓ 1,323
Average Daily	↓ 202

c) Distribution of Change in Dynamic RF Collectible during the Reference Period

Change in Dynamic RF Collectible (in HK$ mn)	Number of Days	% of Total Days
> 400 (Maximum increment: 550)	7	0.9%
> 200 to 400	38	4.6%
> 0 to 200	44	5.4%
= 0	18	2.2%
< 0 to -200	307	37.4%
< -200 to -400	330	40.2%
< -400 to -600	35	4.3%
< -600 to -800	22	2.7%
< -800 to -1,000	0	0.0%
< -1,000 to -1,200	1	0.1%
< -1,200 (Maximum decrement: -1,323)	18	2.2%
Total	**820**	**100.0%**

Reference Period: Three-year period from September 2007 to December 2010

(II) Individual CP Impact Based on Proposed Assumptions

a) Distribution of Change in Dynamic RF Collectible on 11 November 2010 (date with maximum change during the Reference Period)

Change in Dynamic RF Collectible (in HK$ mn)	Number of CPs	% of Total CPs
> 300 (Maximum increment: 303)	1	1.6%
> 50 to 300	0	0.0%
> 10 to 50	11	18.0%
> 5 to 10	7	11.5%
> 1 to 5	9	14.8%
> 0.5 to 1	6	9.8%
> 0 to 0.5	14	23.0%
= 0	8	13.1%
< 0 to -10	4	6.6%
< -10 (Maximum decrement: -11)	1	1.6%
Total	**61**	**100.0%**

b) Distribution of Average Daily Change in Dynamic RF Collectible during the Reference Period

Change in Dynamic RF Collectible (in HK$ mn)	Number of CPs	% of Total CPs
> 0 (Maximum increment: 0.3)	5	7.8%
= 0	9	14.0%
< 0 to -0.5	16	25.0%
< -0.5 to -1	7	10.9%
< -1 to -5	14	21.9%
< -5 to -10	10	15.6%
< -10 to -20	1	1.6%
< -20 to -30	0	0.0%
< -30 to -40	1	1.6%
< -40 (Maximum decrement: -48)	1	1.6%
Total	**64**	**100.0%**

Reference Period: Three-year period from September 2007 to December 2010

APPENDIX XVII:

PERSONAL INFORMATION COLLECTION AND PRIVACY POLICY STATEMENT

Provision of Personal Data

1. Your supply of Personal Data to HKEx is on a voluntary basis. "Personal Data" in these statements has the same meaning as "personal data" in the Personal Data (Privacy) Ordinance, Cap 486, which may include your name, identity card number, mailing address, telephone number, email address, login name and/or your opinion.

Personal Information Collection Statement

2. This Personal Information Collection Statement is made in accordance with the guidelines issued by the Privacy Commissioner for Personal Data. It sets out the purposes for which your Personal Data will be used after collection, what you are agreeing to in respect of HKEx's use, transfer and retention of your Personal Data, and your rights to request access to and correction of your Personal Data.

Purpose of Collection

3. HKEx may use your Personal Data provided in connection with this consultation paper for purposes relating to this consultation and for one or more of the following purposes:

   - administration, processing and publication of the consultation paper and any responses received;
   - performing or discharging HKEx's functions and those of its subsidiaries under the relevant laws, rules and regulations;
   - research and statistical analysis; and
   - any other purposes permitted or required by law or regulation.

Transfer of Personal Data

4. Your Personal Data may be disclosed or transferred by HKEx to its subsidiaries and/or regulator(s) for any of the above stated purposes.

5. To ensure that the consultation is conducted in a fair, open and transparent manner, any response together with your name may be published on an "as is" basis, in whole or in part, in document form, on the HKEx website or by other means. In general, HKEx will publish your name only and will not publish your other Personal Data unless specifically required to do so under any applicable law or regulation. If you do not wish your name to be published or your opinion to be published, please state so when responding to this paper.

Access to and Correction of Data

6. You have the right to request access to and/or correction of your Personal Data in accordance with the provisions of the Personal Data (Privacy) Ordinance. HKEx has the right to charge a reasonable fee for processing any data access request. Any such request for access to and/or correction of your Personal Data should be addressed to the Personal Data Privacy Officer of HKEx in writing by either of the following means:

By mail to: Personal Data Privacy Officer
Hong Kong Exchanges and Clearing Limited
12th Floor, One International Finance Centre
1 Harbour View Street
Central
Hong Kong
By email to: pdpo@hkex.com.hk

Retention of Personal Data

7. Your Personal Data will be retained for such period as may be necessary for the carrying out of the above-stated purposes.

Privacy Policy Statement

8. HKEx is firmly committed to preserving your privacy in relation to the Personal Data supplied to HKEx on a voluntary basis. Personal Data may include names, identity card numbers, telephone numbers, mailing addresses, e-mail addresses, login names, opinion, etc., which may be used for the stated purposes when your Personal Data are collected. The Personal Data will not be used for any other purposes without your consent unless such use is permitted or required by law or regulation.

9. HKEx has security measures in place to protect against the loss, misuse and alteration of Personal Data supplied to HKEx. HKEx will strive to maintain Personal Data as accurately as reasonably possible and Personal Data will be retained for such period as may be necessary for the stated purposes and for the proper discharge of the functions of HKEx and those of its subsidiaries.

APPENDIX XVIII: GLOSSARY

2004 IOSCO Recommendations	CPSS-IOSCO Technical Committee Recommendations for Central Counterparties (November 2004)
2011 IOSCO Consultative Report	CPSS-IOSCO Principles for Financial Market Infrastructures Consultative Report (March 2011)
ASX Clear	ASX Clear Pty Limited, Australia
ASX Clear (Futures)	ASX Clear (Futures) Pty Limited, Australia
CCASS Rules	General Rules of CCASS
CCPs	Central counterparties
CDP	The Central Depository (Pte) Limited, Singapore
CME	Chicago Mercantile Exchange, US
CNS	Continuous Net Settlement
Collateral assumption	Treatment of collateral in stress testing
CP	Clearing Participant
CPSS	Committee on Payment and Settlement Systems
Dynamic GF	Dynamic Guarantee Fund
Dynamic RF	Dynamic Reserve Fund
Eurex	Eurex Clearing AG, Germany
FRR	The Securities and Futures (Financial Resources) Rules under the Securities and Futures Ordinance
GF	Guarantee Fund
HKATS	The Hong Kong Futures Automated Trading System
HKCC	The HKFE Clearing Corporation Limited
HKCC Contingent Advance	HKCC Contingent Advance Capital
HKEx	Hong Kong Exchanges and Clearing Limited
HKEx RM Capital	HKEx Risk Management Capital
HKSCC	The Hong Kong Securities Clearing Company Limited
HSCEI	Hang Seng China Enterprises Index
HSI	Hang Seng Index
IDM	Intra-day margin
IOSCO	International Organization of Securities Commissions
JSCC	Japan Securities Clearing Corporation, Japan
Lehman	Lehman Brothers Securities Asia Limited, Hong Kong
LCH.Clearnet Ltd	LCH.Clearnet Limited, UK

LCH.Clearnet SA	LCH.Clearnet SA, France
NSCC	National Securities Clearing Corporation, US
OCC	The Options Clearing Corporation, US
Projected Loss	Default loss projected under stress testing assumptions
Reference Period	Three-year period of September 2007 through December 2010
RF	Reserve Fund
RMF	Risk Management Fund
RR	Replenishment Right
SEOCH	The SEHK Options Clearing House Limited
SFC	Securities and Futures Commission, Hong Kong
SGX-DC	Singapore Exchange Derivatives Clearing Limited, Singapore