UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation	**)** **)**	**Docket No. EL22-62-000**

RESPONSE TO ORDER TO SHOW CAUSE OF THE CALIFORNIA INDEPENDENT SYSTEM OPERATOR CORPORATION

The California Independent System Operator Corporation (CAISO) submits this response to the Order to Show Cause issued by the Commission on July 28, 2022.[1] As explained below, the currently effective CAISO Tariff is just and reasonable and does not require any further changes to address the policy concerns identified in the Show Cause Order.

In the Show Cause Order, the Commission discussed challenges that could arise if the credit requirements for Firm Transmission Rights (FTRs), known as Congestion Revenue Rights (CRRs) in the CAISO Tariff, did not contain adequate protections.[2] Specifically, the Show Cause Order identified two tariff enhancements that other Regional Transmission Operators (RTOs) and Independent System Operators (ISOs) have adopted recently to reduce the credit risk of FTRs in their markets: (1) use of mark-to-auction valuation as part

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1 *See Cal. Indep. Sys. Operator Corp., et al.*, 180 FERC ¶ 61,049, at Ordering Paragraph (B) (2022) (Show Cause Order) (directing the CAISO to submit a filing "either: (1) to show cause as to why its OATT [open access transmission tariff] remains just and unreasonable and not unduly discriminatory or preferential; or (2) to explain what changes to its OATT it believes would remedy" the concerns identified in the Show Cause Order). Capitalized terms not otherwise defined herein have the meanings set forth in the CAISO Tariff.

2 *Id.* at PP 16-29.

of the RTO/ISO's FTR portfolio valuation, and (2) a separate volumetric credit requirement.[3] The CAISO agrees these two features are desirable tariff enhancements that help ensure entities holding CRRs are sufficiently secured. Section 12.6.3 of the CAISO Tariff includes mark-to-auction valuation and a volumetric credit requirement (known in the CAISO Tariff as the Credit Margin).[4]

The Show Cause Order noted PJM Interconnection, L.L.C's. (PJM) reliance on historical valuation for setting FTR credit requirements failed to consider more recent auction values that would have revealed significant under-security much earlier and would have resulted in PJM taking action to respond to the GreenHat Energy LLC (GreenHat) situation much sooner.[5] As discussed in greater detail below, the CAISO Tariff requires consideration of both the most recent mark-to-auction value and the Historical Expected Value, and it uses the value that produces the higher portfolio Financial Security requirement. The CAISO also updates CRR portfolio valuations frequently, requiring additional Financial Security from CRR holders if necessary.

The Show Cause Order cited the benefits of a volumetric CRR credit requirement, noting that Southwest Power Pool Inc. (SPP), PJM, and the Midcontinent Independent System Operator, Inc. (MISO) have recently received

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3 *Id.* at P 30. The Commission also explained that "while we believe mark-to-auction and volumetric minimum FTR collateral requirements address the concerns identified [in the Show Cause Order], we recognize there may be alternative solutions to address such concerns." *Id.*

4 For ease of reference, the provisions of Section 12.6.3 are provided in Attachment A to this response. They are available on the CAISO website at http://www.caiso.com/Documents/Section12-Creditworthiness-asof-Sep28-2019.pdf.

5 *Id.* at PP 11-12, 25.

approval for a volumetric FTR credit requirement that has a flat dollar-per-megawatt-hour value.[6] The CAISO Tariff already has a volumetric CRR Credit Margin requirement in addition to the portfolio valuation Financial Security requirement. As discussed below, unlike the recent $0.10/MWh volumetric components implemented by PJM and MISO, the CAISO Tariff includes a weighted volumetric credit requirement that imposes a relatively higher credit requirement on the riskier lower-valued and negatively valued CRRs compared to a lower volumetric requirement imposed on the less-risky, higher-valued CRRs. The CAISO Tariff refers to this component as the Credit Margin; all CRRs have a calculated Credit Margin. The volumetric requirement in the form of the CAISO's Credit Margin is superior to a flat volumetric credit requirement because it is weighted, imposing a higher credit requirement on low positive and negatively valued CRRs.

Regarding both of these features—portfolio valuation and the additional volumetric credit requirements—the CAISO's approach is superior to an approach that relies exclusively on mark-to-auction for portfolio valuation or a flat volumetric credit requirement that does not distinguish between lower-valued CRRs, which are the riskiest, and high-valued CRRs, which carry far less risk.

For these reasons, the CAISO Tariff is just and reasonable and not unduly discriminatory or preferential, and it does not require any further changes to address the policy concerns identified in the Show Cause Order.

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6 *Id.* at P 20.

