

# SECURITIES AND EXCHANGE COMMISSION

[Release No. 34-105096; File No. SR-CboeBZX-2026-019]

## Self-Regulatory Organizations; Cboe BZX Exchange, Inc.; Notice of Filing and Immediate Effectiveness of a Proposed Rule Change to Amend Rule 11.22 to Introduce the Exchange's Clock Service

March 26, 2026.

Pursuant to Section 19(b)(1) of the Securities Exchange Act of 1934 (“Act”),<sup>1</sup> and Rule 19b-4 thereunder,<sup>2</sup> notice is hereby given that on March 17, 2026 Cboe BZX Exchange, Inc. (the “Exchange” or “BZX”) filed with the Securities and Exchange Commission (“SEC” or “Commission”) the proposed rule change as described in Items I, II, and III, below, which Items have been prepared by the Exchange. The Commission is publishing this notice to solicit comments on the proposed rule change from interested persons.

### I. Self-Regulatory Organization's Statement of the Terms of Substance of the Proposed Rule Change

The Exchange proposes to amend Rule 11.22, to provide for the new service called the Clock Service. The text of the proposed rule change is also available on the Commission's website (<https://www.sec.gov/rules/sro.shtml>), the Exchange's website ([https://www.cboe.com/us/equities/regulation/rule\\_filings/bzx/](https://www.cboe.com/us/equities/regulation/rule_filings/bzx/)), and at the principal office of the Exchange.

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<sup>1</sup> 15 U.S.C. 78s(b)(1).

<sup>2</sup> 17 CFR 240.19b-4.

II. Self-Regulatory Organization’s Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change

In its filing with the Commission, the Exchange included statements concerning the purpose of and basis for the proposed rule change and discussed any comments it received on the proposed rule change. The text of these statements may be examined at the places specified in Item IV below. The Exchange has prepared summaries, set forth in sections A, B, and C below, of the most significant aspects of such statements.

A. Self-Regulatory Organization’s Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change

1. Purpose

The Exchange proposes to amend Rule 11.22, to provide for the new service called the Clock Service.<sup>3</sup> The Clock Service is an optional product<sup>4</sup> available to Members and non-Members alike. In sum, a subscriber would be able to utilize the proposed Clock Service to synchronize their time recording systems to those of the Exchange for highly correlated latency measurements between the Exchange’s and the subscriber’s systems time measurements related to the same message or order. Time synchronization services are well established in the U.S. and utilized in many areas of the U.S. economy and infrastructure. The proposed Clock Service is not novel to the securities markets and it is similar to the network time synchronization service currently offered by MIAX Emerald, LLC (“MIAX Emerald”).<sup>5</sup> The Exchange proposes to provide the

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<sup>3</sup> The Exchange also proposes to amend the title of Rule 11.22 from “Data Products” to “Data Products and Services.”

<sup>4</sup> A firm that chooses to subscribe to the proposed Clock Service may discontinue the Clock Service at any time if that firm determines that it is no longer useful or that alternatives better meet their business or system needs. The Exchange intends to submit a separate filing with the Commission pursuant to Section 19(b)(1) to propose fees for the Clock Service.

<sup>5</sup> See Securities Exchange Act Release No. 94915 (May 16, 2022), 87 FR 31022 (May 20, 2022) (SR-EMERALD-2022-16).

Clock Service in response to participant demand for more precise and more accurate clock synchronization options with the Exchange’s network.

The U.S. Government’s Global Positioning System (“GPS”) clock<sup>6</sup> time signal is the benchmark by which the Exchange and most, if not all, Members and non-Members use to synchronize their internal primary clock devices.<sup>7</sup> Using the U.S. Government provided GPS time signals publicly available through the GPS network is a de facto standard for high precision time synchronization across geographically diverse locations. Typically, a GPS receiver connected to an antenna serves as a time signal source which feeds the Coordinated Universal Time (referred to as “UTC”) to synchronize other clocks using Precision Time Protocol (“PTP”).<sup>8</sup>

The Exchange’s primary clock<sup>9</sup> is the time source used to synchronize the Exchange’s System,<sup>10</sup> as well as its affiliated options and equities exchanges trading systems (collectively, the

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<sup>6</sup> For a description of the GPS clock, see Official U.S. Government Information About the Global Positioning System (GPS) and Related Topic, available at <https://www.gps.gov/applications/timing/> (providing that “[i]n addition to longitude, latitude, and altitude, the Global Positioning System (GPS) provides a critical fourth dimension – time. Each GPS satellite contains multiple atomic clocks that contribute very precise time data to the GPS signals. GPS receivers decode these signals, effectively synchronizing each receiver to the atomic clocks. This enables users to determine the time to within 100 billionths of a second, without the cost of owning and operating atomic clocks.”)

