Overview

Cboe takes pride in the reliability and availability of its systems. The Cboe exchanges have an uptime history of more than 99.9%. Yet, Cboe continues to spend extensive time and resources toward planning and preparing for system failures, including those that might affect **Cboe's proprietary options and futures products** or the primary auctions of securities listed on Cboe BZX U.S. Equities Exchange. Redundancies and resiliencies are built into every part of the system, including software, hardware, storage, database and network components. Below are highlights of our Business Continuity Plan (BCP) and Disaster Recovery (DR) plan.

Matching Engine Resiliency

Cboe technology includes rigorously engineered matching engine resiliency to ensure markets operate in a fair and orderly manner, especially for proprietary products (including our S&P 500 Index options and Cboe Volatility Index options and futures), and Cboe-listed securities. Cboe-listed and proprietary products trade on dedicated matching engines, and each matching engine has a primary and secondary instance. If the primary instance fails (software or hardware), the secondary instance automatically takes over continuous trading in approximately 45 seconds. This matching engine failover process has handled numerous failovers globally in production and has worked as designed to prevent undue disruption to trading.

Cboe also offers "cancel on disconnect" to customers. This automatically cancels customers' orders on that session if they disconnect. However, our system gives customers the option to persist auction orders through a session disconnect to ensure they participate in the auction even if their session is down. This provides customers maximum flexibility to ensure they are participating in all continuous trading and auction periods they desire, especially in Cboe-listed securities.

Cboe-Listed Equities

Matching engine resiliency also applies during auction periods for Cboe-listed corporate and ETP listings. Cboe has a detailed auction resiliency matrix that automatically drives matching engine recovery during critical auction periods. Cboe will make every effort to failover to the secondary matching engine during these critical periods to conduct the auction.

> If the recovery from a matching engine failure is successful before a scheduled auction closing cutoff, the auction will occur on the secondary matching engine at the normally scheduled time.

> If the failover completes after the closing cutoff time but before the close, the closing auction will be postponed to allow for a normal five-minute period after the cutoff to ensure the closing auction is fair and orderly.

> If recovery cannot be completed until after the close, no auction will be conducted but an Official Closing Price will be reported to the consolidated tape for each Cboe-listed security. The Cboe Official Closing Price will be the price of the Final Last Sale Eligible Trade (FLSET). It will be represented by a sale of condition of "M" (Market Center Official Close).
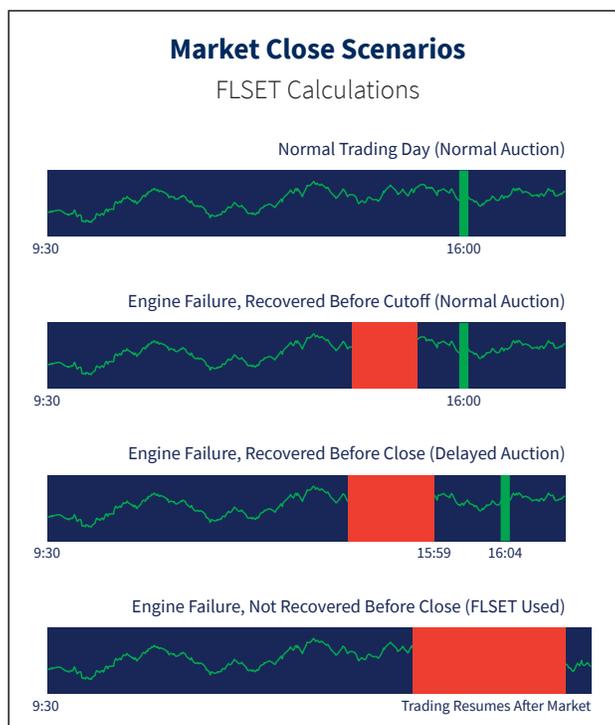
Cboe U.S. Exchanges

EQUITIES

> BZX Exchange
> EDGX Exchange
> BYX Exchange
> EDGA Exchange

OPTIONS

> Cboe Options Exchange
> BZX Options Exchange
> C2 Options Exchange
> EDGX Options Exchange

