



Council for Recurrence Prevention Measures (1st meeting)

Total smart exchange

Tokyo Stock Exchange, Inc.

October 23, 2020

1. Opening Remarks
2. Secretariat Explanation

[Material]

- (1) Purpose of Establishment of Council; Council Members and Observers
- (2) Details of the incident on October 1
- (3) Outline of Recurrence Prevention Measures
- (4) Major Topics for Discussion

3. Discussion
4. Closing

Purpose of Establishment of Council, etc.

- The recent system failure revealed not only issues with the IT system itself but also issues with the operation of the system, such as a need for clarification and better transparency of standards and procedures for recovery, and an absence of rules for order handling in the event of system failures.
- The market users making up the Council will consider how TSE should develop its responses to system failures and its rules and regulations from the perspective of investors, taking into account evidence from overseas.
*Materials and outline of minutes of this Council will be published later on the TSE website.

Specialist Working Group

- A working group comprised of specialists in charge of the relevant areas on the ground will be established separately under the Council to discuss practical detail by around next spring. (Meetings to be held once or twice a month.)
- The Council will then discuss further based on the reports that the working group provides of its discussions.

Council Members and Observers

| | Name of companies, organizations, etc. |
|---|--|
| Trading participants | SMBC Nikko Securities Inc. |
| | SBI SECURITIES CO., Ltd. |
| | Okasan Securities Co., Ltd. |
| | Goldman Sachs Japan Co., Ltd. |
| | Daiwa Securities Co. Ltd. |
| | Nomura Securities Co., Ltd. |
| | Meiwa Securities Co., Ltd. |
| | UBS Securities Japan Co., Ltd. |
| | Rakuten Securities, Inc. |
| Institutional investors | Asset Management One Co., Ltd. |
| | Fidelity Investments (Japan) Limited |
| Retail investors | Retail investors |
| Data vendors | QUICK Corp. |
| | Refinitiv Japan K.K. |
| System vendors | Japan Information Processing Service Co., Ltd. |
| | Nomura Research Institute, Ltd. |
| *Listed in Japanese alphabetical order in each category | |
| Observers | The Financial Services Agency of Japan |
| | The Investment Trusts Association, Japan |
| | Japan Securities Dealers Association |
| | Sapporo Securities Exchange |
| | Nagoya Stock Exchange, Inc. |
| | Fukuoka Stock Exchange |

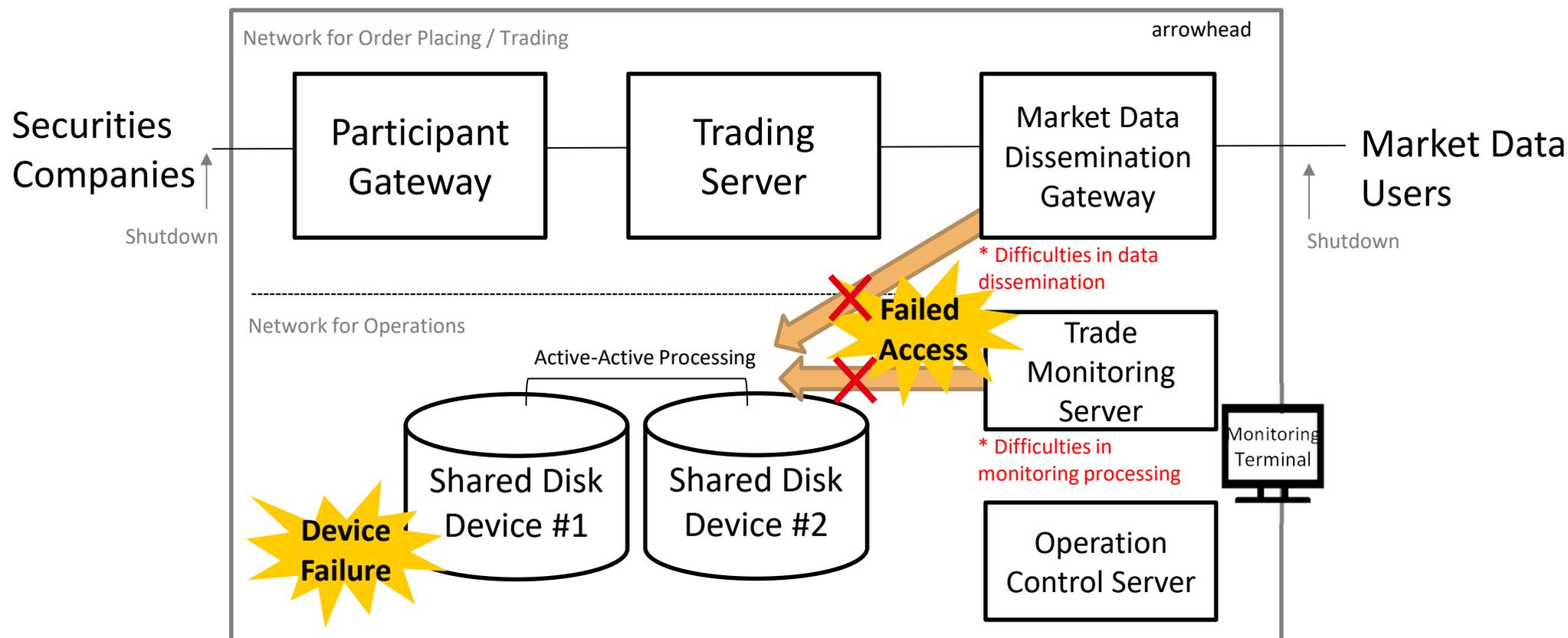
2. Details of the Incident on October 1 (1)