<sup>7</sup> See [An Evaluation of Dependencies of Critical Infrastructure Timing Systems on the Global Positioning System \(GPS\)](#), noting that “the primary time synchronization sources for these systems are signals broadcast by Global Positioning System (GPS) satellites...”

<sup>8</sup> A primary clock device is a precision parent clock that provides timing signals to synchronized secondary child clocks as part of a standalone clock network. The term “Coordinated Universal Time” is defined as the “international standard of time that is kept by atomic clocks around the world.” See Merriam-Webster Dictionary, available at <https://www.merriam-webster.com/dictionary/Coordinated%20Universal%20Time> (last visited November 10, 2021). Coordinated Universal Time is the primary time standard by which the world regulates clocks and time. See <https://www.timeanddate.com/time/aboututc.html>. “Precision Time Protocol” is a method used to synchronize clocks through a computer network. See also “IEEE-1588 Standard for a Precision Clock Synchronization Protocol for Networked Measurement and Control Systems” available at <https://www.nist.gov/system/files/documents/el/isd/ieee/tutorial-basic.pdf>.

<sup>9</sup> The Exchange’s primary clock ordinarily derives its time from the primary Exchange-managed GPS receiver; however, in certain failover or impairment scenarios, the system may temporarily synchronize to an external time service to maintain continuity.

<sup>10</sup> The term “System” shall mean the electronic communications and trading facility designated by the Board through which securities orders of Users are consolidated for ranking, execution and, when applicable, routing away. See Rule 1.5(aa).

“Cboe Trading System”) and feeds a time signal to the Exchange’s timestamping devices and servers within the Exchange’s own network using White Rabbit<sup>11</sup> and PTP. These capture devices are used to timestamp orders and messages as they travel through the Exchange’s System.

Time synchronization services are well established in the U.S. and utilized in many areas of the U.S. economy and infrastructure. Today, the Exchange understands many participants attempt to sync their primary clock devices to the U.S. Government provided GPS network. By getting the GPS signal through a GPS capable antenna, participants can synchronize their primary clock device to the GPS network time to within an accuracy of approximately 30 nanoseconds. From there, by using a PTP time synchronization protocol, participants can synchronize their internal devices to their primary clock devices.

Because the Exchange and participants independently access time signals from the U.S. government provided GPS network to synchronize their own primary clock devices, measurement times of market events by the Exchange and a participant may vary. This may, in turn, lead to incorrect latency measurements that may cause a participant’s time calculations of how long it took for their order or message to leave their systems and reach the trading center to which it was sent to. This may impair the participant’s ability to fully understand latencies within their own systems and whether they need to adjust their systems or trading models.

Under the proposed Clock Service, participants would be able to synchronize their own primary clock devices to the Exchange’s primary clock device, by receiving White Rabbit time signals from the Exchange via a 1 gigabit per second (“Gbps”) Physical Port. The proposed Clock Service simply provides participants with the Exchange’s time signal at a more granular level, and, as part of the Clock Service, participants will receive a 1 Gbps Physical Port offered by the

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<sup>11</sup> White Rabbit is a high-precision time synchronization technology that combines PTP with synchronous ethernet to achieve up to sub-nanosecond accuracy.

Exchange in order to connect.<sup>12</sup> The improved time signal would tell the participant the Exchange's time at a more granular level at a particular point in time. The subscribing participant may then use that time signal to synchronize their own primary clock to the Exchange's primary clock.

Some participants may currently have a White Rabbit clock synchronization<sup>13</sup> device within their own network. This device is not provided by the Exchange. Other participants that do not currently utilize White Rabbit clock synchronization device and optics would need to acquire one from a third-party vendor, of which there are several providers.<sup>14</sup>

Participants may use the proposed Clock Service for numerous purposes. For one, the proposed Clock Service would allow participants to more precisely measure latency between their network and that of the Exchange. The proposed Clock Service would allow them to better understand the times at which their order or message reached certain points when traveling from their network to the Exchange.

