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June 22, 2007

The Honorable Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Re: California Independent System Operator Corporation
Docket Nos. ER07-613-___ and ER07-____- 000
June 2007 Congestion Revenue Rights Credit Policy Amendment

Dear Secretary Bose:

Pursuant to Section 205 of the Federal Power Act ("FPA"),[1] 16 U.S.C. § 824d, and Section 35.13 of the regulations of the Federal Energy Regulatory Commission ("Commission"), 18 C.F.R. § 35.13, the California Independent System Operator Corporation ("CAISO") respectfully submits for filing an original and five copies of an amendment to the ISO Tariff (the "June 2007 Congestion Revenue Rights Credit Policy Amendment" or "Amendment"). The CAISO submits this filing in order to incorporate into the ISO Tariff new credit policy provisions to accommodate the auctioning, holding, and transfer of Congestion Revenue Rights ("CRRs"). As discussed below and in the attached Declaration of Dr. Scott M. Harvey ("Harvey Declaration"), the CAISO's proposed CRR-related credit policies are just and reasonable. The CAISO respectfully requests that the Commission approve the Amendment to be effective sixty days after submittal of the instant filing, *i.e.*, on August 22, 2007.[2]

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[1] Capitalized terms not otherwise defined herein have the meanings set forth in the Master Definitions Supplement, Appendix A to the ISO Tariff, and in Part G (Definitions) of Appendix BB to the ISO Tariff.

[2] *See* Section IV of this transmittal letter for a discussion of the timing of the initial implementation of the CRR credit requirements discussed herein.

In the instant filing, the CAISO also submits for informational purposes, the Business Practice Manual ("BPM") for Credit Management in compliance with the Commission's May 8, 2007, order,[3] and the June 7, 2007, Order Granting Extension of Time in Docket No. ER07-613.[4]

Two extra copies of this filing are also enclosed. Please stamp these copies with the date and time filed and return them to the messenger.

I. BACKGROUND

A. The Implementation of CRRs, and the Current CRR Credit Policy Provisions of the ISO Tariff

Over the last several years, the CAISO has developed through an extensive stakeholder process a structure under the CAISO's Market Redesign and Technology Upgrade ("MRTU") program for creating and releasing CRRs, which will replace the Firm Transmission Rights ("FTRs") that are used under the CAISO's current market design. CRRs are financial instruments that will allow Market Participants[5] to obtain financial protection from the risk of Congestion Charges associated with the Locational Marginal Price ("LMP") design under MRTU, but may also require CRR Holders to pay Congestion Charges, as CRRs are defined as "obligations" and not "options." Accordingly, a CRR may have an expected value that is either positive or negative. Under the accepted provisions of the MRTU Tariff, a CRR may have a term of one year or less. In compliance with Order Nos. 681 and 681-A, the CAISO has also filed Tariff provisions to provide CRRs for a term of ten years ("Long Term CRRs").[6] The CAISO will allocate CRRs to Load-Serving Entities (which are Market Participants) and will auction off CRRs to Market Participants and Candidate CRR Holders on a periodic basis. Market Participants that obtain CRRs may hold them or may, subject to the relevant tariff provisions, transfer them to other Market Participants.[7]

The Commission has approved the early effectiveness of CAISO proposals regarding CRRs in response to the CAISO's March 9, 2007 tariff amendment filing seeking early effectiveness of a number of CRR tariff

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[3] *California Independent System Operator Corp.*, 119 FERC ¶ 61,124 (2007) ("May 8 Order").

[4] *California Independent System Operator Corp.*, 119 FERC ¶ 61,244 (2007) ("June 7 Order").

[5] Market Participants are defined in the ISO Tariff and the MRTU tariff to include, as relevant here, CRR Holders and Candidate CRR Holders.

[6] The CAISO's Long Term CRR filing was submitted in Docket Nos. RM06-8 and ER07-475 on January 29, 2007.

