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

General

1. **What is NextGen?**

Next Generation Post Trade is a programme of work aimed at enhancing our post-trade offering to Clearing Participants; consolidating and streamlining our platforms, simplifying and digitising services, and reducing risk.

It is a multi-year, modular programme that will be delivered in phases. Initially, the focus will be on initiatives that build toward the integration of the three clearing houses supporting exchange traded products, namely, HKSCC, HKCC and SEOCH. Integrating the core systems into a common, streamlined platform will deliver capital and operational efficiency, enhanced risk management and new tools for CPs to manage their business. The common platform will support multiple asset classes and offer new clearing services in line with the HKEX strategy.
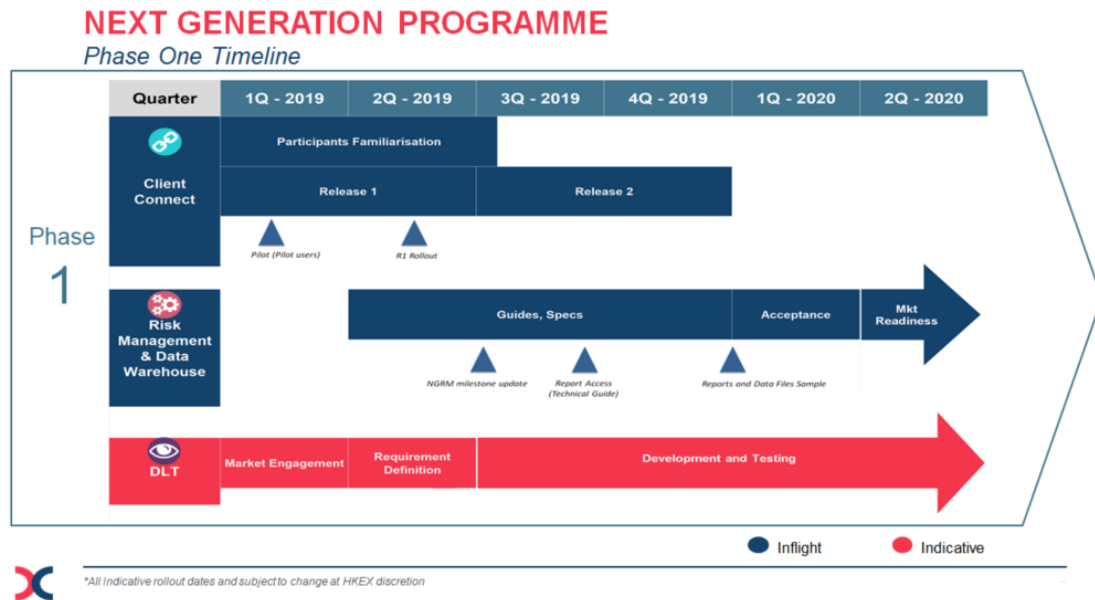
2. **What are the current key changes in NextGen?**

NextGen Phase 1 includes the introduction of Client Connect, a new web portal which digitises and streamlines existing manually intensive paper processes. The initial release, covering 24 e-Services, went live on 14 May 2019, and subsequent updates will extend coverage across the remainder of paper forms.

As part of the release of Client Connect, we have also delivered a key component for Participants to access other HKEX business lines over time – a unified access system with enhanced security and delegated administration.

While Client Connect addresses a number of post trade operational efficiencies and digitisation needs, we are addressing the need of more capital efficient risk models with the introduction of a new multi asset single risk engine and a new VaR-based risk models, planned for release around the middle of 2020. Listed Derivatives will be migrated to the new risk engine and models in subsequent phases.

These new initiatives will allow Participants to benefit from new technology, improved business processes, and simplified data access. In parallel, HKEX continues to plan subsequent phases of NextGen, focused on our clearing and settlement, collateral and payment platforms and market infrastructure.

