

Further Information on Next Generation Post Trade Programme ("NextGen")

General

1. What is the Next Generation Post Trade Platform?

The NextGen Post Trade is a programme of work that will be delivered in a phased modular fashion. The primary purpose of the programme is to reduce risk and enhance our post trade offering to Clearing Participants. It will consolidate and streamline our post trade services – from risk management to the production of share certificates. Initially, the focus will be on the three clearing houses supporting exchange traded products, namely, HKSCC, HKCC and SEOCH. We will integrate core systems together into a common, streamlined platform which will deliver capital and operational efficiency, enhanced risk management and new tools for Clearing Participants to manage their business. The common platform will support multiple asset classes and new clearing services in line with the HKEX strategy. The initial implementation of a post trade Data Warehouse with new reporting and data interrogation tools for Participants and a Client Portal, initially digitizing many manually intensive paper processes are scheduled for Q1 2019. This will be followed by additional data reporting services and a new risk engine and risk models for the cash market in the second half of 2019. Listed Derivatives will be migrated to the new risk engine and models in 2020. Please refer to the latest Client Improvement Timeline (*to be posted on web*).

2. What are the key changes in NextGen?

NextGen Phase 1 is the introduction of a new multi asset single risk engine and new risk models (VaR) together with a data warehouse providing post trade data services. The Client Portal will provide the foundation for Participants to access other HKEX business lines over time – addressing a number of post trade operational efficiencies at the outset while developing a single interface to HKEX products and services over time.

These new platforms will allow Participants to benefit from new technology, business processes and data access whilst in parallel, we plan the next phase of NextGen Post Trade which will involve agreeing a roadmap of change focused on our clearing and settlement platforms, USM (scripless), collateral management, payment infrastructures and CSD platforms.

3. Will OTC Clear be included in NextGen?

Initially, the project scope is cash securities and listed derivatives. The new single risk engine will allow cross-margining different asset classes and various product types. The new infrastructure will support new asset classes including OTC over time and following industry engagement.

4. What services will be available to Clearing Participants?

With the Phase 1 migration to NextGen, there will be new services available to Clearing Participants in 2019:

Data Sets/ Reports

New machine readable consolidated post trade data reports. These reports and supporting data will be securely accessible via a browser interface with a flexible dashboard allowing Participants to interrogate and extract their data.

The new set of specific post trade reports will also be available from a new data delivery channel (SFTP). For a short transition period, the consolidated reports will also be available on the CCASS Participant Gateway.

The new consolidated set of Clearing and Risk Reports will include new risk parameter files and pricing data. Participants will be able to query the more detailed data set with the introduction of the new risk engine. All current CCASS reports will continue to be available via the current delivery mechanism – other than risk specific data – given the introduction of the new risk engine.

Client Portal

The Client Portal will facilitate Clearing Participants access to HKEX services in a more efficient and digitalized manner – removing much of the operational overhead and risk associated with the administrative form filling processes available today. Technical specifications will start to become available from Q3 2018. Please click here for the latest [Clearing Participant Documentation Timetable](#).

Risk Models and Risk Engine

Browser based technology will be available for Clearing Participants to access the risk User Interface. Connectivity and functionality details will be provided.

Risk - New Risk Engine and Risk Models

5. What is Next Generation Risk Models (NGRM)?

NGRM is a risk-based approach for Initial Margin (IM) calculation and Stress Testing (for determination of default fund) of HKSCC. NGRM is based on modern architecture as well as industry best practices, and will be transparent, replicable, resilient and compliant with prudential regulatory requirements.

For IM calculation, NGRM takes the Hang Seng Composite Index (HSCI) as the reference to split all HKSCC clearable products into two tiers i.e. Primary Tier (Tier P) and Non-Constituent Tier (Tier N). All large / mid-cap HSCI constituents, Structured Products with the underlying of large / mid-cap HSCI constituents, and equity index ETFs are in Tier P while the remaining products fall into Tier N. Tier P positions will be subject to portfolio margining while Tier N positions will be subject to the IM calculation similar to the existing approach adopted in HKSCC.

For stress testing, NGRM applies multiple product-specific historical and hypothetical scenarios to all products to estimate the potential loss of Clearing Participants' portfolio under extreme but plausible situations.