[7] *See* California Independent System Operator Corporation Electric Tariff Filing to Reflect Market Redesign and Technology Upgrade, Docket No. ER06-615-000, Transmittal Letter at 23-32 (Feb. 9, 2006).

provisions relating to MRTU.[8] In other words, the Commission has approved ISO Tariff provisions that will allow the CAISO to take the necessary steps to ensure that CRRs are allocated or auctioned to Market Participants prior to the implementation of MRTU. Although the CAISO plans to commence operations under MRTU on January 31, 2008, the CAISO will conduct its first CRR Allocations and CRR Auctions prior to the start of MRTU.[9] Specifically, the CAISO will begin the allocation process by accepting nominations from Load-Serving Entities on July 20, 2007. The CAISO plans to conduct the first auction of CRRs in October 2007.

During the initial allocation and auction of CRRs, the CAISO will still be operating under the current ISO Tariff rather than the MRTU tariff. Section 12 of the ISO Tariff requires each Market Participant to ensure that its Aggregate Credit Limit (*i.e.*, the sum of its Unsecured Credit Limit and Financial Security Amount) is equal to or greater than its Estimated Aggregate Liability ("EAL") at all times.[10] The CAISO may take enforcement action against a Market Participant that fails to meet this requirement and thus is under-secured.[11] In 2006, the Commission approved, in Docket No. ER06-700, a comprehensive set of revisions to the CAISO's credit provisions in Section 12 of the ISO Tariff designed to improve the calculation of credit requirements and ensure that Market Participants provide credit or post financial security sufficient to cover all of their financial obligations.[12]

The provisions of Section 12 currently address the credit policy requirements applicable to CRRs in only a limited fashion. All of the credit policy provisions that apply specifically to CRRs under the current ISO Tariff were added in the CAISO's March 9, 2007 filing in Docket No. ER07-613-000 ("March 9 Filing"). In that filing, the CAISO submitted revisions to the ISO Tariff to facilitate timely implementation of MRTU. The revisions included changes to the ISO Tariff related to the CAISO's planned allocation and auction of CRRs. With regard to credit policy requirements applicable to CRRs, the CAISO added a pair of references to CRRs to Section 12.1 of the ISO Tariff and included, in new Appendix BB to the ISO Tariff, a new Tariff provision – Section 12.6 – concerning credit obligations for CRR Holders and Candidate CRR Holders.[13] Section 12.6.2 requires CRR Holders to post security to cover the value of the net

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8 *See California Independent System Operator Corp.*, 116 FERC ¶ 61,274, at PP 704-900 (2006), *order on reh'g*, *California Independent System Operator Corp.*, 119 FERC ¶ 61,076, at PP 254-60, 348-420 (2007).

9 June 7 Order at P 2.

10 ISO Tariff, § 12.1.

11 *Id.*, § 12.5.

12 *California Independent System Operator Corp.*, 115 FERC ¶ 61,170 (2006).

13 *See* Amendments to the ISO Tariff to Facilitate Timely Implementation of the MRTU Markets, Docket No. ER07-613-000, Transmittal Letter at 10, and Attachment B (Mar. 9, 2007).

projected obligation of the CRRs. In its May 8 Order, the Commission accepted the March 9 Filing in relevant part.[14]

B. Reasons for this Amendment

As the CAISO noted in the March 9 Filing, the CAISO recognizes the need to augment the CRR credit policy provisions in the ISO Tariff in preparation for the implementation of CRRs. In addition, on April 19, 2007, the Commission issued an order providing further guidance on the level of detail concerning credit requirements that must be included in the ISO Tariff.[15] The April 19 Order provided guidance, consistent with Order No. 890,[16] that requires the specification of how the CAISO calculates EAL to be included in the ISO Tariff rather than in a Business Practice Manual. Since the net projected obligations of CRRs are a component of EAL, the CAISO is including details concerning how CRRs are valued in the tariff, consistent with this guidance. Therefore, the CRR credit provisions that must be supplemented relate to credit requirements for CRR Auctions, the holding of CRRs, and the enforcement actions the CAISO may take with regard to entities that failed to meet credit policy requirements concerning CRRs.