I. Background

In 2006, the CAISO began a stakeholder effort to examine potential revisions to the CAISO Tariff to implement CRR credit requirements to determine the appropriate amount of credit required to be maintained by CRR Holders.[7] These revisions were undertaken as part of the Market Redesign and Technology Upgrade (MRTU), pursuant to which the CAISO replaced the path-specific firm transmission rights used as part of its former zonal congestion management methodology with source-to-sink congestion revenue rights conveyed under the CAISO Tariff. The CAISO implemented MRTU in the spring of 2009.[8] The purpose of this effort was to ensure the CAISO Tariff provided reasonable assurance that, if CRR payments differ from the expected level, the CRR Holder would be able to satisfy its financial responsibilities to the market.[9]

The Commission accepted the CAISO's approach of establishing credit requirements for CRR Holders based on (1) the CRR Auction Price, which has a mark-to-auction valuation, plus (2) a separate Credit Margin to reflect the potential for the CRR Holder to face future payment obligations in excess of the expected CRR value associated with low positively valued and negatively valued CRRs.[10] The Commission agreed that incorporating these requirements into the

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[7] *See* CAISO transmittal letter, Docket Nos. ER07-613-004 and ER07-1077-000 (June 22, 2007) (explaining the stakeholder process and its results).

[8] *See Cal. Indep. Sys. Operator Corp.*, 120 FERC ¶ 61,192 (2007) (accepting the CAISO Tariff revisions subject to further revisions on compliance); Commission letter order, Docket Nos. ER07-613-005 and ER07-1077-002 (Dec. 10, 2007).

[9] *See Cal. Indep. Sys. Operator Corp.*, 120 FERC ¶ 61,192, at PP 6-14 (recounting the reasons and purposes driving the CAISO Tariff amendments).

[10] *Id.* at P 32.

CAISO Tariff would enable the CAISO to mitigate the losses to other market participants if a default should occur while also ensuring the credit requirements would not create a barrier to participation in the CRR market by creditworthy CRR participants.[11]

The CAISO enhanced its CRR credit policy in 2008 when it filed tariff amendments to allow it to evaluate credit requirements using both the most recent CRR Auction Prices and the Historical Expected Value of auction CRRs.[12] As the CAISO explained, utilizing CRR Auction Prices alone provided insufficient protection when the CRR Auction Price is higher (*i.e.*, less negative) than the Historical Expected Value of a negatively valued CRR. The Commission accepted the Tariff revisions to allow the CAISO to take into account the Historical Expected Value of CRRs in determining credit requirements for holding CRRs.[13] As modified by these revisions, Section 12.6.3 of the CAISO Tariff imposes a credit requirement equal to the negative of the most recent Auction Price *or* the Historical Expected Value plus a volumetric Credit Margin for the CRR. In addition, the Commission found the CAISO's proposal to permit the adjustment of credit requirements based on anticipated market conditions, which may not be reflected in the CRR Auction Price or the Historical Expected Value, to be a just and reasonable approach to reducing credit risks.[14]

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11 *Id.* at PP 32-38.

12 *See* CAISO transmittal letter, Docket No. ER08-1059-000 (May 30, 2008).

13 *See Cal. Indep. Sys. Operator Corp.*, 124 FERC ¶ 61,107, at P 60 (2008).

14 *See id.*; *see also* CAISO Tariff Section 12.6.3.4 (setting for formula for calculating the Credit Margin).

Following the financial crisis of 2008, the Commission held a technical conference to investigate potential strengthening of the risk and credit procedures pertaining to the organized wholesale electric markets under its jurisdiction.[15] The Commission subsequently adopted reforms through Order Nos. 741, 741-A, and 741-B to address the lack of standardized credit practices and the potential for mutualized default risk.[16] The Commission accepted revisions to the CAISO Tariff required by those orders to strengthen the CAISO's credit practices.[17]

In June 2018, GreenHat defaulted on its obligations to PJM after amassing one of the largest FTR portfolios in the PJM region. In response to the GreenHat situation, as well as other concerns, the Energy Trading Institute (ETI) filed a request for technical conference and rulemaking regarding credit risk in December 2019.[18] ETI noted that "GreenHat was valuing its FTR portfolio as positive in its financial statements—and PJM accepted this this valuation—when

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[15] *Tech. Conference on Credit & Capital Issues Affecting the Elec. Power Indus.*, Docket No. AD09-2-000, held January 13, 2009.

[16] *See Credit Reforms in Organized Wholesale Elec. Mkts.*, Order No. 741, 133 FERC ¶ 61,060 (2010) (Order No. 741), *order on reh'g*, Order No. 741-A, 134 FERC ¶ 61,126, *reh'g denied*, Order No. 741-B, 135 FERC ¶ 61,242 (2011).

