



Feedback Summary

Response to ASX Market Management Consultation 2: Potential Enhancements

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1. Introduction

1.1 Background

ASX issued a consultation paper, 'ASX Market Management Consultation 2: Potential Enhancements'¹ (**the Consultation**) on 31 October 2022.

The Consultation was the second of three ASX consultations in response to the Australian Securities and Investments Commission's (ASIC's) Report 708 entitled 'ASIC's expectation for industry in responding to a market outage' (**REP 708**)². The broader context and detail of ASX's three stage consultation process in response to REP708 is set out in the introduction of the Consultation.

This Consultation sought feedback across the following four proposals:

1. A new order download service (ODS).
2. A new trade download service (TDS).
3. A 'cancel only' session state.
4. An intraday reboot capability of the ASX Trade system.

This paper summarises the responses received to the Consultation and confirms ASX's response/approach.

1.2 Stakeholder engagement

ASX undertook a comprehensive program of stakeholder engagement in relation to the Consultation.

This engagement provided ASX the opportunity to describe the proposed functionality designed to deliver increased certainty during disruptions/outages, and to provide additional technical and operational details on the four potential enhancements. The stakeholder engagement also presented the opportunity to reconfirm feedback from the consultation paper, 'Market Management Consultation'³ on 28 June 2022 (**Consultation 1**) and the actions ASX will implement to uplift the existing incident management process.

Stakeholder engagement included:

- ASX Participants
- industry bodies
- vendors
- Cboe Australia⁴
- wholesale investors

1.3 Consultation feedback

ASX received 15 written responses from a broad range of stakeholders including Participants (9), industry bodies (3), vendors (2), and a market operator (1). ASX would like to thank the many stakeholders that participated in meetings and all the respondents that have provided written feedback. ASX would also like to acknowledge and thank AFMA⁵, SIAA⁶ and FAIT⁷ for their efforts in facilitating discussions with, coordinating responses from, and representing the views of their respective members.

¹ <https://www2.asx.com.au/content/dam/asx/about/regulations/public-consultations/2022/ASX-market-management-consultation-2-potential-enhancements.pdf>

² <https://asic.gov.au/regulatory-resources/find-a-document/reports/rep-708-asic-s-expectations-for-industry-in-responding-to-a-market-outage/>

³ <https://www2.asx.com.au/content/dam/asx/about/regulations/public-consultations/2022/market-management-consultation-28062022.pdf>

⁴ Cboe Australia is the only relevant Market Operator as it is the only other Market Operator that trades ASX-listed securities.

⁵ [The Australian Financial Markets Association](https://www.afma.gov.au/)

⁶ [Stockbrokers and Investment Advisers Association](https://www.siaa.com.au/)

⁷ [Forum for Australian Institutional Traders](https://www.fait.com.au/)

1.4 Summary of consultation responses

A summary of the themes resulting from the Consultation and the ASX response/actions:

NEW ORDER DOWNLOAD SERVICE [ASIC'S EXPECTATION 3]	
Feedback	ASX response/actions
<ul style="list-style-type: none"> - The majority of respondents were supportive of ASX's proposed new order download service (ODS). - General recognition the automated service will be beneficial during a market outage or disruption in providing Participants with certainty as to which orders reside on ASX (and have not executed). - View that a definitive list of orders will assist Participants cross reference their order status and positions, which would then enable cancelling their orders. - General agreement regarding the provision of a .csv file that can be accessed and used systematically. - No concerns were raised in regards to the ODS files being placed in a directory on ASX's SFTP site. - General agreement that systems require all order message fields including private data fields for reconciliation purposes.,. - There were no privacy issues raised on the inclusion of these private data fields in the proposed service. <p>-----</p> <ul style="list-style-type: none"> - A minority stated that ODS would only go some way to solving the order certainty problem. - ODS could be complex functionality that would only be used in very rare occasions (only when there is an outage and the market is moved into the ENQUIRE session state). - Limited value when time and other resources are constrained. - Questions were raised as to why ASX were proposing ODS would only be made available in incident scenarios - and not during normal operations. 	<ul style="list-style-type: none"> - In considering the Consultation responses, ASX concludes that the ODS will be beneficial, enabling Participants to obtain certainty by confirming their order status – as per ASIC's Expectation 3. - ODS will provide a more timely and definitive list of orders resting in ASX Trade compared to the current manual service. - ASX will commence development of a new automated ODS. - ASX will instigate the same solution that was proposed in the Consultation, which is robust and resilient across multiple incident scenarios. (The exception is the scenario where the matching engine(s) itself (the source) is impacted by the outage). - ASX is proposing that the ODS will be available for testing in FY24. - All data fields including the private data fields will be made available in the ODS file. - Further specifications and information will be provided by ASX regarding the details and fields that will be provided in the ODS file. - ODS will provide Participants with an alternative service and data format that they can chose to use during an ASX Trade disruption/outage. - ASX will propose in consultation paper 3 that the ODS be included in BCP test weekend events and recommend that it is reviewed, updated, tested and documented on a regular basis. - ODS will only be available in incident scenarios and not during normal operations. The process of extracting orders from the source is only supported under outage scenarios and when the market is in ENQUIRE.

NEW TRADE DOWNLOAD SERVICE [ASIC's Expectation 3]

Feedback	ASX response/actions
<ul style="list-style-type: none"> - The majority of respondents were supportive of ASX's proposed Trade Download Service (TDS). - Widespread view that TDS would provide more certainty, providing Participants with a definitive list of trades executed on ASX during a market outage, allowing users to accurately cross reference and reconcile trade data within middle office and execution management systems. It will help stop the duplication of trades, and to assist with reporting. - General agreement regarding the provision of a .csv file that can be accessed and used systematically. - No concerns raised in regards to the TDS files being placed in a directory on ASX's SFTP site. - General agreement that for the purpose of reconciliation, Participants require all fields including private data fields for their systems. - There were no privacy issues raised on the inclusion of these private data fields in the proposed service. - Mixed responses in regards to the file being made available immediately, or after the fair, orderly and transparent (FOT) assessment. The preference was that the TDS file be made available as soon as practicable – with the amended file then made available once the FOT assessment has been concluded. ----- - A minority stated that TDS would only go some way to solving the trade certainty problem. - TDS could be complex functionality that may not be used on a day-to-day basis but rather only in the very rare occasions of an ASX Trade disruption/outage incident. - Limited value when time and other resources are constrained. - Questions as to why ASX were proposing TDS would only be made available in ASX Trade disruption/outage scenarios - and not during normal operations. 	<ul style="list-style-type: none"> - In considering the consultation responses, ASX concludes that the TDS will be beneficial and enable Participants to obtain certainty by confirming the status of trades – as per ASIC's Expectation 3. TDS will provide a more timely and definitive list of trades executed on the ASX market compared to the current manual service. - ASX will commence development of a new automated Trade TDS. - ASX is proposing that the TDS will be available for testing in FY24. - Further specifications and information will be provided by ASX regarding the details and fields that will be provided in the TDS file - ASX will instigate the same solution proposed in the Consultation, which is robust and resilient across multiple incident scenarios. - TDS will provide Participants with an alternative system and data format that they can choose to use during an ASX Trade disruption/outage. - ASX will propose in consultation paper 3 that the TDS be included in BCP weekend events and recommend that it is reviewed, updated, tested and documented on a regular basis. - TDS will be made available promptly in an outage to allow Participants to obtain a list of transactions that have executed on ASX. - A subsequent file will be made available with the trades deemed as 'invalid' during the FOT review clearly flagged in the file. - The TDS file will be made available on a daily basis during normal operations and available prior to market open on T+1.