Sequence
Of
Events

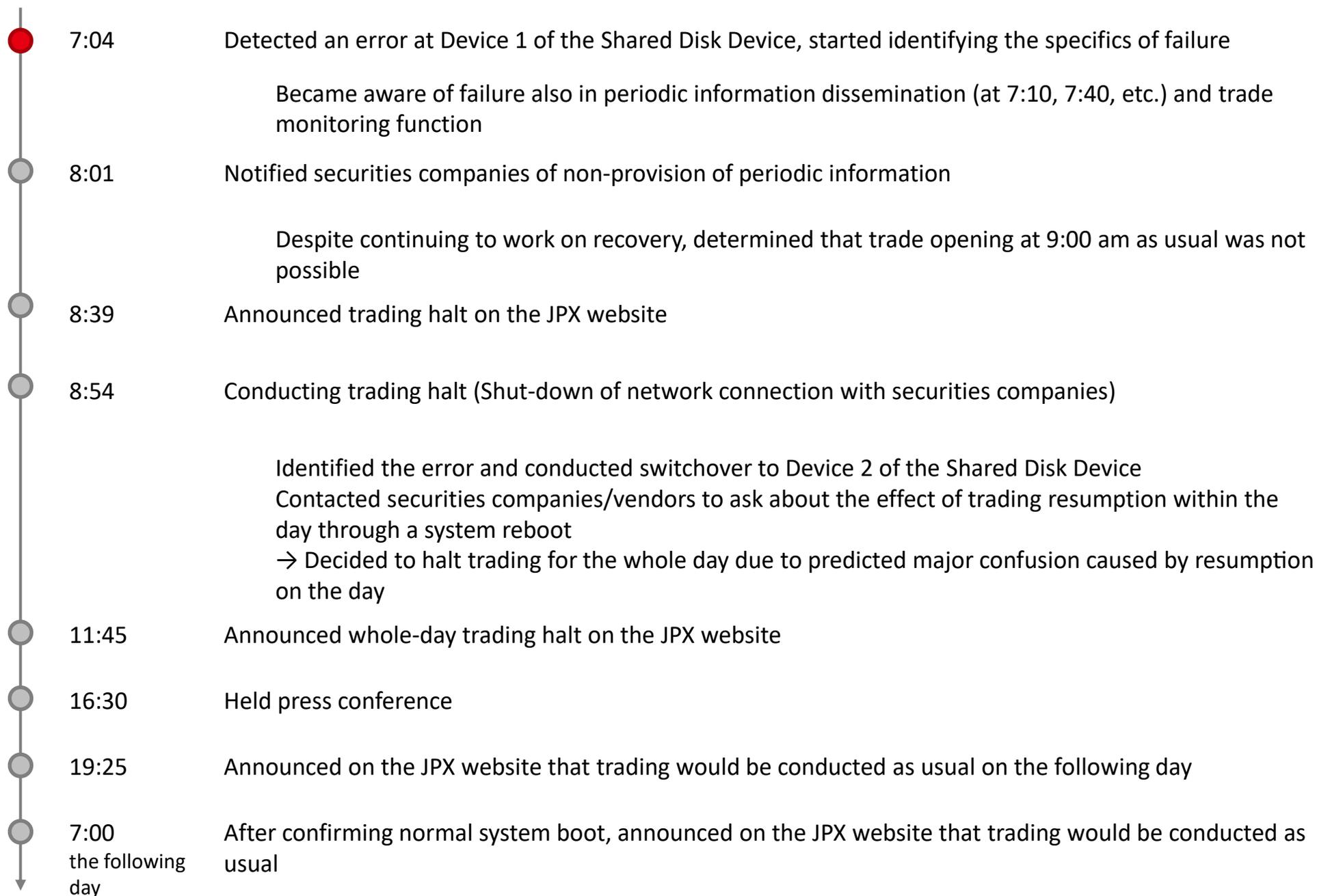
- At 7:04 am on October 1, a memory module failure occurred at Device 1 of the Shared Disk Device
- The automated switchover to Device 2 failed, and there was also a failure of market data dissemination & trade monitoring
- Since market data dissemination was unavailable, trade was halted by shutting down the network connection for routing orders from securities companies and disseminating market data, before the morning session opening.
- TSE decided to halt trading for the whole day because a survey of market users showed that only a limited number of trading participants would be able to take the actions necessary for trading resumption, and because a resumption was predicted to cause confusion over the handling of already received orders, etc.
- Hardware was replaced and the trading system was rebooted within the same day (October 1) and trading was resumed as usual on October 2.

