



Response to Consultation Paper 1 on ASX Market Management

Feedback Summary

19 October 2022

Contacts

For general enquiries, please contact:

Rob Nash

T +61 2 9227 0032
E rob.nash@asx.com.au

Ben Jackson

T +61 2 9227 0897
E ben.jackson@asx.com.au

For media enquiries, please contact:

Matthew Gibbs

T +61 2 9227 0218
E matthew.gibbs@asx.com.au

Contents

1. Introduction	3
1.1 Background.....	3
1.2 Stakeholder engagement	3
1.3 Consultation feedback.....	3
1.4 Summary of consultation responses	4
1.5 This consultation response.....	7
2. Certainty about trade and order status	8
2.1 Background.....	8
2.2 Matching engine impacts	8
2.3 Market data and private data impacts	9
3. The application of session states	9
3.1 Background.....	9
3.2 ENQUIRE	10
3.3 Use of Cancel on Disconnect in ENQUIRE.....	10
3.4 Use of ENQUIRE in the Equity Options market.....	12
3.5 Considerations for the use of ADJUST	12
3.6 Incident management: unfreezing the ASX market.....	13
4. Intraday cut-offs and checkpoint times	14
4.1 Background.....	14
4.2 Market Closure Assessment	15
4.3 Cut-off time for the assessment on resuming the ASX market ...	15
4.4 Resumption process of the ASX market	16
4.5 ASX Closing Auction (CSPA)	17
5. Incident communications	17
5.1 Background.....	17
5.2 ASX System Status Page.....	18
5.3 Content of communication updates.....	18
5.4 Frequency of the System Status Page updates.....	19
6. Dependencies	20
6.1 Background.....	20
6.2 ASX Participants and ASX subscribers.....	20
Annexure A – Glossary	22
Annexure B – ASIC REP 708 Summary of expectations for Market Operators	24

1. Introduction

1.1 Background

ASX issued a consultation paper, 'Market Management Consultation'¹ (**the Consultation**) on 28 June 2022.

The Consultation was the first 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.

The Consultation sought feedback on the following topics:

1. certainty about trade and order status
2. the application of session states (e.g. Enquire and Adjust)
3. intraday checkpoints and a final cut-off time
4. incident communications with the Market during disruptions
5. dependencies

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

1.2 Stakeholder engagement

ASX undertook a broad program of stakeholder engagement in relation to the Consultation. This included 41 meetings with 191 people consisting of direct participants and associated engagement with a range of industry stakeholders.

This stakeholder engagement was extremely beneficial, resulting in greater awareness and understanding of ASX's existing incident management procedures. This alone will significantly improve customer resilience and the robustness of the markets we operate. Stakeholder engagement included:

- ASX Participants
- industry bodies
- vendors
- another market operator³
- wholesale investors

1.3 Consultation feedback

ASX received 19 written responses from a broad range of stakeholders including Participants (11), industry bodies (3), vendors (2), wholesale investor (1), share registry (1) 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 AFMA⁴, SIAA⁵ and FAIT⁶ 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/market-management-consultation-28062022.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 Cboe Australia is the only relevant Market Operator as it is the only other Market Operator that trades ASX-listed securities.

⁴ [The Australian Financial Markets Association](#)

⁵ [Stockbrokers and Investment Advisers Association](#)

⁶ [Forum for Australian Institutional Traders](#)

1.4 Summary of consultation responses

A summary of the themes resulting from the Consultation:

CERTAINTY ABOUT TRADE & ORDER STATUS (ASIC'S EXPECTATION 3)	ASX ACTION/RESPONSE
<p>Trade and order confirmation services</p> <ul style="list-style-type: none"> • Greater awareness was achieved on the current services ASX offers to confirm trade and order status, with positive feedback received. • Some stakeholders confirmed that they can act on these existing confirmations. • Others currently rely on the systematic messaging from ASX Trade. • Some highlighted challenges with the current service citing development / testing required. 	<p>ASX will continue to offer the current services available to Participants to obtain trade and order confirmations.</p> <p>ASX will consult on a proposed new automated service that is less likely to be impacted in certain incident scenarios and that will provide a definitive list of orders and trades in ASX Trade which are promptly available, accessible and accurate.</p>
MARKET SESSION STATES (ASIC'S EXPECTATION 2)	ASX ACTION/RESPONSE
<p>Freezing the market</p> <ul style="list-style-type: none"> • Respondents universally agreed that freezing the ASX market is the appropriate course of action if there is a chance of corrupt market data. • ENQUIRE session state was seen as the appropriate session state in the immediate term. • Some mentioned a temporary freeze – then potentially something less restrictive like a 'cancel only' session state. 	<p>ASX will continue to move the ASX Trade markets into an ENQUIRE session state to freeze the market when an issue has been identified that impacts ASX Trade and/or the data disseminated. This is intended to:</p> <ul style="list-style-type: none"> - Prevent dissemination of potentially incomplete or inaccurate data. - Prevent further issues from manifesting. - Provide a static environment for initial root cause analysis. - Ensure ASX maintains its obligation to provide a fair, orderly and transparent (FOT) market. <p>ASX will consult on a proposed new 'Cancel Only' session state, that would allow ASX Participants to cancel orders and receive a systematic response.</p>
<p>Cancel on Disconnect (removal from ENQUIRE)</p> <ul style="list-style-type: none"> • Feedback was that the ASX proposal to remove Cancel on Disconnect in ENQUIRE is now better understood. 	<p>ASX will not offer Cancel on Disconnect in ENQUIRE session state.</p>

