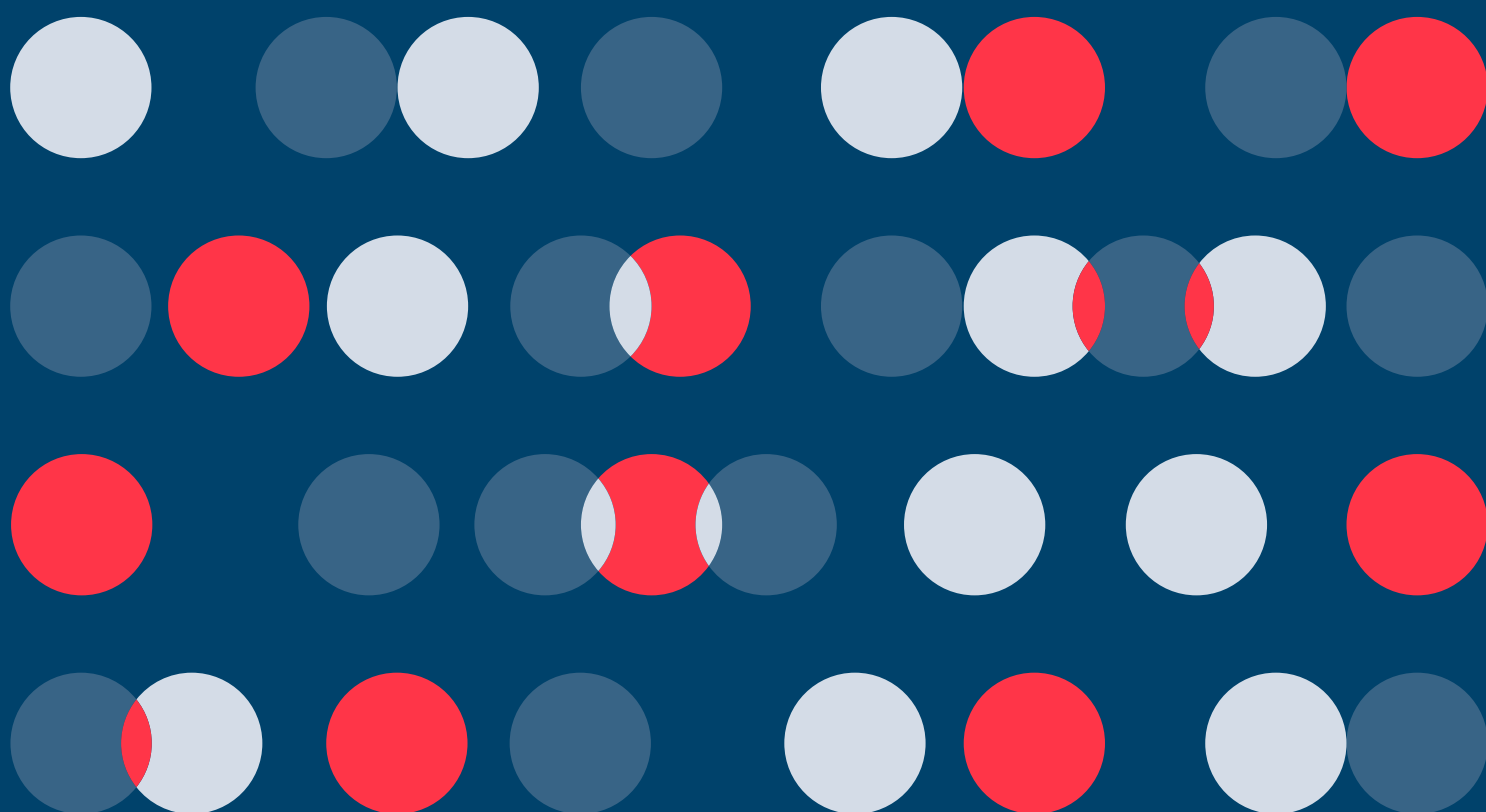# TRADING MECHANISM OF VOLATILITY CONTROL MECHANISM (VCM) IN THE DERIVATIVES MARKET

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NOTE TO THE READER:

This paper is compiled based on the concluded consultation model and the relevant Rules of the Futures Exchange ("Rules") for the Volatility Control Mechanism (VCM). It aims to facilitate understanding of investors and traders about the VCM. While due care has been taken to provide accurate and up to date information, the paper is for general reference only and if any discrepancies or inconsistencies with the Rules are found, the meanings in the Rules shall prevail. HKEX and its subsidiaries 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.
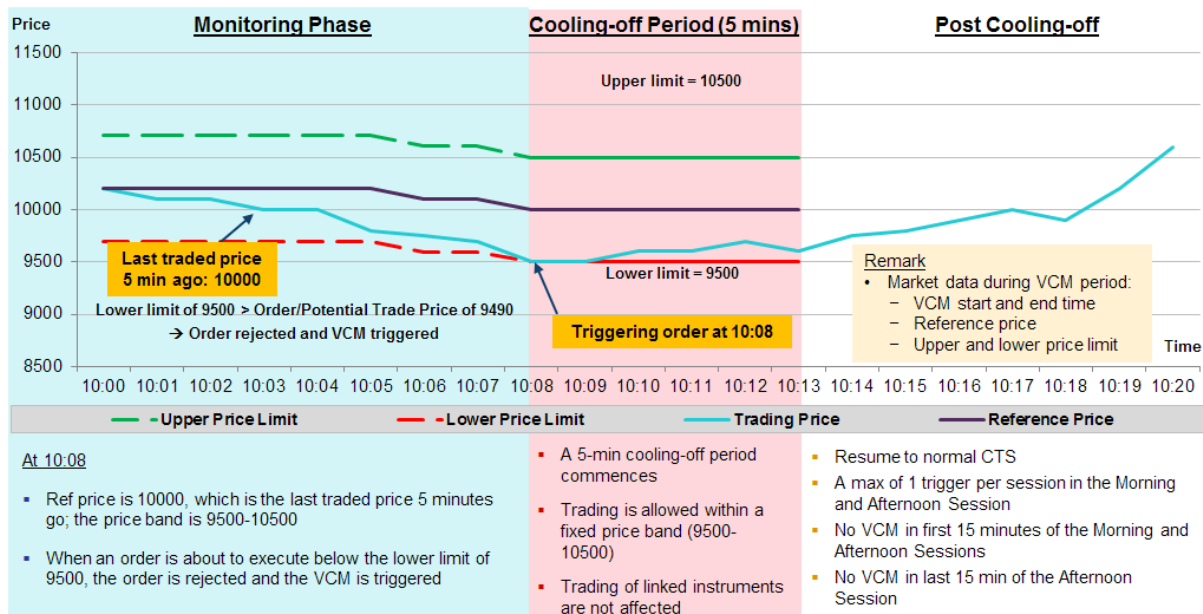
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1. Background

The VCM is based on the regulatory guidance of the Group of Twenty (G20) and International Organization of Securities Commissions (IOSCO), and is designed to prevent extreme price volatility from trading incidents such as a "flash crash" and algorithm errors, and to address systemic risks from the inter-connectedness of securities and derivatives markets. Many international exchanges have implemented some form of volatility control mechanisms to control extreme price volatility.

In the case of HKEX's VCM, if the price deviates more than a predefined percentage within a specific time frame, it will trigger a cooling-off period for five minutes. This provides a window allowing market participants to reassess their strategies, if necessary. It also helps to re-establish an orderly market during volatile market situations.

The VCM for the derivatives market is planned to be implemented tentatively in the fourth quarter of 2016. It will cover the spot month and next calendar month contracts in the Hang Seng Index (HSI), Mini-Hang Seng Index (MHI), H-shares Index (HHI) and Mini H-shares Index (MCH) futures markets (total 8 contracts, collectively known as "VCM Exchange Contracts").

2. Overview of the VCM Model

HKEX has adopted a dynamic price limit VCM model for the securities and derivatives markets, which would trigger a cooling-off period in case of abrupt price volatility detected at the instrument level. It would also focus on instruments that pose systemic risks arising from the inter-connectedness of securities and derivatives markets, particularly with respect to index products. This model is adopted because it is relatively simple and minimises market disruption.

Price

Monitoring Phase | **Cooling-off Period (5 mins)** | **Post Cooling-off**

Upper limit = 10500

11500
11000
10500
10000
9500
9000
8500

Last traded price 5 min ago: 10000

Lower limit of 9500 > Order/Potential Trade Price of 9490
→ Order rejected and VCM triggered

Lower limit = 9500

Triggering order at 10:08

Remark
• Market data during VCM period:
  – VCM start and end time
  – Reference price
  – Upper and lower price limit

Time

10:00 10:01 10:02 10:03 10:04 10:05 10:06 10:07 10:08 10:09 10:10 10:11 10:12 10:13 10:14 10:15 10:16 10:17 10:18 10:19 10:20

— Upper Price Limit — Lower Price Limit — Trading Price — Reference Price

At 10:08

- Ref price is 10000, which is the last traded price 5 minutes go; the price band is 9500-10500

- When an order is about to execute below the lower limit of 9500, the order is rejected and the VCM is triggered

- A 5-min cooling-off period commences

- Trading is allowed within a fixed price band (9500-10500)

- Trading of linked instruments are not affected

- Resume to normal CTS

- A max of 1 trigger per session in the Morning and Afternoon Session

- No VCM in first 15 minutes of the Morning and Afternoon Sessions

- No VCM in last 15 min of the Afternoon Session

- For the derivatives market, the VCM is triggered if the price of a VCM Exchange Contract deviates more than ±5% from the last traded price 5 minutes ago ("VCM Reference Price"); a 5-minute cooling-off period will start.

