Required fields are shown with yellow backgrounds and asterisks.

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SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549
Form 19b-4

File No. * SR 2024 - * 016

Amendment No. (req. for Amendments *)

Filing by   Options Clearing Corporation

Pursuant to Rule 19b-4 under the Securities Exchange Act of 1934

Initial * ✓	Amendment * ☐	Withdrawal ☐	Section 19(b)(2) * ✓	Section 19(b)(3)(A) * ☐	Section 19(b)(3)(B) * ☐

Pilot ☐

Extension of Time Period for Commission Action * ☐

Date Expires *

Rule

19b-4(f)(1) ☐	19b-4(f)(4) ☐
19b-4(f)(2) ☐	19b-4(f)(5) ☐
19b-4(f)(3) ☐	19b-4(f)(6) ☐

Notice of proposed change pursuant to the Payment, Clearing, and Settlement Act of 2010

Section 806(e)(1) * ☐

Section 806(e)(2) * ☐

Security-Based Swap Submission pursuant to the Securities Exchange Act of 1934
Section 3C(b)(2) * ☐

Exhibit 2 Sent As Paper Document ☐

Exhibit 3 Sent As Paper Document ☐

Description

Provide a brief description of the action (limit 250 characters, required when Initial is checked *).

Proposed rule change by the Options Clearing Corporation in connection with enhancements to the modeling approach for implied volatility components within its margin methodology, the System for Theoretical Analysis and Numerical Simulations (STANS), and its Comprehensive Stress Testing (CST) methodology, to better capture the risks associated with short-dated options.

Contact Information

Provide the name, telephone number, and e-mail address of the person on the staff of the self-regulatory organization prepared to respond to questions and comments on the action.

First Name * █████   Last Name * █████

Title * █████████████

E-mail * RuleFilings@theocc.com

Telephone * █████████   Fax

Signature

Pursuant to the requirements of the Securities Exchange of 1934, Options Clearing Corporation
has duly caused this filing to be signed on its behalf by the undersigned thereunto duly authorized.

Date   11/22/2024

(Title *)

By   ██████████   ██████████

(Name *)

NOTE: Clicking the signature block at right will initiate digitally signing the form. A digital signature is as legally binding as a physical signature, and once signed, this form cannot be changed.

Digitally signed by █████
Date: 2024.11.22 14:19:30 -06'00'

SECURITIES AND EXCHANGE COMMISSION
WASHINGTON, D.C. 20549

For complete Form 19b-4 instructions please refer to the EFFS website.

Form 19b-4 Information *		
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SR-OCC-2024-016 19b-4 SDO FINAL

The self-regulatory organization must provide all required information, presented in a clear and comprehensible manner, to enable the public to provide meaningful comment on the proposal and for the Commission to determine whether the proposal is consistent with the Act and applicable rules and regulations under the Act.

Exhibit 1 - Notice of Proposed Rule Change *		
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SR-OCC-2024-016 Exhibit 1A FINAL.

The Notice section of this Form 19b-4 must comply with the guidelines for publication in the Federal Register as well as any requirements for electronic filing as published by the Commission (if applicable). The Office of the Federal Register (OFR) offers guidance on Federal Register publication requirements in the Federal Register Document Drafting Handbook, October 1998 Revision. For example, all references to the federal securities laws must include the corresponding cite to the United States Code in a footnote. All references to SEC rules must include the corresponding cite to the Code of Federal Regulations in a footnote. All references to Securities Exchange Act Releases must include the release number, release date, Federal Register cite, Federal Register date, and corresponding file number (e.g., SR-[SRO]-xx-xx). A material failure to comply with these guidelines will result in the proposed rule change being deemed not properly filed. See also Rule 0-3 under the Act (17 CFR 240.0-3)

Exhibit 1A - Notice of Proposed Rule Change, Security-Based Swap Submission, or Advanced Notice by Clearing Agencies *		
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The Notice section of this Form 19b-4 must comply with the guidelines for publication in the Federal Register as well as any requirements for electronic filing as published by the Commission (if applicable). The Office of the Federal Register (OFR) offers guidance on Federal Register publication requirements in the Federal Register Document Drafting Handbook, October 1998 Revision. For example, all references to the federal securities laws must include the corresponding cite to the United States Code in a footnote. All references to SEC rules must include the corresponding cite to the Code of Federal Regulations in a footnote. All references to Securities Exchange Act Releases must include the release number, release date, Federal Register cite, Federal Register date, and corresponding file number (e.g., SR-[SRO]-xx-xx). A material failure to comply with these guidelines will result in the proposed rule change being deemed not properly filed. See also Rule 0-3 under the Act (17 CFR 240.0-3)

Exhibit 2- Notices, Written Comments, Transcripts, Other Communications		
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Copies of notices, written comments, transcripts, other communications. If such documents cannot be filed electronically in accordance with Instruction F, they shall be filed in accordance with Instruction G.

☐ Exhibit Sent As Paper Document

Exhibit 3 - Form, Report, or Questionnaire		
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SR-OCC-2024-016 Ex 3D - REDACTE
SR-OCC-2024-016 Ex 3E - REDACTE
SR-OCC-2024-016 Ex 3F - REDACTE

Copies of any form, report, or questionnaire that the self-regulatory organization proposes to use to help implement or operate the proposed rule change, or that is referred to by the proposed rule change.

☐ Exhibit Sent As Paper Document

Exhibit 4 - Marked Copies		
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The full text shall be marked, in any convenient manner, to indicate additions to and deletions from the immediately preceding filing. The purpose of Exhibit 4 is to permit the staff to identify immediately the changes made from the text of the rule with which it has been working.

Exhibit 5 - Proposed Rule Text		
Add	Remove	View

SR-OCC-2024-016 Ex 5A - REDACTE
SR-OCC-2024-016 Ex 5B - REDACTE

The self-regulatory organization may choose to attach as Exhibit 5 proposed changes to rule text in place of providing it in Item I and which may otherwise be more easily readable if provided separately from Form 19b-4. Exhibit 5 shall be considered part of the proposed rule change

Partial Amendment		
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If the self-regulatory organization is amending only part of the text of a lengthy proposed rule change, it may, with the Commission's permission, file only those portions of the text of the proposed rule change in which changes are being made if the filing (i.e. partial amendment) is clearly understandable on its face. Such partial amendment shall be clearly identified and marked to show deletions and additions.

SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

_____

Form 19b-4

Proposed Rule Change
by

THE OPTIONS CLEARING CORPORATION

Pursuant to Rule 19b-4 under the
Securities Exchange Act of 1934

Item 1.   <u>**Text of the Proposed Rule Change**</u>

Pursuant to the provisions of Section 19(b)(1) of the Securities Exchange Act of 1934

("Exchange Act" or "Act"),[1] and Rule 19b-4 thereunder,[2] The Options Clearing Corporation

("OCC") is filing with the Securities and Exchange Commission ("Commission") a proposed

rule change in connection with enhancements to the modeling approach for implied volatility

components within OCC's margin methodology, the System for Theoretical Analysis and

Numerical Simulations ("STANS") and OCC's Comprehensive Stress Testing ("CST")

methodology, to better capture the risks associated with short-dated options. Specifically, this

proposed rule change would, as described below: (1) align the day-count convention between

option price smoothing and implied volatility scenario generation, and (2) extend the term

structure of the implied volatility shocks to cover implied volatility risk associated with options

of less than one-month expiration.

The proposed changes to OCC's STANS Methodology Description[3] and Comprehensive

Stress Testing & Clearing Fund Methodology, and Liquidity Risk Management Description[4]

("CST Methodology Description") are contained in Exhibits 5A and 5B, to File No. SR-OCC-

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[1]   15 U.S.C. 78s(b)(1).

[2]   17 CFR 240.19b-4.

[3]   OCC has filed the STANS Methodology Description and amendments thereto with the Commission. <u>See</u>
        Exchange Act Release Nos. 100528 (July 15, 2024), 89 FR 58836 (July 19, 2024) (SR-OCC-2024-008);
        98101 (Aug. 10, 2023), 88 FR 55775 (Aug. 16, 2023) (SR-OCC-2022-012); 95319 (July 19, 2022), 87 FR
        44167 (July 25, 2022) (SR-OCC-2022-001); 93371 (Oct. 18, 2021), 86 FR 58704 (Oct. 22, 2021) (SR-
        OCC-2021-011); 91833 (May 10, 2021), 86 FR 26586 (May 14, 2021) (SR-OCC-2021- \005); 91079 (Feb.
        8, 2021), 86 FR 9410 (Feb. 12, 2021) (SR-OCC-2020-016). OCC makes its STANS Methodology
        Description available to Clearing Members. An overview of the STANS methodology is on OCC's public
        website: https://www.theocc.com/Risk-Management/Margin-Methodology.

[4]   OCC has filed the CST Methodology Description and amendments thereto with the Commission. <u>See</u>
        Exchange Act Release Nos. 100455 (July 2, 2024), 89 FR 56452 (July 9, 2024) (SR-OCC-2024-006);
        90827 (Dec. 30, 2020), 86 FR 659 (Jan. 6, 2021) (SR-OCC-2020-015); 89014 (June 4, 2020), 85 FR 35446
        (June 10, 2020) (SR-OCC-2020-003); 87718 (Dec. 11, 2019), 84 FR 68992 (Dec. 17, 2019) (SR-OCC-
        2019-010); 87717 (Dec. 11, 2019), 84 FR 68985 (Dec. 17, 2019) (SR-OCC-2019-009); 83735 (July 27,
        2018), 83 FR 37855 (Aug. 2, 2018) (SR-OCC-2018-008).

2024-016, respectively. Material proposed to be added is marked by underlining and material

proposed to be deleted is marked with strikethrough text. Within the documents, new, revised,

and deleted text related to the proposed rule change have been incorporated in section 2.1.3

(Implied Volatilities Scenarios) and 2.1.4 (S&P 500 Implied Volatilities Scenarios) of the

STANS Methodology Description and section 3.3.2 (Volatility Shock Model) of the CST

Methodology Description. The proposed rule change does not require any changes to the text of

OCC's By-Laws or Rules. All terms with initial capitalization that are not otherwise defined

herein have the same meaning as set forth in the OCC By-Laws and Rules.[5]

Item 2.   <u>Procedures of the Self-Regulatory Organization</u>

The proposed change was approved for filing with the Commission by OCC's Risk

Committee on October 11, 2023, pursuant to authority delegated by OCC's Board of Directors

("Board") and approved for filing with the Commission by the Board on October 12, 2023.

**Item 3.   <u>Self-Regulatory Organization's Statement of the
                Purpose of, and Statutory Basis for, the Proposed Rule Change</u>**

OCC is the sole clearing agency for standardized equity options listed on national

securities exchanges registered with the Commission. In its role as a clearing agency, OCC acts

as a central counterparty ("CCP"), guarantying all contracts it clears. That is, OCC becomes the

buyer to every seller and the seller to every buyer, which exposes OCC to risk because OCC is

obligated to perform even when one of its members defaults. These risks include: (i) credit risk,

which is the risk that OCC would not maintain sufficient financial resources to cover exposures;

and (ii) liquidity risk, which is the risk that OCC would not have sufficient liquid resources to

meet payment obligations when due.

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[5]   OCC's By-Laws and Rules can be found on OCC's public website: https://www.theocc.com/Company-Information/Documents-and-Archives/By-Laws-and-Rules.

OCC manages its credit and liquidity risks through various safeguards to ensure that it has sufficient financial resources in both form and amount in the event of a Clearing Member failure. To begin with, OCC periodically collects margin collateral from its Clearing Members, which is designed to cover the credit exposures they individually present to OCC with a high degree of confidence. OCC also maintains a Clearing Fund, which is a mutualized pool of financial resources to which each Clearing Member is required to contribute to ensure that OCC maintains sufficient qualifying liquid resources to manage its liquidity risk, and to address the tail risk that the margin collateral OCC collects from each Clearing Member might be insufficient to cover OCC's credit exposure to a defaulting member in extreme but plausible market conditions. In general, OCC performs daily stress testing of its financial resources using scenarios designed to assess whether the resources collected are adequate and inform the size of OCC's financial resources ("Sizing Scenarios") and measure the potential exposures Clearing Members may present to OCC to determine whether calls for additional collateral in either margin or in the Clearing Fund would be needed ("Sufficiency Scenarios"). Clearing Member margin amounts are collected based on calculations obtained from STANS, while Clearing Fund contributions are default scenario-based amounts generated by the CST methodology.