MARKET SESSION STATES (ASIC'S EXPECTATION 2)	ASX ACTION/RESPONSE
<ul style="list-style-type: none"> • Many respondents are now comfortable with removal of Cancel on Disconnect from the ENQUIRE session state. • Others do not support this action. 	<p>ASX will proceed with this change at a future date and will provide at least three months advance notice before it is implemented in production. The timing of the removal of Cancel on Disconnect from the ENQUIRE session state will be advised and be dependent on feedback received on the proposed 'Cancel Only' session state in Consultation Paper two (CP2).</p>
<p>The use of ENQUIRE in the equity options market</p> <ul style="list-style-type: none"> • Majority were neutral over the renaming of the session state used in Equity Option market. • Some recognised the clarity just using ENQUIRE for incidents would bring. 	<p>ASX will proceed with this change, in order to ensure ENQUIRE is only used in exceptional circumstances. This current sole use of ENQUIRE in normal operations in the Equity Option market will cease and a new session 'ADJUST_OPTIONS' will be used for equity options between 17:00 and 18:50.</p> <p>This change will be made at a future date and ASX will provide at least three months advance notice before it is implemented in production.</p>
<p>Unfreezing the Market (ADJUST)</p> <ul style="list-style-type: none"> • The overwhelming majority of respondents were not in favour of moving to ADJUST if there is potential to cause corrupt market data. • There was widespread recognition that if there is a risk that market data and private data are unreliable then the risk (of moving to ADJUST) does not outweigh the potential benefits. • Respondents generally considered the assessments used to test if the market could be moved to ADJUST were 'reasonable', 'appropriate' and/or 'sufficient'. 	<p>ASX will not move to ADJUST where there is no certainty that ASX market data and private data are or will be correct.</p> <p>ASX will continue to apply the assessment when considering if it is appropriate to unfreeze the ASX markets by moving to ADJUST.</p> <p>ASX's second consultation will discuss a potential new session state that would, in some incident scenarios, provide an alternative to ENQUIRE and support the cancellation of orders.</p>

INTRADAY CHECKPOINT AND CUT-OFF TIME (ASIC'S EXPECTATION 5)	ASX ACTION/RESPONSE
<p>Market Closure Assessment</p> <ul style="list-style-type: none"> • Positive feedback was received on the proposed new framework. • Feedback ranged from 12:00 to a 15:00 for the final cut-off time. • A 13:30 final cut-off was the most predominant response (mean, median and mode). • 45 minute assessments were seen as appropriate. 	<p>ASX's market closure assessment is now incorporated into incident management procedures.</p> <p>A market closure assessment will be made every 45 minutes with a final cut-off time at 13:30.</p> <p>ASX will always make a decision on whether the market cannot be reopened on the day 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.</p>
<p>Resuming the Market</p> <ul style="list-style-type: none"> • Most were supportive of 40 minutes (as a minimum) prior to resuming trading. • Many noted it would take additional time to redirect flow. • This ranged from a few minutes to 60 minutes, reflecting the differences in Participants technical capabilities. 	<p>A minimum of 40 minutes notice will be given to the market prior to resuming trading, which in most circumstances will include 20 minutes notification prior to Pre-Open and 20 minutes of Pre-Open.</p>
<p>Closing auction</p> <ul style="list-style-type: none"> • Majority highlighted significance of Closing Single Price Auction (CSPA). • Sentiment not to change timing. 	<p>ASX will not move the time of the ASX closing auction (CSPA) session state during the management of the market.</p> <p>There may be circumstance where the CSPA will not be run and the alternate closing price process will be conducted.</p>

INCIDENT COMMUNICATIONS (ASIC'S EXPECTATION 4)	ASX ACTION/RESPONSE
ASX System Status Page <ul style="list-style-type: none"> Some good feedback received from respondents including suggestions for technical enhancements. 	ASX will continue to use the ASX System Status Page as its primary method of communicating information during incidents and market disruptions or outages.
Frequency of Updates <ul style="list-style-type: none"> Majority agreed 30 minute updates are appropriate. 	ASX will provide 30 minute updates with additional updates if there is new information.
Content of Communications <ul style="list-style-type: none"> Some feedback stated that there was not enough information being provided in each update and that updates were repetitive. Positive feedback received on ASX's proposed use of pre-approved communication templates with prescribed content in each 30 minute update. 	ASX will provide information relating to the current state of the ASX markets and ASX Trade in every update. Where possible, and as it becomes available, information on trade confirmations, order status, expectation for resolution time, results of FOT reviews and market closure assessments will also be provided.

1.5 This consultation response

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

- Section 2: Certainty about trade and order status
- Section 3: The applications of session states
- Section 4: Intraday cut-offs and checkpoint times
- Section 5: Incident communications
- Section 6: Dependencies

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 change to process or policy consequent to the feedback received.

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

2. Certainty about trade and order status

2.1 Background

During an incident, ASX seeks to determine at the earliest possible opportunity the status of all ASX market data and private data published between the start of the incident and the time the ASX market was frozen. In particular, ASX seeks to confirm the status of executed trades and current orders.