[17] *See Cal. Indep. Sys. Operator Corp.*, 136 FERC ¶ 61,194 (2011) (approving, subject to compliance, reforms required by Order No. 741); *Cal. Indep. Sys. Operator Corp.*, 138 FERC ¶ 61,181 (2012) (accepting compliance filing for reforms required by Order No. 741); *Cal. Indep. Sys. Operator Corp.*, 136 FERC ¶ 61,232 (2011) (approving reforms implementing new settlement process timelines); Commission letter order, Docket No. ER11-4176-002 (Apr. 20, 2012) (accepting compliance filing for settlement process timelines); *Cal. Indep. Sys. Operator Corp.*, 140 FERC ¶ 61,169 (approving central counterparty related reforms); *Cal. Indep. Sys. Operator Corp.*, 142 FERC ¶ 61,111 (2013) (accepting compliance filing establishing central counterparty).

[18] Energy Trading Institute Request for Technical Conference and Petition for Rulemaking to Update Credit and Risk Management Rules and Procedure in the Organized Markets, Docket No. AD20-6-000 (Dec. 16, 2019).

the mark-to-auction was $90 million negative."[19] In addition, ETI identified numerous concerns with the credit policies of RTOs/ISOs, but it only mentioned the CAISO in passing as having participated in discussions that led to Order No. 741.[20]

In response to the ETI filing, the CAISO joined the ISO/RTO Council (IRC) in submitting comments urging the Commission to allow each RTO and ISO to develop credit policies for its markets and transmission rights instruments.[21] In addition, the CAISO filed separate comments explaining that the specific risks ETI was concerned about were not applicable to the CAISO Tariff.[22] The CAISO explained in its comments that GreenHat defaulted on its financial obligations associated with a portfolio of sizable FTRs it acquired primarily through long-term auctions that would remain open for a period of approximately three years. GreenHat's default resulted in FTR positions settled without payment from GreenHat in every hour of every day through May 31 of 2021.[23] The CAISO noted that in contrast to PJM's FTR rules, the only types of CRRs available in the CAISO's auction are (1) Monthly CRRs and (2) Seasonal CRRs that have a term

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19 *Id.* at 18.

20 *See id.* at 2 n.4.

21 *See* Motion for Leave to Respond and Response of the ISO/RTO Council, Docket No. AD20-6-000 (Jan. 24, 2020); Comments of the Regional Transmission Council, *et* al., Docket Nos. AD20-6-000 and AD21-6-000 (June 7, 2021).

22 Comments of the California Independent System Operator Corporation on Energy Trading Institute Request for Technical Conference and Rulemaking, Docket No. AD20-6-000, at 3-8 (Mar. 12, 2020)

23 *Id.* at 4 (citing *PJM Interconnection, LLC,* 165 FERC ¶ 61,188, at P 6 & n.7 (2018), Report of the Independent Consultants on the GreenHat Default at 10-11 and appendix A at 7 (Mar. 26, 2019)).

of three months. Long Term CRRs (*i.e.*, CRRs with a term of ten years) are only available as allocated CRRs and are not available through the CAISO's auction. Further, they are highly positively valued and designed to protect load-serving entities (LSEs) from congestion costs. Compared to other RTOs and ISOs, the CAISO has significantly reduced the risk that CRRs impose on the market. Currently, the maximum open position of an auction CRR is three months compared to PJM's three years for auction FTRs described above.[24] In addition, in 2018, the Commission accepted a CAISO tariff amendment to limit the combination of source and sink pairs eligible for CRR Auctions to those pairs associated only with physical supply delivery, which is likely to make CRRs less risky.[25]

The Commission's staff convened a technical conference following the GreenHat default to determine if additional action was needed to ensure best practices for credit risk management in organized wholesale electric markets.[26] Although the CAISO has the desired features of a mark-to-auction valuation and a volumetric credit requirement, the Show Cause Order questioned whether the CAISO Tariff contains a "robust mark-to-auction FTR collateral requirement similar to what has been recently adopted in other organized wholesale electric markets,"[27] and noted an apparent lack of a "volumetric minimum collateral

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24 *Id.* at 4-6.

25 *See Cal. Indep. Sys. Operator Corp.*, 163 FERC ¶ 61,237, at PP 62-76 (2018).

26 *See* Supplemental Notice of Technical Conference, *RTO/ISO Credit Principles & Practices*, Docket Nos. AD20-6-000 and AD21-6-000 (Feb. 10, 2021).

