TMX AUSTRALIA EXCHANGE

Resilience Mechanisms & Disaster Recovery Playbook

TMX

CONTENTS

1. INTRODUCTION

1.1. Purpose

This document provides a high-level overview of resilience mechanisms available at the market of TMX Australia Exchange, which is the trading name of TMX Australia Exchange Pty Limited (previously Cboe Australia Pty Ltd) ("TMX") acquired by TMX Group Limited on 1 August 2026. During the technical transition period, TMX continues to operate its market under the Cboe Titanium trading system ("Cboe Titanium") provided by Cboe Global Markets, Inc.

This document outlines the arrangements available to TMX pparticipants ("Participants"), vendors and other stakeholders (together, "customers") under Cboe Titanium and the disaster recovery ("DR") procedures which TMX will follow in the event of a market outage.

This document further describes:

(a) the services and functionality available during normal operation;

(b) the services available in TMX's DR data centre ("DR DC") following a failover from TMX's primary data centre ("Primary DC") to DR DC; and

(c) the outcomes that customers will experience during a DR event.

1.2. Market Operator Obligations

TMX is required to have a policy in place to outline its DR plan to help ensure the TMX market continues to be fair, orderly and transparent at all times, including during a market outage.

In Australia, TMX has implemented Cboe Global Markets, Inc.'s trading system architecture, including Cboe Titanium, which has been designed to provide a high degree of redundancy and resiliency. This architecture has a proven track record of successful resilient operations across multiple jurisdictions.

In addition, TMX has established a DR plan based on best practice for market operators and in accordance with the *ASIC Market Integrity Rules (Securities Markets) 2017* ("MIRs") and the *ASIC Regulatory Guide 172*. The DR plan is designed to ensure the TMX market continues to be resilient as well as fair, orderly and transparent in the event of a disruption, including an Incident or Major Event as defined under the MIRs.

2. BACKGROUND

2.1. Data Centres

Cboe Titanium is based on a high-availability fault-tolerant design deployed across two separate sites.

(a) **Primary DC**: Cboe Titanium operates in Primary DC in the Equinix SY5 data centre, which is located in Mascot, Sydney, during normal operation (i.e., when Cboe Titanium is not experiencing any outage). The resilience mechanisms available to suit each customer's resilience model are explained further in this document.

(b) **DR DC**: DR DC is located in the DigiCo (formerly, Global Switch) data centre, which is located in Ultimo, Sydney. Cboe Titanium will fail over to DR DC in the event that Primary DC becomes unavailable.

2.2. Order Entry Types and Data Feed Types

The table below outlines the types of logins and data feeds available for Cboe Titanium.

Login Type	Description
FIX	Order entry, trading and trade reporting (FIX protocol)
BOE	Order entry and trading (binary protocol – compressed and low latency protocol)
BOE with Dedicated Core	BOE with the Dedicated Core processor to provide BOE functionality with improved latency
Purge Port (FIX)	Port to purge order(s) across the Participant (FIX protocol)
Purge Port (BOE)	Port to purge order(s) across the Participant (binary protocol)
FIX Drop	Trade feed of permissioned private trade information (FIX protocol)
ODROP	Drop copy of permissioned private order and trade information (FIX protocol)
PITCH ▪ **GRP** ▪ **SPIN**	Public market data feed providing **full-depth** data, available via multicast or via cloud (Amazon AWS), with related multicast recovery logins: ▪ GRP: gap recovery to recover missed messages ▪ SPIN: snapshot recovery to recover recent system snapshots of all order books
TOP ▪ **GRP** ▪ **SPIN**	Public market data feed providing **top-of-book** data, available via multicast or via cloud (Amazon AWS), with related multicast recovery logins: ▪ GRP: gap recovery to recover missed messages ▪ SPIN: snapshot recovery to recover recent system snapshots of all order books

For further information, refer to the Cboe Titanium technical specifications available at available at https://www.tmxaustralia.com/equities/support/technical.

2.3. Functionality Available During Normal Operation

The table below outlines the functionality or feed available during normal operation (i.e., when TMX is not experiencing an outage) for each login type across Primary DC and DR DC.