Feedback was sought on the current policies and processes ASX use to provide information to Participants on the status of their trades and orders. It covers aspects of ASIC's Expectation 3. ASX currently provides a service through which ASX Participants are able to request information about trades and orders during an incident. This is achieved by contacting ASX Trading Operations who have the ability to manually extract this information on request. The tooling used to support this service is reliant on OMNet and may therefore be impacted in certain incident scenarios⁷.

ASX considered that during an outage or disruption to the trading platform, Participants' prime concern was certainty as to what trades had been executed prior to an outage event, and if those transactions would stand. In regards to order confirmations, Participants want to confirm the status of their orders remaining with the ASX and if new orders can be submitted or current orders can be amended or cancelled.

2.2 Matching engine impacts

CP1 Question: If circumstances arise such that all orders in ASX Trade are lost, to what extent are you able to act on a formal notification from ASX (e.g. an ASX Notice or an update to the ASX SSP) that all orders have been cancelled without systematic messaging through the normal channels?

Please detail any technical, operational or compliance challenges you might experience?

Respondents expressed a clear preference for systematic messaging wherever possible but recognised that this may not always be achievable.

A significant number of individual respondents confirmed they are capable of acting on a formal notification from ASX to 'cancel back' orders in their own systems (independently of systematic messaging from ASX Trade), effectively breaking any link with the order present in ASX Trade. In some cases, this is an existing automated capability; in others, it is procedural and may require further development.

A small number of respondents expressed a preference to rely on Cancel on Disconnect (CoD) functionality. As noted in the Consultation, ASX restates that, in an incident scenario, CoD may not be reliable and/or may not be available. ASX accordingly cautions against this approach.

ASX concludes that, in the circumstances where all orders in ASX Trade are lost, there is a reasonably broad general capability for ASX Participants to assume control of such orders in their system which may allow such orders to be directed to alternative trading venues, thus ensuring the operation of a FOT market.

⁷ The current services were partially impacted by the September 2016 incident and the November 2020 incident.

2.3 Market data and private data impacts

CP1 Question: What views do you have on the benefits and risks of ASX unfreezing the ASX market where doing so would result in the publication of erroneous ASX market data and/or private data?

If you see benefits, how will you accommodate the uncertainty that unfreezing the ASX market in such circumstances would create?

Respondents saw no benefit in unfreezing the market where there was uncertainty over data quality – a number of respondents stated explicitly that unfreezing should only take place where there is certainty over data quality. However, respondents also restated their clear desire for stakeholders to be able to cancel orders in ASX Trade during an incident.

Recognising these two positions; certainty over data and the ability to cancel orders – may not be reconcilable, a number of respondents suggested ASX explore new capabilities to cancel orders during incidents. This will form part of ASX's second consultation.

ASX Response:

ASX will continue to offer the current services available to participants to obtain trade and order confirmations.

ASX will consult on a proposed new automated service that is less likely to be impacted in certain incident scenarios and that will provide a definitive list of orders and trades in ASX Trade.

3. The application of session states

3.1 Background

Feedback was sought on ASX's approach to the management of incidents impacting ASX Trade and the ASX market. In particular, consideration was given to a comprehensive freeze of ASX Trade and detail provided as to how this is affected using the ENQUIRE session state. In addition, the assessment of whether or not to permit ASX Participants' interaction with ASX Trade by using the ADJUST session state and the considerations which impact that assessment. This section covers aspects of ASIC's Expectation 2.

ASX considers it best practice that when an issue has been identified that is assessed to result in uncertainty on the status of ASX Trade and/or the data disseminated by ASX Trade, an immediate and comprehensive 'freeze' of ASX Trade should be implemented. This freeze should and will impact the entire ASX market⁸.

This freeze is intended to:

- prevent dissemination of potentially incomplete or inaccurate data⁹;
- prevent further issues from manifesting¹⁰;
- provide a static environment¹¹ for initial root cause analysis; and
- ensure that ASX complies with its obligation to operate a FOT market.

⁸ This includes both the execution of trades by ASX Trade and the reporting of trades to ASX Trade.

⁹ ASX is obliged under s792A(a) of the Corporations Act to operate a FOT market.

¹⁰ In the November 2020 incident, at the time ASX Trade was placed in ENQUIRE, an issue had occurred in matching engine 3 and all the pre-conditions for a similar incident existed in matching engines 1 and 4 (but not in matching engine 2). Placing ASX Trade in ENQUIRE prevented the occurrence of the same issue in matching engines 1 and 4 (likely within a short period given the pre-conditions were already in place) and likely prevented the same issue in matching engine 2 (in due course).

¹¹ A dynamic data environment adds additional complexity to root cause analysis.

CP1 Question: What views do you have about ASX freezing ASX Trade in circumstances where an issue has been assessed to result in uncertainty on the status of ASX Trade and/or the data disseminated by ASX Trade? Please provide reasons why you believe this is or isn't the correct course of action? What are some of the challenges a freeze presents?

Respondents universally agreed that freezing the ASX market is the appropriate course of action.

There were limited comments on the challenges a freeze presents. A small number of respondents suggested that a freeze may hamper the 'move' of an order to an alternative trading venue – both in respect of the mechanics and the uncertainty over positions.

One correspondent noted that this uncertainty may make meeting ASIC's expectations for market participants set out in REP708 (ASIC's expectations of market participants) 'more difficult'.

3.2 ENQUIRE

CP1 Question: What benefits and risks do you think arise when using ENQUIRE as the initial session state during an incident? If not ENQUIRE, what alternative session state would you propose and why?