Clearing Member portfolios contain a mix of products and positions in options of various tenors, as well as other cleared positions (e.g., futures, stock loans) and collateral (e.g., valued securities, delivery obligations, US treasuries, Canadian Government bonds, and cash). Over the past several years, the options markets in particular have experienced a significant increase in the trading of short-dated options ("SDOs"), which refer to option contracts with a maturity of less

than or equal to one month to expiration.[6] However, the increase in the volume of SDO trading

and the larger concentration of SDO positions held from hedging and speculation activities

present unique challenges to the risk management framework.

For these reasons, OCC carried out a study to examine the specific risks posed by SDOs

(the "Study")[7] including risks posed by the increase to volatility due to the feedback between

options and equity hedging activity. OCC also analyzed the valuation of SDOs and option

scenario pricing in OCC's 2-day margin period of risk ("MPOR")[8] and assessed the margin risk

of portfolios dominated by SDOs through sensitivity analysis of realized P&L and risk coverage

metrics. OCC concluded from the Study that valuation of SDOs and options scenario pricing in

the 2-day MPOR was in general reasonable, but that opportunities exist to improve model

performance for Clearing Member portfolios dominated by SDOs. Moreover, a reasonableness

analysis of the mark-to market pricing and theoretical price simulation of SDOs in the MPOR

indicated that certain existing margin model assumptions having a direct impact on SDO risk

coverage needed further enhancement and update.

Specifically, the Study referred to a difference between option price smoothing[9] that uses

calendar day convention, and implied volatility[10] simulation that uses trading day convention.

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[6]   See, e.g., Cboe, The Rise of SPX & 0DTE Options (July 27, 2023), available at
https://go.cboe.com/l/77532/2023-07-27/ffc83k.

[7]   OCC has included the Study as confidential Exhibit 3A to File No. SR-OCC-2024-016

[8]   OCC collects its credit resources with an assumption of a two-day MPOR (i.e., two days after the last good
margin collection) and potential liquidity obligations are evaluated using the same concept and assuming
the liquidation processes details in OCC's Default Management Policy.

[9]   The smoothing algorithm is the process that OCC uses to estimate fair values for plain vanilla listed options
based on closing bid and ask price quotes. See Exchange Act Release No. 86731 (Aug. 22, 2019), 84 FR
45188, 45189 (Aug. 28, 2019) (File No. SR-OCC-2019-005).

[10]   Generally speaking, the implied volatility of an option is a measure of the expected future volatility of the
option's underlying security at expiration, which is reflected in the current option premium in the market.

The usage of two day count conventions[11] results in differences in implied volatility, especially when non-trading days make up a large portion of the time-to-expiration (e.g., on Fridays for options that expire the following Monday). In this regard, SDOs are far more sensitive to differences in day-count convention than contracts with longer expiries. In addition, OCC's model for simulating the theoretical prices assumes that the implied volatility shocks of the one-month tenor ("1M") are sufficient to cover the implied volatility changes for SDO tenors.[12] However, empirical results indicate that the implied volatility changes from SDOs can be much larger than those for options with one month to expiration.[13]

OCC proposes to improve the theoretical price simulation of SDOs and enhance the modeling of the implied volatility risk associated with SDOs by: (1) aligning the day-count convention used between option price smoothing and its models for simulating implied volatility, and (2) extending the term structure[14] to cover implied volatility risk associated with options expiring in less than one-month. The proposed changes will be introduced to the Implied Volatilities Scenarios Model and S&P 500 Implied Volatility Simulation Model in STANS and the Volatility Shock component in CST. The impact of the proposed enhancements on Clearing Member margin and on CST is presented further below.

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[11]   The term "day count convention" refers to a standardized methodology for calculating the number of days between two dates. Both calendar and business day conventions are used by OCC in STANS and CST calculations.

[12]   The "tenor" of an option is the amount of time remaining to its expiration or maturity.

[13]   OCC has observed that the day-over-day at the money implied volatility changes for the 1W tenor are approximately twice that of the 1M tenor on certain risk factors such as SPX, RUT, QQQ, AAPL, TSLA.

[14]   The "term structure" of implied volatility is the curve that depicts the relationship between the implied volatilities of options with different expiration (or maturity) dates on the same underlying. Expiration and maturity are used interchangeably but reflect the same meaning.

A.   <u>Purpose</u>

Background

OCC's risk framework includes its STANS methodology used to calculate Clearing Member margin amounts, and its CST methodology used to stress test Clearing Member portfolios in order to determine the appropriate size of the Clearing Fund and allocate portions to Clearing Members commensurate with the risk they present to OCC.

<u>STANS Overview</u>

STANS is OCC's proprietary risk management system for calculating Clearing Member margin requirements. The STANS methodology utilizes large-scale Monte Carlo simulations to forecast price and volatility movements in determining a Clearing Member's margin requirement.[15] OCC uses a smoothing algorithm to generate theoretical prices and volatilities for option contracts based on the fair value for plain vanilla listed options from closing bid and ask price quotes.[16] OCC does this by first filtering out certain poor-quality quotes on contracts based on certain conditions and estimates the forward prices of the securities underlying these options. OCC then generates the theoretical option prices based on the filtered bid and ask quotes and constructs a volatility surface[17] using the smoothed prices to approximate option contract prices. The output of the Smoothing Algorithm, consisting of various theoretical option contract prices and volatilities, is then used downstream as a starting point to simulate variations in implied volatility for option contracts.

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[15]   See OCC Rule 601.

[16]   See Exchange Act Release No. 86731 (Aug. 22, 2019), 84 FR 45188 (Aug. 28, 2019) (SR-OCC-2019-005).

[17]   The "volatility surface" refers to a three-dimensional plot of the implied volatilities of the various options on the same stock reflecting time to maturity, and different strike prices for the option.

Using the Black-Scholes options pricing model, the implied volatility is the standard deviation of the underlying asset price necessary to arrive at the market price of an option of a given strike, time to maturity, underlying asset price and the current discount interest rate. In effect, the implied volatility is responsible for that portion of the premium that cannot be explained by the current intrinsic value of the option (i.e., the difference between the price of the underlying and the exercise price of the option), discounted to reflect its time value. OCC considers variations in implied volatility within STANS to ensure that the anticipated cost of liquidating options positions in an account recognizes the possibility that the implied volatility could change during the two-business day liquidation time horizon and lead to corresponding changes in the market prices of the options. Specifically, OCC models variations in implied volatility using its (1) Implied Volatilities Scenarios Model for non-S&P 500 based products, and (2) S&P 500 Implied Volatility Simulation Model for products in the S&P 500 group.[18]

Implied Volatilities Scenarios Model

Using its current Implied Volatilities Scenarios Model, OCC models the variations in implied volatility used to re-price non-S&P 500 based options within STANS. Variations in implied volatility are modeled through a volatility surface by incorporating certain risk factors (i.e., implied volatility pivot points) based on a range of tenors and option deltas[19] into the models in STANS. These implied volatility pivot points consist of three tenors of one month, three months and one year, and three deltas of 0.25, 0.5, and 0.75, resulting in nine implied volatility risk factors.[20] These pivot points are chosen such that their combination allows the

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[18]   See generally Exchange Act Release No. 95319, supra note 3, at 44168-69.

[19]   The "delta" of an option represents the sensitivity of the option price with respect to the price of the underlying security.

[20]   See Exchange Act Release No. 94165 (Feb. 7, 2022), 87 FR 8072, 8073 (Feb. 11, 2022) (SR-OCC-2022-001).

model to capture changes in level, skew (i.e., strike price), convexity, and term structure of the implied volatility surface.[21]

The Implied Volatility Scenarios Model has certain limitations related to SDOs. First, the underlying prices and implied volatilities generated from the Smoothing Algorithm, which are an input to the Implied Volatility Scenarios Model, are generated using a calendar day convention, which is not consistent with the trading day convention used in the calibration of the model parameters. The misalignment in day-count conventions may result in over- or under-estimation of option prices based on the implied volatility scenarios. SDOs are more sensitive to day-count convention alignment than contracts with longer expirations due to the proportionally larger difference in time to expiry between the trading day convention and calendar day convention for shorter dated tenors.

Second, the model imposes a flat term structure on SDOs, which forces the use of the implied volatility shock from the 1M tenor on all option contracts expiring in less than one month. Because the term structure for the Implied Volatilities Scenarios Model starts at the 1M tenor, the current model is not consistent with the observed dynamics of the underlying assets and the implied volatility surface for SDOs. This may lead to inadequate coverage for portfolios with concentrations in SDOs.

S&P 500 Implied Volatility Simulation Model

OCC uses the S&P 500 Implied Volatility Simulation Model for the S&P 500 product group.[22] The purpose of the S&P 500 Implied Volatility Simulation Model is to establish a consistent and robust framework for implied volatility simulation and provide natural offsets for volatility products with similar characteristics to S&P 500 implied volatility. The output of the

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[21]   Id.

[22]   See generally Exchange Act Release No. 95319, supra note 3, at 44168-69.

S&P 500 Implied Volatility Simulation Model is used by OCC's options pricing model, as well as the Volatility Index Futures Model. The S&P 500 Implied Volatility Simulation Model is a Monte Carlo simulation model that captures the risk dynamics in the S&P 500 implied volatility surface utilizing standardized log-moneyness[23] and a fixed number of key tenors as well as skew to generate an S&P 500 1M at-the-money ("ATM") risk factor.[24] OCC then uses the generated implied volatility scenarios to produce option prices in margin estimation and stress testing.[25]

The S&P 500 Implied Volatility Simulation Model has certain limitations related to SDOs. Like the Implied Volatilities Scenarios Model discussed above, the S&P 500 Implied Volatility Simulation Model uses a trading day convention in the calibration of the model, which is not consistent with the calendar day convention used in the generation of the input from the Smoothing Algorithm. As for the Implied Volatilities Scenarios Model, this misalignment may result in over- or under-estimation of option prices, particularly for SDOs. Second, the S&P 500 Implied Volatility Simulation Model uses a fixed number of key tenors beginning with the 1M tenor. Because the term structure for the S&P 500 Implied Volatility Simulation Model starts at the 1M tenor, the current model is not consistent with the observed dynamics of the underlying assets and the implied volatility surface for SDOs, which may lead to inadequate coverage for portfolios with concentrations in SDOs.

<u>CST Overview</u>

As described in the CST Methodology Description, OCC uses CST to analyze the adequacy of its financial resources in extreme but plausible scenarios. It enables OCC to better

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23   The term "moneyness" of an option refers to the relationship between the strike price and the price of the option underlying.

24   See Exchange Act Release No. 94165, supra note 20, at 8075.

25   Id.

manage its risks by promoting OCC's ability to thoroughly monitor its potential exposure under varied sets of stressed market scenarios and provides it with the ability to review the sufficiency of its financial resources. Moreover, the methodology includes stress tests designed to size and monitor the sufficiency of both prefunded credit and liquidity resources. OCC relies upon a set of stress scenarios constructed pursuant to the CST Methodology Description, including both Sizing and Sufficiency scenarios.

CST is a scenario-based, one-factor risk model with four principal elements.[26] First, a set of risk drivers is selected based on the portfolio exposures of all Clearing Members in the aggregate.[27] Second, each individual underlying security from the portfolio of a Clearing Member is mapped to a key risk driver, to estimate the sensitivity for the beta[28] of the security with respect to the corresponding risk driver.[29] Third, stress scenarios are generated by assigning a stress shock to each of the risk drivers, which drives the shock of an individual underlying security.[30] Fourth, the aggregate risk exposure or shortfall of each portfolio is generated for each stress scenario for each Clearing Member and the Clearing Member Group level.[31] The CST methodology consists of several component models, including the Volatility Shocks, the VIX Futures Prices Shocks, and Idiosyncratic Scenarios models.