Current
Situation

- It was revealed that automatic switchover would not function for the failed Shared Disk Device in the case of a memory module failure.
- It has been confirmed that the automatic switch will now function in the event of a similar system failure and necessary measures were taken on October 4.



2. Details of the Incident on October 1 (2)



3. Outline of Recurrence Prevention Measures

(excerpt from a document published on Oct. 19)

- Issues recognized through the incident

- (1) Although TSE checked the setting of the Shared Disk Device (NAS) with reference to a product manual when arrowhead was developed, the deficiency in the manual prevented a proper understanding of the product specifications.
- (2) There was no contingency plan to halt trading in the case of NAS becoming unavailable.
- (3) There was no rule on how to handle trade resumption after a trading halt in the event of a system failure.



| Recurrence Prevention Measures | Contents |
|---|--|
| (1) System responses and comprehensive checks | <ul style="list-style-type: none">- Correction of NAS switchover setting (Completed on Oct. 5)- Comprehensive check of NAS settings (by the end of Oct.)- Examination and development of measures to ensure successful switchover (by the end of Nov.)- Switchover tests and drills (by Jan. 2021 for NAS; ongoing) |
| (2) Enhancement of procedures for failsafe trading halts | <ul style="list-style-type: none">- Conformation of whether there are any past cases of failure to halt trading (by the end of Oct.)- (If there are any such cases) Preparation of necessary instructions and operation procedures (by the end of Nov.)- Development of a function which halts trading without using NAS (by the end of Nov.) |
| (3) Development of rules for trading halts and resumptions | <p>Establishment of a "Council for Recurrence Prevention Measures" comprised of market users such as trading participants, investors, and system vendors, and development of necessary rules, etc. based on the discussions of the Council (by around the end of Mar. 2021)</p> <ul style="list-style-type: none">- Development of rules necessary to resume trading on the same day;- Development of procedures for trading resumptions;- Clarification of standards for trading halts/resumptions;- Discussion on ideal information provision; and so on. |

4. Major Topics for Discussion (1)

- The Council will mainly focus on the following discussion points with the aim of considering/responding to IT-related, rule-related and operation-related issues for the purpose of development of rules for trading halts and resumptions and other things.

I. Development of Rules and Procedures for Trading Halts and Resumptions, etc.

1. Development of necessary rules for handling of already received orders to enable same-day trading resumption in the event of system failure

- After listing up different types of system failure, confirmation of which would need responses such as no order acceptance and trading halts, and clarification of this through existing rules if necessary.
- For cases such as the one on October 1 where trading participants need to resend orders due to a system reboot, organization of various issues including handling of brokerage orders at trading participants, what is required by customers for a trading resumption, and the necessity of resending customer orders, and clarification of these through existing rules if necessary.

2. Development of procedures for trading resumptions in case of extraordinary trading halts

- For cases such as the one on October 1 where the system failure is such that the TSE trading system has to be rebooted, establishment of operational procedures for trading resumption, through discussions of what IT-related work would be needed for both the exchange and trading participants, etc.
- Discussion of what would be needed from both TSE and trading participants, etc. to shorten the time between a reboot of the TSE trading system and trading resumption.

3. Drills based on the above

- Conducting periodic drills with trading participants and market data users, etc. to recreate the situation of a TSE trading system reboot.

4. Major Topics for Discussion (2)

II. Clarification of Standards and Procedures for Trading Resumption under Contingency Plan

4. Clarification of standards, etc. for trading resumption under contingency plan

- Given that the current contingency plan contains no standards for trading resumptions, discussion and clarification of these from the beginning, based on the standards for trading halts.
- In addition, in order to increase the foreseeability of trading halts and resumptions, clarification of standards and their applicability in cases where it is necessary to comprehensively take into consideration the percentage share in trading values, damage or system failure caused by a natural disaster, and societal demand for market operations.

5. Development of procedure for gathering opinions when deciding on trading resumptions.

- With the aim of increasing transparency and ensuring effective decision making on trading resumptions, discussion of the scope of trading participants, etc. who would be asked for opinions (e.g. by percentage share in trading value), clarification of their contact persons (ex. a person responsible for securities trading) and, if necessary, development of a framework for this.

III. Enhancement of Information Provision

6. Enhancement of information provision in the event of system failure, etc.

- Discussion and enhancement of the required contents and frequency of information and which channels should be used to disseminate it from the perspective of users, with the aim of swift information provision and timely updates on any system failure, including on the incident itself, its cause and the expected timing of trading resumption, for the purpose of enabling widespread investors and market related parties to receive information on system failures and their details in a timely and appropriate manner.