Participants may use the proposed Clock Service to analyze the efficiency of their network and connections when not only routing orders to the Exchange, but also when receiving messages back from the Exchange. These messages include communications regarding whether their order was accepted, rejected, or executed. Participants may measure message traversal times by comparing their message's (e.g. order, quote, cancellation, etc.) timestamp to the Exchange's matching engine timestamp from the Exchange-generated acknowledgement messages (e.g. order

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<sup>12</sup> The Exchange notes that MIAX Emerald, LLC similarly requires a 1 Gbps connection in order to utilize its respective clock service.

<sup>13</sup> A White Rabbit clock synchronization device has the technological ability to capture time and coordinate time synchronization within a network up to a sub-nanosecond level.

<sup>14</sup> The Exchange notes that participants are responsible for procuring the applicable license(s) as needed.

acknowledgment, quote acknowledgment, cancellation acknowledgment, etc.).<sup>15</sup> Participants may then enhance their own systems to ensure that they are receiving such communications in a timelier manner and to verify that their systems are working as intended. Participants may then utilize these enhanced latency measurements to better analyze latencies within their own systems and use this analysis to optimize their network, models and trading patterns to potentially improve their interactions with the Exchange. In particular, participants may use these metrics to better assess the health of their network and that their systems are working as intended. For example, a participant may use this information when analyzing the efficacy of their various connections and whether a connection is performing as expected or experiencing a delay. A subscriber may then decide to rebalance the amount of orders and/or messages over its various connections to ensure each connection is operating with maximum efficiency. Subscribers may also use the proposed Clock Service for other purposes, such as trade surveillance. Subscribers may also utilize time synchronization to assist them in evaluating compliance with certain clock synchronization requirements.

The proposed Clock Service would be described under proposed Rule 11.22(p), which would provide that:

Clock Service utilizes White Rabbit and Precision Time Protocol (“PTP”) for synchronizing device clocks by leveraging technology designed to maintain tightly aligned timing across systems. Clock Service enables subscribers to synchronize their internal devices to the same time as the Exchange devices with high precision.

The Exchange does not propose to provide a new connectivity option to receive time signals via the proposed Clock Service; rather, dedicated 1 Gbps Physical Ports available will be

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<sup>15</sup> The Exchange sends Members an acknowledgement message that their order or message was received by the Exchange. This acknowledgement includes the time of receipt at a microsecond level; however, the Exchange intends to update the time of receipt to be at a nanosecond by the end of March. The Exchange further notes that participants who subscribe to any one of the optional reports offered by Cboe Timestamping Services (see Rule 11.22(o)) will have additional timestamps to analyze.

included as part of this Clock Service.<sup>16</sup> The proposed Clock Service provides enhanced time synchronization that may be utilized by subscribing participants to adjust their own systems. The Exchange does not propose to include additional connectivity options or modify existing connectivity options as part of this proposal. Participants may continue to use their existing methods to connect to and send orders to the Exchange. The proposed Clock Service will not include any trading data regarding the subscriber's activity on the Exchange or include any data from other trading activity on the Exchange.

## 2. Statutory Basis

The Exchange believes the proposed rule change is consistent with the Securities Exchange Act of 1934 (the "Act") and the rules and regulations thereunder applicable to the Exchange and, in particular, the requirements of Section 6(b) of the Act.<sup>17</sup> Specifically, the Exchange believes the proposed rule change is consistent with the Section 6(b)(5)<sup>18</sup> requirements that the rules of an exchange be designed to prevent fraudulent and manipulative acts and practices, to promote just and equitable principles of trade, to foster cooperation and coordination with persons engaged in regulating, clearing, settling, processing information with respect to, and facilitating transactions in securities, to remove impediments to and perfect the mechanism of a free and open market and a national market system, and, in general, to protect investors and the public interest. Additionally, the Exchange believes the proposed rule change is consistent with the Section 6(b)(5)<sup>19</sup>

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<sup>16</sup> The Exchange notes that the 1 Gbps Physical Port that a participant shall receive as part of this Service shall be used solely for the purposes of the Clock Service and will not be able to be used for any other purpose (e.g., order routing).