Volatility Shocks

The Volatility Shocks model component of the CST methodology provides a method to generate implied volatility in a stress scenario for all individual option products that are cleared

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[26]   See Exchange Act Release No. 83406 (Jun 11, 2018), 83 FR 28018, 28022 (June 15, 2018) (SR-OCC-2018-008).

[27]   Id.

[28]   The "beta" of a security is the sensitivity of the price of the security relative to the price of the security.

[29]   Exchange Act Release No. 83406, supra note 26, at 28022.

[30]   Id.

[31]   Id.

by OCC.[32] This model component is used to shock any option product cleared by OCC.

Shocked implied volatility is needed at the product, expiration, and strike level to evaluate

individual option implied volatilities in stressed market conditions, which is then used to

determine options prices and calculate the profit and loss of Clearing Member accounts in stress

scenarios. For all systemic stress scenarios,[33] the Cboe Volatility Index ("VIX") is used as the

main risk driver in determining shocked implied volatility.[34]

Two methods are used to generate strike-level shocked implied volatility from VIX

shocks: (1) an approach for equity products, including equity ETFs, indexes and futures that have

the S&P 500 Index ("SPX") as the risk driver; and (2) an approach used for options on all risk

factors that do not have SPX as a risk driver. The term structure of SPX-driven implied

volatilities is based on volatility betas versus VIX, while a standardized log-moneyness metric is

used to model the implied volatility curves.[35] For non-SPX driven risk factors, the implied

volatility shocks are based on historical volatility beta regressed directly against the VIX.[36]

The Volatility Shocks component of CST has certain limitations related to SDOs. First,

like the STANS models discussed above, the Volatility Shocks component uses a trading day

convention in the calibration of model parameters, which is not consistent with the calendar day

convention used by the Smoothing Algorithm. As discussed above, this misalignment may result

in over- or under-estimation of option prices, particularly for SDOs. Second, Volatility Shock

imposes a flat term structure for SDOs when calculating shocked implied volatility, which is not

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[32] See generally id. at 28023.

[33] The term "systemic stress scenarios" are scenarios designed to the capture risk to OCC in an extreme event impacting all positions driven by risk drivers.

[34] Exchange Act Release No. 83406, supra note 26, at 28023.

[35] Id.

[36] Id.

consistent with the observed dynamics of the underlying assets and the implied volatility surface

for SDOs. These limitations may result in inadequate shocks for SDOs.

VIX Futures Price Shocks

The VIX is an index for measuring implied volatility based on options on the SPX with

approximately 30 days to expiration. OCC derives VIX futures prices shocks from SPX

volatility betas and VIX index shocks using the VIX Futures Price Shocks component of CST.[37]

The term structure of the VIX futures prices shocks is modeled from that of the SPX ATM

implied volatility shocks. OCC first determines the term structure of the SPX volatility beta, by

running regression of the 2-day returns of SPX ATM implied volatility with respect to the 2-day

returns of the VIX index for different expirations, ranging from 1M to twelve months ("12M").[38]

Through linear interpolation on the term structure curve of SPX volatility beta OCC determines

the volatility beta at the VIX futures expiration and 30 days after, which are the basis to calculate

VIX futures price shocks. As a final step a constraint is then applied to ensure that the VIX

futures price shocks do not exceed the VIX index shock.

Like the Volatility Shocks model, the VIX Futures Price Shocks component imposes a

flat term structure for SDOs when calculating shocked implied volatility, which is not consistent

with the observed dynamics of the underlying assets and the implied volatility surface for SDOs.

This limitation of the VIX Futures Price Shocks model may result in inadequate shocks for

SDOs.[39]

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[37]   See Exchange Act Release No. 87386 (Oct. 23, 2019), 84 FR 57911, 57913-14 (Oct. 29, 2019) (SR-OCC-2019-009).

[38]   See id. at 57916 n. 29 and accompanying text.

[39]   Unlike the other model discussed herein, the VIX Futures Price Shocks model uses the SPX volatility beta with extended tenors less than 1 month from the Volatility Shocks model component and Dynamic VIX Calibration model component as inputs, and day-count convention alignment is not within the scope for this model component.

Idiosyncratic Scenarios

OCC uses Idiosyncratic Scenarios to generate and capture the risk from extreme non-systemic events that may impact OCC's financial resources.[40] Specifically, OCC captures the risk of extreme non-systemic market moves on single name equity securities (non-ETF, non-Index) through individual up and down shocks (assuming all other products are unchanged). Single-name equities are classified into large and small capitalization (cap) for the price shocks. Four types of idiosyncratic moves are constructed based on the market capitalization and direction of the price shock: large cap up, large cap down, small cap up and small cap down.[41] A fixed price shock for each of the four scenarios is calibrated from historical price return data such that probability of idiosyncratic moves is comparable to systemic scenarios and probability in all four scenarios is approximately equal. Based on price shocks, ATM implied volatility shocks are calibrated for each of the four scenarios.[42]

The Idiosyncratic Scenarios component of CST shares the limitations related to SDOs discussed above with respect to the other models. Specifically, the Idiosyncratic Scenarios component uses a trading day convention in the calibration of model parameters, which is not consistent with the Smoothing Algorithm's calendar day convention. As discussed above, this misalignment may result in over- or under-estimation of option prices, particularly for SDOs. Second, like the Volatility Shocks model, Idiosyncratic Scenarios imposes a flat term structure for SDOs when calculating shocked implied volatility, which is not consistent with the observed dynamics of the underlying assets and the implied volatility surface for SDOs. These limitations may result in inadequate shocks for SDOs.

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[40]   See generally Exchange Act Release No. 87386, supra note 37, at 57913.

[41]   Id.

[42]   Id.

Proposed Change

OCC proposes to capture the risks associated with SDOs by applying enhancements to the implied volatility modeling approach to: (1) align the day-count convention between option price smoothing and implied volatility scenario generation, and (2) extend the term structure to cover implied volatility risk associated with options with less than one month to expiration. These enhancements will be implemented for model components in STANS and CST.

Day-Count Convention Alignment

At present, the implied volatility output from smoothing, determined using a calendar day convention, is directly applied in the initial implied volatility scenarios in STANS and CST. However, the calibration of the parameters used in implied volatility scenarios uses a trading day convention, which is also used to model forecasted variance as well as the shocks in CST. OCC proposes to align the day-count convention to be consistent between calibration and price smoothing in both STANS and CST.

In STANS, OCC proposes to align the day-count convention between price smoothing and its model components used for forecasting changes in implied volatility through amendments to the sections of the STANS Methodology Description that address the Implied Volatilities Scenarios Model and the S&P 500 Implied Volatility Simulation Model.[43] For the Implied Volatilities Scenarios Model (pivot-based), implied volatility levels would be initially converted into trading day convention before application of pivot scenario shocks. The shocked implied volatility scenarios would then be converted back to calendar day convention before being used to calculate shocked option price scenarios. For the S&P 500 Implied Volatility Simulation

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[43] OCC would also make conforming changes to the whitepapers for these models. OCC has provided updates to its STANS whitepapers for the impacted models in confidential Exhibit 3B and 3C to File No. SR-OCC-2024-016.

Model, the process for generating the shocked implied volatility scenarios for listed tenors would convert the initial implied volatility from using calendar day convention to using trading day convention followed by generation of the ATM implied volatility log-return scenarios for listed tenors. The skew shock scenarios would be generated next, followed by the shocked implied volatility scenarios. The outputs of the shocked implied volatility scenarios would then be converted back to calendar day convention before calculating the theoretical option price scenarios. These conversion steps taken together would then align the day-count convention used in both option price smoothing and implied volatility simulations.

Similarly, OCC would align the day-count convention of the Implied Volatility Shocks in CST through conversion of the initial volatility surface from the output of the Smoothing Algorithm to business day convention before application of any volatility shocks.[44] After the volatility shock is applied, the shocked implied volatility would then be scaled back to calendar day convention, before being used downstream for option pricing in CST. These changes would be reflected in amendments to the CST Methodology Description's section that addresses the Volatility Shock Model. With respect to the Idiosyncratic Scenarios, the CST methodology already provides that after calculating the shocked ATM volatility, the shocked implied volatility for all the strikes in the expiration follows the same methodology as for the Volatility Shock Model.

<u>Extension of the Term Structure</u>

At present, the STANS Implied Volatilities Scenarios model uses a flat term structure for options with listed tenors that are shorter than one month, which means that the implied volatility

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[44] OCC would also make conforming changes to the whitepapers for these models. OCC has provided updates to its CST whitepapers for the impacted models in confidential Exhibit 3D and 3F to File No. SR-OCC-2024-016.

shock is derived from the 1M key tenor or pivot. OCC proposes to change the Implied Volatility

Scenarios term structure for the implied volatility simulation of all non-SPX related risk factors,

such that for points with shorter than one month to maturity, a squared-root decay is applied with

respect to one month to expiration up to a predetermined shortest time to maturity. For the S&P

500 Implied Volatility Simulation Model term structure and SPX related risk factors, the

applicable sections of the STANS Methodology Description would be updated to provide for a

shorter key tenor than the current 1M time to maturity.

With respect to the CST Volatility Shocks model, which uses the volatility beta from the

1M tenor for SDOs, OCC proposes to extend the volatility beta approach to cover constant

maturity tenors of less than one-month expiration by adding constant maturity tenors at the 1-

week ("1W") and 2-week ("2W") key points of the term structure. Similarly, for the VIX

Futures Price Shocks model, OCC proposes that the volatility beta for listed tenors that are less

than the 1W tenor and down to the 3-day ("3D") tenor would be linearly interpolated from the

1W tenor and 2W tenor volatility betas, i.e., the 1W and 2W tenor expirations would be added as

inputs to the term structure of SPX volatility betas. As for Idiosyncratic Scenarios, the term

structure would be extended from 1M down to the 1W tenor and 2W tenor. These changes

would be applied to the section of the CST Methodology Description that addresses the

Volatility Shock Model, the same methodology for which also applies to the Idiosyncratic

Scenarios Models as described above. In addition, this change would also apply to the VIX

Futures Price Shock Model because the Volatility Shock Model's method is incorporated by

reference in the section that describes the volatility beta shocks applied to volatility instruments.

OCC also proposes to update the day count to the more precise value of 365.25 within the

CST Methodology Description when referring to calendar days in a year and also when used in a

formula. This amendment to the CST Methodology Description conforms with how the system was designed to be consistent with the day-count convention specified in the STANS Methodology Description. Since the CST system already uses a 365.25 day count convention, the proposed change to correct the documentation would have no impact on stress test results. Additionally, OCC plans to make several other minor non-substantial typographical changes throughout the document.

In addition, OCC proposes to further revise the relevant sections of the STANS Methodology Description concerning the S&P 500 Implied Volatility Simulation model to eliminate redundant and duplicative information. Specifically, OCC proposes to remove sections related to the generation of the simulation of certain shocks that are duplicative of information covered in the STANS Methodology Description's discussion of the theory and specifications for that model. The sections related to the simulation of the shocked implied volatility scenarios would be amended to instead refer to those previous sections, which would be updated to reflect the two changes proposed herein.

Impact Analysis

OCC has reviewed the potential impact of the proposed changes on margin across all Clearing Member tier accounts over a 15-month period, between July 2023 and September 2024. OCC observed that the proposed enhancements would lead to an average daily total margin[45] increase of 0.58% (approximately $0.2 billion, calculated based on the average daily margin of nearly $38 billion) across all accounts and activity dates, with the daily total margins falling in a narrow range between the largest decrease of 0.81% (approximately $0.3 billion) to the largest increase of 3.21% (approximately $1.1 billion). The results further demonstrated that the SDO

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[45]   Margin is calculated as the sum of requirement shortfall and stress test add-on charge.

enhancements had a larger measurable impact for accounts with high concentrations of short-dated options.