27 Show Cause Order at P 18.

requirement that scales with a participant's FTR portfolio to ensure participants cannot minimize their required collateral without correspondingly reducing their risk."[28]

II. The CAISO's CRR Credit Holding Requirement Has Two Separate Components—CRR Portfolio Liability Estimate Plus an Additional Volumetric Credit Margin

A. Credit Requirements for Holding CRRs

The CRR credit requirements are set forth in Section 12.6.3 of the CAISO Tariff. As provided therein, "[e]ach CRR Holder that is not a federal agency, whether it obtains CRRs through a CRR Allocation or a CRR Auction, must maintain Financial Security utilizing one or more of the forms specified in Section 12.2 that meets or exceeds the credit requirement of the CRR portfolio determined as described in this Section 12.6.3."[29] Section 12.6.3 also permits a federal agency to hold CRRs, but it allows federal agencies to satisfy the Financial Security requirements by establishing that the current year's appropriation for the agency "meets or exceeds the credit requirement for the CRR portfolio."[30] Entities that are not federal agencies must provide Financial

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[28] *Id.* at P 20.

[29] CAISO Tariff Section 12.6.3(a). The CAISO Tariff requires a CRR Holder (or Candidate CRR Holder) to secure its financial transactions with the CAISO by posting Financial Security, the level of which constitutes the market participant's Financial Security Amount. The Financial Security Amount represents the CRR Holder's (or Candidate CRR Holder's) Aggregate Credit Limit. Each CRR Holder (or Candidate CRR Holder) is required to maintain an Aggregate Credit Limit that is at least equal to its Estimated Aggregate Liability. CAISO Tariff Sections 12.1(a), 12.6.2. The CAISO Tariff formerly allowed CRR Holders and Candidate CRR Holders to include unsecured credit in their Aggregate Credit Limits, but the CAISO eliminated that use of unsecured credit to comply with Order No. 741. *See Cal. Indep. Sys. Operator Corp.*, 136 FERC ¶ 61,194, at PP 24-27.

[30] CAISO Tariff Section 12.6.3(a).

Security in the form of either an irrevocable and unconditional letter of credit by a bank or financial institution reasonably acceptable to the CAISO or a prepayment to the CAISO.[31]

The CAISO Tariff states that "[e]ach CRR Holder that holds a CRR with a term of one year or less shall be subject to a credit requirement ($/MW) equal to the negative of the most recent CRR Auction Price of such CRR or the Historical Expected Value of such CRR, whichever is lower, plus the Credit Margin for such CRR."[32] Similarly, the CAISO Tariff states that "[e]ach CRR Holder that holds a Long Term CRR shall be subject to a credit requirement ($/MW) equal to the negative of the most recent annual CRR Auction Price of a CRR with the same CRR Source and CRR Sink as the Long Term CRR or the Historical Expected Value of such a CRR, whichever is lower, plus the Credit Margin calculated for the CRR but with only a one-year term."[33] For all CRRs, the Credit Margin equals the Expected Congestion Revenue minus the Fifth Percentile Congestion Revenue for the CRR, both of which values are "based on the probability distribution of Congestion revenue of such CRR calculated using historical Locational Marginal Price data, when available . . . with the details of such calculation published in a Business Practice Manual."[34] All CRRs receive a

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31 CAISO Tariff Section 12.2(a)-(b).

32 CAISO Tariff Section 12.6.3.2. The CRR Auction Price is the positive or negative price to pay or be paid for a CRR at auction. *See* CAISO Tariff, Appendix A, definition of CRR Auction Price.

33 CAISO Tariff Section 12.6.3.3.

34 CAISO Tariff Section 12.6.3.4.

Credit Margin that cannot have a negative value.[35] The CAISO updates the Credit Margin calculations annually.[36] Thus, for every CRR, the credit requirement consists of two component parts: (1) a portfolio valuation (*i.e.*, the negative of the most recent CRR Auction Price or the Historical Expected Value, whichever is lower); and (2) the Credit Margin, which is calculated using historical Locational Marginal Price data.

To provide a simplified hypothetical example of the CAISO's CRR credit practices, consider a 10-megawatt (MW) CRR with a term of one year or less that has a CRR Auction Price of negative $1,000/MW (*i.e.*, the bidder is willing to be paid $1,000/MW to take on the CRR), a Historical Expected Value of negative $800/MW, and a Credit Margin of $400/MW. The credit requirement for the 10-MW CRR is $1,000/MW (because the negative $1,000/MW CRR Auction Price is lower than the negative $800/MW Historical Expected Value) plus the $400/MW Credit Margin, which equals $1,400/MW, multiplied by 10 MW (because it is a 10-MW CRR). The result of this calculation is a credit requirement of $14,000 for the 10-MW CRR.