FUTURES

> Cboe Futures Exchange (CFE)

Market Close Scenarios
FLSET Calculations

Normal Trading Day (Normal Auction)
9:30   16:00

Engine Failure, Recovered Before Cutoff (Normal Auction)
9:30   16:00

Engine Failure, Recovered Before Close (Delayed Auction)
9:30   15:59   16:04

Engine Failure, Not Recovered Before Close (FLSET Used)
9:30   Trading Resumes After Market

Special Opening Quotation ("SOQ") Auctions

Cboe has the same matching engine failover mechanism implemented on all Cboe Options markets, including the Cboe Options Exchange, which hosts periodic SOQ auctions to facilitate the settlement of certain options and futures. After the failover to the secondary matching engine is complete, series openings for SOQ constituent series will continue until all constituents are open.

Note that Cboe also may delay the opening of constituent series on an as-needed basis when Cboe determines that the interests of a fair and orderly market requires such action be taken.
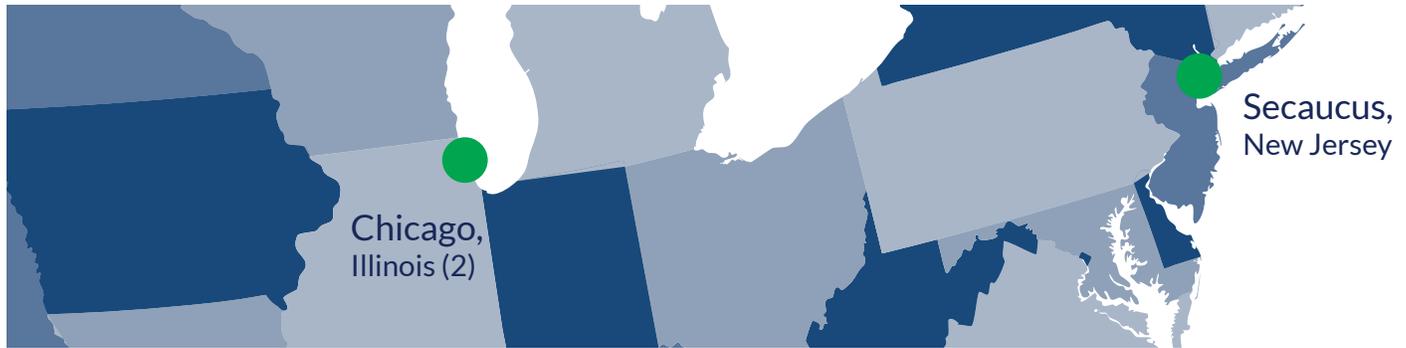
Data Center Redundancy

Cboe maintains multiple data centers (primary and secondary) in different parts of the country for geographic diversity. Cboe tests its secondary exchange platforms with its customers and other exchanges annually and is able to quickly initiate trading out of its backup data centers in the event of an outage at the primary data center.

In fact, Cboe switched the trading of one of its exchanges (BYX Exchange) to its secondary data center intraday on September 26, 2013, without issue. To our knowledge, Cboe is the first and only operator to have successfully switched exchange operations to a DR data center intraday on an actual trading day.

Business Continuity

To ensure business continuity of operations in the United States, Cboe operations personnel report to a business continuity office space to operate the U.S. markets one day each month.

On an annual basis, the Cboe's primary exchange operations facility is taken completely offline for an entire trading day, with Cboe associates located at that facility reporting to the business continuity office to ensure the facility's readiness and viability. For more information regarding business continuity, read the Cboe Business Continuity Disclosure.

Communications

Cboe strives to keep customers well informed during failure scenarios and will seek to provide updates as frequent as every 30 minutes after an initial System Status notice has been distributed through event resolution. Event updates may be viewed via the Exchange Notices/System Status section for each asset class on markets.cboe.com, or by subscribing to the System Status email distribution list through the Cboe Trade Desk.

U.S. Equities System Status   **U.S. Options System Status**   **U.S. Futures System Status**

❖ Cboe appreciates your continued business. Please call the Cboe Trade Desk or your Director of Account Coverage with any questions regarding the Cboe BCP/DR Plan.