A 'Cancel Only' Session State [ASIC's Expectation 2]

Feedback	ASX response/actions
<ul style="list-style-type: none"> - There was general support for the creation of a new CANCEL_ONLY session state. - Acknowledgement that it would <u>only</u> be used by ASX when it is inappropriate and not viable to move from ENQUIRE to ADJUST. For example when market data broadcasts are corrupted or not being produced. - Appreciation that it would offer a preferable alternative to remaining in ENQUIRE for day. - Wide-spread consensus that it will assist in providing more certainty and confidence around order status. - Agreement that it enables a decision to be made regarding the transfer of orders to an alternative execution venue as it removes the risk of order duplication. - Vendors were supportive noting that in past incidents, their clients would have made use of this session state had it been available. ----- - Some suggested ASX use caution prior to moving to CANCEL_ONLY as it prevents ASX market reopening. - A few responses considered that CANCEL_ONLY is adding complexity with nominal benefits. - Some Participants noted they do not need a specific session state to cancel orders as they do not need a positive confirmation from ASX to cancel orders in their own systems. - General consensus was that developing to a CANCEL_ONLY session state would require more development effort than ODS and TDS. - Acknowledgment that changes may be required to ensure that the new state was recognised by systems and platforms. - Comments that appropriate testing would be needed in the ASX Test environment. - Testing would be required to ensure there are no impacts from cancelled orders during this state, or no data integrity issues on recovery. - A market operator suggested that the onus should be on operators and that all orders should be purged if there is an outage. 	<ul style="list-style-type: none"> - ASX will commence configuration and testing of a new CANCEL_ONLY session state. - ASX is proposing that the CANCEL_ONLY session state will be available for testing in FY24. - As per ASIC's Expectation 2 – a CANCEL_ONLY session state will provide an alternative to the ENQUIRE session state and allow Participants to cancel their orders without the risk of incorrect, incomplete or duplicated market data and/or broadcasts data. - ASX reiterates that it will <u>only</u> use CANCEL_ONLY when it is inappropriate/not viable to move from ENQUIRE to ADJUST. - The CANCEL_ONLY session state can be used in conjunction with the ODS and TDS. - ASX appreciates that Participants intending to make use of the new session state may need to undertake development as the usual OMNet broadcast (BO5) may not be available. However, ASX is proposing an existing message flow, as an alternative acknowledgment source of an order cancellation, which should minimise the development required. Participants using OUCH will be able to rely on the normal transactional flows in most cases. As such ASX considers the proposal is worth pursuing. - ASX will propose in consultation paper 3 that the CANCEL_ONLY session state will be included in BCP weekend events and recommend that it is reviewed, updated, tested and documented on a regular basis. - Further specifications and information on the CANCEL_ONLY session state will be provided by ASX. It will be made available in the appropriate test environment.

Intraday reboot of ASX Trade [ASIC's Expectation 5]

Feedback	ASX response/actions
<ul style="list-style-type: none"> - The majority of responses were generally unsupportive of introducing an intraday reboot of ASX Trade. - Feedback focussed on the additional risks and cost that would be introduced by an intraday reboot, placing additional strain on resources. - Most highlighted that the introduction of an intraday reboot would require significant development work and testing which would result in a sizeable cost for the industry. - Many questioned the cost versus benefit for such a rare event. - It was noted that participant systems have a myriad of automated and interdependent end of day / start of day processes - which were not designed to run intraday. - All agreed that it was important that an intraday reboot should <u>only</u> be considered if it was practicable in a timely manner and questioned if this is achievable, with concerns also on their own process being able to be completed in a timely manner. - Considerations were given as to whether a Fair, Orderly and Transparent market can be maintained after an outage, and then an intraday reboot, with the potential for Participants being at different levels of ability to continue to conduct trading on that day. - There were concerns raised that day orders would be lost and that only long orders could be maintained with a reboot. - A general view was that a simpler and better outcome for members may well be for the ASX market to remain closed for the day, rather than to adopt an intraday reboot. - Some responses highlighted this proposal differs from the earlier enhancements which all provided a choice of when/how a Participant may use them, an intraday reboot would need to be fully implemented by all Participants. - Many stressed that the intraday reboot would provide an additional option in the ASX playbook that may add complexity, dilute 	<ul style="list-style-type: none"> - ASX will not progress with the development of an intraday reboot capability (turning off and restarting ASX Trade). To avoid any doubt, a reboot/restart is different and more complex to simply resuming the market once an issue has been resolved e.g. moving from ENQUIRE to Pre-Open and then Open). - ASX has considered the feasibility of an intraday reboot of ASX Trade, as an alternative approach to restoring trading. Whilst it is likely that such functionality can be developed and implemented, ASX has made the decision not to progress after taking into consideration both stakeholder feedback, and the internal implications of this proposal. - ASX recognises that the majority of stakeholders were generally unsupportive of ASX introducing the intraday reboot. - ASX has taken into account the concerns raised regarding additional risks that would be introduced by this complex solution catering for a rare event. The combined factors of complexity and rare usage will result in a higher probability of operational failure and could even exacerbate an incident. - ASX recognises from the feedback that the introduction of an intraday reboot would require significant development and testing, impacting the majority of Participant systems. If ASX were to proceed with the initiative it would be at a sizeable cost for the industry. - An intraday reboot would only be an option to resolve specific outage scenarios. - ASX understands that the market wants certainty. Certainty is a critical objective of any market management process, and is advanced when all market stakeholders can rely on a few clear options in a playbook. There has been general consensus from a broad range of customers that ASX should either aim to quickly diagnose, resolve and

<p>certainty as to actions that will be taken during outage.</p> <p>-----</p> <ul style="list-style-type: none"> - One Participant was very supportive of an intraday reboot in certain circumstances. Explaining that it would need to be well tested and included in BCP events, and then well-coordinated and communicated if an outage occurred. - Vendors were supportive in principle, but provided caution that further assessment would be required, identifying that introducing an intraday reboot will introduce a range of challenging complexities. 	<p>reopen for trading – or determine that it will close the remainder of the day. It is considered that an additional option of an intraday reboot reduces this certainty around market management and significantly increases the complexity.</p> <ul style="list-style-type: none"> - ASX has reflected on the practicality of a reboot. Given the complexity involved for both ASX and Participants, questions have been raised concerning how much of the trading day would remain if an intraday reboot was applied⁸. It is unlikely to be achievable in the required timeframe⁹.
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1.5 Format of the consultation response

The structure of this paper reflects the detail of the Consultation. Feedback is presented in sections corresponding with the different topics set out in the Consultation.

- Section 2: New Order Download Service
- Section 3: New Trade Download Service
- Section 4: ‘Cancel Only’ Session State
- Section 5: Intraday Reboot of ASX Trade

The first part of each section is a brief introduction to the topic. Subsections set out the associated questions and the summarised feedback.

In some cases, ASX will be proposing amendments to existing processes or policies consequent to the feedback received.

ASX’s policy positions are set out in green boxes below (and are additionally summarised above).

⁸ Immediately following a disruption or outage, a period of technical diagnoses and assessment is required together with consultation with the vendor. Corrective maintenance would then be applied to resolve the issue. The intraday recovery process would then be applied to ASX Trade, followed by the reboot of all ASX internal adapters, interfaces and downstream applications. ASX would monitor if Participants were successfully reconnecting and assess that there was a significant proportion of the market connected. Market resumption timers would then be communicated and configured.

⁹ Following market feedback on checkpoints during an outage day and a final cut-off time, ASX has committed to making a final decision to open or close for the day by 1:30pm, with the aim of opening by 2:30pm.

2. Order Download Service

2.1 Background

ASX currently provides a service through which ASX Participants are able to obtain information about their current orders during an incident. As noted in Consultation 1, these services are currently operated manually on request to the ASX Trading Operations team. In certain incident scenarios the current service may be impacted¹⁰.