The CAISO Tariff specifies that if a CRR Holder owns more than one CRR, the CRR Holder is subject to an overall credit requirement calculated on a portfolio basis – *i.e.*, equal to the sum of the individual credit requirements

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[35] Attachment G to the Business Practice Manual for Congestion Revenue Rights at Section 1.2.2 (CRR BPM). Attachment G to the CRR BPM sets forth the details concerning how the Credit Margin is calculated.

[36] Business Practice Manual for Credit Management & Market Clearing at Section 6.2.2 (Credit Management BPM).

applicable to each of the CRR Holder's CRRs.[37] "If this sum is positive, the amount will be added to the CRR Holder's Estimated Aggregate Liability. However, if the sum is negative, the CRR Holder's Estimated Aggregate Liability shall not be reduced."[38] Further, if a CRR Holder holds one or more CRRs obtained through a CRR Allocation and also holds one or more CRRs obtained through a CRR Auction, "the individual credit requirements applicable to any of the CRRs obtained through a CRR Allocation may not be netted against the individual credit requirements applicable to any of the CRRs obtained through a CRR Auction in determining such CRR Holder's Estimated Aggregate Liability."[39] Thus, no netting is permitted as between allocated CRRs and auction CRRs.

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[37] CAISO Tariff Section 12.6.3(b). That tariff section also states that the overall credit requirement is "calculated after the MW associated with any Offsetting CRRs are netted out." *Id.* However, Offsetting CRRs cannot reduce the overall Financial Security requirement of a CRR Auction portfolio. Offsetting CRRs are instead part of the CAISO's load migration adjustment, and they only apply to CRR Allocations, not CRR Auctions. *See* CAISO Tariff Sections 12.6.4 and 36.8.5.3 (the latter requiring the CAISO to make certain adjustments to CRRs to reflect load migration between LSEs that have been allocated CRRs). The Commission expresses concern that the CAISO "allow[s] for some limited offsetting of collateral requirements to reduce the overall collateral requirement of an FTR portfolio" and "without appropriate backstops like a volumetric minimum collateral requirement . . . market participants may be able to structure their FTR portfolios to minimize their collateral requirements without correspondingly reducing risk." Show Cause Order at P 29. Because the CAISO's offsetting only occurs in the context of CRR allocations, not CRR auctions, this risk of concern to the Commission does not exist.

[38] CAISO Tariff Section 12.6.3(b).

[39] CAISO Tariff Section 12.6.3(b). *See* Section 6.2.2 of the Credit Management BPM for additional detail.

B. The CRR Portfolio Estimate Utilizes Both Mark-to-Auction and Historical Estimates to Set the Higher Amount of Financial Security Requirement

In the Show Cause Order, the Commission stated that "mark-to-auction collateral requirements help ensure that market participants post adequate collateral to meet the evolving risk of their portfolio as the value of the portfolio changes over time."[40] The Show Cause Order directed the CAISO to explain whether its Tariff incorporates a mark-to-auction mechanism that addresses the increased risk of default that may arise when an FTR (*i.e.*, CRR) portfolio declines in value.[41]

Under the CAISO Tariff provisions described in Section II.A above, the CAISO utilizes both a mark-to-auction mechanism and Historical Expected Value to determine the value to use in setting Financial Security requirements. The CAISO Tariff provides that the CRR holding requirement is established on a portfolio-wide basis after computing the "sum of the individual credit requirements applicable to each of the CRRs held by such CRR Holder."[42] The individual credit requirements for each CRR are calculated as the negative of the most recent CRR Auction Price of the CRR or the Historical Expected Value of the CRR, whichever is lower, plus the Credit Margin (which cannot have a negative value).[43] The Historical Expected Value is defined as the "expected value of a

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40 Show Cause Order at P 24.

41 *Id.* at PP 26, 30-32.

42 CAISO Tariff Section 12.6.3(b).

43 CAISO Tariff Sections 12.6.3.2-12.6.3.3. The Credit Margin is discussed further in Section II.C below.

CRR, as calculated by the CAISO, based on monthly historical market operation data for the applicable month. Such values are established based on at least one (1) year and up to three (3) years of historical market operations data.[44] The CAISO Tariff does not allow a CRR Holder to provide estimates of the CRR values to set Financial Security requirements. By basing the credit requirements on market data through the use of either the CRR Auction Price or the Historical Expected Valuation, the CAISO utilizes market data to set Financial Security requirements in all cases.

In a CRR Auction, bidders submit bids to purchase positively valued CRRs. These are the CRRs that are expected to generate revenues in the CAISO market during the term of the CRR. These bids clear at positive values. Bidders can also submit bids to be paid to hold CRRs. These are the negatively valued CRRs that are expected to require the CRR holder to pay revenues during the term of the CRR. The auction clearing price is one estimate of the expected market obligation. If the auction price is, for example, negative $100,000, one option is to require $100,000 of Financial Security relying strictly on mark-to-auction. However, if the Historical Expected Value is negative $150,000, the CAISO will require the CRR holder to provide $150,000 in Financial Security even though the CRR Auction cleared at $100,000.

