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Business Improvement Orders on System Failure and Clarification of Locus of Responsibility

We deeply apologize again for the inconvenience caused to investors and other market users due to the system failure on October 1, 2020.

Today, the Financial Services Agency of Japan (FSA) issued business improvement orders regarding the system failure to Japan Exchange Group, Inc. (JPX) and its subsidiary Tokyo Stock Exchange, Inc. (TSE), as described in 1. below. JPX and TSE have clarified the locus of responsibility for the incident as described in 2. below.

We take the orders from the authorities with utmost seriousness and will respond in good faith. We will make every effort to prevent a recurrence of the incident in order to build speedier and more appropriate recovery procedures, including (i) system responses and comprehensive checks, (ii) enhancement of procedures for failsafe implementation of trading suspensions, and (iii) development of rules for trading suspensions and resumptions, while placing importance on "Resilience".

1. Business improvement orders by FSA

On October 1, 2020, a system failure occurred in the cash equity trading system at TSE. The failure made it impossible to start trading of all listed issues on TSE. Trading failed to resume and was suspended for the whole day.

Although various countermeasures were implemented at TSE after a trading system glitch occurred in October 2018, another system failure has occurred to cause trading of all listed issues to be suspended from market open to market close. The incident has seriously undermined the confidence of investors and other stakeholders in Japanese financial instruments exchanges.

On October 2, 2020, FSA ordered TSE to submit a report on the cause(s) of the failure and other matters regarding the incident, and ordered JPX, the parent company of TSE, to submit a report on its awareness,

the issues to be resolved, and its policy to resolve said issues for improvement of the reliability of the JPX Group's systems. On October 16, 2020, TSE and JPX respectively submitted reports to FSA.

FSA examined the cause(s) of the failure based on said reports and through on-site inspections. FSA found that, although the incident was directly caused by a defect in a failed device, a setting for the automatic switchover regarding the failed device was inadequate and TSE had not developed sufficient rules for trading resumption.

Based on the above, the following administrative disposition was taken against TSE and JPX, respectively.

[Business improvement order issued to TSE (pursuant to the first sentence of Article 153 of the Financial Instruments and Exchange Act)]

1. Another report on the content and implementation schedule, etc. of recurrence prevention measures for this incident that have been established and reported by TSE before October 16 as well as other recurrence prevention measures that were established by TSE after that, including items (1) through (4) below, shall be submitted, and such measures shall be swiftly and effectively implemented.

(1) TSE and the outsourcing company failed to properly understand that a discrepancy between the actual specifications of the system and the product manual provided by the manufacturer of the device meant that a setting would prevent automatic switchover in the event of a device failure.

As such, TSE shall implement measures, such as those to reconfirm existing device settings and further confirm switching processes, to ensure an appropriate and swift switchover in the event of a device failure, as is expected of TSE, and conduct a review the confirmation process for any changes in the specifications of devices, etc. to be used in the systems (including requesting the outsourcing company to conduct a review).

(2) Although TSE had multiple measures to suspend trading in a normal manner, such measures were developed based on the assumption that the device that failed this time would function normally. Therefore, the implementation of a trading suspension by means other than the normal manner was a major obstacle to resume trading within the day.

As such, TSE shall develop functions to suspend trading without depending on the device that failed this time, as is expected of TSE, and conduct a review of the dependency relationships within the systems to implement measures to prevent the failure of any particular device from affecting any important functions for continuing trading.

(3) TSE failed to sufficiently consider cases of resuming trading within the day of suspending trading by means other than the normal manner, and had not developed rules between TSE and trading participants to restrict order acceptance in the event of a system failure or to handle orders that were accepted before the trading suspension.

As a result, trading participants had not sufficiently developed systems of response for their IT systems or customers in such cases and had not conducted any tests or drills.

Also, an absence of clear rules for trading resumption was a major obstacle to resuming trading within the day of the system failure.

As such, TSE shall develop clear and effective rules for suspension of order acceptance and trading resumption, assuming a case of trading suspension by means other than the normal manner, taking into consideration various viewpoints of roles to be played by an exchange, such as protection of investors, improvement of convenience and stable operation of markets, and then carry out tests and drills involving trading participants.

(4) In the report submitted by TSE on October 16, TSE said, as part of its basic policy of system development and maintenance, going forward, TSE plans to develop speedier and more appropriate recovery procedures to improve "Resilience" in addition to measures to enhance reliability under the slogan "Never Stop".

Based on a review of said basic policy, TSE shall identify measures to tackle and implement necessary responses.

2. TSE was unable to start trading due to the system failure and failed to resume trading within the day. Given the fact that the confidence of investors and other stakeholders was seriously undermined as a result, TSE shall clarify the locus of responsibility as a market provider.
3. TSE shall periodically submit reports on the progress and status of the above 1. and 2.

[II. Business improvement order issued to JPX (pursuant to Article 106-28, Paragraph 1 of the Financial Instruments and Exchange Act)]

1. Another report on the content and implementation schedule, etc. of recurrence prevention measures for this incident that have been established and reported by JPX before October 16 as well as other recurrence prevention measures that were established by JPX after that, including items (1) through (3) below, shall be submitted, and such measures shall be swiftly and effectively implemented.

(1) TSE failed to take appropriate responses that consider the possibility of the automatic switchover failing to function in the event of a device failure in the trading system or the possibility of a failure to suspend trading normally.

As such, comprehensive checks of systems and drills toward swift recovery in order to minimize the impact in the event of a system failure shall be conducted not only at TSE but also at Osaka Exchange, Inc. (OSE) and other subsidiaries.

(2) TSE, as a market provider, failed to communicate sufficiently with trading participants and other market users and make a decision to resume trading within the day on which the system failure occurred based on pre-agreed rules.

As such, rules for trading resumption involving trading participants shall be developed not only at TSE but also at other exchanges including OSE.

(3) As part of the basic policy of system development and maintenance at TSE, efforts centered on various measures to enhance reliability under the slogan "Never Stop" and measures to enhance "Resilience" (failure recovery capacity) took lower precedence.

Now, TSE plans to develop speedier and more appropriate recovery procedures to improve

"Resilience" in addition to measures to enhance reliability under the slogan "Never Stop".

Based on the above, a review of the basic policy of system development and maintenance to improve "Resilience" shall be conducted not only at TSE but also at other subsidiaries including OSE.

2. TSE, a JPX subsidiary, was unable to start trading due to the system failure and failed to resume trading within the day. Given the fact that the confidence of investors and other stakeholders was seriously undermined as a result, the locus of responsibility regarding the management of subsidiary exchanges shall be clarified.
3. Reports on the progress and status of the above 1. and 2. shall be periodically submitted.

2. Clarification of Locus of Responsibility

Based on the system failure and business improvement orders, the locus of responsibility has been clarified as follows.

(JPX)

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| Kiyota Akira | Director & Representative Executive Officer, Group CEO | 50% reduction in monthly pay for four months |
| Miyahara Koichiro | Director & Representative Executive Officer, Group Co-COO | Resignation (effective on November 30) |
| Yokoyama Ryusuke | Senior Executive Officer & CIO | 20% reduction in monthly pay for four months |

(TSE)

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| Miyahara Koichiro | President & CEO | Resignation (effective on November 30) |
| Kawai Hiroki | Executive Officer | 10% reduction in monthly pay for four months |

* The pay reductions will start in December 2020.

* Stern warnings were issued to Hasegawa Takaaki, Director, Equities Department, and Tamura Yasuhiko, Director, IT Development Department (Trading System).

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