Login Type	Primary DC	DR DC
FIX	Order entry, trading and trade reporting	Login accepted; all other requests are rejected
BOE **BOE with Dedicated Core**	Order entry and trading	Login accepted; all other requests are rejected **Note that BOE with Dedicated Core in Primary DC are replicated as standard BOE in DR DC*
Purge Port (FIX) **Purge Port (BOE)**	Purge order(s) across the Participant	Login accepted; all other requests are rejected
FIX Drop	Trade feed of permissioned private trade information **Available in both primary and secondary instances*	Login accepted **FIX Drop in DR DC is live on any normal operation day and includes the same trade data provided on related primary or secondary FIX Drop in Primary DC*

ODROP	Drop copy of permissioned private trade and order information **Available in both primary and secondary instances*	Login accepted
PITCH ▪ GRP ▪ SPIN	▪ PITCH multicast feeds A and B ▪ Recovery login bundle [1 x GRP and 2 x SPIN] for each feed subscription	▪ PITCH multicast feed E ▪ Recovery login bundle [1 x GRP and 2 x SPIN] for each feed E subscription **PITCH multicast feed E is live on any normal operation day and contains the same market data provided on related feeds A and B*
TOP ▪ GRP ▪ SPIN	▪ TOP multicast feeds A and B ▪ Recovery login bundle [1 x GRP and 2 x SPIN] for each feed subscription	▪ TOP multicast feed E ▪ Recovery login bundle [1 x GRP and 2 x SPIN] for each feed E subscription **TOP multicast feed E is live on any normal operation day and contains the same market data provided on related feeds A and B*

TMX strongly encourages customers to review their port attribute settings regularly to ensure they remain aligned with their resilience requirements and operating models.

Note that customers may log in to all login types available in DR DC to facilitate connectivity testing on any TMX business day.

2.4. Customer Web Portal Functionality

Trade Data and Order Lookup tools are available through the Customer Web Portal during normal operation (i.e., when TMX is not experiencing an outage). For further information, refer to the Customer Web Portal Specification available at https://www.tmxaustralia.com/equities/support/technical.

3. RESILIENCE MECHANISM

3.1. Port and Login Resilience at Primary DC

Cboe Titanium provides a range of resilience mechanisms for individual components within Primary DC, enabling customers to select the arrangements that best align with their resilience requirements and operating models.

The table below summarises the resilience mechanisms available for each login type.

Login Type	Resilience Mechanism within Primary DC
▪ FIX ▪ BOE ▪ BOE with Dedicated Core ▪ Purge Port (FIX) ▪ Purge Port (BOE)	▪ The standby process, which is also housed in Primary DC, can be accessed using the same port connectivity details ▪ The standby process typically becomes available within approximately 10 minutes. Customers should configure their applications to automatically re-attempt login until a connection is successfully established ▪ Each of these login types in Primary DC is charged on a per-login basis and includes access to the standby process failover capability

▪ **FIX Drop** ▪ **ODROP**	▪ FIX Drop and ODROP logins are created on either the primary or secondary infrastructure in Primary DC as requested by the customer ▪ Each primary login and secondary login operates concurrently and are charged separately ▪ Customers may choose a primary login, secondary login, or both, to align with their resilience requirements and operating models ▪ If the primary process for a login type becomes unavailable, the corresponding secondary process persists, and vice versa
PITCH, TOP, and multicast recovery logins: ▪ **GRP** ▪ **SPIN**	▪ PITCH and TOP multicast feeds A and B are available in Primary DC ▪ A recovery bundle of [1 x GRP and 2 x SPIN] is provisioned per feed at the customer's request. ▪ Each feed subscription (including a GRP/SPIN recovery bundle) operates concurrently and is charged separately. ▪ Customers may choose to subscribe to feed A or feed B, or both, to align with their resilience model requirements. ▪ If feed A fails, then feed B persists, and vice-versa.

3.2. Network Resilience

The TMX network architecture incorporates redundant network paths and infrastructure across both Primary DC and DR DC.