Accordingly, using the negative of the most recent CRR Auction Price or the Historical Expected Value (whichever is lower) ensures a conservative

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[44] Definition of Historical Expected Value, Appendix A to CAISO Tariff.

outcome by requiring the CRR Holder post the higher Financial Security amount to address the risk that CRR Auction revenues may not be sufficient to cover the market risk of a particular CRR. The CAISO also adds the Credit Margin, which is weighted to impose a higher volumetric requirement on riskier negatively valued CRRs. Thus, in the GreenHat example described in Section I, the actual mark-to-auction value was negative $90 million. If PJM were updating credit requirements to consider the most recent auction valuation, PJM would have required GreenHat to provide $90 million in Financial Security. The CAISO's approach of considering both mark-to-auction value and Historical Expected Value is particularly valuable when applied to CRRs that may at times be negatively valued or have low positive values. If the Historical Expected Value is negative, but a CRR has a more recent CRR Auction value that is low-positive, the CAISO would use the lower Historical Expected Value and continue to require Financial Security even though the most recent CRR Auction value is positive.[45] The Credit Margin provides additional protection.

The CAISO's approach is superior to relying solely on a mark-to-auction mechanism because a mark-to-auction mechanism alone could fail to capture the full range or risks that emerge when auction results diverge materially from historical outcomes. Evaluating the CRR Holder's CRR portfolio based on the negative value of the lower of the CRR Auction Price or the Historical Expected Value provides superior risk mitigation when compared to reliance solely on a

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[45] *See* CAISO Tariff Section 12.6.3(c).

mark-to-auction mechanism or solely on historical values. In addition, as described in Section II.A, the CAISO Tariff limits netting across the CRR Holder's portfolio.

To help ensure that a CRR Holder is fully secured at all times, the CAISO Tariff requires the CAISO to "reevaluate the credit requirements for holding CRRs, and [to] adjust the credit requirements accordingly, not less than monthly."[46] In addition, the CAISO may perform a reevaluation and reassessment of CRR credit requirements "more frequently than monthly if necessary if the CAISO finds that actual or anticipated market conditions indicate that CRR credit requirements may be inadequate to cover the financial risk of the CRRs."[47]

In the Show Cause Order, the Commission expressed concern that a lack of ability to perform current valuations of FTR portfolios could result in under-secured FTR risks when historical congestion or system conditions deviate significantly from future congestion or system conditions.[48] As explained above, the CAISO Tariff not only uses a mark-to-auction mechanism, it also includes additional features, such as frequent review, to ensure a CRR Holder is fully secured based on valuations that reflect both current market information and historical information, whichever results in a higher Financial Security requirement. The CAISO's CRR market design, which requires a CRR Holder to

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46 CAISO Tariff Section 12.6.3(c).

47 *Id.*

48 *See* Show Cause Order at P 24.

maintain Financial Security in an amount equivalent to 100 percent of its potential CRR liabilities and allows the CAISO frequently to reassess the credit requirement for the entity's CRR portfolio, effectively mitigates the risk of defaults consistent with the objectives of the Show Cause Order.

C. The CRR Credit Holding Requirements Include a Separate Volumetric Minimum Credit Margin

In the Show Cause Order, the Commission noted that following the GreenHat default in 2018, PJM and SPP both changed their tariffs to include a flat volumetric minimum collateral requirement of $0.10/MWh for FTR positions.[49] The Commission explained that "[m]echanisms that ensure some minimum level of collateral support, such as a volumetric minimum FTR collateral requirement, can help address the risk from under-collateralized portfolios."[50] The Commission found that "[v]olumetric minimum FTR collateral requirements act as a floor, ensuring that an FTR portfolio's collateral requirement cannot be reduced below the applicable $/MWh threshold."[51] The Commission expressed concern that an RTO/ISO tariff that lacks an explicit $/MWh volumetric minimum FTR collateral requirement could allow market participants to minimize their collateral requirements without a corresponding reduction in risk.[52] In this regard, the Commission stated that the CAISO Tariff appears "to lack an equivalent backstop

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[49] *Id.* at P 20. Further, the Commission noted that MISO implemented a flat $0.05/MWh minimum requirement. *Id.* Subsequent to the Greenhat default, PJM and MISO also revised their tariffs to include mark-to-auction provisions. *See id.* at P 18.

[50] *Id.* at P 28.