All respondents that offered a view agreed that ENQUIRE is the appropriate initial session state during an incident. A number of respondents expressed appreciation for ASX's discussion of the reasoning behind this approach and noted that this was helpful in reaching this view.

No respondent suggested an alternative was necessary and, correspondingly, none was proposed.

Some respondents expressed concern that the potential duration of any period of ENQUIRE might present challenges for ASX Participants in meeting ASIC's expectations of market participants¹².

3.3 Use of Cancel on Disconnect in ENQUIRE

ASX Trade offers optional CoD functionality¹³. When enabled, if a CoD event¹⁴ occurs¹⁴ for a given user of a given ASX Participant, relevant orders¹⁵ for that user will be automatically inactivated by ASX Trade in accordance with the user's pre-configured settings.

Currently, CoD functionality is enabled in ENQUIRE. Participants that have users that are configured for CoD are therefore able to trigger cancellation of those users' relevant orders by creating a CoD event¹⁶. There is no other means for Participants to cancel orders when ASX Trade is in ENQUIRE.

When ASX Trade is experiencing an issue, data created and published in response to order cancellations, whether Participant initiated or automatically through CoD, may be incomplete or inaccurate and the cancellations may lead to the manifestation of further issues.

¹² Expectation E10 (of Market Participants) in REP 708 states: "Configuration changes should be made swiftly and safely through the participant's usual system change governance process..."

¹³ More accurately, 'inactivate on disconnect' functionality which is described in detail in the ASX Trade Introduction and Business Information:

<https://www.asxonline.com/content/dam/asxonline/public/documents/asx-trade-refresh-manuals/asx-trade-introduction-and-business-information.pdf#page=109>

¹⁴ Per the pre-configured settings for that user, either a timeout after three missed heartbeats (which does not include a logout) or a disconnection (which does include a logout).

¹⁵ Per the pre-configured settings for that user, either orders valid for that day only or all orders.

¹⁶ In the November 2020 incident, a few ASX Participants triggered a CoD event.

Consequently, whilst CoD offers a means for Participants to cancel orders during an incident, it is ASX's view that the availability of CoD during ENQUIRE can result in:

- the dissemination of potentially incomplete or inaccurate data¹⁷
- the manifestation of further issues¹⁸

ASX considers that the availability of CoD functionality in ENQUIRE is not consistent with the comprehensive freeze that the use of ENQUIRE is intended to create. In order to ensure ENQUIRE effects a comprehensive freeze on all ASX Participant-initiated activity, ASX proposes that CoD functionality should NOT be available in ENQUIRE¹⁹.

With this proposed change in place, ENQUIRE effects a comprehensive pause on ASX Participant-initiated activity. Use of CoD functionality in all other session states is unaffected by this proposal.

CP1 Question: What benefits and risks arise if ASX discontinues the availability of cancel on disconnect functionality in ENQUIRE? If cancel on disconnect was to remain, how will you accommodate the potential unreliability of the data that the cancel on disconnect could create?

Respondents were mixed on the availability of CoD in ENQUIRE.

Respondents that do not make use of CoD were, perhaps unsurprisingly, neutral to the proposed change.

Some respondents that use CoD were generally concerned at the proposal given their assumed confidence in the functionality. Most of these respondents made no comment on the potential unreliability that might result in an incident scenario or on how this would be accommodated. The nature of CoD will be discussed further in the second consultation.

A small number of respondents who were in favour of retaining CoD in ENQUIRE acknowledged that if it were to result in unreliable data, it would be preferable that it was not available – further noting that it should be restored as soon as safe to do so.

ASX Response:

ASX will not offer Cancel on Disconnect in ENQUIRE.

The timing of the removal of Cancel on Disconnect from the ENQUIRE SESSION state²⁰ will be advised and be dependent with feedback received on the proposed 'Cancel Only' session state in consultation paper 2.

ASX reiterates that CoD remains available in all other session states.

ASX Participants should also be aware that triggering Cancel on Disconnect after an incident has commenced and before ASX has moved the ASX market to ENQUIRE may – depending on the nature of the incident – also result in unreliable outcomes. Further, given the nature of incidents, it may not be clear in real time that an incident is underway.

ASX Response:

¹⁷ In the November 2020 incident, data published consequent to the CoD events in relation to instruments in matching engine 3 was potentially incomplete and inaccurate.

¹⁸ In the November 2020 incident, at the time ASX Trade was placed in ENQUIRE there were no issues present in matching engines 1, 2 and 4. Given the nature of the issue experienced in matching engine 3, cancellations triggered by a CoD event could have resulted in the same issue manifesting in matching engines 1, 2 and 4. In this case, perhaps given only a few ASX Participants triggered a CoD event, that did not occur. More widespread triggering of CoD events would have significantly increased the likelihood of the same issue manifesting in the previously unaffected matching engines.

¹⁹ CoD configuration is loaded at the start of each business day and cannot be disabled in real-time.

²⁰ any changes to rules and procedures will be subject to regulatory clearance.

ASX will provide information about behaviour of Cancel on Disconnect during an incident on the System Status Page.

3.4 Use of ENQUIRE in the Equity Options market

CP1 Question: What benefits and risks arise by removing ENQUIRE from the closing sequence of the Equity Option Market?. Does this change, to restrict the ENQUIRE session state to incident management only, create any operational concerns? How does replacing the ENQUIRE Session State with a new session state 'ADJUST OPTIONS' for the closing sequence of the Equity Options Market impact your systems/operations?