6. What are the key changes compared with HKSCC's current margin model?

Current Initial Margin model

- Single margin rate based on the volatility of Hang Seng Index
- Applied to all products cleared by HKSCC

NGRM IM model

- Value-at-Risk (VaR) based portfolio margining with potential risk offset for Tier P positions
- More conservative single margin rate for Tier N positions
- Liquidation risk add-on (for Tier P) and liquidation risk buffer (for Tier N) in place for portfolios with concentrated positions (See Q14 for details)
- Improved risk management measures and margin methodology

7. What are the benefits to Clearing Participants (CPs) with business focusing on cash equities?

In general, the Initial Margin requirement is driven by the balance of the long / short positions and the diversification of the portfolio. Therefore, the risk of each CP's portfolio is more accurately measured resulting in higher capital efficiencies for HKSCC CPs. Specifically, CPs carrying less market and liquidity risk in their portfolios will see decreases in the collateral requirements to HKSCC.

8. Why does HKSCC believe that it is the right time to implement NGRM now?

Since the launch of Stock Connect in 2014, the cash equity market has experienced a significant increase in the number of Clearing Participants and market turnover. This prominent reason along with the increasing regulatory requirements globally has become the driving forces for NGRM.

9. What products does NGRM cover?

NGRM covers all HKSCC clearable products including the following:

- Cash Equities (Ordinary shares & Preference shares)
- Exchange Traded Products (ETPs)
- Callable Bull / Bear Contracts (CBBCs)
- Derivative Warrants
- Equity Warrants

- Debt Securities
- Rights
- Real Estate Investment Trusts/ Unit Trusts/ Mutual Funds

10. Will there be any impact to Clearing Participants' margining of Stock Connect products?

NGRM margining methodology will be applied to the Southbound products. For the Northbound products, home market rules still prevail therefore there will be no impact on the margin requirement.

11. Is it mandatory for Clearing Participants (CPs) to implement NGRM? What tools will be available to CPs to facilitate implementation?

Yes. To facilitate implementation and ensure transparency, margin simulation tools (e.g. web-based Graphical User Interface "GUI" and risk parameter files) will be available for CPs to estimate the potential margin associated with accounts, trades and portfolios.

12. How will the migration to NGRM be completed?

HKSCC is currently devising the testing schedules and launch plans, and examining the appropriate options to allow the market to migrate in a secure and orderly manner. There will be a period of time for a parallel running in addition to market rehearsals. Details will be shared in due course.

13. What factors did HKSCC consider in selecting NGRM over other types of risk models?

HKSCC has considered the model performance and stability, margin coverage requirement, and other model related features as the key selection criteria. In addition, international benchmarking analysis was performed as a reference for selecting appropriate models. The aims of the new risk models selected are to manage risk in a more robust and resilient manner and in-line with industry best practices.

14. Under what circumstances will Clearing Participants experience a saving or increase in Initial Margin (IM)?

NGRM will be applied to the securities market cleared at HKSCC where IM will be calculated on a net portfolio basis allowing risk offset among selected securities where applicable.

As to IM reduction or increase, it depends on the portfolio composition, for example, the IM requirements would likely be reduced for a balanced, diversified portfolio while a directional, concentrated portfolio will likely see IM requirements increase.

15. How does the NGRM Initial Margin (IM) model mitigate pro-cyclicality?

The inclusion of stressed Value-at-Risk (VaR) component, consistent with the European Market Infrastructure Regulation, mitigates the pro-cyclical effect in the NGRM IM model. Other anti-pro cyclical measures, including margin floor and volatility smoothing are also in place to reduce the fluctuation of IM requirement.

16. How does the NGRM Initial Margin (IM) model treat concentrated positions and illiquid securities?

NGRM IM model applies liquidation risk add-on to concentrated Tier P positions and illiquid securities. A flat rate of liquidation risk buffer is also implemented for Tier N's IM requirement. The IM model is reviewed periodically to ensure sound model performance as well as reflecting the latest developments in the market.

17. Will the margin credit of HK\$5 million still be offered to Clearing Participants?

Yes. The arrangement will be the same as today.

18. Where can Clearing Participants obtain additional details of the NGRM methodologies?

All the materials relating to NGRM can be found on the [HKEX website](#). This document will also be updated periodically.

Clearing Participants may contact Clearing Risk Management Department (email: Margin_Modelling@hkex.com.hk) should they have any feedback or questions.

Data Warehouse

19. Is access to the Data Warehouse mandatory or optional?

In principle, Participants will choose when to use the services of the Data Warehouse. The primary purpose of the data warehouse is to store all post trade data in one location in a secure, accessible manner for Participants.

A browser based Graphical User Interface (GUI) providing a data interrogation tool (Business Intelligence tool) will be available to Participants, which will allow Participants to query their own data, schedule reports and extract data in machine readable files. User Guides will be available describing the functionality available.

20. Will CCASS reports be decommissioned?

With the implementation of the NextGen risk engine – new risk related reports will be available and the current risk reports from CCASS will be decommissioned. No other reports will be decommissioned from CCASS in the short term. We plan to put all current CCASS data into the data warehouse in 2019. New machine readable reports and data queries will be available from the outset to allow Participants more efficient access to data. However, the current reports

available from CCASS will remain – other than any CCASS risk reports from the moment the new risk engine is available.