<sup>17</sup> 15 U.S.C. 78f(b).

<sup>18</sup> 15 U.S.C. 78f(b)(5).

<sup>19</sup> Id.

requirement that the rules of an exchange not be designed to permit unfair discrimination between customers, issuers, brokers, or dealers.

Trading technology in the U.S. market is constantly evolving and providing market participants with tools to increase speed and reduced latency opportunities. Today, the Exchange provides participants timestamp information in microseconds.<sup>20</sup> The Exchange and its participants independently access time signals from GPS and use those time signals to synchronize their own primary clock devices. Even though both the Exchange and participants synchronize to GPS, differences among GPS receivers may vary by about 30 nanoseconds, with the potential for further deviation based on a participant's infrastructure. In today's market, such a potential inaccuracy in a subscriber's latency measurements is meaningful and potentially impactful to the performance of their trading strategies.

The proposed Clock Service addresses this issue by enabling subscribers to synchronize their primary clock device with the Exchange's by utilizing technology that allows up to a sub-nanosecond level. For example, the proposed Clock Service would allow subscribers to timestamp a quote sent from their system to the very same quote timestamped by the Exchange and have confidence that the time delta between timestamps is attributable to latency and not due to a potential offset in their primary clocks as discussed above. The Exchange, therefore, believes the proposed Clock Service promotes just and equitable principles of trade, removes impediments to and perfects the mechanism of a free and open market because it would allow latency sensitive subscribers to measure latency in a manner consistent with their trading behavior and the evolving pace of trading and technology in today's markets. Time synchronization removes impediments to and perfects the mechanism of a free and open market because it would provide Members with a

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<sup>20</sup> The Exchange intends to provide this information in nanoseconds by the end of March.

tool to assess and re-calibrate their systems at a more acute level that is in line with the increasing speeds at which today's markets operate.

The proposed Clock Service provides participants with the Exchange's time signal. The time signal provided by the proposed Service could be beneficial in multiple areas, one of which is enabling subscribers to more precisely measure latency between their network and that of the Exchange by utilizing technology that allows up to a sub-nanosecond level. The proposed Clock Service would allow them to better understand the times at which their order or message reached certain points when traveling from their network to the Exchange through more granular latency measurements. The proposed Clock Service is, therefore, consistent with Section 6(b)(5) of the Act because a more granular latency measurement would enable latency sensitive subscribers to more precisely calculate and thus better understand and manage their own latency.

Subscribers may utilize these enhanced latency measurements to better analyze latencies within their own systems and use this analysis to optimize their network, models and trading patterns to potentially improve their interactions with the Exchange. The ability to more precisely measure network efficiency could provide subscribers with a set of metrics that allow them to better assess the health of their network and that their systems are working as intended. The Exchange anticipates that most, if not all, subscribers to the proposed Clock Service would be those whose trading models are latency sensitive; however, managed service providers may also subscribe in order to redistribute the Cboe Clock to their downstream clients.

The Exchange believes providing this optional clock synchronization service to interested subscribers is, therefore, consistent with facilitating transactions in securities, removing impediments to and perfecting the mechanism of a free and open market and a national market system, and, in general, protecting investors and the public interest.

As noted above, MIAX Emerald currently offers a clock service that has been reviewed and approved by the Commission.<sup>21</sup> MIAX Emerald’s clock service is substantially similar to the proposed Clock Service as both offerings synchronize a subscriber’s time recording systems to those of the exchange at a more granular level for highly correlated latency measurements between the exchange’s and the subscriber system’s time measurements related to the same message or order. Both offerings allow subscribers to synchronize their own primary clock devices to the exchange’s primary clock device, by receiving time signals from the 1 Gbps connection.