The majority of respondents who replied to this question were neutral as to the proposed change to the renaming of the ENQUIRE session state use in the equity option market. There was some support for the clarity over the use of ENQUIRE that the proposed change would provide.

No risks or issues with the proposed change were raised on the basis that this was, in substance, a change of name and that there would be sufficient notice of the change.

A small number of respondents are not active in the Equity Options Market and offered no comment.

ASX Response:

ASX will proceed with this change, in order to ensure ENQUIRE is only used in exceptional circumstances²¹.

This current sole use of ENQUIRE, in normal operations in the Exchange Traded Options market, will cease and a new session state.

'ADJUST_OPTIONS' will be used for equity options between 17:00 and 18:50.

This change will be made at a future date and ASX will provide at least three months advance notice before it is implemented in production.

3.5 Considerations for the use of ADJUST

The ADJUST session state permits ASX Participants to cancel and amend (but not add or improve) orders.

The consultation explained that if, during an incident, there are issues in any of the processes in the path of the inbound and outbound message flows relating to a cancellation or an amendment, the act of processing a cancellation or amendment may result in a recurrence of an issue, or the manifestation of a new issue.

Furthermore, for an ASX Participant's cancellation or amendment to be both effective and confirmed back to the ASX Participant, the matching engine processes and the relevant private data processes must be working correctly. If either the matching engine process or the private data process is not working correctly, then the cancellation may not be effective and/or may not be confirmed back to the ASX Participant.

This means that in some situations, unfreezing the market, and allowing cancellations or amendment of orders to occur may result in corrupt market data. The cancellation or amendment functionality may not be working correctly and order or trade data may be incomplete, inaccurate or duplicated.

CP1 Question: What are the benefits and risks of moving to ADJUST (or any other session state) that permits cancellation or amendment, when there is no certainty that ASX market data and private data are correct?

²¹ any changes to rules and procedures will be subject to regulatory clearance.

The overwhelming majority of respondents were not in favour of moving to ADJUST (or any other session state that permits cancellation or amendment) when there is no certainty that ASX market data and private data is correct.

Respondents recognised the primary benefits of moving to ADJUST as the ability to manage orders. However, there was widespread recognition that this comes at a risk if the market data and private data are unreliable. The consensus was that the risk does not outweigh the potential benefit. This consensus was perhaps best summarised by one respondent: ‘ADJUST is fine if our order data is correct’.

One respondent suggested it would be possible to ignore potentially incorrect market data in ADJUST, but made no comment on private data.

ASX considers that moving to ADJUST without absolute confidence that matching engine functionality, market data and private data are working correctly is most likely to exacerbate any issue.

ASX understands the desire for ASX Participants to be able manage their orders in ASX Trade in the normal manner during incidents. However, ASX suggests that a requested cancellation or amendment which may not be effective and/or may not be confirmed is likely to be of limited value to the submitting ASX Participant and is likely to lead to increased reconciliation differences.

ASX therefore proposes that it is inappropriate to move to ADJUST, or any other session state that permits cancellation or amendment, where doing so would result in the publication of incomplete or inaccurate data²² and/or may lead to the occurrence of an issue that would result in the publication of incomplete and inaccurate data²³.

ASX’s second consultation will discuss a potential new session state that would, in some incident scenarios, provide an alternative to ENQUIRE and support the cancellation of orders.

ASX Response:

ASX will not move to ADJUST where there is no certainty that ASX market data and private data are correct.

3.6 Incident management: unfreezing the ASX market

The Consultation explained that as a matter of procedure, ASX seeks to unfreeze the ASX market and proceed towards resumption of trading as soon as it is assessed to be appropriate²⁴ to do so.

In considering when it is appropriate to unfreeze the ASX market, ASX considers the status of ASX Trade, the status of private data and the status of market data.

It was explained that during an outage or disruption, ASX considers that a positive assessment of all these tests is sufficient to indicate that ASX Trade can move out of ENQUIRE into a session state that permits ASX Participant-initiated activity. However, if there is a negative assessment of any one of the tests then ASX Trade should remain in a freeze.

CP1 Question: Do you consider the tests above are appropriate and sufficient to determine if ASX can unfreeze the ASX market? If not, what additional tests should be considered?

Respondents generally considered the tests ‘reasonable’, ‘appropriate’ and/or ‘sufficient’.

²² This was the circumstance in relation to matching engine 3 during the November 2020 incident.

²³ This was the circumstance in relation to matching engines 1, 2 and 4 during the November 2020 incident. All necessary pre-conditions for a recurrence of the issue observed in matching engine 3 were present in matching engines 1 and 4 at the time ASX Trade was moved to ENQUIRE.

²⁴ In the context of ASX’s obligations to operate an FOT market.

A small number of respondents suggested potential further tests with a common theme - on resumption it should be 'business as usual'; all 'critical components are stable and feeding satisfactorily'; and 'systems and connectivity are fully operational'.

One respondent observed that the tests are reasonable for a move to, for example, ADJUST but noted that the tests might be too conservative for a new session state that permits cancellation only.

ASX Response:

ASX will continue to apply the tests when considering if it is appropriate to unfreeze the ASX markets by moving to ADJUST (or any other session state that allows cancellation and amendment of orders).

ASX proposes no new tests but notes the additional suggestions which are, in practice, implicit in any decision to move to ADJUST. Such a decision will only occur when it would – time permitting – be possible to resume the ASX markets. However, resumption may be prevented by the backstop time.