OCC also reviewed the potential impact on CST for the proposed model enhancements based on backtesting results over the same time period. OCC observed that the proposed changes had a relatively small impact on the Cover 1 and Cover 2 shortfalls used in Sufficiency and Sizing Scenarios for the leading Clearing Member Groups. The impact varied among Clearing Members, influenced by factors such as portfolio size, product diversity within those portfolios, and the concentration of SDO positions. Smaller Clearing Members with a high concentration of SDO positions experienced relatively more meaningful impacts.

With respect to Sizing Scenarios impacts, OCC observed a decrease in the average Cover 2 shortfall for the 1-in-80-Year Rally Scenario of 0.1% (approximately $12.7 million) with the daily variation falling in a narrow range between the largest decrease of 3.18% to the largest increase of 0.53%. For the Cover 2 shortfall on the 1-in-80-Year Decline Scenario OCC observed an average decrease of 0.47% (approximately $65 million) with the daily variation falling in a narrow range between the largest decrease of 3.17% to the largest increase of 1.16%.

Simliarly, regarding Sufficiency Scenarios impacts, OCC observed a decrease in the average Cover 1 shortfall for the 1987 Crash Scenario of 0.39% (approximately $37 million) with the daily variation falling in the range between the largest daily decrease of 3.15% and largest daily increase of 1.97%. For the Largest Rally from 2008 Sufficiency Scenario, the daily average Cover 2 Shortfall increased by around 0.22%, which is about $16 million. The shortfall ranged between a decrease of $208 million and an increase of $116 million, which is about a decrease of 3.54% to an increase of 1.90%. For the Largest Rally from 2008 - Historical Beta

Sufficiency Scenario[46], the daily average Cover 2 Shortfall decreased by around 0.1%, which is about $7 million. The shortfall ranged between a decrease of $196 million and an increase of $143 million, which is about a decrease of 1.93% to an increase of 1.41%.

Overall, OCC observed a reduction to the Clearing Fund size of around 0.14% (approximately $14 million) based on the changes in Cover 2 shortfalls in Sizing Scenarios. OCC believes that such changes to margin and Cover 1 Sufficiency Scenarios and Cover 2 Sizing Scenarios are commensurate with the risks presented by Clearing Members SDO trading activities.

Implementation and Timeframe

The proposed margin model and CST methodology changes will be integrated into OCC's current production system, and implemented within 180 days after the date that OCC receives all necessary regulatory approvals for the proposed changes. OCC will announce the implementation date of the proposed changes by an Information Memorandum posted to its public website at least 2 weeks prior to implementation.

B.   Statutory Basis

OCC believes the proposed rule change is consistent with Section 17A of the Exchange Act[47] and Rules 17Ad-22(e)(6)[48] and (e)(7)[49] thereunder. Section 17A(b)(3)(F) of the Act[50] requires, among other things, that the rules of a clearing agency be designed to promote the prompt and accurate clearance and settlement of securities transactions, and in general, to protect

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[46]   OCC notes that backtesting data for this scenario is limited due to its recent deployment and use in production.

[47]   15 U.S.C. 78q-1.

[48]   17 CFR 240.17Ad-22(e)(6).

[49]   17 CFR 240.17Ad-22(e)(7).

[50]   15 U.S.C. 78q-1(b)(3)(F).

investors and the public interest. As described above, OCC could be exposed to increased credit

and liquidity risk if the margin and Clearing Fund models do not adequately capture changes to

the dynamic behavior of the implied volatility associated with portfolios dominated by SDO

positions. As discussed above, OCC believes the proposed enhancements improve the model

performance for portfolios with high SDO concentration. The output of these models would be

used by OCC to calculate margin and Clearing Fund requirements designed to limit its credit and

liquidity exposures to participants and ensure that OCC is able to continue the prompt and

accurate clearance and settlement of its cleared products. The collection of margin and Clearing

Fund helps to protect investors and the public interest by ensuring OCC has sufficient resources

to manage a potential Clearing Member default that may otherwise impose unexpected costs on

non-defaulting Clearing Members and, ultimately, their customers. For these reasons, OCC

believes the proposed changes are designed to promote the prompt and accurate clearance and

settlement of securities transactions, and, thereby, to protect investors and the public interest in

accordance with Section 17A(b)(3)(F) of the Exchange Act.[51]

OCC also believes that the proposed changes are consistent with Rule 17Ad-22(e)(6).[52]

In particular, paragraphs (i), (iii), and (v) of Rule 17Ad-22(e)(6)[53] require a covered clearing

agency that provides central counterparty services to establish, implement, maintain and enforce

written policies and procedures reasonably designed to cover its credit exposures to its

participants by establishing a risk-based margin system that (1) considers, and produces margin

levels commensurate with, the risks and particular attributes of each relevant product, portfolio,

and market; (2) calculates margin sufficient to cover its potential future exposure to participants

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[51]   Id.

[52]   17 CFR 240.17Ad-2(e)(6).

[53]   17 CFR 240.17Ad-2(e)(6)(i), (iii), (v).

in the interval between the last margin collection and the close out of positions following a participant default; and (3) uses an appropriate method for measuring credit exposure that accounts for relevant product risk factors and portfolio effects across products. As noted above, OCC's current models in STANS may not adequately capture the implied volatility behaviors associated with SDO in portfolios that may be dominated by SDO positions, which could result in inadequate margin requirements. As described in detail above, OCC believes that aligning the day count convention and extending the term structure in OCC's margin system to take into consideration SDO specific attributes, are appropriate methods to enable OCC to measure SDO credit exposure and produce margin requirements commensurate with the risks presented by SDO trading activities, and as designed enables OCC to calculate margin sufficient to cover SDO exposure from Clearing Member accounts with high concentrations of short-dated options. The proposed changes are designed to enhance model outputs to produce margin requirements that are commensurate with the risks presented by portfolios containing SDO s positions. As a result, OCC believes that the proposed changes are reasonably designed to calculate margin commensurate with risks and particular attributes of SDO and sufficient to cover its potential future exposure to participants in the interval between the last margin collection and the close out of positions following a participant default, and uses an appropriate method to measure credit exposures that accounts for the relevant SDO product risk factors in a manner consistent with Rules 17Ad-22(e)(6)(i), (iii) and (v).[54]

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[54] Id.

Item 4.   <u>Self-Regulatory Organization's Statement on Burden on Competition</u>

Section 17A(b)(3)(I) requires that the rules of a clearing agency do not impose any burden on competition not necessary or appropriate in furtherance of the purposes of the Act.[55] The proposed alignment of the calendar convention between price smoothing and model calibration, and the extension of the term structure for implied volatility and volatility shocks, would be used by OCC to manage its credit and liquidity risk across all Clearing Members. Accordingly, OCC does not believe that the proposed rule change would unfairly hinder access to OCC's services.

While the proposed rule change may impact different accounts to a greater or lesser degree depending on the composition of SDO positions in each account, OCC does not believe that the proposed rule change would impose any burden on competition not necessary or appropriate in furtherance of the purposes of the Exchange Act. As discussed above, OCC is obligated under the Exchange Act and the regulations thereunder to establish, implement, maintain and enforce written policies and procedures reasonably designed to cover its credit exposures to its participants by establishing a risk-based margin system that, among other things, considers, and produces margin levels commensurate with the risks and particular attributes of each relevant product, portfolio, and market.[56] Overall, the impact analysis indicates there are significant improvements in performance and margin coverage for SDOs from the proposed model enhancements.

Moreover, while the composition of SDOs within Clearing Member portfolios may drive margin and scenario charges that may be higher or lower than under the current regime, nevertheless OCC believes that margin coverage improvements occur with the adoption of the

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[55]   15 U.S.C. 78q-1(b)(3)(I).

[56]   <u>See</u> 17 CFR 240.17Ad-2(e)(6)(i).

proposed enhancements. These enhanced model components would utilize a more consistent approach to calendar conventions, while the term structure is also extended to account for SDO tenors, which directly address certain limitations within the current implementation of STANS and CST models. In addition, the proposed model enhancements are expected to produce margin requirements that are more commensurate to the risks generated from holding SDO positions within Clearing Member portfolios, and therefore consistent with OCC's obligations under the Exchange Act and regulations thereunder. Accordingly, OCC believes that the proposed rule change would not impose any burden or impact on competition not necessary or appropriate in furtherance of the purposes of the Exchange Act.

Item 5. **Self-Regulatory Organization's Statement on Comments on the Proposed Rule Change Received from Members, Participants or Others**

Written comments were not, and are not, intended to be solicited with respect to the proposed change and none have been received.

Item 6. **Extension of Time Period for Commission Action**

Not applicable.

Item 7. **Basis for Summary Effectiveness Pursuant to Section 19(b)(3) or for Accelerated Effectiveness Pursuant to Section 19(b)(2) or Section 19(b)(7)(D)**

Not applicable.

Item 8. **Advance Notice Based on Rule of Another Self-Regulatory Organization or of the Commission**

Not applicable.

Item 9. **Security-Based Swap Submissions Filed Pursuant to Section 3C of the Exchange Act**

Not applicable.

Item 10.   **Advance Notices Filed Pursuant to Section 806(e) of**
                    the Payment, Clearing and Settlement Supervision Act

Not applicable.

Item 11.   **Exhibits**

Exhibit 1A.   Completed Notice of Proposed Rule Change for publication in the <u>Federal</u>
               <u>Register</u>.

Exhibit 3A.   OCC Short-dated Options Study.

Exhibit 3B.   Implied Volatilities Scenarios Model whitepaper.

Exhibit 3C.   S&P 500 Implied Volatility Simulation Model whitepaper.

Exhibit 3D.   CST Model Component VIX Futures Prices Shocks whitepaper.

Exhibit 3E.   CST Model Component Volatility Shocks whitepaper.

Exhibit 3F.   CST Idiosyncratic Stress Scenarios whitepaper.

Exhibit 5A.   Proposed changes to the System for Theoretical Analysis and Numerical
               Simulation (STANS) Methodology Description.

Exhibit 5B.   Proposed changes to the Comprehensive Stress Testing & Clearing Fund
               Methodology, and Liquidity Risk Management Description.

Confidential Treatment is Requested for Exhibits 3A, 3B, 3C, 3D, 3E, 3F, 5A and 5B
pursuant to SEC Rule 17 CFR 240.24b-2.

EXHIBIT 1A

SECURITIES AND EXCHANGE COMMISSION
(Release No. 34-[_____]; File No. SR-OCC-2024-016)

[___, 2024]

Self-Regulatory Organizations; The Options Clearing Corporation; Notice of Filing of
Proposed Rule Change by The Options Clearing Corporation Concerning Enhancements
to the System for Theoretical Analysis and Numerical Simulations ("STANS") and
OCC's Comprehensive Stress Testing ("CST") Methodology, to Better Capture the Risks
Associated with Short-dated Options.

Pursuant to Section 19(b)(1) of the Securities Exchange Act of 1934 ("Exchange

Act" or "Act"),[1] and Rule 19b-4 thereunder,[2] notice is hereby given that on November

22, 2024, The Options Clearing Corporation ("OCC" or "Corporation") 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

primarily by OCC. The Commission is publishing this notice to solicit comments on the

proposed rule change from interested persons.

I.   Clearing Agency's Statement of the Terms of Substance of the Proposed Rule
        Change

This proposed rule change Pursuant to the provisions of Section 19(b)(1) of the

Securities Exchange Act of 1934 ("Exchange Act" or "Act"),[3] and Rule 19b-4

thereunder,[4] The Options Clearing Corporation ("OCC") is filing with the Securities and

Exchange Commission ("Commission") a proposed rule change in connection with

enhancements to the modeling approach for implied volatility components within OCC's

margin methodology, the System for Theoretical Analysis and Numerical Simulations

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[1]   15 U.S.C. 78s(b)(1).