C. Policy Rationale for Credit Requirements for CRRs

All Market Participants can participate in CRR Auctions by submitting bids to purchase positively or negatively valued CRRs. As with any other market, there are potential opportunities for speculation and gaming that could have adverse impacts on other parties if market rules and credit requirements are not properly designed. Absent credit requirements for participation in the CRR Auctions, a Market Participant could potentially submit bids to purchase positively priced CRRs that would be beyond its financial capability to pay for, and then fail to pay the purchase price for CRRs won in a CRR Auction. Alternatively, a Market Participant could bid for negatively priced CRRs, take the payments by the CAISO and then default on subsequent payment obligations to the CAISO to the detriment of market creditors in the months of the defaults.

Like an FTR in the current CAISO market, a CRR entitles its holder to receive a payment from the CAISO if the Congestion in a given trading hour is in the same direction as the CRR. Unlike today's FTRs, however, a CRR requires the holder to pay a charge to the CAISO if the Congestion in a given trading hour is in the opposite direction of the CRR. In the event that a CRR Holder is unable

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[14] May 8 Order at Ordering Paragraph (A).

[15] This order addressed rehearing requests and compliance filings in Docket No. ER06-700. *California Independent System Operator Corp,*, 119 FERC ¶ 61,053 (2007) ("April 19 Order").

[16] *Preventing Undue Discrimination in Transmission Service*, Order No. 890, 71 Fed. Reg. 12,266 at P 1657 (Mar. 15, 2007), FERC Stats. & Regs. ¶ 31,241 (2007).

or unwilling to make the required payment, the uncovered financial loss will be shared by other Market Participants, potentially for the entire term of the CRR.

In order to minimize the occurrence and the impact of the kinds of situations described above, the CAISO determined that it needed to establish a comprehensive credit policy governing the financial requirements for obtaining and holding CRRs, and means of enforcing those requirements.

In developing the Amendment, the CAISO was mindful of the need to balance competing goals. On the one hand, the CAISO seeks to protect the financial interests of all Market Participants by including changes in the Amendment that will reduce the likelihood of default and will mitigate the losses to other Market Participants if a default happens. On the other hand, the CAISO seeks to ensure that the credit requirements in the Amendment are not so conservative as to create a barrier to participation in the CRR market by creditworthy Market Participants. The CAISO understands that, if the Amendment did not strike a reasonable balance between these two goals, the Amendment would discourage the participation of Market Participants and would eventually reduce the liquidity and effectiveness of the CRR market. In balancing these two goals, the CAISO is following the specific guidance provided by the Commission on ISO and RTO credit issues.[17]

D. CRR Credit Policy Design Elements

This Amendment was developed based on expert advice from Dr. Scott Harvey of LECG and on feedback the CAISO received over the course of an extensive stakeholder process concerning CRR credit policy issues that was part of the CAISO's larger stakeholder process on CRR-related issues. The CAISO's stakeholder process on CRR credit policy issues was consistent with Commission directives encouraging, to the extent practicable, each ISO and RTO to improve its credit practices through its stakeholder processes.[18] The documents related to the CAISO stakeholder process are found on the "Congestion Revenue Rights (CRR) Initiative" page on the ISO Website.[19] A description of the stakeholder and ISO Governing Board process is included in Attachment C to this Amendment, and certain particularly relevant documents supporting the development of the instant filing are included as appendices to Attachment C.

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[17] *See Policy Statement on Electric Creditworthiness*, 109 FERC ¶ 61,186, at PP 17-19 (2004) ("Credit Policy Statement") (discussing the need for ISOs and RTOs to maintain balance in their credit policy provisions); *Midwest Independent Transmission System Operator, Inc.*, 111 FERC ¶ 61,250, at P 31 (2005) (same).

[18] *See* Credit Policy Statement at P 32; *Midwest Independent Transmission System Operator, Inc.*, 111 FERC ¶ 61,053, at P 177 (2005).