ASX agrees with the view that these tests may be too conservative for a new session state that permits cancellation only. This will be discussed in ASX's second consultation.

ASX's second consultation will also present an overview of incident playbooks.

4. Intraday cut-offs and checkpoint times

4.1 Background

Throughout an incident, ASX periodically assesses the feasibility of resuming the ASX market. Subsequent to the November 2020 incident, ASX introduced a process to undertake this assessment every 45 minutes throughout an outage or disruption. This assessment is to be continually taken up to and including a predetermined cut-off time and considers whether or not an intraday recovery is possible. It considers if the issue has been diagnosed, if a recovery path has been confirmed and if that recovery path can be completed by the defined cut-off time. It covers ASIC's Expectation 5.

ASX has previously published details of its standard resumption process including session states²⁵. A minimum of 40 minutes elapsed time is required for this sequence, usually consisting of 20 minute notice of pending PRE-OPEN followed by 20 minutes in PRE-OPEN. After the PRE-OPEN concludes an auction occurs and OPEN trading commences.

²⁵ <https://www2.asx.com.au/content/dam/asx/about/regulations/asx-market-management-response-to-consultation-paper-on-the-management-of-the-asx-market.pdf>

4.2 Market Closure Assessment

ASX proposed that the market closure assessment would be taken every 45 minutes throughout an outage or disruption.

CP1 Question: Do you consider 45 minutes to be an appropriate period between each assessment of the feasibility of resuming the ASX market? If not, what period do you consider appropriate and why?

The majority of respondents that expressed a view that supported the proposed period of 45 minutes between assessments.

A minority of respondents suggested 30 minutes would be more appropriate with some noting that this would mirror the schedule for communication updates on the ASX System Status page.

ASX Response:

ASX will continue to 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.

ASX notes that the outcomes of these assessments will be published when available which may be out of the regular cycle of updates to the SSP.

4.3 Cut-off time for the assessment on resuming the ASX market

ASX sought feedback on a suitable cut-off time that would be incorporated into the market closure assessment.

CP1 Question: Taking into consideration the resumption session state sequence what would you consider an appropriate backstop time for the final determination of the resumption of the ASX market and why?

Perhaps unsurprisingly, this question regarding a suggested cut-off time received the broadest range of feedback.

The industry group respondents confirmed that they had also received a wide range of views on the appropriate backstop timing. Some did not specify a time but rather provided general principles such as ensuring certainty in the market of order and trade confirmations. Another view offered considered 1.00pm, being halfway through a normal trading day, as an appropriate backstop time for the final determination of the resumption of the ASX market.

Participant respondents that offered a view ranged from 12:00pm to 3:00pm and included 12:00pm, 12:30pm, 1:30pm, 2:00pm, 2:30pm and 3:00pm. Both the median and modal individual backstop time determined from individual responses was 1:30pm; the mean was 1:33pm.

A small number of respondents suggested their timings are driven by considerations of the activities required to inform clients and redirect order flow.

ASX Response:

ASX confirms that 1:30pm will be the final cut-off time for the market closure assessment.

4.4 Resumption process of the ASX market

ASX has previously considered that a minimum of 40 minutes elapsed time is required prior to resuming the ASX market. Feedback was sought on this in the Consultation.

CP1 Question: Do you consider the current minimum timings for the resumption sequence to be sufficient? If not, what periods do you consider appropriate for notice and for PRE-OPEN and why?

There was clear consensus from individual respondents supporting the current timings of at least 40 minutes. Just one response offered a view for shorter timings suggesting 10 to 15 minutes should be sufficient for market participants.

One industry respondent suggested 40 minutes should be sufficient but that in certain circumstances, 60 minutes would be more appropriate.

Some respondents noted that if action had already been taken to reconfigure systems to an outage configuration (cut over), the 40 minute period would also need to allow roll back of any such configuration changes (roll back) to occur and would not be sufficient. This scenario suggests there may also be a precondition for the start of this resumption sequence. Namely, that either no cut over has commenced or cut over and roll back have been completed. These cut over and roll back activities could impact when the resumption sequence can commence (but not its duration).

ASX considers the observation on roll back raises a very important point. Whilst respondents have agreed that the current timings are appropriate for resumption of the ASX markets from a freeze, this may be based on an implicit assumption that no cut over has occurred in the meantime. This is contingent on the trigger for Participants to cut over. The trigger could be a regulatory expectation, that cut over²⁶ will occur shortly after an incident occurs²⁷ and before ASX has determined through the market closure assessment that the ASX markets will not resume. The regulatory expectations on Market Participants set out in REP 708 may make this a possible valid scenario.

Through ASX's bilateral conversations with ASX Participants²⁸, it seems that there may be a significant range in possible cut over and roll back times – perhaps up to one hour for a cut over and up to one hour for a rollback. Therefore in some cases, participants may require two hours before resumption can begin. Given ASX's commitment to a 1:30pm cut-off or a market closure assessment, this might imply that any incident where a wholesale cut over has commenced may significantly reduce the length of the trading day.

As such, the implications if cut over has commenced need to be considered. Is cut over a 'one way street' until the end of that trading day, or is there appetite for roll back once cut over has commenced?

ASX Response:

ASX will continue to follow the existing timings for the resumption sequence.

A minimum of 40 minutes notice will be given to the market prior to resuming trading.

