

Submission to the LegCo Panel on Financial Affairs

The issues arising from the interruption of the futures and options trading system on the 28th May 2002

Purpose

1. On the 28th of May 2002 at approximately 3:12 p.m., trading on Hong Kong Exchanges and Clearing Limited's (HKEx) futures and options trading system (HKATS) was disrupted following a power outage. Due to the subsequent failure of the Uninterruptible Power Supply (UPS) system, the futures and options markets were temporarily closed. This submission to the LegCo Financial Affairs Panel summarises the events that occurred on the 28th May 2002, the SFC's involvement in the incident, the ongoing monitoring and the follow-up action taken by the SFC in relation to this incident.

The SFC's Role in Contingency Management

2. The SFC's mission is to ensure that a fair and transparent securities and futures market is maintained in Hong Kong, there is public confidence in these markets, and to generally regulate Hong Kong's securities, futures and related financial markets firmly, efficiently and in a transparent and accountable manner. Accordingly, the SFC ensures that HKEx has proper policies, procedures and processes in place to operate a stable and fair market. In the event of an emergency, the SFC monitors the corrective measures that HKEx implements to minimise the impact on the market, ensures that the investing public and market intermediaries are kept informed, and the market operates in a fair and orderly manner.
3. When an emergency incident affects an HKEx mission-critical system such as HKATS, the HKEx Risk Management Division will inform the SFC of the incident. The SFC will work very closely with and monitor HKEx's implementation of corrective measures to address the cause of the incident. The SFC will inform the relevant parties of the incident and keep the public informed. The SFC will also ensure that risk management measures are in place to mitigate risk, request an incident report, and ensure that proper corrective measures are taken to prevent recurrence.

The SFC's Involvement during and after the Market Disruption

4. The following is the sequence of events that occurred on and after the 28th May 2002:

- 4.1 The SFC was informed of the incident at approximately 3:25 p.m. The SFC followed its Market Contingency Plans and kept in constant contact with HKEx throughout the incident. The FSB was immediately informed of the problem.
- 4.2 In accordance with HKEx's Market Contingency Plan (HKEx MCP), an HKEx Contingency Management Team meeting (ExCMT) was immediately convened. The SFC was in constant communication with the ExCMT members on how to deal with the incident and to obtain the latest updates. Preliminary reports showed the futures and options market could not be reopened (after allowing for a 30 minute notice period to participants) until after the underlying cash market had closed at 4:00 p.m.
- 4.3 The ExCMT following its HKEx MCP and in consultation with the SFC, decided at 3:45 p.m. that the Hong Kong equity related derivatives markets and the Dow Jones Industrial Average Index Futures market would not be re-opened. This is because the cash market would be closed by 4:00 p.m. After the required 30-minute notification period for participants to re-login, the earliest the equity related derivatives market could reopen would be at 4:15 p.m. However, at that point, the derivatives market would be trading without an underlying cash market. The guiding principle for both HKEx and the SFC have adhered to is that once the underlying cash market is closed, the related derivatives market should also be closed within 15 minutes. The 15-minute period has been considered the maximum period the derivatives market should remain open without the cash market. The close relationship between the derivatives market and the underlying cash market would make it difficult for the derivatives market to continue to operate in the absence of the cash market for the following reasons:
- The derivatives market will not be able to effectively perform its price discovery function in the absence of the underlying cash market.
 - Investors may be forced to trade based on incomplete or no market information on the underlying stocks.
 - Many trading strategies involving simultaneous trading in both the derivatives and cash market cannot be conducted. The existence of these strategies is critical to the continued maintenance of the reasonable price relationship between the two markets.
- 4.4 Following the completion of the site failover at 3:53 p.m., the ExCMT decided that the non-Hong Kong equity related derivatives markets would be reopened at 4:30 p.m. This allowed a 30-minute notice period to be given to participants to relog into the system. The reopened markets continued trading until the normal market close.

- 4.5 During the day, the SFC closely monitored the markets and continued to co-ordinate with HKEx over the communication of the incidents to exchange participants and the public to ensure they were informed in a timely manner of the development of the incident and HKEx's decisions.
- 4.6 The SFC was informed at approximately 5:00 p.m. that due to an operational error during the derivatives system site fail-over, the trades executed before the power interruption had been duplicated in the stock options clearing system. HKEx had to manually reverse each of the duplicated transactions. The SFC monitored the process until all the trades were properly reversed and the margin calculations and other settlements related reports were finalised almost six hours later.
- 4.7 Since the incident, the SFC has continually monitored HKEx's activities in relation to the incident, followed up with HKEx over the implementation of corrective measures and took steps to better understand the cause of the problem. SFC staff also obtained copies of the contracts between Enviro-tech the vendor of the UPS system and HKEx and other supporting documentation for reference.
- 4.8 The SFC met with P&T (M&E) Ltd. (P&T), the independent consultants who approved the original installation of the UPS and conducted an on-site visit to APFT to better understand the set-up of the UPS system.
- 4.9 The SFC also met with Enviro-tech to clarify certain issues relating to their reports and their work performed.
- 4.10 The SFC has received an initial report from HKEx by Ove Arup & Partners Hong Kong Limited (Ove Arup), an independent certified electrical and maintenance consultant, on their investigation of the incident.