- During the cooling-off period, trading is allowed within a pre-defined price band.

- Normal trading without restriction will resume after cooling-off period.

3. Instruments covered under the VCM

In the derivatives market, the VCM will only be applied to the spot month and next calendar month contracts in the Hang Seng Index (HSI), Mini-Hang Seng Index (MHI), H-shares Index (HHI) and Mini H-shares Index (MCH) futures markets (total 8 contracts, collectively known as "VCM Exchange Contracts"). Currently, there is no plan to include more contract in the VCM Exchange Contracts .

4. Monitoring Phase of the VCM

The VCM is only applicable to normal orders ("VCM Exchange Contract Order") input during the normal trading session, excluding the Pre-Market Opening Period and After-Hours Futures Trading session ("VCM Monitoring Period").

During the VCM Monitoring Period, the potential trade price of a VCM contract will be continuously checked against a dynamic price limit of ±5% based upon the VCM Reference Price, which is the last traded price 5 minutes ago .

Periods during the normal trading session when the VCM monitoring will not be applied

- *Market Open* - The VCM Monitoring Period excludes the first 15 minutes of the morning and afternoon trading session to allow free price discovery at the beginning of the trading session after a trading break.

- *Afternoon trading session* - The VCM Monitoring Period excludes the last 20 minutes[1] of the afternoon trading session in order to ensure that there is an uninterrupted trading period (not interfered by an cooling-off period) during the last 15 minutes of the last trading session of the day. This can also allow investors to unwind their day positions and avoid taking overnight risks.

5. Cooling-Off Period

During the normal trading session, the potential trade price of a VCM Exchange Contract will be continuously checked against a dynamic price limit of ±5% based upon the VCM Reference Price, which is the last traded price 5 minutes ago.

If the potential execution price will be outside the above-mentioned price limit, the order concerned will be rejected and a 5-minute cooling-off period will be triggered immediately.

Maximum number of the VCM triggers

For each VCM Exchange Contract, there will be a maximum of <u>one</u> VCM trigger in each trading session (morning trading session and afternoon trading session are counted as two separate trading sessions). When normal trading has been resumed after the VCM, there will not be any VCM monitoring within the same trading session.

Trading within a fixed price band

During the 5-minute cooling-off period, trading for the VCM Exchange Contract will continue within a fixed price band (±5% from the VCM Reference Price).

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[1] Since a cooling-off period will last for 5 minutes, the monitoring will stop 20 minutes before the end of the afternoon trading session

Order handling when the VCM is triggered

If the VCM is Triggered Due to Potential Trade Price > Upper Price Limit	• The incoming order can be partially executed to the extent that the trade prices are at or within limits. The remaining part of the order with potential trade price exceeds the limits will not be executed and cancelled by HKATS • HKATS will also cancel the existing high price buy orders (i.e. those with buy price > upper price limit) that reside in the buy order queue • All the existing sell orders will remain in the order queue no matter if their prices are higher than the upper price limit, and will not be cancelled by HKATS
If the VCM is Triggered Due to Potential Trade Price < Lower Price Limit	• The incoming order can be partially executed to the extent that the trade prices are at or within limits. The remaining part of the order with potential trade price exceeds the limits will not be executed and cancelled by HKATS • HKATS will also cancel the existing low price sell orders (i.e. those with sell price < lower price limit) that reside in the sell order queue • All the existing buy orders will remain in the order queue no matter if their prices are lower than the lower price limit and will not be cancelled by HKATS

The cancelled orders will NOT be re-entered by HKATS after the cooling-off period, Exchange Participants are required to re-enter if necessary.

Order handling during the cooling-off period

Any incoming buy orders with price higher than upper price limit and sell order with price lower than lower price limit will be rejected by HKATS immediately.

Any incoming buy orders with price equal to or lower than upper price limit and sell order with price equal to or higher than lower price limit will still be accepted by HKATS to allow building of liquidity.

Cooling-off period will not be brought forward to next trading sessions

If the morning trading session closes before the end of a cooling-off period (e.g. a cooling-off period starting at 11:56), the remaining time of the cooling-off period will not be brought forward to the afternoon trading session.