[19] This page on the ISO Website is http://www.caiso.com/1b8c/1b8cdf25138a0.html.

In addition to the other materials discussed herein, this Amendment includes the Declaration of Dr. Harvey of LECG. The Declaration includes, among other things, detailed discussion of the risks the CAISO faces from CRR credit defaults, the options available to the CAISO to address those risks, the CAISO's proposed credit requirements for the CRR Auctions and for the holding of CRRs, alternative proposals that were discussed during the CRR credit policy stakeholder process, and the analytical framework for determining CRR credit requirements.[20]

The CAISO's CRR Credit Policy consists of the following general elements: (1) credit requirements for participation in CRR Auctions; (2) credit requirements applicable to CRR Holders of CRRs with a term of a year or less; (3) credit requirements applicable to Long Term CRRs; (4) credit requirements associated with transfers of CRRs; and (5) enhanced enforcement tools in case of default or for failure to comply with the CAISO's Credit Policies. The following is an overview of these elements with a discussion of the justification for these elements and key decisions the CAISO made based on stakeholder input. A more detailed discussion of the specific Tariff changes is provided in Section II of this transmittal letter.

1. Credit Requirements for Participation in CRR Auctions

Participants in a CRR Auction must satisfy a $500,000 minimum available credit requirement. The Commission approved a similar $500,000 minimum credit requirement for use in the tariff of ISO New England, Inc. ("ISO-NE").[21]

The available credit of a participant in a CRR Auction must also exceed the absolute value of all bids for either positively priced or negatively priced CRRs. Otherwise, all the bids made by the participant will be rejected. After the conclusion of the CRR Auction, and subject to the credit requirements applicable to CRR Holders (discussed subsequently), successful bidders will pay the full amount (*i.e.*, the sum of auction market clearing price times MW quantities awarded) due to the CAISO for positively priced CRRs awarded, and the CAISO will pay the full amounts to Market Participants awarded negatively priced CRRs in the CRR Auction.

These elements of the CAISO's CRR credit policy address two sets of concerns identified through the stakeholder process. First, several stakeholders

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20 Dr. Harvey's Declaration is provided in Attachment D to this Amendment.

21 Subsequent to this approval, ISO-NE submitted a filing under Section 205 of the FPA to remove this minimum credit requirement, which the Commission accepted. *See* Amendments to the ISO New England Financial Assurance Policies and ISO New England Billing Policy, Docket No. ER06-647-000, Transmittal Letter at 9 (Feb. 16, 2006); *ISO New England Inc.*, 115 FERC ¶ 61,054 (2006). This filing does not alter the Commission's prior finding that a $500,000 minimum credit requirement is just and reasonable.

expressed concern that, absent a pre-auction credit requirement for the purchase of low-priced and negatively priced CRRs, entities with minimal assets could bid to acquire large portfolios of CRRs with low or negative prices in the CRR Auction and then be unable to post the required credit coverage. There was a further concern that, absent an appropriate credit requirement for bidding in the CRR Auction, such behavior could be orchestrated between affiliates so as to depress CRR Auction prices by the offer of substantial quantities of counterflow CRRs at artificially low prices by entities with little or no assets. As discussed by Dr. Harvey, these concerns are addressed by the proposed credit requirements for participation in the CRR Auction.

2. Credit Requirements Applicable To CRR Holders of CRRs With A Term Of A Year Or Less

The CAISO's CRR credit requirements are designed to reflect the reality that Congestion revenue associated with CRRs can be highly variable because of the variability of LMPs. Due to many factors, such as load, generation resource availability, and transmission outages, the power flow and the Congestion pattern on the transmission grid changes constantly. By definition, the Congestion revenue derived from a CRR is the difference between the Congestion component of the LMP at the sink and the Congestion component of the LMP at the source multiplied by the megawatt quantity of the CRR, based on the LMPs of the Day-Ahead Integrated Forward Market ("IFM"). As a result of the constant change in the power flow and Congestion pattern, the Congestion revenue of a CRR can vary even from one hour to the next and can also swing from positive to negative from hour to hour. This is true with regard to both CRRs with terms of one year or less (hereafter "short term CRRs") and Long Term CRRs. Consequently, the credit requirement for holding each CRR (regardless of its term) must be designed to reasonably cover the potential actual Congestion revenues associated with that CRR, in the event that actual Congestion revenues differ from those expected at the time the Market Participant obtained the CRR.