Participants will have access to different reports:

- Current CCASS reports – subject to CCASS risk reports being decommissioned – available per current delivery mechanisms
- New standard Clearing Reports – consolidated reports with key data – machine readable and available on the SFTP server and the Participant Gateway
- Data Warehouse Browser based GUI – access to an increasing set of post trade data – for interrogation, extracts, analysis – with dashboard functionality to assist in the display and management of data.

21. Will the Data Warehouse store historical data?

Given the risk engine will require historical data for calculation/ simulation, the data warehouse will keep an appropriate amount of data necessarily for the risk functions. On average the post trade data, in the data warehouse and accessible in real time will be 1 – 5 years, dependent on the actual data fields.

Client Portal

22. Is access to the Client Portal mandatory or optional?

In principle, HKEX strongly encourages our Participants use the e-Services of the Client Portal instead of submitting manual forms. There will be a transition period for Participants to familiarize themselves with the Client Portal. Following industry engagement, the manual forms will become a contingency channel for service submission over time.

23. Will all the manual forms on HKEX website be migrated to the Client Portal as e-Services?

Digitalization of the manual forms are anticipated over time. Certain manual forms that are currently GUI-related functions will be automated through the implementation of other NG applications and to avoid duplicate effort.

24. Will the Client Portal replace current CCASS Terminal?

Changes and removal of the CCASS Terminal is anticipated over time but they these changes will not happen in a big bang fashion. The clearing and settlement process will continue to be available to all Participants on the CCASS Terminal and/ or Participant Gateway over SDNet. The NextGen Roadmap which will be discussed with the industry will clearly set out the time table of events and

changes anticipated over time. The Client Portal is intended to facilitate Participants access to HKEX services in a more efficient and digitalized manner over the Internet.

Others

25. Will any NextGen Services be available to the end clients (NCPs) of Clearing Participants?

All post trade services are designed for our Clearing Participants, while recognizing they have clients to serve. With the move to more modern technology, the NextGen Post Trade developments will allow Clearing Participants to offer more services to their clients.

With the current approach

- Data will be more readily available – easier to manage and interrogate – both automated and machine readable. Clearing Participants will be able to offer their clients more extensive data / reporting services. The data warehouse will be introduced in phases and we will continue to add data – extending beyond post trade.
- The Client Portal – strategically is being developed as a corporate wide tool – again, beginning in Phases starting with post trade and digitizing some key manual processes that exist today – enhancing current Clearing Participant access and processes will no doubt benefit clients. As we look to extend the reach and services within the Portal, access will be developed in tandem.

Within our design of NextGen services, the ability of Clearing Participants to provide a newer level of access to data and information remains a core strategy. As we work through the details of the design and plans, we will look to be more specific.

26. Is NextGen mandatory for all Clearing Participants?

The entire NextGen Programme will be a complete upgrade of services provided by HKEX and certain phases will be mandatory for all Clearing Participants. Systems like CCASS, DCASS and other manual interfaces will be phased out and replaced over time.

However, there is no mandatory technical upgrade with NextGen Phase 1 although there are many new services via new access points which will require some change at a Participant. If Participants want to take advantage of new (data) services, they will need to be able to access (the Participant Gateway or the SFTP server) where our new risk reports and the extended consolidated machine readable Clearing Reports will be available. In addition, Clearing Participants may want to consider accessing the data interrogation tool (Business Intelligence tool) to access their own data for analysis. This access will be via a secure browser based interface. The margin simulator, although not mandatory is a value add service and available to Clearing Participants.

With the introduction of a new risk engine and models, Participants who wish to see and track their risks and positions throughout the day (as opposed to end of day) will need to access the risk

engine by a new browser interface. Technical connectivity details will be made available for all services over the coming months.

27. Will there be changes in Participant Gateway or is there any NextGen gateway? What are the expectations on changes on reports /files? Do we continue to use SDNet?

Changes to the Gateway are anticipated over time but they will not happen in a big bang fashion. Given we will be focusing on the single risk engine and models in 2019, the clearing and settlement process and existing Participant Gateway functionality will continue to be available to all Clearing Participants.

SDNet currently provides us with a secure network – no changes are envisaged for Phase 1, however, if any changes are considered going forward in Phase 2, we will communicate any updates.

28. Will the NextGen platform utilize ISO standards?

All NextGen components will be ISO compatible where appropriate. There is limited impact in Phase 1 – however when we consider for example Clearing and Settlement/ Payment/ Collateral initiatives, incorporating ISO 20022 will be a key part of the programme. In parallel, we continue to look at ISO 20022 initiatives in our post trade Business as Usual projects.