[2]   17 CFR 240.19b-4.

[3]   15 U.S.C. 78s(b)(1).

[4]   17 CFR 240.19b-4.

("STANS") and OCC's Comprehensive Stress Testing ("CST") methodology, to better capture the risks associated with short-dated options. Specifically, this proposed rule change would, as described below: (1) align the day-count convention between option price smoothing and implied volatility scenario generation, and (2) extend the term structure of the implied volatility shocks to cover implied volatility risk associated with options of less than one-month expiration.

The proposed changes to OCC's STANS Methodology Description[5] and Comprehensive Stress Testing & Clearing Fund Methodology, and Liquidity Risk Management Description[6] ("CST Methodology Description") are contained in Exhibits 5A and 5B, to File No. SR-OCC-2024-016, respectively. Material proposed to be added is marked by underlining and material proposed to be deleted is marked with strikethrough text. Within the documents, new, revised, and deleted text related to the proposed rule change have been incorporated in section 2.1.3 (Implied Volatilities Scenarios) and 2.1.4 (S&P 500 Implied Volatilities Scenarios) of the STANS Methodology Description and section 3.3.2 (Volatility Shock Model) of the CST Methodology Description. The proposed rule change does not require any changes to the

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5   OCC has filed the STANS Methodology Description and amendments thereto with the Commission. See Exchange Act Release Nos. 100528 (July 15, 2024), 89 FR 58836 (July 19, 2024) (SR-OCC-2024-008); 98101 (Aug. 10, 2023), 88 FR 55775 (Aug. 16, 2023) (SR-OCC-2022-012); 95319 (July 19, 2022), 87 FR 44167 (July 25, 2022) (SR-OCC-2022-001); 93371 (Oct. 18, 2021), 86 FR 58704 (Oct. 22, 2021) (SR-OCC-2021-011); 91833 (May 10, 2021), 86 FR 26586 (May 14, 2021) (SR-OCC-2021-\005); 91079 (Feb. 8, 2021), 86 FR 9410 (Feb. 12, 2021) (SR-OCC-2020-016). OCC makes its STANS Methodology Description available to Clearing Members. An overview of the STANS methodology is on OCC's public website: https://www.theocc.com/Risk-Management/Margin-Methodology.

6   OCC has filed the CST Methodology Description and amendments thereto with the Commission. See Exchange Act Release Nos. 100455 (July 2, 2024), 89 FR 56452 (July 9, 2024) (SR-OCC-2024-006); 90827 (Dec. 30, 2020), 86 FR 659 (Jan. 6, 2021) (SR-OCC-2020-015); 89014 (June 4, 2020), 85 FR 35446 (June 10, 2020) (SR-OCC-2020-003); 87718 (Dec. 11, 2019), 84 FR 68992 (Dec. 17, 2019) (SR-OCC-2019-010); 87717 (Dec. 11, 2019), 84 FR 68985 (Dec. 17, 2019) (SR-OCC-2019-009); 83735 (July 27, 2018), 83 FR 37855 (Aug. 2, 2018) (SR-OCC-2018-008).

text of OCC's By-Laws or Rules. All terms with initial capitalization that are not otherwise defined herein have the same meaning as set forth in the OCC By-Laws and Rules.[7]

II.   Clearing Agency's Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change

In its filing with the Commission, OCC 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. OCC has prepared summaries, set forth in sections (A), (B), and (C) below, of the most significant aspects of these statements.

(A)   Clearing Agency's Statement of the Purpose of, and Statutory Basis for, the Proposed Rule Change

OCC is the sole clearing agency for standardized equity options listed on national securities exchanges registered with the Commission. In its role as a clearing agency, OCC acts as a central counterparty ("CCP"), guarantying all contracts it clears. That is, OCC becomes the buyer to every seller and the seller to every buyer, which exposes OCC to risk because OCC is obligated to perform even when one of its members defaults. These risks include: (i) credit risk, which is the risk that OCC would not maintain sufficient financial resources to cover exposures; and (ii) liquidity risk, which is the risk that OCC would not have sufficient liquid resources to meet payment obligations when due.

OCC manages its credit and liquidity risks through various safeguards to ensure that it has sufficient financial resources in both form and amount in the event of a

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[7]   OCC's By-Laws and Rules can be found on OCC's public website: https://www.theocc.com/Company-Information/Documents-and-Archives/By-Laws-and-Rules.

Clearing Member failure. To begin with, OCC periodically collects margin collateral

from its Clearing Members, which is designed to cover the credit exposures they

individually present to OCC with a high degree of confidence. OCC also maintains a

Clearing Fund, which is a mutualized pool of financial resources to which each Clearing

Member is required to contribute to ensure that OCC maintains sufficient qualifying

liquid resources to manage its liquidity risk, and to address the tail risk that the margin

collateral OCC collects from each Clearing Member might be insufficient to cover

OCC's credit exposure to a defaulting member in extreme but plausible market

conditions. In general, OCC performs daily stress testing of its financial resources using

scenarios designed to assess whether the resources collected are adequate and inform the

size of OCC's financial resources ("Sizing Scenarios") and measure the potential

exposures Clearing Members may present to OCC to determine whether calls for

additional collateral in either margin or in the Clearing Fund would be needed

("Sufficiency Scenarios"). Clearing Member margin amounts are collected based on

calculations obtained from STANS, while Clearing Fund contributions are default

scenario-based amounts generated by the CST methodology.

Clearing Member portfolios contain a mix of products and positions in options of

various tenors, as well as other cleared positions (e.g., futures, stock loans) and collateral

(e.g., valued securities, delivery obligations, US treasuries, Canadian Government bonds,

and cash). Over the past several years, the options markets in particular have experienced

a significant increase in the trading of short-dated options ("SDOs"), which refer to

option contracts with a maturity of less than or equal to one month to expiration.[8]

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[8]   See, e.g., Cboe, The Rise of SPX & 0DTE Options (July 27, 2023), available at
https://go.cboe.com/l/77532/2023-07-27/ffc83k.

However, the increase in the volume of SDO trading and the larger concentration of SDO positions held from hedging and speculation activities present unique challenges to the risk management framework.

For these reasons, OCC carried out a study to examine the specific risks posed by SDOs (the "Study")[9] including risks posed by the increase to volatility due to the feedback between options and equity hedging activity. OCC also analyzed the valuation of SDOs and option scenario pricing in OCC's 2-day margin period of risk ("MPOR")[10] and assessed the margin risk of portfolios dominated by SDOs through sensitivity analysis of realized P&L and risk coverage metrics. OCC concluded from the Study that valuation of SDOs and options scenario pricing in the 2-day MPOR was in general reasonable, but that opportunities exist to improve model performance for Clearing Member portfolios dominated by SDOs. Moreover, a reasonableness analysis of the mark-to market pricing and theoretical price simulation of SDOs in the MPOR indicated that certain existing margin model assumptions having a direct impact on SDO risk coverage needed further enhancement and update.

Specifically, the Study referred to a difference between option price smoothing[11] that uses calendar day convention, and implied volatility[12] simulation that uses trading

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[9]   OCC has included the Study as confidential Exhibit 3A to File No. SR-OCC-2024-016

[10]   OCC collects its credit resources with an assumption of a two-day MPOR (i.e., two days after the last good margin collection) and potential liquidity obligations are evaluated using the same concept and assuming the liquidation processes details in OCC's Default Management Policy.

[11]   The smoothing algorithm is the process that OCC uses to estimate fair values for plain vanilla listed options based on closing bid and ask price quotes. See Exchange Act Release No. 86731 (Aug. 22, 2019), 84 FR 45188, 45189 (Aug. 28, 2019) (File No. SR-OCC-2019-005).

[12]   Generally speaking, the implied volatility of an option is a measure of the expected future volatility of the option's underlying security at expiration, which is reflected in the current option premium in the market.

day convention. The usage of two day count conventions[13] results in differences in implied volatility, especially when non-trading days make up a large portion of the time-to-expiration (e.g., on Fridays for options that expire the following Monday). In this regard, SDOs are far more sensitive to differences in day-count convention than contracts with longer expiries. In addition, OCC's model for simulating the theoretical prices assumes that the implied volatility shocks of the one-month tenor ("1M") are sufficient to cover the implied volatility changes for SDO tenors.[14] However, empirical results indicate that the implied volatility changes from SDOs can be much larger than those for options with one month to expiration.[15]

OCC proposes to improve the theoretical price simulation of SDOs and enhance the modeling of the implied volatility risk associated with SDOs by: (1) aligning the day-count convention used between option price smoothing and its models for simulating implied volatility, and (2) extending the term structure[16] to cover implied volatility risk associated with options expiring in less than one-month. The proposed changes will be introduced to the Implied Volatilities Scenarios Model and S&P 500 Implied Volatility Simulation Model in STANS and the Volatility Shock component in CST. The impact of the proposed enhancements on Clearing Member margin and on CST is presented further below.

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[13]   The term "day count convention" refers to a standardized methodology for calculating the number of days between two dates. Both calendar and business day conventions are used by OCC in STANS and CST calculations.

[14]   The "tenor" of an option is the amount of time remaining to its expiration or maturity.

[15]   OCC has observed that the day-over-day at the money implied volatility changes for the 1W tenor are approximately twice that of the 1M tenor on certain risk factors such as SPX, RUT, QQQ, AAPL, TSLA.

[16]   The "term structure" of implied volatility is the curve that depicts the relationship between the implied volatilities of options with different expiration (or maturity) dates on the same underlying. Expiration and maturity are used interchangeably but reflect the same meaning.

1.   Purpose

Background

OCC's risk framework includes its STANS methodology used to calculate

Clearing Member margin amounts, and its CST methodology used to stress test Clearing

Member portfolios in order to determine the appropriate size of the Clearing Fund and

allocate portions to Clearing Members commensurate with the risk they present to OCC.

STANS Overview

STANS is OCC's proprietary risk management system for calculating Clearing

Member margin requirements. The STANS methodology utilizes large-scale Monte

Carlo simulations to forecast price and volatility movements in determining a Clearing

Member's margin requirement.[17] OCC uses a smoothing algorithm to generate

theoretical prices and volatilities for option contracts based on the fair value for plain

vanilla listed options from closing bid and ask price quotes.[18] OCC does this by first

filtering out certain poor-quality quotes on contracts based on certain conditions and

estimates the forward prices of the securities underlying these options. OCC then

generates the theoretical option prices based on the filtered bid and ask quotes and

constructs a volatility surface[19] using the smoothed prices to approximate option contract

prices. The output of the Smoothing Algorithm, consisting of various theoretical option

contract prices and volatilities, is then used downstream as a starting point to simulate

variations in implied volatility for option contracts.

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[17]   See OCC Rule 601.

[18]   See Exchange Act Release No. 86731 (Aug. 22, 2019), 84 FR 45188 (Aug. 28, 2019) (SR-OCC-2019-005).

[19]   The "volatility surface" refers to a three-dimensional plot of the implied volatilities of the various options on the same stock reflecting time to maturity, and different strike prices for the option.

Using the Black-Scholes options pricing model, the implied volatility is the standard deviation of the underlying asset price necessary to arrive at the market price of an option of a given strike, time to maturity, underlying asset price and the current discount interest rate. In effect, the implied volatility is responsible for that portion of the premium that cannot be explained by the current intrinsic value of the option (i.e., the difference between the price of the underlying and the exercise price of the option), discounted to reflect its time value. OCC considers variations in implied volatility within STANS to ensure that the anticipated cost of liquidating options positions in an account recognizes the possibility that the implied volatility could change during the two-business day liquidation time horizon and lead to corresponding changes in the market prices of the options. Specifically, OCC models variations in implied volatility using its (1) Implied Volatilities Scenarios Model for non-S&P 500 based products, and (2) S&P 500 Implied Volatility Simulation Model for products in the S&P 500 group.[20]

Implied Volatilities Scenarios Model

Using its current Implied Volatilities Scenarios Model, OCC models the variations in implied volatility used to re-price non-S&P 500 based options within STANS. Variations in implied volatility are modeled through a volatility surface by incorporating certain risk factors (i.e., implied volatility pivot points) based on a range of tenors and option deltas[21] into the models in STANS. These implied volatility pivot points consist of three tenors of one month, three months and one year, and three deltas of

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[20]   See generally Exchange Act Release No. 95319, supra note 3, at 44168-69.