ASX notes the potential implications on resumption timings depending on actions that Market Participants may take given the expectations set out in REP708.

²⁶ Expectation E10 (of Market Participants) in REP 708 states: "Configuration changes should be made swiftly and safely through the participant's usual system change governance process..."

²⁷ Expectation E12 (of Market Participants) in REP 708 states: "During an outage on a particular market, participants should submit new client orders to an alternative trading venue where available."

²⁸ Whilst there was no formal question in the Consultation on the possible time required for 'cut over' and 'roll back', this was highlighted in a number of ASX's bilateral conversations with ASX Participants.

4.5 ASX Closing Auction (CSPA)

During an incident and subsequent management of the market, ASX needs to consider existing market schedules and any impacts to changing these standard timings. In regard to the ASX closing auction (or CSPA) session state, ASX understands that ASX Participants and other stakeholders have processes that may be contingent on the existing timings. ASX has previously not proposed to change the timing of the closing auction sequence as the result of an incident.

One of the considerations taken when determining the cut-off time for the market closure assessment needs to contemplate the duration of the resumption sequence and the duration of a minimum viable period of open trading before the closing auction sequence commences at 4.00pm.

Following the September 2016 incident, ASX and ASX Clear respectively consulted on the determination of the ASX market closing price and the ASX Clear settlement price – if there was no CSPA. The resultant policy, which will be followed in the event that there is no closing auction on the ASX market, is available on ASX's website²⁹.

CP1 Question: What are the benefits and risks if ASX does NOT change the timing of the closing auction sequence as a result of an incident? What system changes would be required for you, if the closing auction time was extended? What would be the latest time for the closing auction sequence to commence?

The majority of respondents strongly recommended against any change to the ASX closing auction. Respondents with this view noted that a change might add significant risk and would have flow on impacts to other processes and systems.

Respondents servicing retail customers suggested that with a few internal changes, they were able to accommodate a change to the timing of the closing auction. It was suggested that 6:00pm or 7:00pm could be the possible latest time, although these respondents also recommended no change to the closing auction sequence.

One respondent noted there is no hard cut off time for their participation in the closing auction.

Many respondents stressed the criticality of the ASX closing auction.

ASX Response:

As a matter of policy, ASX does not propose to change the timing or the sequence of the closing auction as the result of an incident.

5. Incident communications

5.1 Background

The Consultation considered the communication protocol for outages, including the mechanism for delivering communications to customers, how often updates should be made and what information should be provided. It covers ASIC's Expectation 5.

It was noted that ASX has established processes regarding communications during incidents. The ASX System Status Page (SSP)³⁰ on the ASX website is the mechanism for providing live, public updates during any incidents.

²⁹ <https://www.asxonline.com/content/dam/asxonline/public/notices/2018/apr/asx-closing-and-settlement-price-determination.pdf>

³⁰ <https://www2.asx.com.au/markets/market-resources/system-status>

This is the primary source of information during market outages or disruptions. Any interested party can configure active alerts³¹ for individual ASX systems so that they immediately receive text and/or email alerts when that system status changes or ASX publishes an update.

ASX has technical, operational and business teams that support ASX Participants and ASX subscribers during an incident. These teams provide the same general information as is made available on the SSP. In addition, they are able to assist customers with their specific matters, but do not provide information about the incident or the management of the incident that has not been made available via the SSP.

5.2 ASX System Status Page

General feedback from market stakeholders, not only here in Australia but globally, is that generally improvements to the communications made during market incident can be made by all global exchanges. Criticism has previously been received on the way Exchanges communicate during an outage/disruption, and the lack of content provided.

ASX received favourable feedback on the ASX SSP. There was considerable awareness across all market stakeholders that this is how ASX communicate during market events. Many respondents had subscribed or were aware of the alerting functionality. Some suggested enhancements to the mechanism, which ASX appreciates and they are currently being investigated.

5.3 Content of communication updates

The consultation sought feedback on the content of communications and the suggestion to increase the standard content for inclusion in SSP updates. ASX proposed that pre-approved templates would be utilised. Each update should include information relating to the current state of the ASX market and ASX Trade.

It was also considered that where possible and as it becomes available, information relating to any known impacts to ASX Trade, the status of current orders and executed trades and updates from the market closure assessment and where relevant, the results of any appropriate FOT reviews.

CP1 Question: Do you consider that the proposed scope of content of updates to the SSP is sufficiently comprehensive? If not, what other items of information would you propose are included?

The majority of respondents were satisfied with the proposed content to be included in incident updates. Feedback was that this information would be sufficiently comprehensive and informative.

Some respondents requested the inclusion of further specific information. This included a summary of the nature of the issue, which specific services are impacted (e.g. OMnet, ITCH and OUCH), impacted gateways and the status of clearing and settlements services. ASX had intended that the proposed content would include this specific information, and can confirm that this detail will be included in updates.

ASX recognises that it is important for stakeholders to know that executed trades are being appropriately cleared and will duly be settled. Transactions executed on and reported to ASX Trade are cleared and settled by CHES (CHES) and the Derivative Clearing System (DCS). CHES and DCS have separate system statuses on the SSP and relevant updates will be provided through those channels.

General feedback on the communications made during the ASX market outage on 16 November 2020 was that they were repetitive and too conservative. One industry group considered that the ASX communications did not provide sufficient information and created uncertainty as to when the market would re-open.