3.3. Cancel on Disconnect

TMX offers the Cancel on Disconnect ("CoD") functionality for both BOE and FIX sessions to prevent orders from being stuck in an unknown state in the event of telecommunication failure. When CoD is enabled, all orders associated with the relevant session will be automatically cancelled if no messages have been received from the port for a specified number of heartbeat intervals.

A Participant may select one of the following CoD configuration options at the port level.

(a) **Default setting**: Cancel all open orders (including Market on Close orders)

(b) **No cancellation**: Leave all open orders active

(c) **Day order cancellation only**: Cancel day orders only and leave Good-Till-Cancelled ("GTC") and Good-Till-Date ("GTD") orders active

For further information, refer to the Cboe Titanium technical specifications available at available at https://www.tmxaustralia.com/equities/support/technical.

3.4. Industry Wide BCP Testing

As part of its resilience framework, TMX conducts multi-faceted, industry-wide BCP testing periodically (generally, twice a year). Each BCP testing event alternates between the following simulated failover scenarios:

(a) failover from primary instances to standby instances within Primary DC, as described in Section 3.1; and

(b) failover from Primary DC to DR DC, as described in Section 4.2.

TMX strongly encourages Participants to take part in these BCP testing events. Further details are provided in the relevant Market Operations Notice available at https://www.tmxaustralia.com/equities/notices/market-operation.

4. DISASTER RECOVERY PLAYBOOK

Failover scenarios may arise from a range of events and may have varying operational impacts. As a general principle, TMX will halt trading in impacted products or close the market if it determines that it can no longer ensure that the market is operating in a fair, orderly and transparent manner.

4.1. Market Communications

In the event TMX identifies an issue with Cboe Titanium which requires a notification to customers, TMX will use the System Status page (available at https://www.tmxaustralia.com/equities/notices/system) and Market Operations Notice (available at https://www.tmxaustralia.com/equities/notices/market-operation) as its primary communication channels. The initial notice will contain the information available at the time regarding the identified issue.

TMX will provide an update as information becomes available and will aim to issue an update at least every 30 minutes until the issue is resolved. Where possible, updates will include:

(a) details of the identified technical issues;

(b) the likely severity and impact of those issues;

(c) options available to customers, including failover to DR DC; and

(d) expected timelines, to the extent known at the time.

TMX expects that each Participant subscribes to the notices to stay informed of the TMX updates.

4.2. Order Management

At a high level, TMX market trading statuses can be grouped into two categories:

(a) **Trading state**: The TMX market is operating within its normal trading schedule, including pre-market, auction and pre-open states; and

(b) **Non-trading state**: The TMX market is operating outside its normal trading schedule and only permits order cancellations (e.g., trading halts or suspensions).

In both states, a Participant will have visibility of the status of its orders and executed trades and may cancel existing orders, including through the CoD function if opted in.

Available Functionality	During Trading State	During Non-Trading State
Cancel orders	▪ Cancel orders accepted ▪ CoD available, with the granularity to include or exclude multi-day (GTC/GTD) orders	▪ Cancel orders accepted ▪ CoD available, with the granularity to include or exclude multi-day (GTC/GTD) orders
New/ amend orders	New/ amend orders accepted **Subject to certain rules. For further details, see TMX Operating Rules: Procedures*	New/ amend orders rejected
Order status	Market data and drop copy available	Market data and drop copy available

Note that, in the event TMX experiences an issue affecting Cboe Titanium, some or all market operations, including order cancellation and market data dissemination, may be impacted.

4.3. Failover from Primary DC to DR DC

In the event of a total failure of Primary DC, TMX may fail over to DR DC.

To maintain market integrity and enable Participants to manage the failover process effectively, TMX will perform verification steps and provide information necessary for each Participant to reconcile its executed trades.

4.3.1. *Failover Phases*

If TMX makes a decision to fail over to DR DC, TMX will execute the following phases.

(a) **Primary session disconnection**: TMX will cease normal trading sessions in Primary DC and disconnect logins.