NEXT GENERATION PROGRAMME
Phase One Timeline

| Quarter | 1Q - 2019 | 2Q - 2019 | 3Q - 2019 | 4Q - 2019 | 1Q - 2020 | 2Q - 2020 |

Phase 1

Client Connect
- Participants Familiarisation
- Release 1
- Release 2
- Pilot (Pilot users)
- R1 Rollout

Risk Management & Data Warehouse
- Guides, Specs
- Acceptance
- Mkt Readiness
- NGRM milestone update
- Report Access (Technical Guide)
- Reports and Data Files Sample

DLT
- Market Engagement
- Requirement Definition
- Development and Testing

● Inflight   ● Indicative

*All Indicative rollout dates and subject to change at HKEX discretion

3.   What is the DLT Prototype?

HKEX is undergoing a Proof of Concept (POC) exercise using distributed ledger technology (DLT) to better support the post-trade community for the pre-settlement process of Stock Connect Northbound transactions.

An optional service within the pre-settlement workflow aiming to provide an alternative to the "single sided settlement" process, the DLT Prototype will allow for transaction details to be visible only to Authorized participants and synchronized in a secure, seamless manner across the post-trade ecosystem.

The prototype is being developed as a collaborative platform, facilitating institutional buy-side investors, global custodians, local custodians, brokers, exchange and clearing participants in the Clearing and Settlement process.

HKEX is active in exploring the uses of distributed ledger technology, and we are seeking to extend its application to other areas.

4.   Will OTC Clear be included in NextGen?

NextGen's initial project scope is cash securities and listed derivatives. However, over time the new single risk engine will allow cross-margining different asset classes and various product types. The NextGen infrastructure is intended to support new asset classes (including OTC) in subsequent phases, and development will be pursued in conjunction with industry engagement.

5.   What services will be available to CPs?

Phase 1 of the NextGen programme will introduce a number of new services available to CPs.

Reports
New post trade data reports containing risk related data will be available in both machine-readable CSV and in PDF formats via a new Report Access Platform, superseding the existing CCASS reports.

Participants will need to configure their internal systems in order to integrate the CSV reports, specification documentation for the risk new reports and Report Access Platform connectivity will be provided. Please refer to the [NextGen Post Trade Programme](#) website for more details.

These new risk reports will contain information such as marks, margin, northbound deposit and default fund. Reports containing new risk parameters and End of Day settlement prices will also be available.

- Existing CCASS reports containing risk related data will be decommissioned.
- Existing CCASS reports for Clearing, Settlement and Collateral will continue to be provided through existing channels.

Client Connect
The Client Connect portal allows CPs to access HKEX services in a more efficient and digitized manner – removing much of the operational overhead and risk associated with the physical form filling processes prevalent today. Please refer to [Client Connect](#) for the latest information. All Participants are invited to register to use Client Connect from May 2019 onwards.

Risk Engine and Risk Models

An accurate, efficient, robust risk management framework allowing CPs to optimize their balance sheets.

A new User Interface will include a margin Simulator which will allow CP to perform simulation on its risk requirement. Further information on connectivity and functionality details will be provided in Aug 2019, including (1) VaR Risk Parameter file guide providing file specification and margin calculation examples, and (2) Stress testing Risk Parameter file guide providing file specification and stress testing calculation examples.

Please refer to Q6 below for a more in depth description of the new Risk Engine and Risk Models.

New Risk Engine and Risk Models

6.   What is the Next Generation Risk Management (NGRM)?

NGRM is a new risk-based approach for Initial Margin (IM) calculation and Stress Testing (for determination of default fund) of HKSCC. While being based on modern architecture and industry best practices, NGRM will be transparent, replicable, resilient and compliant with relevant regulatory requirements, resulting in improved risk management measures.

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 by HKSCC.

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

7. 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

Primary Tier (Tier P): Value-at-Risk (VaR) based portfolio margining with potential risk offset for Tier P positions.
- HSCI Large Cap and Mid Cap constituent stocks
  - Covers securities which rank in the top 95% of the total market capitalization
- All Equity indices ETFs
- As at Mar 2018:
  - Includes ~450 instruments
  - Covers 74% of the total market turnover

Cash Equities and Structured Products (SP) Handling
- Portfolio Margining and subject to minimum margin level
- Includes SP with Tier P underlying or HIS/HHI index

Non-Constituent Tier (Tier N): More conservative single margin rate for Tier N positions.
- Contains all instruments not in Tier P (e.g.: GEM stocks, small/micro cap stocks, etc.)
- Operationally easier to adopt by CPs given the similarity to current single margin rate model
- As at Mar 2018:
  - Includes ~ 1950 instruments

Cash Equities and Structured Products (SP) Handling
- Flat rate on higher of Long/Short CNS positions (current HKSCC methodology)

Liquidation risk add-on (for Tier P) and liquidation risk buffer (for Tier N) will be in place for portfolios with concentrated positions (Refer to Q7 for details).