ASIC REP 708 Expectation 3 states that:

“Market operators need to refine their policies and processes for providing participants with trade confirmations and order status. This includes the development of playbooks with a hierarchy of alternative systems and data formats for providing information to participants...Further consultation with participants on technical requirements is likely to be required”

Feedback was sought on a proposed automated service to provide a new order confirmation service that:

- is **less prone to be impacted in incident scenarios**¹¹ – by removing dependencies on internal ASX Trade processes. The ODS will source data directly from the matching engine¹² and will not be impacted by incidents affecting components downstream;
- is **automatically generated** and requires no manual processing by ASX – other than to initiate the service (where relevant) during incidents;
- can be **accessed**¹³ and **used systematically**¹⁴ by ASX Participants – with some development required;
- **provides sufficient information** to assist stakeholders in incident scenarios – in particular, provide all the information required to support reconciliation and cancellation of orders; and
- when available, is **definitive** as to the orders which are currently present in ASX Trade.

2.2 Feedback

Consultation Paper 2 – questions asked:

ASX proposes to develop a new, more secure and robust ODS for use during incidents, to improve certainty over Participant order book positions.

Question 2.1: Are you supportive of this proposal?

Question 2.2: If so, how could you make use of the service?

Question 2.3: Please provide any further feedback you have regarding this proposal?

Question 2.4: In considering data security - would there be any challenges if private data fields were omitted from the file (*exClient Info, Customer Info and Regulatory data*)?

¹⁰ The current services were partially impacted by the September 2016 incident and the November 2020 incident.

¹¹ ASX assesses that the proposed ODS would not have been impacted by either the September 2016 incident or the November 2020 incident and, were it in place at that time, the ODS would have been available during both incidents.

¹² The matching engine is the ultimate source of order data in ASX Trade. If the matching engine is impacted in an incident¹², ASX may not be able to provide any information about outstanding orders and may need to deem all orders as having been lost.

¹³ The ODS files will be placed in a directory in ASX's SFTP site accessible only by the relevant Participant's authorised SFTP client.

¹⁴ One file of orders will be created for each combination of ASX Trade Participant ID ("PID") and ASX Trade matching engine ASX Participants should therefore currently expect 4 files which will be provided in a machine readable format such as csv.

General feedback on ODS Initiative

A significant number of respondents were supportive of ASX's proposed ODS, with 12 stakeholders (80%) supportive of the initiative. There was general consensus towards a preference for systematic messaging wherever possible. Some confirmed that it would be useful to receive the ODS file in a .csv format that is easily transferable into Excel. There were no concerns raised in regards to the ODS files being placed in a directory in ASX's SFTP site that would only be accessible by the relevant Participant's authorised SFTP client.

There was a widespread view that the service would allow stakeholders to achieve certainty as to which orders reside on ASX (and have not executed). Many acknowledged that the additional data would be useful to allow them to cross reference their order status and positions which would then assist with cancelling orders. In general, the initiative was encouraged as it would assist in reducing risk during an outage. Some Participants noted that the ODS would be especially helpful in the scenario when the ASX market isn't likely to reopen. Some Participants noted that there could be ways for their vendors to make use of this service, for example, by consuming a controlled data set to drive a reconciliation of the order state prior to further cancellation of orders.

The remaining 3 respondents (20%) noted that the proposed ODS only goes some way to solving the order certainty problem. One explained that whilst they were supportive of the concept, they were not supportive of the design, suggesting that it was overly complex for a functionality that would only be used on very rare occasions. Another suggested that ASX use matching engine data to provide a real-time audit feed over FIX, acknowledging that this would require additional development by many Participants.

There was one concern raised regarding the timeliness of the provision of this data, which ASX Participants would then be required to download before they were able to perform an order reconciliation. The respondent therefore questioned the value of the ODS in the event of an exchange outage, when time and other resources are limited, suggesting that it is unlikely participants will be prepared to quickly ingest and rely on the ODS files.

Feedback on Availability of ODS

Some respondents questioned why ASX is proposing the ODS would only be made available in incident scenarios and not during normal operations. There was a concern raised in regards to the accessibility and file decoding, given the likely infrequent generation and use. One respondent noted that maintaining a tool that would only be used infrequently requires additional resources to support (which would be weighed on a cost to use benefit) and as a result create the risk of the functionality not being operational when needed. It was suggested that to assist adoption and robustness of ODS from the participant side, it should be made available during normal trading days, which would encourage Participants to develop a tool for file ingestion.

In response, ASX reiterates that the ODS sources data from the matching engine, and will therefore impact the performance of the matching engine if used during normal operations. Therefore, the ODS will only be available in incident scenarios and BCP event weekends. The existing order confirmation service¹⁵ will continue to be available at other times. ASX recommends that it is reviewed, updated, tested and documented on a regular basis.

¹⁵ <https://www2.asx.com.au/markets/market-resources/incident-management>

Feedback on Private Data Fields

When considering data security, ASX sought feedback on the information that should be included in the ODS file, and specifically asked stakeholders if there would be any challenges if private data fields were omitted from the file.

There was general agreement from respondents that for the purposes of reconciliation, their systems require the inclusion of the private data fields. Some expressed concern that the file would only be useful if it contained all information. Another noted that the omission of private data fields would make it more challenging to process the file. Feedback was received that without that private data fields, the development build is significantly larger resulting in higher development costs. One respondent stated that initial estimates indicated that their development would be approximately 66% larger to build (with the omission of private data fields).

Importantly, there were no responses received that considered privacy concerns would arise with the inclusion of the private data fields in the ODS. One industry response noted that both ASX and Participants already have this private data.

2.3 ASX Response

ASX will commence development of a new automated Order Download Service (ODS).

ASX is proposing that the ODS will be available for testing in FY24.

In considering the Consultation responses, ASX concludes that the ODS will be beneficial and enable Participants to obtain certainty by confirming their order status - as per ASIC's Expectation 3. ODS will provide Participants with an alternative data source that they can choose to use during an ASX Trade disruption/outage.

ODS will provide a more timely and definitive list of orders resting in ASX Trade compared to the current manual service.

A comprehensive set of data fields including the private data fields will be made available in the ODS file. All confidentiality and information security obligations, including those stipulated under the MIRs will be adhered to when making the private data fields available.

Further specifications and information will be provided by ASX regarding the details and fields that will be provided in the ODS file.

ASX will implement the same solution proposed in the Consultation, which is robust and resilient cross multiple incident scenarios.

ASX will propose in consultation paper 3 that the ODS be included in BCP weekend events and recommend that it is reviewed, updated, tested and documented on a regular basis.

ODS files will only be available in incident scenarios and not during normal operations.

3. Trade Download Service

3.1 Background

ASX currently provides a service through which ASX Participants are able to obtain information about their executed trades during an incident. As noted in Consultation 1, this information is produced manually on request and may be impacted in certain incident scenarios¹⁶.

The data provided from this service must always be considered in the context of any separate advice ASX gives about the status of trades further to any FOT review undertaken by ASX. Consequently, whilst the current service provides a list of trades present in ASX Trade it does not, in isolation, serve as a definitive statement of trades that are valid.

ASIC REP 708 Expectation 3 states that:

“Market operators need to refine their policies and processes for providing participants with trade confirmations and order status. This includes the development of playbooks with a hierarchy of alternative systems and data formats for providing information to participants...Further consultation with participants on technical requirements is likely to be required.

Market operators must inform all participants of alternative arrangements in place to provide trade confirmations during operational incidents where they are not reliably available via the usual channels.

Market operators need to ensure that this information is promptly available, accessible and accurate.”

Feedback was sought on a proposed new automated service to provide a new trade confirmation service that:

- is **less prone to be impacted in incident scenarios** – by reducing dependencies on internal ASX Trade processes; TDS will source data directly from the ASX Trade component, the ‘Trade Handler’, which is downstream of the matching engine and unlikely to be impacted by incidents affecting other components¹⁷;
- is **automatically generated** and requires no manual processing by ASX – other than to initiate the service (where relevant) during incidents¹⁸;
- can be **accessed¹⁹ and used systematically²⁰** by ASX Participants – some development will be required;
- **provides sufficient information²¹** to assist stakeholders in incident scenarios; and
- will be made available in the event of an outage, is **definitive** as to the trades present in ASX Trade.