(b) **Failover announcement**: TMX will communicate to the market and provide details of the timelines and sequence. TMX will execute failover steps in a methodical sequence with manual reconciliation measures and will provide periodic updates to the market. See Section 4.1.1 for further details.

(c) **DR logins activation**: At a pre-announced time, TMX will activate DR connectivity for all order-entry login types.

(d) **Order reconciliation**: Via PITCH Feed E and TOP Feed E, TMX will disseminate Unit Clear messages for each matching unit, confirming that all resting orders have been purged (cancelled). TMX will thereby provide customers with confirmation that all outstanding orders have been cancelled. TMX will commence any subsequent trading session with an empty order book.

(e) **Trade reconciliation**: FIX Drop in DR DC is live during normal operation and provides each Participant with its private executed trade data for the trading day up to the point of failover. A Participant may also use the Customer Web Portal as a secondary validation source to confirm its executed trade data to assist with trade reconciliation. A Participant may contact the TMX Trade Desk to verify the status of their executed trades.

(f) **DR trading session timeline announcement**: TMX will announce DR trading session times for the remainder of the trading day.

4.3.2. *Functionality Available After Failover to DR DC*

This section outlines the functionality available following a failover to DR DC for each login type. It also includes information on expected sequence number behaviour.

Login Type	Primary DC	DR DC
FIX	N/A	▪ Order entry, trading and trade reporting Sequence numbers will typically restart at 1 (unless there have been prior rejections)
BOE	N/A	▪ Order entry and trading ▪ Sequence numbers will typically restart at 1 (unless there have been prior rejections) **Note that BOE with Dedicated Core in Primary DC are replicated as standard BOE in DR DC*
BOE with Dedicated Core	N/A	
Purge Port (FIX)	N/A	▪ Purge order(s) across the Participant ▪ Sequence numbers will typically restart at 1 (unless there have been prior rejections)
Purge Port (BOE)	N/A	
FIX Drop	N/A	▪ Trade feed of permissioned private trade information ▪ Sequence numbers will resume from the value reached prior to failover
ODROP	N/A	▪ Drop copy of permissioned private trade and order information ▪ Sequence numbers will typically restart at 1

PITCH ▪ GRP ▪ SPIN	N/A	▪ PITCH multicast feed E ▪ Recovery login bundle [1 x GRP and 2 x SPIN] for each feed E subscription ▪ Sequence numbers will resume from the value reached prior to failover
TOP ▪ GRP ▪ SPIN	N/A	▪ TOP multicast feed E ▪ Recovery login bundle [1 x GRP and 2 x SPIN] for each feed E subscription ▪ Sequence numbers will resume from the value reached prior to failover.

4.4. Trading Halt, Suspension, Closure and Resumption

4.4.1. Trading Halt and Suspension

In the event TMX identifies an issue with Cboe Titanium which impacts its ability to operate a fair, orderly and transparent market, TMX will halt the impacted products or close the market until it is resolved.

As outlined above, each Participant will have visibility of the status of its orders and executed trades and may cancel existing orders, unless functionality is affected by an issue impacting Cboe Titanium.

4.4.2. Market Resumption

If an outage is resolved intraday, TMX will apply objective criteria to decide whether the TMX market should resume before the end of trading hours.

TMX will **not** resume trading intraday if:

(a) the outage has lasted for 60 minutes or more uninterrupted, or TMX reasonably believes/ascertains it will run for at least 60 minutes; **and**

(b) the outage occurs after 2:00 pm, the outage is not resolved by 2:00 pm, or TMX reasonably believes/ascertains it will not be resolved by 2:00 pm.

Notwithstanding the above, TMX may decide to resume the market if TMX reasonably believes it will deliver greater benefits to the Australian market to do so. TMX will communicate its decision to resume or not resume trading through the public notice process described above as soon as practicable.

4.4.3. Market Closure (Done for Day)

When the TMX market closes for the day, whether at the end of the normal trading day or earlier, TMX will purge (cancel) all resting orders on the TMX order book, except for multi-day orders (GTC and GTD).