³¹ <https://www.asxonline.com/content/dam/asxonline/public/notices/2018/nov/user-guide-subscribe-to-system-status-alerts-v1.0.pdf>

ASX Response:

During an incident, the content of updates to ASX's SSP in relation to ASX Trade will include:

- the current state of the ASX market
- the current state of ASX Trade

and, where possible and as it becomes available, information relating to:

- any known impacts to ASX Trade, including:
 - services impacted
 - users impacted
 - nature of impact
- the status of executed trades – including where relevant, the results of any FOT review
- the status of current orders
- the results of market closure assessments including any negative determination of the feasibility of resuming the ASX market.

Where relevant, ASX will also provide separate updates on the SSP regarding the status of CHES, DCS and Signal B.

5.4 Frequency of the System Status Page updates

ASX currently updates the ASX SPP at a minimum of every 30 minutes. The consultation sought feedback on the appropriate frequency of updates.

CP1 Question: Do you consider half-hourly updates are appropriate? If not, what frequency would you propose?

There was clear consensus that the current frequency is appropriate. In total, 17 respondents offered a view and all agreed that 30 minute updates are appropriate.

Many made the additional point that material updates should be distributed as soon as they are available.

Some suggested that ASX should ensure there is alignment between the market closure assessment and communication updates.

ASX Response:

During an incident, ASX's will provide updates at least every 30 minutes.

ASX reiterates that pertinent new information will be published as soon as possible and will not be held back until the next scheduled update.

6. Dependencies

6.1 Background

An incident impacting ASX Trade directly impacts the ASX market. ASX recognises that the status of ASX Trade and the status of the ASX market can have a direct impact on ASX Participants and may indirectly impact participants and Market Operators of other markets.

The consultation considered the potential dependencies on ASX Trade and the ASX market for ASX Participants. In particular, potential dependencies which may impact their ability to manage orders in their own systems and potential dependencies on other Market Operators.

6.2 ASX Participants and ASX subscribers

ASX Trade provides confirmations of activity undertaken in ASX Trade to ASX Participants in their private data and publishes corresponding market data. An incident which impacts private data will affect the ability of ASX Participants to maintain an accurate view of their orders in ASX Trade. An incident which impacts market data will affect the ability of ASX subscribers to maintain an accurate view of the order books in ASX Trade.

The impact of an incident may, for a period of time, therefore include both uncertainty over data and an inability to systematically manage orders due to an absence of systematic messaging from ASX Trade.

ASX sought to understand the extent to which ASX Participants remain dependent on ASX in such circumstances.

CP1 Question: To what extent are you able to manage orders in your systems where the current state of orders in ASX Trade is uncertain?

There was a divergence of views from the 14 respondents.

Some respondents are able to manage client orders and/or their own orders (in accordance with the nature of the business of the respondent) in their systems independently of messaging from ASX Trade. Other respondents are, to varying degrees, less able to do so.

All respondents noted that there remains a dependency on accurate data about the state of orders in ASX Trade. Those respondents that, at the technical level, are able to [independently] manage orders in their systems will nevertheless at least have difficulty or may find it impossible to resume trading activity whilst order statuses are unresolved.

CP1 Question: To what extent are you able to manage orders in your systems where the state of orders in ASX Trade is certain but there is no systematic messaging from ASX Trade? Do you have procedures for such circumstances?

Once again, respondents' views were mixed on their capabilities.

A minority of respondents are capable of managing orders in their systems in such circumstances, though this is not always well proven.

The majority of respondents that are ASX Participants would not support, do not support or do not have proven manual procedures for such circumstance – in some cases, not least because of the likely volume of orders that would need to be processed.

All respondents that offered a view expressed a very strong preference for systematic messaging.

CP1 Question: To what extent are you able to rely on the certainty that no trades will execute on the ASX market during an incident?

All respondents expected that no trades will occur once the incident is identified and the ASX markets are placed into ENQUIRE. However, the larger concern remains the certainty of trades that have already been executed.

The certainty that no further trades will execute therefore appears to be somewhat of a given and, as such, ASX infers it is not very material to stakeholders abilities to manage orders in their systems.

CP1 Question: To what extent are you able to rely on the certainty that you will be able to cancel or otherwise manage all orders on the ASX market before trading resumes on the ASX market?

Some respondents suggested they are able to make use of and, indeed, rely on the certainty that all existing orders will be able to be managed prior to trading resuming on the ASX market. However, this remains contingent on a preceding successful reconciliation of executed trades and outstanding orders.

The certainty that all orders can be cancelled, or otherwise managed, prior to trading resuming on the ASX, therefore appears to be a given and, as such, ASX infers it is not very material to stakeholders abilities to manage orders in their systems.

CP1 Question: Aside from the points in the preceding questions, what other factors prevent you from managing orders in your systems during an incident on the ASX market?

Respondents generally added no further factors but reiterated the key dependencies are the status of orders remaining in ASX Trade, trades executed in ASX Trade – and the ability to reconcile these, together with the ability to cancel open orders – with corresponding and accurate systematic messaging.

ASX will address each of the above points in the second consultation.

Annexure A – Glossary

ADJUST	The ADJUST session state on ASX Trade as described in the 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
CoD	Cancel on disconnect capability offered by ASX Trade
Corporations Act	Corporations Act 2001 (Cth)
ENQUIRE	The ENQUIRE session state on ASX Trade 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
SSP	The System Status Page on ASX's website
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.