3.2 Feedback

Consultation Paper 2 – questions asked:

ASX proposes to develop a new, more secure and robust trade download service (TDS) for use during incidents, to improve certainty over executed trades.

¹⁶ The current services were partially impacted by the September 2016 incident and the November 2020 incident.

¹⁷ In the event that Trade Handler is unavailable, TDS will source data from an internal ASX component not dependent on OMNet.

¹⁸ When an incident occurs and after ASX Trade has been placed into ENQUIRE, ASX will initiate the process to extract, from the Trade Handler, the source data for the TDS.

¹⁹ The TDS files will be placed in a directory in ASX’s SFTP site accessible only by the relevant Participant’s authorised SFTP client.

²⁰ Files will be provided in a machine readable format such as csv. One file of trades will be created for each combination of ASX Trade Participant ID (“PID”) and ASX Trade matching engine.

²¹ The content of the TDS file will replicate the data provided in the CB15 Directed Trade Broadcast Section 26, ASXT Broadcasts - [LINK](#)

Question 3.1: Are you supportive of this proposal?

Question 3.2: If so, how could you make use of the service?

Question 3.3: Please provide any further feedback you have regarding this proposal?

Question 3.4: In considering data security - would there be any challenges if private data fields was omitted from the file (*Customer Info, Account ID and Regulatory Data*)?

General feedback on TDS Initiative

A significant number of respondents were supportive of ASX's proposed TDS, with 12 stakeholders (80%) supportive of the initiative. Similar to responses received on the ODS, there was general consensus towards a preference for systematic messaging wherever possible. Most confirmed that it would be useful to receive the TDS file in a .csv format that is easily transferable into Excel. There were no concerns raised in regards to the TDS files being placed in a directory in ASX's SFTP site that would only be accessible by the relevant Participant's authorised SFTP client.

Feedback was largely consistent throughout; that the TDS is a sensible and practical approach allowing Participants to achieve certainty around their executed trades. Another benefit offered (in numerous responses) is that in the event of any type of ASX outage, the additional data provided from the TDS, allows users to accurately cross reference and reconcile trade data within middle office and execution management systems. It was explained that this would be beneficial to help stop the duplication/erroneous orders, and to assist with reporting purposes.

One vendor explained they were supportive of the TDS proposal, observing that there is currently no consistent process in place where missed trades can be recovered intraday, in the scenario of an ASX outage. By the same token, a Participant explained that their vendor lost executed trade information during the November 2020 outage due to ASX Trade being unable to provide it. Their opinion is that promptly available and accurate trade execution data from the TDS would enable their vendor to reconcile and update the database, which they suggest would have been useful and saved their staff a lot of time post the November 2020 outage.

One industry group considered that while they were in favour of the TDS (providing various feedback on where it will be helpful) their members had remarked that it's availability will not enable a seamless shift of orders to an alternative exchange. The response noted that whilst Participants will have the data, decisions may still need to occur in a very short period of time, with client contact required to determine their intentions for their orders. Their response contemplates that even with order and trade certainty, clients may not want to move their orders for a variety of reasons, with some of the challenges of moving liquidity not being solely of a technical nature. The example provided was that a client with a longstanding order may be disadvantaged if the order is moved to an alternate exchange, as they will lose their priority. In addition, another risk put forward is that if the order is not filled on the day and subsequently purged, it may necessitate them having to move their order back to ASX. The response considers that the client could essentially lose their priority twice, and as such, if ASX is down for the day, a client with a longstanding order may very well decide not to move their order but to "stay put" at the ASX.

A number of responses stated that if there is a lack of liquidity in the market when ASX is not operational then this may still cause clients to keep their orders on the ASX rather than test liquidity on an alternative exchange on the day.

Similarly to the feedback provided to the ODS, 3 respondents (20%) noted that the proposed TDS only goes some way to solving the trade certainty problem. One of these respondents conceded that a TDS may be marginally more useful than an ODS. Another explained that whilst they were supportive of the concept, they

were not supportive of developing complex and costly solutions with the single purpose of addressing relatively rare occasions. They suggested that rather a solution should be provided that can provide value on an ongoing basis and that can leverage the existing infrastructure, to minimise the resourcing impact for market participants in maintaining such infrastructure.

Feedback on Availability of TDS

Some respondents questioned why ASX were proposing that the TDS would only be made available in incident scenarios and not during normal operations. One participant encouraged ASX to make the TDS file available outside of an outage situation. One industry group noted their members' concerns of how to ensure that, in the event of an outage, which occurs rarely, the trade file process will work and provide them with the information they need to make timely decisions.

ASX reiterates that the TDS sources data from the Trade Handler, and therefore impacts the performance of the Trade Handler engine. Accordingly, it was ASX's intention that the TDS will only be available in outage scenarios. The existing trade confirmation service through ASX Trading Operations will continue to be available at other times. However, in response to the concerns expressed through the Consultation, ASX has committed to also make TDS file available daily during normal operations, on a T+1 basis. ASX will generate the T+1 files and make them available prior to market open. This will ensure that Participants can get used to retrieving the data in this format and test it with their own internal systems. This will be useful for Participants as they can use it as part of their Business Continuity Planning.

Feedback on timing of TDS in regards to FOT assessment

ASX received many questions throughout the Consultation in regards to the timing of the TDS file, and whether it would be made available immediately, or if the ASX would wait until the conclusion of any FOT²² assessment that may be required on the trades that had transacted prior to the market being placed into ENQUIRE.

There was mixed feedback from respondents, with the preference being that the TDS file be made available immediately. Two industry groups were in favour of this noting that their members would prefer that the TDS be made available immediately (after the market outage occurs) with updates then provided following ASX's FOT assessment. Similar feedback was received from participant responses with one suggesting that at a minimum, the TDS should be made available upon the outage occurring, and a second file made available once ASX completed the FOT assessment. Conversely, one participant's preference would be to receive a conclusive file, albeit later, explaining that in their view this leads to a cleaner reconciliation process.

The ASX intention was that any FOT review would be concluded and communicated prior to TDS being made available. The file would therefore be intended to serve as a definitive statement of valid trades. However, it is acknowledged that there may be certain situations when it is more timely to enable TDS and then subsequently communicate FOT assessment decision. ASX has concluded that an initial file will be made available immediately that can be used as a list of transactions that have executed on ASX. Once the FOT assessment has been concluded, an updated file will be made available, with the trades deemed as invalid from the FOT assessment clearly flagged.

²² referenced in Market management Consultation paper 1.

Feedback on Private Data Fields

ASX sought feedback on the information that should be included in the TDS file, and specifically asked stakeholders when considering data security - would there be any challenges if private data fields were omitted from the file.

There was general agreement from respondents that for the purposes of reconciliation, their systems require these private data fields. Some expressed concern that the file would only be useful if it contained all information with one noting that the private data fields are critical. Another noted that the omission of private data fields would make it more challenging to process the file.

Consistent with their feedback on the content of the ODS, one industry group response clarified that the omission of private data fields from the TDS files will substantially increase development costs as they will need to build a solution to assist them to 'read' the data file.

One vendor's preference was to include and receive as many of the data fields as possible, noting that without all of the private data fields, they may face challenges for reconciliation.

Importantly, there were no responses received that considered privacy concerns would arise with the inclusion of the private data fields in the ODS. One industry response noted that both ASX and Participants already have this private data.

3.3 ASX Response

ASX will commence development of a new automated TDS.

ASX is proposing that the TDS will be available for testing in FY24.