One key distinction between the Exchange’s proposed Clock Service and MIAX Emerald’s similar offering is that the Exchange includes a 1 Gbps Physical Port as part of its offering for this Clock Service.<sup>22</sup> Similar to MIAX Emerald, this 1 Gbps Physical Port will be used solely for the Clock Service offering.<sup>23</sup> However, a participant that purchases the Exchange’s Clock Service will only need one 1 Gbps Physical Port to receive this service for the Exchange and its affiliated equities and options exchanges.<sup>24</sup>

Additionally, MIAX Emerald’s offering also utilizes White Rabbit technology.<sup>25</sup> with both services synchronizing a subscriber’s time recording systems to those of the respective

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<sup>21</sup> See Securities Exchange Act Release No. 94335 (March 1, 2022), 87 FR 12756 (March 7, 2022) (SR-EMERALD-2021-38) (Notice of Filing of Amendment No. 1 and Order Granting Accelerated Approval of a Proposed Rule Change, as Modified by Amendment No. 1, To Amend Exchange Rule 531 To Provide for a New Service Called the High Precision Network Time Signal Service) (“Approval Order”).

<sup>22</sup> As noted above, MIAX also requires a 1 Gbps connection.

<sup>23</sup> See Securities Exchange Act Release No. 94915 (May 16, 2022), 87 FR 31002 (May 20, 2022) (SR-EMERALD-2022-16).

<sup>24</sup> MIAX Emerald’s affiliates do not offer this service, thus the 1 Gbps connection is only used for the MIAX Emerald clock service while the Exchange’s proposed offering allows for the Clock Service to be used for the Exchange and its affiliated options and equities exchanges.

<sup>25</sup> See [MIAX Emerald Options EnhancedPTP WhiteRabbit\\_08302021.pdf](#), noting the White Rabbit technology that is used for this service offering.

exchange at a more granular level for highly correlated latency measurements between the respective exchange's and the subscriber system's time measurements related to the same message or order.

The proposed Clock Service also protects investors and the public interest because subscribers may use the Clock Service for determining compliance with trade surveillance and to assist them in evaluating compliance with certain clock synchronization requirements.<sup>26</sup>

Additionally, the Exchange believes the proposed rule change is consistent with the Section 6(b)(5)<sup>27</sup> requirement that the rules of an exchange not be designed to permit unfair discrimination between customers, issuers, brokers, or dealers as it will be available to all Members and non-Members who choose to subscribe. Use of the proposed Clock Service would be voluntary and no Member or non-Member would be required to subscribe to the proposed Clock Service.<sup>28</sup> The Exchange notes that the proposed Clock Service would be an additional, optional tool for participants and some participants may not find it useful based on their business needs and trading activity. Participants that choose not to subscribe to the proposed Clock Service are free to utilize other time synchronization methods or services that may assist them in time synchronization of their systems at a more granular level. The proposed Clock Service may not provide utility to all participants based on their business model, use of existing time synchronization methods, or reliance on other methods to test their system's performance to ensure it is operating as intended. For example, certain participants employ business models that are not latency sensitive, such as those that only enter resting liquidity.

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<sup>26</sup> See Rule 4.6.

<sup>27</sup> 15 U.S.C. 78f(b)(5).

<sup>28</sup> The Exchange intends to submit a separate filing with the Commission pursuant to Section 19(b)(1) to propose fees for the Clock Service

Lastly, the Exchange believes the proposed changes to the title of Rule 11.22 promote just and equitable principles of trade and remove impediments to and perfect the mechanism of a free and open market and a national market system because the proposed rule changes will provide greater clarity to participants and the public regarding the Exchange's Rules. It is in the public interest for rules to be accurate and concise so as to eliminate the potential for confusion.

B. Self-Regulatory Organization's Statement on Burden on Competition

The Exchange does not believe that the proposed rule change will impose any burden on competition that is not necessary or appropriate in furtherance of the purposes of the Act. In this instance, the proposed rule change to offer the optional Clock Service is in response to participant interest and requests for tools that would enable them to better measure traversal times between their network and that of the Exchange at a more granular level.

Intra-Market Competition

The Exchange does not believe the proposed Clock Service will have an inappropriate burden on intra-market competition between participants that choose to subscribe to the Clock Service and those participants that do not. The proposed Clock Service would provide participants with the ability to synchronize their primary clock devices with the Exchange's primary clock device by utilizing technology that allows up to a sub-nanosecond level, which they may then use to measure their network's efficiency to determine whether their systems are performing as expected.

The Exchange notes that the proposed Clock Service would be an additional, optional tool for participants and some participants may not find it useful based on their business needs and trading activity. The proposed Clock Service may not provide utility to all participants based on their business model, use of existing time synchronization methods, or reliance on other methods to test their system's performance to ensure it is operating as intended.