[51] *Id.*

[52] *Id.*

ensuring that market participants maintain some minimum level of collateral that scales with the size of their FTR portfolios."[53]

As explained above, the CAISO CRR credit holding requirements consist of two components: the Financial Security required for the CRR portfolio based on the value of the portfolio, plus an additional CRR Credit Margin that must be non-negative. The Credit Margin is a volumetric value that is weighted to produce a $/MWh amount that imposes a higher Financial Security requirement on negative and low positively valued CRRs compared to high positively valued CRRs. Specifically, the Credit Margin is designed such that, in case of default by a CRR Holder, the probability that the CRR credit requirements cannot fully cover the financial loss over the remaining term of the CRR does not exceed five percent.[54] The CAISO Tariff provides that the Credit Margin will be calculated the same for all types of CRRs and will cover the difference between the expected value of the congestion revenue (the Expected Congestion Revenue) and the fifth percentile value of the congestion revenue (the Fifth Percentile Congestion Revenue) of the CRR.[55] This ensures the volumetric minimum Credit Margin covers 95 percent of the risk. The volumetric minimum Credit Margin formula was developed based on the "Value-at-Risk" approach that uses an

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[53] *Id.* at P 29.

[54] CAISO Tariff Section 12.6.3.4; Attachment G to CRR BPM at Section 1.1.

[55] CAISO Tariff Section 12.6.3.4.

estimate of the downside financial risk of the CRR in order to cover the worst-case loss with a specific confidence level over a given period of time.[56]

To perform the volumetric minimum Credit Margin calculations, the CAISO computes a Credit Margin for each of the three time-of-use categories associated with the CRR products – on-peak, off-peak, and Sunday. The off-peak hours are the hours ending 1 through 6 and hour ending 23 and 24 from Monday to Saturday; the on-peak hours are the hours ending 7 through 22 from Monday to Saturday; and Sunday is the calendar Sunday from hours ending 1 through 24. Using statistics software, the CAISO performs hourly computations to compute the difference between the expected value and the fifth percentile value based on the most current 36 months of historical data. The hourly values are then summed for each of the three periods, with the CAISO computing Credit Margins for each month by time-of-use period expressing such credit margins in a $/MW-day format.[57]

Thus, for each period the CRR Holder must maintain the Credit Margin in addition to the Financial Security requirement for the CRR Holder's CRR portfolio. Further, as discussed above, the CAISO may reassess its determinations regarding the Credit Margin at any time and require additional Financial Security if the reassessment results in an increase in a credit requirements not covered by the Financial Security posted with the CAISO.[58] For

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56 *See* Attachment G to the CRR BPM at Section 1.1.

57 *See id.* at Sections 1.2-1.3.

58 CAISO Tariff Section 12.6.3(c).

these reasons, the Credit Margin helps to reduce the default risk of large, risky portfolios.

III. Conclusion

The CAISO's existing credit policy utilizes a mark-to-auction mechanism and imposes volumetric minimum Credit Margin requirements. Therefore, as explained above, the CAISO Tariff is just and reasonable and does not require any further changes to address the policy concerns identified in the Show Cause Order.

Respectfully submitted,

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Attachment A – CAISO Tariff Section 12.6.3

Response to Order to Show Cause

California Independent System Operator Corporation

October 26, 2022

12.6.3 Credit Requirements for the Holding of CRRs

12.6.3.1 Credit Requirements Generally

(a) Each CRR Holder that is not a federal agency, whether it obtains CRRs through a CRR Allocation or a CRR Auction, must maintain Financial Security utilizing one or more of the forms specified in Section 12.2 that meets or exceeds the credit requirement of the CRR portfolio determined as described in this Section 12.6.3. Each CRR Holder that is a federal agency, whether it obtains CRRs through a CRR Allocation or a CRR Auction, must provide to the CAISO a letter, executed by an officer of the CRR Holder, that satisfies all of the following requirements: (1) attests that the federal agency is lawfully authorized to obtain the CRRs and that any debt the federal agency incurs due to holding the CRRs is a debt of the United States; (2) identifies the current year's appropriations for the federal agency from the United States Congress; and (3) verifies that the amount of the current year's appropriations for the federal agency from the United States Congress meets or exceeds the credit requirement for the CRR portfolio determined as described in this Section 12.6.3. The provision of such an executed letter to the CAISO shall constitute sufficient Financial Security for the federal agency to hold the CRRs.