In considering the Consultation responses, ASX concludes that the TDS will be beneficial and enable Participants to obtain certainty by confirming their trade status – as per ASIC's Expectation 3. TDS will provide a more timely and definitive list of trades executed on the ASX market compared to the current manual service.

Further specifications and information will be provided by ASX regarding the details and fields that will be provided in the TDS file.

ASX will instigate the same solution proposed in the consultation, which is robust and less likely to be impacted in incident scenarios.

TDS will provide Participants with an alternative data source that they can choose to use during an ASX Trade disruption/outage.

ASX will propose in consultation paper 3 that the TDS be included in BCP weekend events and recommend that it is reviewed, updated, tested and documented on a regular basis.

TDS will be made available immediately in incident scenarios to allow Participants to obtain a list of trades that have executed on ASX.

A subsequent file will be made available with the trades deemed as 'invalid' from the FOT review clearly flagged in the file.

The TDS files will be made available on a daily basis during normal operations and available prior to market open on T+1.

4. CANCEL_ONLY session state

4.1 Background

ASX's overriding obligation is, to the extent that it is reasonably practicable, to do all things necessary to ensure that each of its licensed markets is FOT. As previously highlighted, a consequence of this obligation is that ASX's incident management may result in ASX Trade remaining in ENQUIRE - if moving to ADJUST will result in the potential broadcast of inaccurate, incomplete or duplicate market data or private data.

The consensus from Consultation 1 was that freezing the ASX market is the appropriate course of action, if there is corrupt market or private data. However, there was widespread agreement that if the market can't be moved to ADJUST, then ASX should introduce an alternative solution that would be less restrictive, would permit the cancellation of orders to facilitate transmission of such orders by ASX Participants to an alternative execution venue²³.

ASIC REP 708 Expectation 2 states that:

"ASX should explore alternatives to the Enquire session state for mitigating risks to its trading system and market data from order amendments during market outages, and assess options that allow participants to manage their orders. This may involve purging some (i.e. good-for-day) or all orders submitted on the day after a specified checkpoint time, or developing additional session states, and will require further consultation with participants".

Feedback was sought on a potential new session state "CANCEL_ONLY" that:

- **provides an alternative to remaining in ENQUIRE** when it is not possible to move to ADJUST and:
 - is **likely to be available in incident scenarios** – by substantially removing dependencies on internal ASX Trade processes other than the matching engine, gateways and a small number of critical subsystems;
 - "CANCEL_ONLY"²⁴ will be offered specifically for the purpose of allowing ASX Participants to cancel orders during incidents; and
 - **allows for processes that may broadcast inaccurate, incomplete or duplicate market data to be shut down;**
- is **accessible via existing protocols** – OMNet and OUCH;
- **provides a systematic response** – using existing message flows - noting that, in the case of OMNet, an existing transaction acknowledgement ('Ack') is used instead of the BO5 Broadcast; and
- is **not dependent on the data**²⁵ typically acquired by ASX Participants' application initiation processes²⁶ – and can therefore be used when ASX Trade reference data queries and messaging are impacted²⁷.

²³ As noted Consultation 1, ASX's existing incident management process affords stakeholders time to cancel any orders in ASX Trade before they can be executed. However, cancellation would not occur in real-time but during the market recovery. Given this timing offset, and the consequent lack of systematic messaging until any cancellation occurs, this approach may present technical, risk and compliance challenges to stakeholders in managing their orders in their own systems.

²⁴ Moving to CANCEL_ONLY allows erroneous market data broadcasting processes to be shut down to ensure that no incorrect, incomplete or duplicate data is disseminated. In addition, CANCEL_ONLY does not allow order amendments, which may have posed risks to ASX systems.

²⁵ The proposed new order confirmation service discussed in section 2 will provide sufficient information to permit the deletion of all orders using this service.

²⁶ ASX understands that as part of the initiation process to initiate an ASX Participant's application that interacts with ASX Trade, certain queries may routinely be run against ASX Trade to establish a view of reference data and market data. These queries may be unreliable in an incident scenario. This could prove particularly problematic if the application is disconnected from and has to reconnect to ASX Trade during the incident.

²⁷ In the September 2016 and November 2020 incidents, queries against the output of the matching engines impacted in each incident would have been impacted in a similar way to the private data broadcasts.

4.2 Feedback

Consultation Paper 2 – questions asked:

ASX proposes to develop and configure a new cancel only session state for use during incidents. This will allow the cancellation of orders without relying on normal broadcast responses which may have been corrupted. In this scenario, certain system broadcasts may be disabled where there is no certainty they are functioning correctly.

Question 4.1: Are you supportive of this proposal?

Question 4.2: If so, how would you make use of the service?

Question 4.3: Please provide any other feedback you have regarding this proposal including the level of change required for you to support and make use of this session state?

General feedback on CANCEL_ONLY session state

There was overall backing for the establishment of a new session state which would unfreeze the ASX market to permit the cancellation of orders. A significant number of respondents were generally supportive of ASX's proposed CANCEL_ONLY, with 12 stakeholders (80%) encouraging the initiative.

Industry groups confirmed that their members were supportive of the additional session state, highlighting a better customer experience during an ASX Trade outage. It was expected CANCEL_ONLY would assist members having more certainty and confidence in their order positions, which in turn would allow them to make a decision on whether they transfer orders to alternative execution venues and remove the risk of order duplication. It was noted that many Participants cannot place an order on another venue unless they cancel it first. It was reiterated that the introduction of a CANCEL_ONLY session state will *"...not necessarily result in a seamless transfer of all orders to alternative execution venues if there is an outage on the ASX"*.

Participant responses were largely consistent; that the new session state would allow the cancellation of standing client orders, and if deemed appropriate, the ability to transfer to alternative trading venue. In principle the majority of Participants appeared to be in favour of the additional session state and functionality.

One Participant highlighted that multi-day orders only represent a small portion of their own order activity. Whilst generally supportive of CANCEL_ONLY, they noted that if it is confirmed by ASX that it will not be re-opening for the day, they are able to redirect the majority of their business to alternative venues regardless of the ASX session state. They explained they would review multi-day orders to determine whether there is client benefit in transferring them to an alternative venue, sighting factors such as: order price; order priority; remaining trading time; and the effort to return any unexecuted orders back to the ASX for the next trading day.

A Participant questioned the value of CANCEL_ONLY, observing that the ASX is proposing to only utilise the new CANCEL_ONLY session state when a decision has been made that the Market will not re-open. They therefore made the point that by default, if such a decision was made, the risk of open ASX orders executing that same day would be impossible (or extremely low). They explained that they would have the confidence to close all orders in their order system, regardless of ASX session state. Whilst ASX acknowledges that this is the situation for some Participants, there are others who can't or won't rely on that methodology.

It was emphasised by one Participant that ASX should contemplate when it uses CANCEL_ONLY. They warned that consideration should be given by the Market as to how quickly the ASX would move ASX Trade into this session, sighting it would then prevent the reopening of the ASX market for that day. As a reminder, ASX consulted on a proposed Market Closure Assessment in Consultation 1 on market management. Following feedback from that consultation a procedure is now in place where ASX will undertake the assessment of the feasibility of resuming the ASX market every 45 minutes. ASX will always make a decision on whether to

unfreeze/resume the market at the earliest practicable opportunity, and will not wait until the cut-off time if it becomes clear that the market cannot be unfrozen/resumed. It was confirmed in Consultation 1 that 1:30pm will be the final cut-off time for a decision as part of the market closure assessment. This is to ensure that if trading was to recommence on the day, the ASX market would be resumed prior to 2:30pm. This includes the minimum 40 minute notice that would be given to the market prior to resuming trading, as reiterated in Consultation 1.

Vendors were supportive of CANCEL_ONLY noting that in past incidents, their clients would have made use of this session state had it been available to them. One confirmed that they were supportive of the new session state being limited to order cancellations only. They would allow clients to cancel orders during this session state.