29. What account structures are available with the NextGen Post Trade?

Several account structures will be available depending on the end user's preferences. All NextGen components will be developed according to an account hierarchy – catering for House, Omnibus, and Individual Segregated Accounts (ISA) accounts with a choice of margining capabilities – gross or net – as appropriate. CPs must bear in mind that whilst we continue to have a dependency on CCASS and its current account structure, the full benefit of the NG new account structures delivered with NextGen will not be fully apparent.

30. Is Corporate Actions processing part of NextGen Phase 1?

No, we have a Business-As-Usual project, scheduled for implementation in Q3/Q4 2019 to streamline and address some of the key manual process – around 80% of the current Corporate Action manual processes will be addressed with the introduction of ISO 20022 standard SWIFT messages.

NextGen Phase 2 will look to address any outstanding improvements required ensuring HKEX will be the Golden Source of Corporate Action information.

31. What is the rollout schedule for HKATS and DCASS upgrade? Will it coincide with the launch of NextGen Risk?

For the rollout schedule of HKATS and DCASS Upgrade, please click [HERE](#). The new single risk engine and risk models are scheduled to be launched in 2H 2019 for securities market only (HKSCC). The rollout of the new engine and models for the derivatives market will follow thereafter after the rollout for HKATS and DCASS upgrade. We will continue to keep the Customer Improvement Timeline up to date and available on our website.

32. When will test environments be made available to Clearing Participants?

Clearing Participants testing environments will be made available as early as possible including access to the margin simulator. Detailed test packs will be made available for Clearing Participants. Please click here for the latest [Clearing Participant Documentation Timetable](#).

33. Current legacy platform requires Clearing Participants to perform daily upload and download of instructions/reports and to manually carry out clearing and settlement procedures. Does HKEX plan to upgrade/replace the clearing and settlement platform to support more automation and STP?

Phase 1 of the NextGen programme is the new risk engine/models, Data Warehouse and Client Portal. Now that we have started the implementation of these projects, in parallel we are starting to analyze the next phase of NextGen. We need to consider clearing, settlement, collateral management, the payments infrastructure, international standards and the central securities depository function and devise the appropriate roadmap to replace aging technology and processes. We need to work with our Participants to devise new business models where appropriate and improve the business model from a business process, technology and operating perspective. Over the next couple of months we will create a new target operating model – to share with the industry for comment and feedback.

We have started the programme to replace CCASS (and DCASS) risk engines and platforms. We are working on a more detailed road map for Phase 2.

34. Does HKEX plan to use Distributed Ledger Technology in NextGen?

We will continue to investigate DLT and what potential value it may bring to HKEX and the market. We are at early stages in our investigations but will continue to explore any potential benefits. We will continue dialogue with the market regarding the potential benefits of this new technology.

DISCLAIMER

The information contained in this document is for general informational purposes only and does not constitute an offer, solicitation, invitation or recommendation to subscribe for or purchase any securities or other products or to provide any investment advice of any kind. This document is not directed at, and is not intended for distribution to or use by, any person or entity in any jurisdiction or country where such distribution or use would be contrary to law or regulation or which would subject Hong Kong Exchanges and Clearing Limited (“HKEX”) to any registration requirement within such jurisdiction or country.

This document contains forward-looking statements which are based on the current expectations, estimates, projections, beliefs and assumptions of HKEX about the businesses and the markets in which it and its subsidiaries operate or aspires to operate in. These forward-looking statements are not guarantees of future performance and are subject to market risk, uncertainties and factors beyond the control of HKEX. Therefore, actual outcomes and returns may differ materially from the assumptions made and the statements contained in this document. The implementation of these initiatives is subject to a number of external factors, including government policy, regulatory approval, the behavior of market participants, competitive developments and, where relevant, the identification of and successful entry into agreements with potential business partners. As such, there is no guarantee that the initiatives described herein will be implemented, or that they will be implemented in the form and timeframe described herein.

Although the information contained in this document is obtained or compiled from sources believed to be reliable, HKEX does not guarantee the accuracy, validity, timeliness or completeness of the information or data for any particular purpose, and shall not accept any responsibility for, or be liable for, errors, omissions or other inaccuracies in the information or for the consequences thereof. The information set out in this document is provided on an “as is” and “as available” basis and may be amended or changed. It is not a substitute for professional advice which takes account of your specific circumstances and nothing in this document constitutes legal advice. HKEX shall not be responsible or liable for any loss or damage, directly or indirectly, arising from the use of or reliance upon any information provided in this document.