4.5. Impact of Data Unavailability

4.5.1. Issues Affecting TMX Data Services

In the event that TMX experiences an issue that affects its ability to disseminate data to customers as required under the MIRs (e.g., market data), TMX will fail over to the redundant infrastructure within Primary DC and/or DR DC.

If the failover is unsuccessful, or if the required data is unavailable in its entirety, TMX will halt trading in the impacted products, or close the market, until the issue is resolved.

4.5.2. Issues Affecting Information Sharing Arrangements with ASX

In the event that TMX experiences an issue affecting its ability to receive or disseminate critical data (e.g., security status information, reference prices, regulatory halt notifications), while **trading remains available on both the ASX and TMX markets**, TMX will follow the process set out below.

Issue	Impacted Obligation	TMX Process
ASX market data (ITCH)	▪ Enforcement of Anomalous Order Thresholds ("AOT") ▪ Validation of price improvement orders and trades, including off-exchange trade reports	If the primary ASX channel fails, TMX will fail over to the redundant channel automatically. If the failover is not successful: ▪ TMX will use only TMX data to enforce AOT; and ▪ TMX will disable price improvement orders and trade reporting
ASX reference data (OMNet) **To be replaced by ASX MDF feed*	▪ Security status synchronisation ▪ Notifications related to Extreme Trade Range ("ETR") ▪ Validation of security status for off-exchange trade reports	If the primary ASX feed fails, TMX will fail over to the redundant feed automatically. If the failover is not successful, TMX will halt the impacted products until the ASX feed and/or required data becomes available.

4.5.3. ASX Market Outages Affecting Trading on the ASX Market

In the event that ASX market data becomes unavailable due to an outage affecting trading on the ASX market, TMX will continue to facilitate trading in the following instrument types:

(a) TMX investment products (including ETFs and warrants) whose underlying assets are **not** ASX-listed or ASX-quoted products; and

(b) TMX securities.

In relation to ASX-listed or ASX-quoted products (including securities and ETFs), as well as TMX investment products whose underlying assets are ASX-listed or ASX-quoted products, TMX will continue trading of the impacted products on the TMX market, subject to the circumstances of the ASX outage assessed on a case-by-case basis.

If ASX invokes the CANCEL_ONLY session state in ASX Trade, TMX intends to take the following steps.

(a) **ASX market outage announcement**: ASX announces a market outage and transitions to the ENQUIRE session state. If ASX determines that the market will remain closed for the remainder of the trading day, ASX will transition to the CANCEL_ONLY session state during which ASX participants may cancel existing orders on ASX.[1]

(b) **TMX trading halt**: TMX will place the impacted products into a trading halt to facilitate an orderly transition.

(c) **TMX trading resumption**: Once TMX has confirmed its readiness to resume trading, TMX will resume trading in the impacted products.

(d) **ASX security status**: To the extent available, TMX will use the ASX MAP system to obtain security status updates arising from company announcements and other security status events.

A summary of how TMX will use the data in ASX outage scenarios is below.

[1] For further information, see the relevant ASX documents, including the ASX Trade Failover and Recovery Guide.

Issue	Impacted Obligation	TMX Process
ASX market data (ITCH)	▪ Enforcement of AOT ▪ Validation of price improvement orders and trades, including off-exchange trade reports	If the primary ASX channel fails, TMX will fail over to the redundant channel automatically. If the failover is not successful: ▪ TMX will rely solely on TMX data to enforce AOT; and ▪ TMX will rely solely on TMX data to validate price improvement orders and trades
ASX reference data (OMNet) **To be replaced by ASX MDF feed*	▪ Security status synchronisation ▪ Notifications related to ETR ▪ Validation of security status for off-exchange trade reports	If the primary ASX feed fails, TMX will fail over to the redundant feed automatically. If the failover is not successful: ▪ TMX will obtain security status updates (e.g., halts required due to announcements) through the ASX MAP system or other arrangements agreed with ASX; ▪ TMX will rely solely on TMX data to enforce ETR; and ▪ TMX will rely solely on TMX data to validate off-exchange trade reports