[21]   The "delta" of an option represents the sensitivity of the option price with respect to the price of the underlying security.

0.25, 0.5, and 0.75, resulting in nine implied volatility risk factors.[22] These pivot points are chosen such that their combination allows the model to capture changes in level, skew (i.e., strike price), convexity, and term structure of the implied volatility surface.[23]

The Implied Volatility Scenarios Model has certain limitations related to SDOs. First, the underlying prices and implied volatilities generated from the Smoothing Algorithm, which are an input to the Implied Volatility Scenarios Model, are generated using a calendar day convention, which is not consistent with the trading day convention used in the calibration of the model parameters. The misalignment in day-count conventions may result in over- or under-estimation of option prices based on the implied volatility scenarios. SDOs are more sensitive to day-count convention alignment than contracts with longer expirations due to the proportionally larger difference in time to expiry between the trading day convention and calendar day convention for shorter dated tenors.

Second, the model imposes a flat term structure on SDOs, which forces the use of the implied volatility shock from the 1M tenor on all option contracts expiring in less than one month. Because the term structure for the Implied Volatilities Scenarios Model starts at the 1M tenor, the current model is not consistent with the observed dynamics of the underlying assets and the implied volatility surface for SDOs. This may lead to inadequate coverage for portfolios with concentrations in SDOs.

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[22]   See Exchange Act Release No. 94165 (Feb. 7, 2022), 87 FR 8072, 8073 (Feb. 11, 2022) (SR-OCC-2022-001).

[23]   Id.

S&P 500 Implied Volatility Simulation Model

OCC uses the S&P 500 Implied Volatility Simulation Model for the S&P 500 product group.[24] The purpose of the S&P 500 Implied Volatility Simulation Model is to establish a consistent and robust framework for implied volatility simulation and provide natural offsets for volatility products with similar characteristics to S&P 500 implied volatility. The output of the S&P 500 Implied Volatility Simulation Model is used by OCC's options pricing model, as well as the Volatility Index Futures Model. The S&P 500 Implied Volatility Simulation Model is a Monte Carlo simulation model that captures the risk dynamics in the S&P 500 implied volatility surface utilizing standardized log-moneyness[25] and a fixed number of key tenors as well as skew to generate an S&P 500 1M at-the-money ("ATM") risk factor.[26] OCC then uses the generated implied volatility scenarios to produce option prices in margin estimation and stress testing.[27]

The S&P 500 Implied Volatility Simulation Model has certain limitations related to SDOs. Like the Implied Volatilities Scenarios Model discussed above, the S&P 500 Implied Volatility Simulation Model uses a trading day convention in the calibration of the model, which is not consistent with the calendar day convention used in the generation of the input from the Smoothing Algorithm. As for the Implied Volatilities Scenarios Model, this misalignment may result in over- or under-estimation of option prices, particularly for SDOs. Second, the S&P 500 Implied Volatility Simulation Model uses a fixed number of key tenors beginning with the 1M tenor. Because the term

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[24]   See generally Exchange Act Release No. 95319, supra note 3, at 44168-69.

[25]   The term "moneyness" of an option refers to the relationship between the strike price and the price of the option underlying.

[26]   See Exchange Act Release No. 94165, supra note 22, at 8075.

[27]   Id.

structure for the S&P 500 Implied Volatility Simulation Model starts at the 1M tenor, the

current model is not consistent with the observed dynamics of the underlying assets and the

implied volatility surface for SDOs, which may lead to inadequate coverage for portfolios

with concentrations in SDOs.

CST Overview

As described in the CST Methodology Description, OCC uses CST to analyze the

adequacy of its financial resources in extreme but plausible scenarios. It enables OCC to

better manage its risks by promoting OCC's ability to thoroughly monitor its potential

exposure under varied sets of stressed market scenarios and provides it with the ability to

review the sufficiency of its financial resources. Moreover, the methodology includes

stress tests designed to size and monitor the sufficiency of both prefunded credit and

liquidity resources. OCC relies upon a set of stress scenarios constructed pursuant to the

CST Methodology Description, including both Sizing and Sufficiency scenarios.

CST is a scenario-based, one-factor risk model with four principal elements.[28]

First, a set of risk drivers is selected based on the portfolio exposures of all Clearing

Members in the aggregate.[29] Second, each individual underlying security from the

portfolio of a Clearing Member is mapped to a key risk driver, to estimate the sensitivity

for the beta[30] of the security with respect to the corresponding risk driver.[31] Third, stress

scenarios are generated by assigning a stress shock to each of the risk drivers, which

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[28]   See Exchange Act Release No. 83406 (Jun 11, 2018), 83 FR 28018, 28022 (June 15, 2018) (SR-OCC-2018-008).

[29]   Id.

[30]   The "beta" of a security is the sensitivity of the price of the security relative to the price of the security.

[31]   Exchange Act Release No. 83406, supra note 26, at 28022.

drives the shock of an individual underlying security.[32] Fourth, the aggregate risk

exposure or shortfall of each portfolio is generated for each stress scenario for each

Clearing Member and the Clearing Member Group level.[33] The CST methodology

consists of several component models, including the Volatility Shocks, the VIX Futures

Prices Shocks, and Idiosyncratic Scenarios models.

Volatility Shocks

The Volatility Shocks model component of the CST methodology provides a

method to generate implied volatility in a stress scenario for all individual option

products that are cleared by OCC.[34] This model component is used to shock any option

product cleared by OCC. Shocked implied volatility is needed at the product, expiration,

and strike level to evaluate individual option implied volatilities in stressed market

conditions, which is then used to determine options prices and calculate the profit and

loss of Clearing Member accounts in stress scenarios. For all systemic stress scenarios,[35]

the Cboe Volatility Index ("VIX") is used as the main risk driver in determining shocked

implied volatility.[36]

Two methods are used to generate strike-level shocked implied volatility from

VIX shocks: (1) an approach for equity products, including equity ETFs, indexes and

futures that have the S&P 500 Index ("SPX") as the risk driver; and (2) an approach used

for options on all risk factors that do not have SPX as a risk driver. The term structure of

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[32]   Id.

[33]   Id.

[34]   See generally id. at 28023.

[35]   The term "systemic stress scenarios" are scenarios designed to the capture risk to OCC in an
extreme event impacting all positions driven by risk drivers.

[36]   Exchange Act Release No. 83406, supra note 26, at 28023.

SPX-driven implied volatilities is based on volatility betas versus VIX, while a standardized log-moneyness metric is used to model the implied volatility curves.[37] For non-SPX driven risk factors, the implied volatility shocks are based on historical volatility beta regressed directly against the VIX.[38]

The Volatility Shocks component of CST has certain limitations related to SDOs. First, like the STANS models discussed above, the Volatility Shocks component uses a trading day convention in the calibration of model parameters, which is not consistent with the calendar day convention used by the Smoothing Algorithm. As discussed above, this misalignment may result in over- or under-estimation of option prices, particularly for SDOs. Second, Volatility Shock imposes a flat term structure for SDOs when calculating shocked implied volatility, which is not consistent with the observed dynamics of the underlying assets and the implied volatility surface for SDOs. These limitations may result in inadequate shocks for SDOs.

VIX Futures Price Shocks

The VIX is an index for measuring implied volatility based on options on the SPX with approximately 30 days to expiration. OCC derives VIX futures prices shocks from SPX volatility betas and VIX index shocks using the VIX Futures Price Shocks component of CST.[39] The term structure of the VIX futures prices shocks is modeled from that of the SPX ATM implied volatility shocks. OCC first determines the term structure of the SPX volatility beta, by running regression of the 2-day returns of SPX ATM implied volatility with respect to the 2-day returns of the VIX index for different

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[37] Id.

[38] Id.

[39] See Exchange Act Release No. 87386 (Oct. 23, 2019), 84 FR 57911, 57913-14 (Oct. 29, 2019) (SR-OCC-2019-009).

expirations, ranging from 1M to twelve months ("12M").[40] Through linear interpolation

on the term structure curve of SPX volatility beta OCC determines the volatility beta at

the VIX futures expiration and 30 days after, which are the basis to calculate VIX futures

price shocks. As a final step a constraint is then applied to ensure that the VIX futures

price shocks do not exceed the VIX index shock.

Like the Volatility Shocks model, the VIX Futures Price Shocks component

imposes a flat term structure for SDOs when calculating shocked implied volatility,

which is not consistent with the observed dynamics of the underlying assets and the

implied volatility surface for SDOs. This limitation of the VIX Futures Price Shocks

model may result in inadequate shocks for SDOs.[41]

Idiosyncratic Scenarios

OCC uses Idiosyncratic Scenarios to generate and capture the risk from extreme

non-systemic events that may impact OCC's financial resources.[42] Specifically, OCC

captures the risk of extreme non-systemic market moves on single name equity securities

(non-ETF, non-Index) through individual up and down shocks (assuming all other

products are unchanged). Single-name equities are classified into large and small

capitalization (cap) for the price shocks. Four types of idiosyncratic moves are

constructed based on the market capitalization and direction of the price shock: large cap

up, large cap down, small cap up and small cap down.[43] A fixed price shock for each of

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[40]   See id. at 57916 n. 29 and accompanying text.

[41]   Unlike the other model discussed herein, the VIX Futures Price Shocks model uses the SPX volatility beta with extended tenors less than 1 month from the Volatility Shocks model component and Dynamic VIX Calibration model component as inputs, and day-count convention alignment is not within the scope for this model component.

[42]   See generally Exchange Act Release No. 87386, supra note 37, at 57913.

[43]   Id.

the four scenarios is calibrated from historical price return data such that probability of idiosyncratic moves is comparable to systemic scenarios and probability in all four scenarios is approximately equal. Based on price shocks, ATM implied volatility shocks are calibrated for each of the four scenarios.[44]

The Idiosyncratic Scenarios component of CST shares the limitations related to SDOs discussed above with respect to the other models. Specifically, the Idiosyncratic Scenarios component uses a trading day convention in the calibration of model parameters, which is not consistent with the Smoothing Algorithm's calendar day convention. As discussed above, this misalignment may result in over- or under-estimation of option prices, particularly for SDOs. Second, like the Volatility Shocks model, Idiosyncratic Scenarios imposes a flat term structure for SDOs when calculating shocked implied volatility, which is not consistent with the observed dynamics of the underlying assets and the implied volatility surface for SDOs. These limitations may result in inadequate shocks for SDOs.

Proposed Change

OCC proposes to capture the risks associated with SDOs by applying enhancements to the implied volatility modeling approach to: (1) align the day-count convention between option price smoothing and implied volatility scenario generation, and (2) extend the term structure to cover implied volatility risk associated with options with less than one month to expiration. These enhancements will be implemented for model components in STANS and CST.

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44   Id.

Day-Count Convention Alignment

At present, the implied volatility output from smoothing, determined using a
calendar day convention, is directly applied in the initial implied volatility scenarios in
STANS and CST. However, the calibration of the parameters used in implied volatility
scenarios uses a trading day convention, which is also used to model forecasted variance
as well as the shocks in CST. OCC proposes to align the day-count convention to be
consistent between calibration and price smoothing in both STANS and CST.