SFC's Continued Monitoring and Follow-up in Three Key Areas

5. The SFC is very concerned over the effects of the incident. The SFC has formally requested an incident report from HKEx and has taken pro-active steps to meet with Enviro-tech, the UPS vendor, and P&T, the independent consultant to understand the cause of the problem and to recommend corrective measures.
6. In addition to following up on the rectification of the problem that caused the incident, the SFC requested HKEx:
 - 6.1 To critically review the contingency procedures in relation to trading disruptions and to consult the market with a view to improving the procedures. The areas for improvement include, in particular:

- a) System failover and market readiness –
 - i) the feasibility of reducing the time taken for the data centre site failover;
 - ii) the feasibility of shortening the period for system readiness/notification to participants; and
 - iii) to streamline and rationalise the process in (i) and (ii) above.
- b) Trading resumption policy – to revise and make public the procedure for the resumption of trading as a result of a trading disruption; and
- c) Communication to the public – to further improve the procedures relating to the provision of timely and accurate information to the market when there is trading disruption and ensure the market knows what steps HKEx will take in the event of a temporary market closure.

6.2 To review the robustness of HKEx's systems and the effectiveness of its procedures - strongly urged HKEx to commission a comprehensive review of its systems, in particular the HKATS system.

6.3 To review HKEx's decision processes and the procedures for handling the derivatives system site fail-over procedures so that duplicate trade issue in relation to the stock options market will not be repeated. HKEx should use as reference, past control procedures or conventions that were in place to deal with such incidents and should consider adopting new policies and procedures for desktop walk-throughs or market rehearsals of critical functions.

7. Whilst the cause of the incident has been identified as a technical problem, HKEx has accepted responsibility and has expedited improvements to its policies, procedures, processes and management as a part of the corrective measures to deal with this incident. The SFC will continue to work closely with and actively monitor HKEx as it implements the following broad categories of corrective measures:

Investigation into the cause of the problem and the action taken to resolve the cause of the problem:

8. The SFC has reviewed Ove Arup's report and accepts the view that the root cause of the UPS failure was a lack of proper calibration of the inverters in the UPS system. HKEx has also agreed to publish the investigation report. The SFC welcomes the publication of the report and firmly believes it will demonstrate HKEx's accountability and willingness to be transparent in relation to the handling of the matter.

9. HKEx has accepted all of the Ove Arup report recommendations for implementation. The SFC is in agreement with HKEx's timeline for completion of all the short-term actions by the end of July 2002, the medium term items by the

end of October 2002 and agrees that a review must be conducted by HKEx to ascertain the best way to address and implement the long-term recommendations. The SFC will continue to monitor the implementation of the recommendations and the review that addresses the long-term recommendations.

Improvement in the handling of such incidents:

10. Whilst contingency procedures to handle a trading disruption have been in place in HKEx's Market Contingency Plans, the SFC has identified a number of areas where HKEx needs to improve their procedures so that the market will be timely informed in a timely manner of the trading resumption arrangements and the system fail-over process will be streamlined.
11. As discussed at paragraphs 6 & 7 above, HKEx has committed to revising the procedures and publicising them widely to the market. HKEx is also looking into alternative ways to send messages to HKATS users via alternative channels in the event the HKATS system is disrupted. The SFC is in agreement with HKEx's timeline as the review has already been started and will be completed with the revised procedures implemented at the end of July 2002.
12. In relation to the duplicate trades issue, as requested by the SFC, HKEx reviewed and revised their derivatives system site fail-over procedures, performed a desktop walkthrough of the procedures for verification, and has scheduled a HKATS disaster drill to test the revised procedures.

Information Technology operations and the overall review of the systems:

13. HKEx has also committed to expediting a comprehensive review of its mission-critical systems (as discussed at paragraphs 6 & 7 above). The review of the HKATS system will commence in the beginning of July 2002 and will be completed in stages by late February 2003. HKEx will also be commencing a review of other mission-critical systems beginning October 2002.
14. In addition, HKEx is planning to engage external consultants to review its overall IT requirements and environment in order to recommend a quality management and certification framework for its IT systems development and management. This in addition to other ongoing work in the system area will help to improve on HKATS' overall system stability. The SFC is in agreement with this timetable and will be taking an active role in monitoring the implementation of new systems and the results of the various reviews.

Conclusion

15. The SFC is very concerned over the market impact of the trading disruption that occurred on the 28th May 2002. The SFC has strongly advised HKEx to take

immediate corrective measures to prevent the recurrence of the incident. Since the incident, the SFC has been closely working with HKEx to ensure that the underlying problem that caused the incident has been fixed and the UPS system and HKATS are thoroughly tested. The SFC will continue to actively monitor HKEx's implementation of the corrective measures recommended by Ove Arup so that investors' confidence will be restored and to ensure that Hong Kong's reputation as an international financial centre is maintained.

The Securities and Futures Commission
27th June 2002