(b) Each CRR Holder shall be required to ensure that its Financial Security is sufficient to satisfy the credit requirements described in this Section 12.6.3. Except as provided in this paragraph, CRRs are evaluated on a portfolio basis as follows. If a CRR Holder owns more than one (1) CRR, such CRR Holder shall be subject to an overall credit requirement that is equal to the sum of the individual credit requirements applicable to each of the CRRs held by such CRR Holder , which is calculated after the MW associated with any Offsetting CRRs are netted out. If this sum is positive, the amount will be added to the CRR Holder's Estimated Aggregate Liability. However, if the sum is negative, the CRR Holder's Estimated Aggregate Liability shall not be reduced. If a CRR Holder holds one (1) or more CRRs obtained through a CRR Allocation and also holds one (1) or more CRRs obtained through a CRR Auction, the individual credit requirements applicable to any of the CRRs obtained through a CRR Allocation may not be netted against the individual credit requirements applicable to any of the CRRs obtained through a CRR Auction in determining such CRR Holder's Estimated Aggregate Liability.

(c) The CAISO shall reevaluate the credit requirements for holding CRRs, and shall adjust the credit requirements accordingly, not less than monthly. The CAISO may adjust the credit requirements for holding CRRs with terms of one (1) year or less at the CAISO's discretion to account for changes in the monthly auction prices for CRRs and changes in the Historical Expected Values for CRRs, or more frequently than monthly if necessary if the CAISO finds that actual or anticipated market conditions indicate that CRR credit requirements may be inadequate to cover the financial risk of the CRRs. The CAISO may also adjust the credit requirements for holding Long Term CRRs annually to reflect the changes in auction prices of one-year CRRs in annual auctions and changes in the Historical Expected Values for CRRs, and to reflect updates to Credit Margins based on actual Locational Marginal Price data derived from market operations. Whenever the CAISO requests additional Financial Security from a Market Participant as a result of a change in CRR value that is not related to an adjustment due to the monthly CRR Auction Price or an adjustment related to Historical Expected Value, the CAISO will provide a written explanation of the reason for that request. Any additional Financial Security must be in one or more of the forms specified in Section 12.2.

(d) In cases where the ownership of a CRR is to be transferred through the Secondary Registration System, the CAISO shall evaluate and adjust the credit requirements for both the current owner of the CRR and the prospective owner of the CRR as appropriate prior to the transfer. If additional Financial Security is required from either the current or prospective owner, the transfer will not be completed until such Financial Security has been provided to and accepted by the CAISO. CRRs transferred through the Secondary Registration System will be treated like auctioned CRRs for the purpose of calculating the credit requirements for holding the CRRs, regardless of whether the CRRs were originally allocated or purchased at auction or acquired through the Secondary Registration

System. CRRs assigned to Load-gaining or Load-losing Load Serving Entities as a result of Load Migration will be treated like allocated CRRs for the purpose of calculating the credit requirements for holding the CRRs. Any additional Financial Security must be in one or more of the forms specified in Section 12..

12.6.3.2 Calculation of the Credit Amount Required to Hold a CRR with a Term of One Year or Less

Each CRR Holder that holds a CRR with a term of one year or less shall be subject to a credit requirement ($/MW) equal to the negative of the most recent CRR Auction Price of such CRR or the Historical Expected Value of such CRR, whichever is lower, plus the Credit Margin for such CRR. The CRR Auction Price will be used until twelve (12) months of historical market operations data are available.

12.6.3.3 Calculation of the Credit Amount Required to Hold a Long Term CRR

Each CRR Holder that holds a Long Term CRR shall be subject to a credit requirement ($/MW) equal to the negative of the most recent annual CRR Auction Price of a CRR with the same CRR Source and CRR Sink as the Long Term CRR or the Historical Expected Value of such a CRR, whichever is lower, plus the Credit Margin calculated for the CRR but with only a one-year term. If there is less than one year remaining in the term of a Long Term CRR, the credit requirement shall be determined pursuant to Section 12.6.3.2.

12.6.3.4 Calculation of Credit Margin

The Credit Margin ($/MW) for a CRR is equal to (i) the Expected Congestion Revenue minus (ii) the Fifth Percentile Congestion Revenue of such CRR. Both values will be based on the probability distribution of Congestion revenue of such CRR calculated using historical Locational Marginal Price data, when available, and proxy values, including data taken from Locational Marginal Price studies conducted by the CAISO, until such time as historical Locational Marginal Price data is available, with the details of such calculation published in a Business Practice Manual. The CAISO may reassess its determinations regarding the Credit Margin determination at any time and shall require additional Financial Security if the reassessment results in an increase in a CRR Holder's CRR credit requirements that are not covered by the CRR Holder's Financial Security. Any additional Financial Security must be in one or more of the forms specified in Section 12.2.

CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon all of the parties listed on the official service list for the captioned proceeding, in accordance with the requirements of Rule 2010 of the Commission's Rules of Practice and Procedure (18 C.F.R. § 385.2010).

Dated at Folsom, California this 26th day of October, 2022.

/s/ Jacqueline Meredith
Jacqueline Meredith