Accordingly, the CAISO's approach for determining the value of a CRR has two components: (1) the most recent evidence of expected value of the CRR (*i.e.*, the CRR Auction price), plus (2) a credit margin to reflect the potential for the CRR Holder to face future payment obligations in excess of the expected value of the CRR.

The expected value of the CRRs will be based on the prices of CRRs in the auction because it is the best evidence of future value. Some stakeholders proposed the use of LMP studies the CAISO has already conducted as a basis for determining the expected value of a CRR, rather than CRR Auction prices. Dr. Harvey has considered this issue based on his extensive experience with financial transmission rights in other ISOs and RTOs and explains that, even

though the actual future value of a CRR will always be uncertain, auction prices are the best evidence of the expected value of a CRR:

> Actual future congestion payments will always be unknown at the time of the auction and there will be particular uncertainty at the time of the initial auction, as there will be no history of actual congestion patterns to guide market participant expectations for prospective congestion patterns. Nevertheless, the auction price is the best measure of expected congestion payments.[22]

On a related issue, some stakeholders have raised concerns that, because the initial CRR Allocation will precede the initial CRR Auction by several months, Load-Serving Entities ("LSEs") who receive CRRs in the initial allocation will not know their credit obligations until after completion of the initial CRR Auction. The CAISO believes this approach is appropriate because the alternative is to use a less-accurate measure of the expected value of a CRR in establishing CRR Holder credit requirements. Prior to the allocation, LSEs should have sufficient information to know which CRRs are positive and will be expected to receive net-positive valued portfolios. Although the credit margin, discussed below, can result in credit requirements for CRRs with low but positive prices coming out of the auction, there is no basis for assuming the prices would be artificially low.

The requirement of a credit margin is intended to reflect reflecting the unpredictability of the future value of the CRR. As Dr. Harvey explains in the attached Declaration, the potential for negatively priced CRRs or CRRs with low positive prices to result in future payment liabilities in excess of the expected value of the CRR is not hypothetical; it can be seen in the patterns of financial rights auction prices and payments for the eastern ISOs/RTOs. Figure 3 in this Declaration illustrates the relationship between uncollateralized "CRR payments" and "CRR prices" for negatively priced annual "CRRs" in the New York ISO's annual auctions.[23] Dr. Harvey explains how this analysis demonstrates that there would be many instances of uncollateralized CRR payments in excess of $10,000/MW under a credit policy that did not require credit coverage in excess of the expected value of CRR payments (*i.e.*, a credit policy that did not include a credit margin as proposed by the CAISO).

As discussed at length in paragraphs 47-50 of Dr. Harvey's Declaration, four options for addressing the unpredictability of the future value of CRRs were considered in the CAISO stakeholder process. Ultimately the CAISO elected to base the initial estimate of CRR payment variability on the results of various LMP

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[22] Harvey Declaration, Attachment D to this Amendment, at footnote 11.

[23] Financial transmission rights are called TCCs in the New York ISO. Dr. Harvey uses the CAISO term for financial transmission rights (CRRs) when referring to TCCs in his Declaration for ease of comparison.

price simulations that the CAISO has undertaken using historical real-time load and generation data. Specifically, the credit margin will be calculated as the difference between the expected value and 5th percentile value from the probability distribution of Congestion revenue of the short term CRR. The CAISO believes that this approach represents the best estimate of the expected payment obligations related to a CRR. As Dr. Harvey explains, "While this approach has a number of limitations, neither the CAISO nor the CAISO stakeholders were able to identify a preferred alternative."