Additionally, some participants may be able to enhance their own traversal time calculations without subscribing to the proposed Clock Service by using other time synchronization methods or utilize some other services that may assist them in time synchronization of their systems. Participants may also prefer to utilize or develop other methods that would enable them to determine whether their own primary clock device is recording time in close proximity to the primary clock devices of other market participants. Participants may view these alternatives as more in line with their business needs or choose an alternative that is more compatible with their existing technology.

#### Inter-Market Competition

The Exchange does not believe the proposed Clock Service will have an inappropriate burden on inter-market competition. The proposed Clock Service will further enhance inter-market competition between exchanges by allowing the Exchange to expand its product offerings. As previously noted, MIAX Emerald provides a clock service to its Members.<sup>29</sup> The proposed Clock Service would provide subscribers with a tool to assist them in recalibrating their own models and trading strategies to improve their overall experience on the Exchange, thereby potentially improving execution and order fill rates. This may improve the Exchange's overall market quality through increased liquidity and improved execution opportunities for resting orders, enhancing the Exchange's overall competitive position. The proposed rule change should enhance competition by promoting further initiatives and innovation among market centers and market participants as it concerns time measurements and synchronization among trading platforms.

Lastly, if the proposed Clock Service is unattractive to participants, participants will opt not to subscribe to it. Accordingly, the Exchange does not believe that the proposed change will

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<sup>29</sup> See MIAX Emerald Fee Schedule, Section 8, Services.

impair the ability of participants or competing order execution venues to maintain their competitive standing in the financial market.

C. Self-Regulatory Organization’s Statement on Comments on the Proposed Rule Change Received from Members, Participants, or Others

The Exchange neither solicited nor received comments on the proposed rule change.

III. Date of Effectiveness of the Proposed Rule Change and Timing for Commission Action

Because the foregoing proposed rule change does not:

- A. significantly affect the protection of investors or the public interest;
- B. impose any significant burden on competition; and
- C. become operative for 30 days from the date on which it was filed, or such shorter

time as the Commission may designate, it has become effective pursuant to Section 19(b)(3)(A) of the Act<sup>30</sup> and Rule 19b-4(f)(6)<sup>31</sup> thereunder. At any time within 60 days of the filing of the proposed rule change, the Commission summarily may temporarily suspend such rule change if it appears to the Commission that such action is necessary or appropriate in the public interest, for the protection of investors, or otherwise in furtherance of the purposes of the Act. If the Commission takes such action, the Commission will institute proceedings to determine whether the proposed rule change should be approved or disapproved.

IV. Solicitation of Comments

Interested persons are invited to submit written data, views and arguments concerning the foregoing, including whether the proposed rule change is consistent with the Act. Comments may be submitted by any of the following methods:

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<sup>30</sup> 15 U.S.C. 78s(b)(3)(A).

<sup>31</sup> 17 CFR 240.19b-4(f)(6).

Electronic Comments:

- Use the Commission's internet comment form (<https://www.sec.gov/rules/sro.shtml>); or
- Send an email to [rule-comments@sec.gov](mailto:rule-comments@sec.gov). Please include file number SR-CboeBZX-2026-019 on the subject line.

Paper Comments:

- Send paper comments in triplicate to Secretary, Securities and Exchange Commission, 100 F Street NE, Washington, DC 20549-1090.

All submissions should refer to file number SR-CboeBZX-2026-019. This file number should be included on the subject line if email is used. To help the Commission process and review your comments more efficiently, please use only one method. The Commission will post all comments on the Commission's internet website (<https://www.sec.gov/rules/sro.shtml>). Copies of the filing will be available for inspection and copying at the principal office of the Exchange. Do not include personal identifiable information in submissions; you should submit only information that you wish to make available publicly. We may redact in part or withhold entirely from publication submitted material that is obscene or subject to copyright protection.

All submissions should refer to file number SR-CboeBZX-2026-019 and should be submitted on or before [INSERT DATE 21 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*].

For the Commission, by the Division of Trading and Markets, pursuant to delegated authority.<sup>32</sup>

**Sherry R. Haywood,**  
*Assistant Secretary.*

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<sup>32</sup> 17 CFR 200.30-3(a)(12).