6. Post Cooling-Off Monitoring

After the cooling-off period, trading will resume to normal and no further VCM monitoring will be imposed on that particular VCM Exchange Contract for the remainder of the trading session.

7. Determination of the VCM Reference Price

The reference price of the VCM is the price of the last trade 5 minutes ago (excluding prices of combo vs. combo trades, tailor-made combination trades and block trades), and this being a dynamic price, captures both the magnitude and speed of price changes of individual VCM Exchange Contracts.

The VCM Monitoring Period starts at 9:30am for the derivatives market. The first VCM Reference Price for the trading day should be the last traded price executed before 9:25am (i.e. 5 minutes before). Thereafter the VCM Reference Price will be updated by HKATS at the end of each one second interval.

It should also be noted that the VCM Reference Price established during the Morning Session will not be brought forward to the Afternoon Session.

No trade execution 5 minutes before the VCM Monitoring Period Begins

The VCM Monitoring Period begins 15 minutes after market open for both the morning and afternoon sessions, i.e. 9:30am and 1:15pm respectively. If there is no trade execution in the previous 5 minutes interval, HKATS will further search backward in time for the latest last traded price as the VCM Reference Price. This search can go backward till the market open when the Calculated Opening Price ("COP") was established during the Pre-Market Opening and it will be used as the VCM Reference Price. In case there is no trade execution from market open to the start of the VCM Monitoring Period, the VCM Monitoring Period will be postpone until there is a first trade. The first traded price will be used as the VCM Reference Price.

8. Dynamic Price Banding During Cooling-off Period

The existing Dynamic Price Banding will still be applicable to the VCM Exchange Contracts during the VCM cooling-off period.

9. Adverse Weather Arrangements

Delay open of derivatives market due to bad weather

In the case that market open is delayed due to bad weather (e.g. hoisting of typhoon signal no.8 or above or issuance of black rainstorm warning), similar to the normal market open, the first 15 minutes after market open will not be subject to the VCM monitoring.

Early close of derivatives market due to bad weather

In the case of an early close of the market due to bad weather (e.g. hoisting of typhoon signal no.8 or above during trading hours), cooling-off period can still be triggered in the last 15 minutes before market close and can continue until market close.

10. Additional Market Data Dissemination for the VCM

Additional market information will be disseminated on HKEX Orion Market Data Platform for Derivatives Market (OMD-D) to provide transparency of the VCM to the market.   No new messages or data fields will be introduced to OMD-D for the VCM but the related information will be provided via two existing messages, namely Market Status and Market Alert.

New trading sessions (namely "OPEN_DPL_VCM", "OPEN_VCM", "RESET_VCM", "VCM_COOL_OFF_DPL" and "VCM_COOL_OFF") introduced for the VCM in the derivatives market will be provided as **Market Status** via OMD-D.   Also, **Market Status** of the Instrument Series concerned will be updated upon the start and the end of a cooling-off period triggered by the VCM. In addition, the details of the cooling-off period, including the contract code of the concerned contract, the VCM Reference Price, the lower price limit, the upper price limit, the start and end times of the cooling-off period, will be disseminated in a **Market Alert** message immediately once a cooling off period is triggered.

11. Trading of Linked Instruments

All VCM Exchange Contracts will be treated independently, and therefore trading of its related or linked instruments (e.g. far month futures and options contracts) will remain unaffected when a VCM is triggered on a VCM Exchange Contract.

When a VCM Exchange Contract is under a cooling-off period, trading of its related contracts will continue without restriction.

12. Orders and Trades subject to the VCM monitoring

The VCM is only applicable to normal and market maker orders input during the VCM Monitoring Period.

Standard Combination orders (except derived orders generated automatically as Bait Orders), Tailor Made Combination orders and Block Trades are not subject to the VCM monitoring.

13. Derivatives Market Making and Liquidity Provision

HKEX recognises that it may be difficult for market makers or liquidity providers to hedge when a VCM is triggered, since the VCM would impact their market making capability.

The passing rates of market maker and liquidity provider obligations have already provided flexibility for market makers and liquidity providers not to quote in case of such market situations.

14. Enquiries and Others

Market participants who would like to further understand the details of the VCM can refer to the following website, email accounts and hotline numbers:

VCM webpages	http://www.hkex.com.hk/eng/market/dv_tradinfra/vcm.htm http://www.hkex.com.hk/vcm/en/index.htm
Email	Derivatives Market: clicksupport@hkex.com.hk Market Data/OMD-D: IVSupport@hkex.com.hk
Hotline	Derivatives Market : 2211 6360 Market Data/OMD-D : 2211 6558