By contrast, a market stakeholder gave the view that when there is an outage, the onus should be on the operator to purge its entire order book, sighting that such an approach would be *“...simple, clear, timely, and consistent across venues for all Participants”*. It was noted that ASX, *“...in its ENQUIRE, ADJUST, and potentially CANCEL_ONLY paradigm”*, places the onus on participants to manage the fallout of an outage. Their view was that CANCEL_ONLY increases uncertainty and that it adds *“...unnecessary complexity for what could and should be a very simple playbook for outages: a purge, an announcement, and a process for rebooting”*.

ASX has considered if purging all orders following an outage could be an option. It was determined that this would be quite disruptive, given the fact that ASX reloads approximately two hundred thousand long orders each day. Whilst the impact to some Participants may be negligible if all orders were purged, it would have a significant impact on other Participants and their customers.

One Participant considered that CANCEL_ONLY is *“...adding complexity with nominal benefits”*. They were concerned that having a new session state that is only triggered during incidents could lead to some *“...odd market data state with various vendors”* and adds complexity with order entry logic - with very limited benefits.

Feedback on development to CANCEL_ONLY

In general the feedback received was that developing a CANCEL_ONLY session state would be more involved than the Order and Trade download services.

One industry group noted that their members would need to undertake development work to adjust their systems to be able to make use of the new session state. They added that this system adjustment will incur a cost that is not insubstantial noting there will be a technical challenge as Participants will not be receiving broadcast updates which their current systems are reliant on, requiring work to address that issue. The general consensus from their members was that as long as the cost impact on Market Participants for the CANCEL_ONLY Session is modest, then the proposal is worth pursuing, noting however that the cost impact needs to be carefully considered.

Participant feedback was largely consistent, with many positive about the new session state, but cautious that changes would be needed to ensure that the new state was recognised by all affected components on their systems and platforms to ensure the correct behaviour. A few noted that although formal assessments had not been completed, they had initially categorised the level of change as high.

Some Participants commented that appropriate testing would be required, and the functionality made available on ASX Test environments, to ensure that there were no impacts from a lack of messaging for cancelled orders during this state and no resulting data integrity issues on recovery.

This view was echoed by another Participant who added that handling a new session state would require significant development effort across a number of their systems and therefore they did not see benefits from this proposal large enough to justify the work required to support it.

One Participant noted that the implementation of a new market state would increase complexity and the testing requirements of all market-facing vendor applications. It was pointed out that there is also the possibility that since the new market state will be rarely utilised, it may not be tested among participants and vendors leading to greater issues when the new market state is enacted during a future outage.

ASX reiterates that any additional functionality will be available for testing in appropriate test environments and will be included in BCP events. ASX will be consulting on an uplift to testing and BCP in the third and final consultation.²⁸

Feedback on the proposed utilisation of CANCEL_ONLY

Some feedback was received on the proposed utilisation of CANCEL_ONLY and the timing ASX propose to move into the session state. One industry group noted that their members have suggested a move into CANCEL_ONLY mode be considered in a more timely manner, rather than only when a 'done for day' determination has been made, in order to facilitate the movement of orders and assist Participants to meet ASIC's expectations.

One Participant stipulated that this feature has to be available within minutes after the ASX market is moved to ENQUIRE, regardless of the severity of the disruption and as soon as operationally possible.

Conversely, another Participant noted that consideration and caution should be given to how quickly the ASX would move the market into this session, given it would prevent the reopening of ASX Trade for that day.

One market stakeholder stated that "...ASX's approach to outage management is overwhelmingly driven by a desire to lock its order book for as long as it deems necessary to resolve technical issues, at the expense of enabling the transition of 'locked orders' to alternative markets".

A vendor noted that the ASX Market will not resume trading for the remaining day if the market is put on CANCEL_ONLY. They have contemplated that if that was the case, they should be able to keep the feed until end of day and reboot the following trade date establishing a new book from fresh.

ASX intends that the CANCEL_ONLY session state should only be used in scenarios where the market data broadcasts have been determined to be incomplete, incorrect or duplicated, and therefore a resumption of the market is no longer possible. ASX proposes that in such situations, when it remains inappropriate and not a viable option to move from ENQUIRE to ADJUST, ASX would instead disable the process that publishes market data and move to CANCEL_ONLY²⁹.

ASX reiterates that in an outage scenario, the market will not resume the same day once CANCEL_ONLY is used.

4.3 ASX Response

ASX will commence development of a new CANCEL_ONLY session state.

ASX is proposing that the CANCEL_ONLY session state will be available for testing FY24.

As per ASIC's Expectation 2 – a CANCEL_ONLY session state will provide an alternative to the ENQUIRE session state and allow Participants to cancel their order without the risk of incorrect, incomplete or duplicated data.

ASX will only use CANCEL_ONLY where market data broadcasts are corrupted, and therefore it is inappropriate/not viable to move from ENQUIRE to ADJUST.

²⁸ The broader context and detail of ASX's three stage consultation process in response to REP708 is set out in the introduction of the Consultation. <https://www2.asx.com.au/content/dam/asx/about/regulations/public-consultations/2022/ASX-market-management-consultation-2-potential-enhancements.pdf>

²⁹ Moving to CANCEL_ONLY allows erroneous market data broadcasting processes to be shut down to ensure that no incorrect, incomplete or duplicate data is disseminated. In addition, CANCEL_ONLY does not allow order amendments, which may have posed risks to ASX systems

The CANCEL_ONLY session state can be used in conjunction with the ODS and TDS.

There are no OMNet or ITCH API changes required. The CANCEL_ONLY session state will be similar to the ADJUST session state, but configured to remove order amendment capability.

ASX appreciates that Participants intending to make use of the new session state may need to undertake development as the usual OMNet broadcast (BO5) may not be available. However, ASX is proposing an existing message flow, as an alternative acknowledgment source of an order cancellation, which should minimise the development required. Participants using OUCH should be able to rely on the normal transactional flows in most cases. As such ASX considers the proposal is worth pursuing.

ASX will propose in consultation paper 3 that the CANCEL_ONLY session state will be included in BCP weekend events and recommend that it is reviewed, updated, tested and documented on a regular basis.

Further specifications and information on the CANCEL_ONLY session state will be provided by ASX. It will be made available in the appropriate test environment.

5. Intraday reboot

5.1 Background

ASX's current practice for the most severe incidents and outages is to recover ASX Trade overnight. When considering both the September 2016 and the November 2020 incidents, it is ASX's view that in similar circumstances, the only path to successful resumption of the ASX market, on the same day of the incident, would have been an intraday reboot. In the absence of such a capability, it is most likely that the ASX market would not resume until the start of the subsequent business day.

ASIC REP 708 Expectation 5 states that:

"Market operators should consider the feasibility of alternative approaches that may assist with restoring trading more quickly, such as an intraday reboot of key trading systems or purging some or all existing orders."

To avoid any confusion, an intraday restart/reboot capability (turning off and restarting ASX Trade) is different and more complex to simply resuming the market once an issue has been resolved e.g. moving from ENQUIRE to Pre-Open and then Open). The reboot process entails logging out all system users, shutting down all of ASX Trade backend processes, performing maintenance, and restarting ASX Trade backend processes on a new session.

Feedback was sought on the concept of a potential intraday reboot of ASX Trade that:

- **is timely:**
 - can be executed and ready by 1:30pm which is the cut-off for the last decision point to assess that the ASX Trade resumption session state sequence can begin (or not) and be open by 2:30pm;
- **facilitates market resumption** by affording ASX the ability to:
 - preserve long orders, where possible;
 - remediate functional issues;
 - re-establish accurate market data and private data. ASX generally anticipates that an intraday reboot is likely to be catered for by current market data recovery processes; and

- provide an accurate position of Participants orders and trades; and
- has **minimal impact** on ASX Participants:
 - from the ASX Participant perspective, the process for an intraday reboot should be **as similar as possible to the existing process** followed in the event of a disconnection³⁰.