In STANS, OCC proposes to align the day-count convention between price
smoothing and its model components used for forecasting changes in implied volatility
through amendments to the sections of the STANS Methodology Description that address
the Implied Volatilities Scenarios Model and the S&P 500 Implied Volatility Simulation
Model.[45] For the Implied Volatilities Scenarios Model (pivot-based), implied volatility
levels would be initially converted into trading day convention before application of pivot
scenario shocks. The shocked implied volatility scenarios would then be converted back
to calendar day convention before being used to calculate shocked option price scenarios.
For the S&P 500 Implied Volatility Simulation Model, the process for generating the
shocked implied volatility scenarios for listed tenors would convert the initial implied
volatility from using calendar day convention to using trading day convention followed
by generation of the ATM implied volatility log-return scenarios for listed tenors. The
skew shock scenarios would be generated next, followed by the shocked implied
volatility scenarios. The outputs of the shocked implied volatility scenarios would then
be converted back to calendar day convention before calculating the theoretical option

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[45]   OCC would also make conforming changes to the whitepapers for these models. OCC has
         provided updates to its STANS whitepapers for the impacted models in confidential Exhibit 3B
         and 3C to File No. SR-OCC-2024-016.

price scenarios. These conversion steps taken together would then align the day-count

convention used in both option price smoothing and implied volatility simulations.

Similarly, OCC would align the day-count convention of the Implied Volatility

Shocks in CST through conversion of the initial volatility surface from the output of the

Smoothing Algorithm to business day convention before application of any volatility

shocks.[46] After the volatility shock is applied, the shocked implied volatility would then

be scaled back to calendar day convention, before being used downstream for option

pricing in CST. These changes would be reflected in amendments to the CST

Methodology Description's section that addresses the Volatility Shock Model. With

respect to the Idiosyncratic Scenarios, the CST methodology already provides that after

calculating the shocked ATM volatility, the shocked implied volatility for all the strikes

in the expiration follows the same methodology as for the Volatility Shock Model.

Extension of the Term Structure

At present, the STANS Implied Volatilities Scenarios model uses a flat term

structure for options with listed tenors that are shorter than one month, which means that

the implied volatility shock is derived from the 1M key tenor or pivot. OCC proposes to

change the Implied Volatility Scenarios term structure for the implied volatility

simulation of all non-SPX related risk factors, such that for points with shorter than one

month to maturity, a squared-root decay is applied with respect to one month to

expiration up to a predetermined shortest time to maturity. For the S&P 500 Implied

Volatility Simulation Model term structure and SPX related risk factors, the applicable

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[46]   OCC would also make conforming changes to the whitepapers for these models. OCC has
provided updates to its CST whitepapers for the impacted models in confidential Exhibit 3D and
3F to File No. SR-OCC-2024-016.

sections of the STANS Methodology Description would be updated to provide for a shorter key tenor than the current 1M time to maturity.

With respect to the CST Volatility Shocks model, which uses the volatility beta from the 1M tenor for SDOs, OCC proposes to extend the volatility beta approach to cover constant maturity tenors of less than one-month expiration by adding constant maturity tenors at the 1-week ("1W") and 2-week ("2W") key points of the term structure. Similarly, for the VIX Futures Price Shocks model, OCC proposes that the volatility beta for listed tenors that are less than the 1W tenor and down to the 3-day ("3D") tenor would be linearly interpolated from the 1W tenor and 2W tenor volatility betas, i.e., the 1W and 2W tenor expirations would be added as inputs to the term structure of SPX volatility betas. As for Idiosyncratic Scenarios, the term structure would be extended from 1M down to the 1W tenor and 2W tenor. These changes would be applied to the section of the CST Methodology Description that addresses the Volatility Shock Model, the same methodology for which also applies to the Idiosyncratic Scenarios Models as described above. In addition, this change would also apply to the VIX Futures Price Shock Model because the Volatility Shock Model's method is incorporated by reference in the section that describes the volatility beta shocks applied to volatility instruments.

OCC also proposes to update the day count to the more precise value of 365.25 within the CST Methodology Description when referring to calendar days in a year and also when used in a formula. This amendment to the CST Methodology Description conforms with how the system was designed to be consistent with the day-count convention specified in the STANS Methodology Description. Since the CST system

already uses a 365.25 day count convention, the proposed change to correct the documentation would have no impact on stress test results. Additionally, OCC plans to make several other minor non-substantial typographical changes throughout the document.

In addition, OCC proposes to further revise the relevant sections of the STANS Methodology Description concerning the S&P 500 Implied Volatility Simulation model to eliminate redundant and duplicative information. Specifically, OCC proposes to remove sections related to the generation of the simulation of certain shocks that are duplicative of information covered in the STANS Methodology Description's discussion of the theory and specifications for that model. The sections related to the simulation of the shocked implied volatility scenarios would be amended to instead refer to those previous sections, which would be updated to reflect the two changes proposed herein.

Impact Analysis

OCC has reviewed the potential impact of the proposed changes on margin across all Clearing Member tier accounts over a 15-month period, between July 2023 and September 2024. OCC observed that the proposed enhancements would lead to an average daily total margin[47] increase of 0.58% (approximately $0.2 billion, calculated based on the average daily margin of nearly $38 billion) across all accounts and activity dates, with the daily total margins falling in a narrow range between the largest decrease of 0.81% (approximately $0.3 billion) to the largest increase of 3.21% (approximately $1.1 billion). The results further demonstrated that the SDO enhancements had a larger measurable impact for accounts with high concentrations of short-dated options.

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[47] Margin is calculated as the sum of requirement shortfall and stress test add-on charge.

OCC also reviewed the potential impact on CST for the proposed model enhancements based on backtesting results over the same time period. OCC observed that the proposed changes had a relatively small impact on the Cover 1 and Cover 2 shortfalls used in Sufficiency and Sizing Scenarios for the leading Clearing Member Groups. The impact varied among Clearing Members, influenced by factors such as portfolio size, product diversity within those portfolios, and the concentration of SDO positions. Smaller Clearing Members with a high concentration of SDO positions experienced relatively more meaningful impacts.

With respect to Sizing Scenarios impacts, OCC observed a decrease in the average Cover 2 shortfall for the 1-in-80-Year Rally Scenario of 0.1% (approximately $12.7 million) with the daily variation falling in a narrow range between the largest decrease of 3.18% to the largest increase of 0.53%. For the Cover 2 shortfall on the 1-in-80-Year Decline Scenario OCC observed an average decrease of 0.47% (approximately $65 million) with the daily variation falling in a narrow range between the largest decrease of 3.17% to the largest increase of 1.16%.

Simliarly, regarding Sufficiency Scenarios impacts, OCC observed a decrease in the average Cover 1 shortfall for the 1987 Crash Scenario of 0.39% (approximately $37 million) with the daily variation falling in the range between the largest daily decrease of 3.15% and largest daily increase of 1.97%. For the Largest Rally from 2008 Sufficiency Scenario, the daily average Cover 2 Shortfall increased by around 0.22%, which is about $16 million. The shortfall ranged between a decrease of $208 million and an increase of $116 million, which is about a decrease of 3.54% to an increase of 1.90%. For the

Largest Rally from 2008 - Historical Beta Sufficiency Scenario[48], the daily average

Cover 2 Shortfall decreased by around 0.1%, which is about $7 million. The shortfall

ranged between a decrease of $196 million and an increase of $143 million, which is

about a decrease of 1.93% to an increase of 1.41%.

Overall, OCC observed a reduction to the Clearing Fund size of around 0.14%

(approximately $14 million) based on the changes in Cover 2 shortfalls in Sizing

Scenarios. OCC believes that such changes to margin and Cover 1 Sufficiency Scenarios

and Cover 2 Sizing Scenarios are commensurate with the risks presented by Clearing

Members SDO trading activities.

Implementation and Timeframe

The proposed margin model and CST methodology changes will be integrated

into OCC's current production system, and implemented within 180 days after the date

that OCC receives all necessary regulatory approvals for the proposed changes. OCC

will announce the implementation date of the proposed changes by an Information

Memorandum posted to its public website at least 2 weeks prior to implementation.

2.   Statutory Basis

OCC believes the proposed rule change is consistent with Section 17A of the

Exchange Act[49] and Rules 17Ad-22(e)(6)[50] and (e)(7)[51] thereunder. Section

17A(b)(3)(F) of the Act[52] requires, among other things, that the rules of a clearing agency

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[48]   OCC notes that backtesting data for this scenario is limited due to its recent deployment and use in production.

[49]   15 U.S.C. 78q-1.

[50]   17 CFR 240.17Ad-22(e)(6).

[51]   17 CFR 240.17Ad-22(e)(7).

[52]   15 U.S.C. 78q-1(b)(3)(F).

be designed to promote the prompt and accurate clearance and settlement of securities

transactions, and in general, to protect investors and the public interest. As described

above, OCC could be exposed to increased credit and liquidity risk if the margin and

Clearing Fund models do not adequately capture changes to the dynamic behavior of the

implied volatility associated with portfolios dominated by SDO positions. As discussed

above, OCC believes the proposed enhancements improve the model performance for

portfolios with high SDO concentration. The output of these models would be used by

OCC to calculate margin and Clearing Fund requirements designed to limit its credit and

liquidity exposures to participants and ensure that OCC is able to continue the prompt

and accurate clearance and settlement of its cleared products. The collection of margin

and Clearing Fund helps to protect investors and the public interest by ensuring OCC has

sufficient resources to manage a potential Clearing Member default that may otherwise

impose unexpected costs on non-defaulting Clearing Members and, ultimately, their

customers. For these reasons, OCC believes the proposed changes are designed to

promote the prompt and accurate clearance and settlement of securities transactions, and,

thereby, to protect investors and the public interest in accordance with Section

17A(b)(3)(F) of the Exchange Act.[53]

OCC also believes that the proposed changes are consistent with Rule 17Ad-

22(e)(6).[54] In particular, paragraphs (i), (iii), and (v) of Rule 17Ad-22(e)(6)[55] require a

covered clearing agency that provides central counterparty services to establish,

implement, maintain and enforce written policies and procedures reasonably designed to

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[53]   Id.

[54]   17 CFR 240.17Ad-2(e)(6).

[55]   17 CFR 240.17Ad-2(e)(6)(i), (iii), (v).

cover its credit exposures to its participants by establishing a risk-based margin system that (1) considers, and produces margin levels commensurate with, the risks and particular attributes of each relevant product, portfolio, and market; (2) calculates margin sufficient to cover its potential future exposure to participants in the interval between the last margin collection and the close out of positions following a participant default; and (3) uses an appropriate method for measuring credit exposure that accounts for relevant product risk factors and portfolio effects across products. As noted above, OCC's current models in STANS may not adequately capture the implied volatility behaviors associated with SDO in portfolios that may be dominated by SDO positions, which could result in inadequate margin requirements. As described in detail above, OCC believes that aligning the day count convention and extending the term structure in OCC's margin system to take into consideration SDO specific attributes, are appropriate methods to enable OCC to measure SDO credit exposure and produce margin requirements commensurate with the risks presented by SDO trading activities, and as designed enables OCC to calculate margin sufficient to cover SDO exposure from Clearing Member accounts with high concentrations of short-dated options. The proposed changes are designed to enhance model outputs to produce margin requirements that are commensurate with the risks presented by portfolios containing SDO s positions. As a result, OCC believes that the proposed changes are reasonably designed to calculate margin commensurate with risks and particular attributes of SDO and sufficient to cover its potential future exposure to participants in the interval between the last margin collection and the close out of positions following a participant default, and uses an

appropriate method to measure credit exposures that accounts for the relevant SDO

product risk factors in a manner consistent with Rules 17Ad-22(e)(6)(i), (iii) and (v).[56]

(B)   Clearing Agency's Statement on Burden on Competition

Section 17A(b)(3)(I) requires that the rules of a clearing agency do not impose

any burden on competition not necessary or appropriate in furtherance of the purposes of

the Act.[57] The proposed alignment of the calendar convention between price smoothing

and model calibration, and the extension of the term structure for implied volatility and

volatility shocks, would be used by OCC to manage its credit and liquidity risk across all

Clearing Members. Accordingly, OCC does not believe that the proposed rule change

would unfairly hinder access to OCC's services.