In the future, the CAISO anticipates that data on the variability of CRR payments will be used to revise the required credit margins. Prior to MRTU start-up, however, the historical data required for such an analysis is obviously not available. As Dr. Harvey explains, moreover, even a year's worth of actual CRR data would provide only limited information concerning CRR payment variability.[24]

If a holder owns more than one CRR, the overall credit requirement is assessed for the whole portfolio of CRRs of this CRR Holder. The excess credits from CRRs with negative credit requirements (*i.e.*, CRRs with high positive expected values) can offset credit requirements for other CRRs in the same portfolio. However, the excess credits of a CRR portfolio will not offset any non-CRR component of the Market Participant's Estimated Aggregate Liability. As Dr. Harvey explains, allowing excess credits of a CRR portfolio to offset other components of a Market Participant's EAL would not be appropriate for a number of reasons. First, the credit offset for CRRs derives from payments that will be due to the holder in the future, not in the current billing period. The value reflected in the credit offset is therefore not available to the CAISO to cover a default by a market participant in the current period. Second, the initial determination of CAISO CRR credit requirements and the credit offset is based on very limited information regarding the actual variability of CRR payments, and the prices of CRRs in the initial auctions themselves will be based on limited information regarding the potential distribution of Congestion charges. Third, although the expected value of each CRR will be defined at the time of the auction by the auction price, the CAISO the determinations of credit requirements for CRRs will always be more speculative that other liabilities included in EAL, although the CAISO anticipates that over time, expected revenues of CRRs are more likely to correlate with actual revenues.[25] Given the uncertainty as to the reliability of the estimated credit offset, the CAISO has limited the potential impact on the overall settlements process of understated assessments of CRR payment volatility by limiting the CRR offset to the credit requirement for the CRR market.

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[24] Harvey Declaration, Attachment D to this Amendment, at footnote 12.

[25] *Id.* at PP 27-30.

Finally, the CAISO notes that an LSE outside the CAISO Control Area who is allocated short-term CRRs will be subject to the same credit requirements for holding short-term CRRs as other Market Participants. In addition, consistent with Commission precedent concerning LSEs outside of the CAISO Control Area, such LSEs will be required to maintain one period of credit coverage for their Wheeling Access Charge ("WAC") prepayment beyond the current period. Consistent with the Commission's April 20, 2007 order in the MRTU proceeding,[26] LSEs outside the CAISO Control Area who are allocated short-term CRRs will be given the option to prepay the WAC on a monthly basis in advance of the trade month.

3. Credit Requirements Applicable To CRR Holders of Long Term CRRs

All requirements for holding short term CRRs apply to Long Term CRRs. In the case of a default involving a Long Term CRR, the CAISO may choose to resell it in the subsequent monthly auctions, but it may not be possible for a Long Term CRR to be fully liquidated at the auction. If the Long Term CRR is not resold in an auction, the financial loss includes not only the current period Congestion revenue payments of the defaulting holder of the Long Term CRR, but also the Congestion revenue payments due for all the years in the remaining term of the defaulted Long Term CRR. Therefore the one period credit requirement for holding a short term CRR does not provide all necessary coverage for holding a Long Term CRR. Instead, the credit requirement for holding a Long Term CRR must cover financial risk over the whole term of the Long Term CRR.

Accordingly, the CAISO must value the Long Term CRRs in a manner that reasonably reflects the payment obligations over the term of the CRR. The CAISO considered a number of alternatives for evaluating the credit requirements for Long Term CRRs and ultimately chose a conservative approach given the initial uncertainty as to the volatility of CRR payment obligations.

Specifically, the credit requirement for holding a Long Term CRR is the negative of the one-year expected value of the CRR times the number of years remaining in the term of the Long Term CRR, plus the one-year CRR credit margin times the square root of the number of remaining years in the term of the Long Term CRR.

The credit requirements for holding Long Term CRRs will be adjusted at least once a year. The adjustment will account for the change of remaining terms of the Long Term CRRs and the new auction prices of short term CRRs.