5.2 Feedback

Consultation Paper 2 – questions asked:

ASX proposes to explore developing and testing the ability to reboot ASX Trade within a trading day and resume the market following an incident.

Question 5.1: Are you supportive of this proposal?

Question 5.2: Do you believe an intraday reboot would be of benefit to the market?

Question 5.3: Describe any system impact(s) you foresee and the effort required for you to support an intraday reboot of ASX Trade?

Question 5.4: Please provide any further feedback you have including any estimated timeframes it would take were ASX Trade rebooted intraday for you to be 'back online' and ready to trade?

General feedback on Intraday Reboot

ASX received a broad range of views on the proposal of a potential intraday reboot of ASX Trade. A considerable number of respondents were generally unsupportive of the proposal, with 12 stakeholders (80%) expressing either some or serious concerns around the initiative.

Feedback from the Industry groups centred around the additional risks and cost that would be introduced by an intraday reboot explaining that this could place additional strain on Participant resources. Their members noted that a decision to participate in an intraday reboot would be dependent on their capacity to do so considering resource loads and the associated risks on the day.

In general, industry groups agreed that an intraday reboot would increase their confidence that the ASX Trade system will function correctly and is more reliable than attempting a carry forward of a state that has had issues. But it was highlighted that complex solutions to rare problems have a higher risk of being non-operational, can often lead to more errors and therefore are harder to justify on a cost benefit basis, particularly when mandating implementation to systems. It was proposed that these combined factors of complexity and rare usage will result in a high probability of operational failure. It was noted that any potential benefit would come at a disproportionately high development and maintenance cost.

All appeared to agree that it was important that an intraday reboot should only be considered if it was achievable in a timely manner, allow for an adequate portion of the trading day and to not exceed regular trading hours. Questions have been raised regarding how much of the trading day would remain if an intraday reboot was applied. Some questioned whether this would be achievable and queried if there would be sufficient time for members to respond to the intraday reboot, reset their own system and to allow adequate time for them to contact their clients who may have had day-only orders purged from the system. It was indicated by one industry group that once ASX had performed a reboot, it would take a minimum of 45 minutes to an hour for Participants to reset systems. They would then need time to reconcile and ready themselves for the open. Considering there would also need to be an initial ASX analysis and investigation period, prior to an ASX Trade reboot process, then potentially 3-4 hours of trading time may be lost, which in their view is

³⁰ ASX assumption on reconnection: query reference data; connect to live feeds; query orders, query trades, query market data; apply live feed.

unacceptable. In addition, it was pointed out that in parallel, Participants would also have to enact procedures needed to continue trading on alternate trading venues, which would need to be reverted as part of the ASX resumption process.

This led to considerations from some as to whether a FOT market can be maintained following such a disruption, where a full-day's trading is essentially compressed into a short time frame. One response suggested that the level of risk involved may put Participants at different levels of being able to continue to conduct trading on that day and may not be equitable.

Another concern from members of industry groups was the fact that an intraday reboot would result in day only orders being lost. It was explained that there would be impacts from the cancellation or purge of orders on their operations and this represents a material change with increased risks.

There were additional concerns raised regarding the potential that long orders could be lost. It was explained by some Participants that this would be extremely disruptive, resulting in a loss of priority and the issue of partial confirmations and reconciliation. ASX's intention is that all long orders should be preserved during outages and recovery where possible. However, ASX reiterates that this is a scenario that could eventuate if one or more of the ASX Trade matching engines are lost (regardless of the system being rebooted intraday or not). As such, Participants should consider their options should this scenario occur.

There was a general sense from feedback from industry groups that as a result of these concerns, it was considered that a more simple and better outcome for their members may well be for the ASX market to remain closed for the day, rather than for ASX to adopt an intraday reboot. It was recognised that the Australian financial markets are better served by fully operational exchanges, which may be practically unworkable given the time required by ASX Participants to reset their systems.

Some individual Participants responses highlighted that compared to the ODS, TDS and CANCEL_ONLY proposals, where there is a choice of when/how a Participant may use them, the intraday reboot would need to be fully supported by all Participants as, if an intraday reboot occurs, it will affect everyone.

One Participant was only supportive if all orders are maintained, but reiterated that remaining closed for the day would be more simple and better for most customers. ASX confirms that this would not be possible and there is no intraday recovery model in which OUCH orders and OMNet day orders can be preserved.

Many Participant were not supportive of developing complex solutions which are created with the sole intent of addressing extremely rare events. Comments were provided by some Participants that in outage or major incident scenarios, providing certainty, or as much certainty as possible, is vital. There were observations that with ASX introducing a Market Closure Assessment protocol and a CANCEL_ONLY session state, and an additional option of an intraday reboot into the playbook of potential outcomes, would introduce additional complexity, operational risk and add unnecessary pressure on Participants' resources. In their view they would prefer a hard shutdown at that exchange if it could not be resolved by the final decision cut-off at 1:30pm.

Only one Participant (of those that responded) was fully supportive of an intraday reboot, noting that they could see benefits in some circumstances, explaining that it would need to be well tested, included in BCP events and on the provision it was well-coordinated and communicated on any day it was utilised. It was noted that the participant has limited client activity with primarily a low cost/low latency trading strategy and as such would not be impacted by an intraday reboot in the same way as most Participants.

Vendors were supportive in principle, but provided caution that further assessment would be required, identifying that introducing an intraday reboot will introduce a range of challenging complexities. One vendor noted that where trading data and system health is in a suitable state to allow for resumption of trading in the same day, and a complete intraday reboot is appropriate, being able to do so could benefit clients. It was noted that in prior incidents, waiting for the following day caused further issues to order and trade reconciliation.

Feedback on development to Intraday Reboot

The overwhelming consensus from all responses was that the introduction of an intraday reboot would require significant development work and be at a sizeable cost for the industry. It was noted that participant systems have a myriad of automated and interdependent end of day and start of day processes that run overnight and that these processes were not designed to run intraday. As well as extensive testing, development would be required to adapt these processes significantly increasing broker and market risk.

Individual Participants were explicit with where the challenges in developing to an intraday reboot would be. Some pointed out the risk associated with identifiers being reset and overlaps occurring as their systems track these identifiers intraday, which is especially risky around trades/bookings that can materially impact order management. Others noted that the removal of the OUCH Session ID may prevent the ability to recover cancelled or filled order messages with standard recovery.

Many noted that the requirement to develop to an intraday reboot would impact the majority of their systems. It was emphasized that trading platforms would face material challenges which would impact a wide range of operations highlighting examples: trading systems, middle office systems, settlement systems and reconciliation engines).

ASX acknowledges that an intraday reboot is a not a trivial change for both ASX and ASX Participants. ASX has assessed the internal implications of this proposal and the analysis that has been performed recognises that considerable impact is likely to be unavoidable.

As highlighted in the consultation, there would be multiple additional steps required for an intraday reboot, in comparison to the current ASX Trade overnight reboot process. An intraday recovery process would not be fully automated and recovery tasks would be performed on a manual basis. It is highly likely that maintenance will need to be undertaken to configure out functionality, prior to being able to perform the reboot. In addition, internal adapters, interfaces and downstream applications would require attention.

It is also conceivable that some ASX Participants would encounter issues reconnecting. Before making a decision to set the market resumption process, ASX would be required to ensure that a significant proportion of Participants have reconnected to ASX Trade, so as to enable proper price discovery to occur on the ASX Market.

5.1 ASX Response

ASX will not progress with the development of an intraday reboot.

ASX has considered the feasibility of rebooting ASX Trade following a disruption or an outage, as an alternative approach to restoring trading. Whilst it is likely that such functionality can be developed and implemented, ASX has made the decision to not progress after reflecting on both stakeholder feedback, and considering the internal implications of this proposal.