8. What are the benefits to CPs with businesses focused on cash equities?

In general, IM requirements are driven by the volatility of positions in a portfolio, the balance of long / short positions and portfolio diversification. Under the new IM model, 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.

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

Since the launch of Stock Connect in 2014, the cash equity market has experienced a significant increase in the number of CPs and market turnover. This surge in demand and the increasingly complex global regulatory environment are the key driving forces for NGRM.

10.   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

11.   Will there be any impact to CPs' margining of Stock Connect products?

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

12.   Will there be any tools available for CPs to facilitate the implementation of NGRM?

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. For further information, please visit [NextGen Risk Management](#) for details.

13.   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 market rehearsals planned for 2020.

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

HKSCC took a number of key criteria into consideration when selecting NGRM, including model performance and stability, margin coverage requirement, and other model related features. In addition, international benchmarking analysis was performed as a reference for selecting appropriate models. The goal of any new risk model is to manage risk in a more robust and resilient manner, while being in line with industry best practices.

15.   Under what circumstances will CPs experience a saving or increase in IM?

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

IM reduction or increase will be dependent on 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.

16.   How does the NGRM 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 cyclicality measures, such as margin floor and volatility smoothing, are also in place to reduce the fluctuation of IM requirements.

17.   How does the NGRM IM model treat concentrated positions and illiquid securities?

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

18. Will the margin credit of HKD5 million still be offered to CPs?

Yes. The margin credit arrangement will remain unchanged.

19. Where can CPs obtain additional details of the NGRM methodologies?

Relevant NGRM materials can be found on the HKEX website. This FAQ document will also be updated periodically and posted onto the [NextGen Post trade Programme](#) web corner. Alternatively, CPs may contact the Clearing Risk Management Department (email: [Margin_Modelling@hkex.com.hk](#)) should they have any feedback or questions.

20. Will CCASS reports be decommissioned?

With the implementation of the NextGen risk engine, new risk related reports will be available in the new NGRM system, and the current risk reports from CCASS will be decommissioned. No other reports will be decommissioned from CCASS in the short term. The current CCASS reports will remain accessible, via the current CCASS Terminal, and all risk related reports and other risk specific data will be made available via Report Access Platform and NGRM new user interface respectively.

Data Warehouse

21. **What information can be provided by Data Warehouse?**

The primary purpose of the Data Warehouse is to store all post trade data in a single, secure, and accessible location for Participants.

A phased approach has been adopted for the rollout of data warehouse services which start with internal consumption and additional information will be published in due course.

22. **Will the Data Warehouse store historical data?**

The data warehouse will retain an appropriate amount of data to support risk calculation and simulation. Post trade data in the data warehouse will have different retention periods, depending on the nature of the data fields.

In subsequent phases, full historical data for business intelligence and analytics purposes is intended to be made available.

Client Connect

23.   Is access to Client Connect mandatory or optional?

HKEX strongly encourages our Participants to take advantage of the e-Services available on Client Connect instead of submitting manual forms. There will be a transition period for Participants to familiarize themselves with Client Connect.

Over time, Client Connect will become the mandatory access channel for service submission, with manual forms retained only for contingency purposes.

24.   Will all the manual forms on HKEX website be migrated to the Client Connect as eServices?

Digitization of manual forms will take place over time. Certain manual forms supporting GUI-related functions will be streamlined and automated through other NextGen applications to avoid duplication.

25.   Will Client Connect replace the current CCASS Terminal?

HKEX supports multiple access channels for Participants. Client Connect is intended to facilitate Participants' access to HKEX services in a more efficient and digital manner.

The removal of the CCASS Terminal is anticipated at a future date, but this will be a gradual process. The NextGen Roadmap will clearly set out the time table of events and changes anticipated over time. In the meantime, clearing and settlement processes will continue to be available to all Participants on the CCASS Terminal and/or the Participant Gateway (PG) over SD/Net.