While the proposed rule change may impact different accounts to a greater or

lesser degree depending on the composition of SDO positions in each account, OCC does

not believe that the proposed rule change would impose any burden on competition not

necessary or appropriate in furtherance of the purposes of the Exchange Act. As

discussed above, OCC is obligated under the Exchange Act and the regulations

thereunder to establish, implement, maintain and enforce written policies and procedures

reasonably designed to cover its credit exposures to its participants by establishing a risk-

based margin system that, among other things, considers, and produces margin levels

commensurate with the risks and particular attributes of each relevant product, portfolio,

and market.[58] Overall, the impact analysis indicates there are significant improvements

in performance and margin coverage for SDOs from the proposed model enhancements.

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[56]   Id.

[57]   15 U.S.C. 78q-1(b)(3)(I).

[58]   See 17 CFR 240.17Ad-2(e)(6)(i).

Moreover, while the composition of SDOs within Clearing Member portfolios may drive margin and scenario charges that may be higher or lower than under the current regime, nevertheless OCC believes that margin coverage improvements occur with the adoption of the proposed enhancements. These enhanced model components would utilize a more consistent approach to calendar conventions, while the term structure is also extended to account for SDO tenors, which directly address certain limitations within the current implementation of STANS and CST models. In addition, the proposed model enhancements are expected to produce margin requirements that are more commensurate to the risks generated from holding SDO positions within Clearing Member portfolios, and therefore consistent with OCC's obligations under the Exchange Act and regulations thereunder. Accordingly, OCC believes that the proposed rule change would not impose any burden or impact on competition not necessary or appropriate in furtherance of the purposes of the Exchange Act.

> (C)　Clearing Agency's Statement on Comments on the Proposed Rule Change Received from Members, Participants or Others

Written comments were not, and are not, intended to be solicited with respect to the proposed change and none have been received.

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

Within 45 days of the date of publication of this notice in the Federal Register or within such longer period up to 90 days (i) as the Commission may designate if it finds such longer period to be appropriate and publishes its reasons for so finding or (ii) as to which the selfregulatory organization consents, the Commission will:

> (A)　by order approve or disapprove such proposed rule change, or

(B)   institute proceedings to determine whether the proposed rule change

should be disapproved.

The proposal shall not take effect until all regulatory actions required with respect

to the proposal are completed.

IV.   <u>Solicitation of Comments</u>

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:

<u>Electronic Comments</u>:

- Use the Commission's Internet comment form

  (http://www.sec.gov/rules/sro.shtml); or

- Send an e-mail to rule-comments@sec.gov. Please include File Number SR-

  OCC-2024-016 on the subject line.

<u>Paper Comments</u>:

- Send paper comments in triplicate to Vanessa Countryman, Secretary, Securities

  and Exchange Commission, 100 F Street, NE, Washington, DC 20549-1090.

All submissions should refer to File Number SR-OCC-2024-016. This file number should

be included on the subject line if e-mail 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

(http://www.sec.gov/rules/sro.shtml). Copies of the submission, all subsequent

amendments, all written statements with respect to the proposed rule change that are filed

with the Commission, and all written communications relating to the proposed rule

change between the Commission and any person, other than those that may be withheld

from the public in accordance with the provisions of 5 U.S.C. 552, will be available for

website viewing and printing in the Commission's Public Reference Room, 100 F Street,

NE, Washington, DC 20549, on official business days between the hours of 10:00 a.m.

and 3:00 p.m. Copies of such filing also will be available for inspection and copying at the

principal office of OCC and on OCC's website at https://www.theocc.com/Company-

Information/Documents-and-Archives/By-Laws-and-Rules.

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-OCC-2024-016 and should be

submitted on or before [insert date 21 days from publication in the Federal Register].

For the Commission, by the Division of Trading and Markets, pursuant to

delegated authority.[59]

<div align="center">Secretary</div>

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[59]   17 CFR 200.30-3(a)(12).

Exhibit 3A

This Exhibit contains one electronic file embedded in this cover page for filing efficiency, as identified below. OCC has omitted the embedded file pursuant to 17 CFR 240.24b-2. OCC has separately filed and requested confidential treatment of the cover page containing the embedded file as protected from public disclosure by Exemptions 4 and 8 of the Freedom of Information Act ("FOIA"), 5 U.S.C. 552(b)(4), (b)(8), and 15 U.S.C. 78x(e) because the information it contains concerns (i) OCC's trade secrets and commercial information not customarily released to the public and is, and always has been, treated as the private information of OCC, the release of which is likely to cause foreseeable harm to OCC's commercial or financial interests; and (ii) the supervision of OCC, a financial institution regulated by the Commission. OCC believes the Form 19b-4 Information and Exhibit 1A provide a clear and adequate description of the relevant substance of the embedded file to facilitate meaningful public comment.

Embedded File: **[Redacted Pursuant to Rule 24b-2]**

- Short Dated Options Study; 23 pages.

Exhibit 3B

This Exhibit contains one electronic file embedded in this cover page for filing efficiency, as identified below. OCC has omitted the embedded file pursuant to 17 CFR 240.24b-2. OCC has separately filed and requested confidential treatment of the cover page containing the embedded file as protected from public disclosure by Exemptions 4 and 8 of the Freedom of Information Act ("FOIA"), 5 U.S.C. 552(b)(4), (b)(8), and 15 U.S.C. 78x(e) because the information it contains concerns (i) OCC's trade secrets and commercial information not customarily released to the public and is, and always has been, treated as the private information of OCC, the release of which is likely to cause foreseeable harm to OCC's commercial or financial interests; and (ii) the supervision of OCC, a financial institution regulated by the Commission. OCC believes the Form 19b-4 Information and Exhibit 1A provide a clear and adequate description of the relevant substance of the embedded file to facilitate meaningful public comment.

Embedded File: **[Redacted Pursuant to Rule 24b-2]**

- Implied Volatilities Scenarios Model whitepaper; 106 pages.

Exhibit 3C

This Exhibit contains one electronic file embedded in this cover page for filing efficiency, as identified below. OCC has omitted the embedded file pursuant to 17 CFR 240.24b-2. OCC has separately filed and requested confidential treatment of the cover page containing the embedded file as protected from public disclosure by Exemptions 4 and 8 of the Freedom of Information Act ("FOIA"), 5 U.S.C. 552(b)(4), (b)(8), and 15 U.S.C. 78x(e) because the information it contains concerns (i) OCC's trade secrets and commercial information not customarily released to the public and is, and always has been, treated as the private information of OCC, the release of which is likely to cause foreseeable harm to OCC's commercial or financial interests; and (ii) the supervision of OCC, a financial institution regulated by the Commission. OCC believes the Form 19b-4 Information and Exhibit 1A provide a clear and adequate description of the relevant substance of the embedded file to facilitate meaningful public comment.

Embedded File: **[Redacted Pursuant to Rule 24b-2]**

- S&P 500 Implied Volatility Simulation Model whitepaper; 134 pages.

Exhibit 3D

This Exhibit contains one electronic file embedded in this cover page for filing efficiency, as identified below. OCC has omitted the embedded file pursuant to 17 CFR 240.24b-2. OCC has separately filed and requested confidential treatment of the cover page containing the embedded file as protected from public disclosure by Exemptions 4 and 8 of the Freedom of Information Act ("FOIA"), 5 U.S.C. 552(b)(4), (b)(8), and 15 U.S.C. 78x(e) because the information it contains concerns (i) OCC's trade secrets and commercial information not customarily released to the public and is, and always has been, treated as the private information of OCC, the release of which is likely to cause foreseeable harm to OCC's commercial or financial interests; and (ii) the supervision of OCC, a financial institution regulated by the Commission. OCC believes the Form 19b-4 Information and Exhibit 1A provide a clear and adequate description of the relevant substance of the embedded file to facilitate meaningful public comment.

Embedded File: **[Redacted Pursuant to Rule 24b-2]**

- VIX Futures Price Shocks whitepaper; 31 pages.

Exhibit 3E

This Exhibit contains one electronic file embedded in this cover page for filing efficiency, as identified below. OCC has omitted the embedded file pursuant to 17 CFR 240.24b-2. OCC has separately filed and requested confidential treatment of the cover page containing the embedded file as protected from public disclosure by Exemptions 4 and 8 of the Freedom of Information Act ("FOIA"), 5 U.S.C. 552(b)(4), (b)(8), and 15 U.S.C. 78x(e) because the information it contains concerns (i) OCC's trade secrets and commercial information not customarily released to the public and is, and always has been, treated as the private information of OCC, the release of which is likely to cause foreseeable harm to OCC's commercial or financial interests; and (ii) the supervision of OCC, a financial institution regulated by the Commission. OCC believes the Form 19b-4 Information and Exhibit 1A provide a clear and adequate description of the relevant substance of the embedded file to facilitate meaningful public comment.

Embedded File: **[Redacted Pursuant to Rule 24b-2]**

- Volatility Shocks whitepaper; 73 pages.

Exhibit 3F

This Exhibit contains one electronic file embedded in this cover page for filing efficiency, as identified below. OCC has omitted the embedded file pursuant to 17 CFR 240.24b-2. OCC has separately filed and requested confidential treatment of the cover page containing the embedded file as protected from public disclosure by Exemptions 4 and 8 of the Freedom of Information Act ("FOIA"), 5 U.S.C. 552(b)(4), (b)(8), and 15 U.S.C. 78x(e) because the information it contains concerns (i) OCC's trade secrets and commercial information not customarily released to the public and is, and always has been, treated as the private information of OCC, the release of which is likely to cause foreseeable harm to OCC's commercial or financial interests; and (ii) the supervision of OCC, a financial institution regulated by the Commission. OCC believes the Form 19b-4 Information and Exhibit 1A provide a clear and adequate description of the relevant substance of the embedded file to facilitate meaningful public comment.

Embedded File: **[Redacted Pursuant to Rule 24b-2]**

- Idiosyncratic Stress Scenarios whitepaper; 55 pages.

Exhibit 5A

This Exhibit contains one electronic file embedded in this cover page for filing efficiency, as identified below. OCC has omitted the embedded file pursuant to 17 CFR 240.24b-2. OCC has separately filed and requested confidential treatment of the cover page containing the embedded file as protected from public disclosure by Exemptions 4 and 8 of the Freedom of Information Act ("FOIA"), 5 U.S.C. 552(b)(4), (b)(8), and 15 U.S.C. 78x(e) because the information it contains concerns (i) OCC's trade secrets and commercial information not customarily released to the public and is, and always has been, treated as the private information of OCC, the release of which is likely to cause foreseeable harm to OCC's commercial or financial interests; and (ii) the supervision of OCC, a financial institution regulated by the Commission. OCC believes the Form 19b-4 Information and Exhibit 1A provide a clear and adequate description of the relevant substance of the embedded file to facilitate meaningful public comment.

       Embedded File: **[Redacted Pursuant to Rule 24b-2]**

- System for Theoretical Analysis and Numerical Simulation (STANS) Methodology Description; 88 pages.

Exhibit 5B

This Exhibit contains one electronic file embedded in this cover page for filing efficiency, as identified below. OCC has omitted the embedded file pursuant to 17 CFR 240.24b-2. OCC has separately filed and requested confidential treatment of the cover page containing the embedded file as protected from public disclosure by Exemptions 4 and 8 of the Freedom of Information Act ("FOIA"), 5 U.S.C. 552(b)(4), (b)(8), and 15 U.S.C. 78x(e) because the information it contains concerns (i) OCC's trade secrets and commercial information not customarily released to the public and is, and always has been, treated as the private information of OCC, the release of which is likely to cause foreseeable harm to OCC's commercial or financial interests; and (ii) the supervision of OCC, a financial institution regulated by the Commission. OCC believes the Form 19b-4 Information and Exhibit 1A provide a clear and adequate description of the relevant substance of the embedded file to facilitate meaningful public comment.

Embedded File: **[Redacted Pursuant to Rule 24b-2]**

- Comprehensive Stress Testing & Clearing Fund Methodology, and Liquidity Risk Management Description; 48 pages.