The majority of stakeholders were generally unsupportive of ASX introducing the intraday reboot.

ASX has taken into account the concerns raised regarding the additional risks that would be introduced by this complex solution to a rare event. The combined factors of complexity and rare usage will likely result in a high probability of operational failure and could even exacerbate an incident.

The consensus of feedback given to ASX was that the introduction of an intraday reboot would require significant development and testing and impact the majority of Participant systems. If ASX were to proceed with the initiative it would be at a sizeable cost for the industry.

An intraday reboot would only be an option to resolve specific outage scenarios. There are many scenarios where an intraday reboot may not be a valid option.

ASX has reflected on the practicality of a reboot. Given the complexity involved for ASX and Participants, questions have been raised regarding how much of the trading day would remain if an intraday reboot was applied. Immediately following a disruption or outage, a period of technical diagnosis and assessment is required together with consultation with the vendor.

ASX understands that the Market requires certainty. Certainty is a critical objective of any market management process, and is advanced when all market stakeholders can rely on clear options and reduced functionality.

There has been general consensus from a broad range of customers that ASX should either aim to quickly diagnose, resolve and reopen for trading – or determine that it will not be reopening for the day. It is considered that an additional option of an intraday reboot reduces this certainty around market management and significantly increases the complexity for ASX and participants.

6. Next Steps

Following the feedback and analysis of the Consultation 2 responses, ASX is now proposing to introduce:

- Automated Order Download Service (ODS)
- Automated Trade Download Service (TDS)
- 'Cancel Only' Session State

ASX will now move to the planning and development stage for an ASX Trade service release with our vendor. This service release will contain the ODS, TDS and other minor fixes.

ASX will confirm the test approach with Participants following the completion of Consultation 3. Conditional on development progress and testing outcomes, the ODS, TDS and Cancel Only session state is anticipated to be made available in the CDE+ environment for participant testing in the second half 2023.

Subsequent to successful completion of ASX internal testing and Participant testing in CDE+, an ASX Trade service release to production will follow.

ASX plan to install the ASX Trade service release in readiness for an Industry Wide Test (IWT) of the new functionality, before making the new services available. ASX will liaise with customers in regards to their readiness for the new functionality after the IWT. ASX will ensure that all Customers are provided with sufficient notice prior to enabling the proposed ODS, TDS and Cancel Only sessions state.

Annexure A – Glossary

ADJUST	The ASX Trade ADJUST session state as described in ASX Operating Rules
ASIC	The Australian Securities and Investments Commission
ASIC’s expectations	ASIC’s expectations of Market operators as set out in REP 708
ASX	ASX Limited
ASX market	The markets in ASX-listed products offered by ASX as a licensed Market operator
ASX participant	An entity authorised to interact transactionally with, and receive private data from, ASX Trade
ASX subscriber	An entity authorised to receive market data from ASX Trade
ASX Trade	The trading platform through which ASX operates the ASX market
Corporations Act	Corporations Act 2001 (Cth)
ENQUIRE	The ASX Trade ENQUIRE session state as described in the ASX Operating Rules
FOT	“Fair, orderly and transparent” as required of Market operators by the Corporations Act
FOT review	A review of trades undertaken in the context of ASX’s obligation to operate a FOT market
ITCH	A protocol used by ASX Trade to publish market data
Market data	Data broadcast by ASX Trade to ASX subscribers that includes public non-confidential data about orders and trades
Market operator	As defined in the MIRs
MIRs	ASIC Market Integrity Rules (Securities Markets) 2017
November 2020 incident	The market outage and other operational incidents that affected the ASX market in the week of 16 November 2020
OMNet	A protocol used by ASX Participants to interact with ASX Trade and by ASX Trade to publish market data and private data
other market	A market in ASX-listed securities operated by a Market operator other than ASX
OUCH	A protocol used by ASX Participants to interact with ASX Trade and by ASX Trade to publish private data
private data	Data published by ASX Trade directly to ASX Participants to whom the data relates that contains confidential data about orders and trades
REP 708	Report 708, entitled “ASIC’s expectation for industry in responding to a market outage” published by ASIC on 24 November 2021
September 2016 incident	The market outage and other operational incidents that affected the ASX market on 19 September 2016
systematic messaging	Private data and market data variously distributed via OUCH, ITCH and OMNet
the market	The totality of all markets in ASX-listed securities operated by all Market operators

Annexure B – ASIC REP 708 | Summary of expectations for Market operators

E1: Monitoring market data issues

- Market operators should develop automated systems and processes to proactively monitor for market data issues within their trading systems and identify trading anomalies in real time.

E2 (i): Session state procedures

- Market operators need to refine their procedures for session states during market outages. This includes clear thresholds for moving to a session state that accommodates participant interaction, check points at which this will be re-assessed throughout the day, staff responsible for providing advice and decision making, and consideration of participants' order management requirements to continue trading on alternative trading venues.

E2 (ii): Alternatives to Enquire

- ASX should explore alternatives to the Enquire session state for mitigating risks to its trading system and market data from order amendments during market outages, and assess options that allow participants to manage their orders. This may involve purging some (i.e. good-for-day) or all orders submitted on the day after a specified checkpoint time, or developing additional session states, and will require further consultation with participants.

E3: Procedures for confirming trade and order status

- Market operators need to refine their policies and processes for providing participants with trade confirmations and order status. This includes the development of playbooks with a hierarchy of alternative systems and data formats for providing information to participants so they can continue trading on alternative trading venues in an informed manner. Further consultation with participants on technical requirements is likely to be required.
- Market operators must inform all participants of alternative arrangements in place to provide trade confirmations during operational incidents where they are not reliably available via the usual channels. Market operators need to ensure that this information is promptly available, accessible and accurate.

E4: Communication protocols

- Market operators need to review their communication protocol for market outages and consult with participants on the types of additional updates and standardised information that could help with providing greater certainty, including nature of issues, order status, order management and the process for reconciling trade positions.
- Market operators must develop and agree on communications protocols for incidents or major events (including outages) that may affect other market operators that rely on and interact with common market infrastructure. Depending on the nature of a market outage, coordination between market operators may be critical for re-establishing an orderly market.

E5: Market re-opening protocols and alternatives

- Market operators must develop a formal protocol with intraday checkpoints during an outage day and a final cut-off time after which the market would not be re-opened. This includes threshold issues that would enable the market to be re-opened, minimum required trading session length to support orderly trading, and notification time for participants to prepare for resumption of trading.
- Market operators should consider the feasibility of alternative approaches that may assist with restoring trading more quickly, such as an intraday reboot of key trading systems or purging some or all existing orders. This may require further consultation with participants to understand the risks and benefits of this approach.

E6: Functionality controls, playbooks & monitoring

- Market operators need to document the circumstances under which particular order types or market components will be disabled, as well as the notice period before these changes are made. This includes procedures for changes before market open as well as intraday.
- Market operators should develop robust arrangements for order monitoring and management, where order types that cannot be disabled create the risk of significant operational issues or market integrity concerns, to complement our expectations for market monitoring outlined in Expectation E1.

E7: Test approach

- Market operators need to have a comprehensive test strategy that includes a wide coverage of the system (functional, non-functional and operational aspects) and data.
- Regression testing should be conducted across the entire suite of test scenarios to demonstrate that any changes will not introduce defects.
- Market operators should conduct simulation testing with participants and other market operators to simulate scenarios with their usual order book activities ahead of major equity market system changes.

E8: BCP testing

- Market operators should facilitate testing of simulated market outage events during their business continuity plan testing that enable participants to develop test cases to participate in these scenarios.
- Recovery strategies or alternative arrangements for identified critical dependencies should be exercised (or, where appropriate, tested) as part of or in addition to standard business continuity plan exercises and tests.