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[26] *California Independent System Operator Corp.*, 119 ¶ 61,076, at PP 368, 378.

The credit margins will also be updated at least once a year based on the actual LMP data from the market operation of the past year.

As Dr. Harvey explains, if CRR returns were perfectly correlated over the ten-year term of a Long Term CRR, then a change in value in year one would change the expected value in all subsequent years by the same amount and a credit margin equal to ten times the one-year credit margin would be necessary to protect CAISO Market Participants. Such an extreme assumption of perfect correlation between current and expected future returns is very unlikely to reflect actual conditions, however, as many potential causes of transmission Congestion will be transitory and not persist from year to year, let alone over ten years. On the other hand, there is no data on the actual degree of persistence of the average kind of unexpected Congestion shock. Given the very limited information available, Dr. Harvey concludes that "the CAISO's policy of multiplying the one-year credit margin by the square root of the remaining term duration of a long-term CRR in years is a reasonable starting point."[27]

4. Credit Requirements Associated With CRR Transfers

When the ownership of a CRR is to be transferred through either secondary market trading or through load migration, credit requirements for both the current owner and prospective new owner will be evaluated and adjusted if necessary. Such transfers will not be carried out until and unless the entity to which CRRs would be transferred has sufficient credit coverage in place to satisfy the credit requirement for holding the transferred CRRs, in addition to any other credit coverage requirements. These credit requirements ensure that there is no lapse in credit coverage resulting from the transfer of CRRs from one owner to another.

5. Enhanced Enforcement Tools

The CAISO is also adding provisions to the ISO Tariff that establish the CAISO's authority to take certain steps if a Market Participant fails to comply with the revised CRR credit requirements. Specifically, if a Market Participant's Estimated Aggregate Liability, as calculated by the CAISO, at any time exceeds its Aggregate Credit Limit, the CAISO may take actions that include the following: (1) the CAISO may limit trading, which may include limiting CAISO market activity, including limiting eligibility to participate in a CRR Allocation or CRR Auction; (2) the CAISO may restrict, suspend, or terminate the Market Participant's CRR Entity Agreement or Service Agreement, and (3) the CAISO may resell the CRR Holder's CRRs in a subsequent CRR Auction or bilateral transaction, as appropriate. In addition, the CAISO will not implement the

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[27] Harvey Declaration, Attachment D to this Amendment, at P 67.

transfer of a CRR if the transferee or transferor has an Estimated Aggregate Liability in excess of its Aggregate Credit Limit.

These provisions supplement the existing enforcement tools available to the CAISO in cases where a Market Participant's Estimated Aggregate Liability exceeds its Aggregate Credit Limit. The CAISO requires these additional enforcement tools because the current ISO Tariff does not contain enforcement provisions that are specific to CRR-related issues.

II. PROPOSED ISO TARIFF CHANGES

A. Changes to Section 12.1 – Credit Requirements

The CAISO proposes to make several general changes to Section 12 to reflect the implementation of CRRs. The CAISO has modified Section 12.1 of the ISO Tariff in several places to state that the section applies to CRR Holders and Candidate CRR Holders.[28]

B. New Section 12.6.1 – Credit Requirements for CRR Allocations

The CAISO does not believe it is necessary to require credit in advance of CRR Allocations, since LSEs will not have to pay for positively valued CRRs and will not be paid for negatively valued CRRs. Therefore, new Section 12.6.1 of the ISO Tariff states that, subject to applicable requirements of Section 36.9.2 of the ISO Tariff concerning the prepayment of Wheeling Access Charges, LSEs eligible to participate in any CRR Allocation are not required to provide additional Financial Security in advance of a CRR Allocation. As discussed below, however, after an LSE receives CRRs through the allocation process, it will be subject to credit requirements applicable to all CRR Holders. As discussed below, for the initial CRR Allocation, the obligation to comply with the credit requirements will not occur until after the first CRR Auction, which will occur in October 2007.