Others

26.   Will any NextGen Services be available to the end clients (NCPs) of CPs?

All post trade services are designed for CPs, while recognizing that they have clients to serve. With the move to more modern technology, the NextGen Post Trade developments will allow CPs to offer a wider range of services to their clients.

With the NextGen approach

- Data will become more readily available, easier to manage and analyse. Subsequently, CPs will be able to offer their clients more extensive data analytics / reporting services. The data warehouse will be introduced in phases and data will continue to be added, extending beyond post trade.
- Client Connect is being developed with the aim of being an all-encompassing tool, beginning with post trade and digitizing some key manual processes that exist today. Enhancing user experience from initial access to actual processes will no doubt benefit our CPs. As we look to extend the reach and services of Client Connect, extended accessibility will also be developed in parallel.

Within our NextGen design, the ability for CPs to access added levels of data and information remains a core strategy.

27.   Is NextGen mandatory for all CPs?

The NextGen Programme is a complete upgrade of current HKEX services and certain phases will be mandatory for all CPs. Systems such as CCASS, DCASS and other manual interfaces will be phased out and replaced over time.

Although there is no mandatory technical upgrade with NextGen Phase 1, there is an abundance of new services via new access points which may require some change at the CP level. For example, Participants will be able to access the secure file transfer server where our new risk reports in machine readable format will be available.

The margin simulator, although not mandatory, is a value-add service and available to CPs. With the introduction of a new risk engine and risk models, Participants who wish to monitor and track their 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.

28.   Will there be changes to the Participant Gateway or will there be a NextGen gateway? What are the expected changes to reports and files? Do we continue to use SDNet?

Changes to the PG are anticipated over time, but these changes will not happen overnight or suddenly. With the current focus on the single risk engine and risk models in 2019, the clearing and settlement process and existing PG functionality will continue to be available to all CPs.

No changes are envisaged for Phase 1 in relation to SDNet and its secure network.

29. Will the NextGen platform utilize ISO standards?

All NextGen components will be ISO compatible where appropriate. Although there is limited impact in Phase 1, when consideration is given for certain initiatives (e.g. Clearing and Settlement, Payment, Collateral initiatives, etc.) 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.

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

The NextGen Programme's roadmap includes several account structures that 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 margining capabilities (gross or net). CPs must bear in mind that we continue to have a dependency on CCASS and its current account structure, and thus the full benefit of NextGen's new account structures will not be immediately fully realized until further along the programme's implementation.

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

Corporate Actions Straight Through Processing is being developed as an incremental business improvement and is not currently considered part of the NextGen Programme.

Internal system development and deployment been scheduled for year end 2019 (subject to change), streamlining and addressing some of the key manual processes. Approximately 80% of current announcement setup volume will be addressed with the successful introduction of straight through processing at source.

Outstanding improvements or further integration will be considered under NextGen Phase 2, ensuring HKEX continues to be the golden source for Corporate Action information in the market.

32. What is the rollout schedule for HKATS and DCASS upgrade? Will it coincide with the launch of NGRM?

The rollout of HKATS and DCASS Upgrade is on 6 May 2019. The new single risk engine and risk models are scheduled to be launched in 1H 2020 for securities market only (HKSCC). The rollout of the new engine and models for the derivatives market will follow thereafter. Updates to the timeline will be made available on our website.

33.   When will test environments be made available to CPs?

CPs' testing environments for Margin Simulator (where CPs will provide a file with test positions) will be made available as early as possible, including access to the margin simulator. Detailed test packs will be made available for CPs once available. Please visit [Document List for Clearing Participants](#) for the latest updates

34.   The current legacy platform requires CPs 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 Connect. With implementation of these projects having begun, parallel analysis is being conducted in relation to the next phase of NextGen. Consideration will be given to clearing, settlement, collateral management, payments infrastructure, international standards, and the central securities depository function when devising the roadmap to replace aging technology and processes. In working with our Participants, the aim is to devise new appropriate business models and improve the existing models from a process, technology and operations perspective, which means targeting to replace CCASS (and DCASS) risk engines and platforms. Work on a more detailed road map for Phase 2 is underway.

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

HKEX will continue to investigate DLT and potential values it may bring to HKEX and the market. We are conducting a Proof of Concept (POC) for Stock Connect North Bound transactions and will continue to engage in dialogue with the market regarding the potential benefits of this new technology.