C. Changes to Section 12.6.2 – Credit Requirements for CRR Auctions

The CAISO and stakeholders agree that there is the potential for credit risk in the context of CRR Auctions. Therefore, the CAISO proposes to modify current Section 12.6.1 of the ISO Tariff and re-number it as Section 12.6.2. As modified, Section 12.6.2 requires each Candidate CRR Holder that participates in a CRR Auction to ensure that its Aggregate Credit Limit in excess of its Estimated Aggregate Liability is the greater of $500,000 or the sum of the

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[28] For ease of reference, the CRR credit provisions previously included in Appendix BB of the ISO Tariff are being consolidated with the new provisions in Section 12 of the main body of the ISO Tariff.

absolute values of all of its bids for CRRs submitted in the relevant CRR Auction. A Candidate CRR Holder that fails to satisfy this requirement will not be permitted to participate in the relevant CRR Auction.

D. New Section 12.6.3 – Credit Requirements for the Holding of CRRs; New Definitions Provided in the Master Definitions Supplement, Appendix A to the ISO Tariff, in Support of Section 12.6.3

The CAISO proposes new Section 12.6.3 to address credit risks associated with holding CRRs.

Section 12.6.3.1 concerns general CRR Holder credit requirements. Section 12.6.3.1(a) requires each CRR Holder, whether it obtains CRRs through a CRR Allocation or a CRR Auction, to maintain an Aggregate Credit Limit in excess of its Estimated Aggregate Liability including the prospective value of the CRR portfolio determined as described in Section 12.6.3. CRR Holders obtaining CRRs in the initial CRR Allocation will be required to comply with the credit requirements associated with such CRRs as determined by the CAISO after completion of the initial CRR Auction; the CAISO will issue a market notice announcing that such CRR Holders must comply with the credit requirements. Section 12.6.3.1(b) requires each CRR Holder to ensure that its Aggregate Credit Limit is sufficient to satisfy the applicable credit requirements, and states that, for purposes of satisfying credit requirements, CRRs are evaluated on a portfolio basis. Each CRR Holder is subject to an overall credit requirement that is equal to the sum of the individual credit requirements applicable to each of its CRRs; if the sum is positive, the amount is added to the CRR Holder's EAL, but if the sum is negative the CRR Holder's EAL will not be reduced. Section 12.6.3.1(c) provides for the CAISO to reevaluate the credit requirements for holding CRRs, not less than monthly, and to adjust credit requirements accordingly. Further, the CAISO may adjust the credit requirements for holding CRRs with terms of one year or less more frequently than monthly to account for changes in the monthly auction prices for CRRs, and may adjust the credit requirements for holding Long Term CRRs annually to reflect the number of years remaining in the term of any Long Term CRR and other considerations. Section 12.6.3.1(d) states that, in cases where the ownership of a CRR is to be transferred through either the Secondary Registration System or through load migration, the CAISO will 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. The transfer will not be completed until any additional Financial Security that is required from either the current or prospective owner has been provided to and accepted by the CAISO.

Section 12.6.3.2 states that each CRR Holder that holds a CRR with a term of one year or less is subject to a credit requirement (expressed in dollars

per MW) equal to the negative of the most recent "Expected CRR Congestion Revenue" for such CRR plus the "Credit Margin" for such CRR. Section 12.6.3.3 states that each CRR Holder that holds a Long Term CRR will be subject to a credit requirement (expressed in dollars per MW) equal to (i) the negative of the one-year Expected CRR Congestion Revenue of the same CRR (same source and sink) as the Long Term CRR but with only a one-year term, multiplied by the number of years remaining in the term of the Long Term CRR, plus (ii) the Credit Margin calculated for the one year CRR multiplied by the square root of the number of years remaining in the term of the Long Term CRR.

The CAISO has added several defined terms to the Master Definitions Supplement, Appendix A to the ISO Tariff. The CAISO has added the term Credit Margin, which means "[t]he quantity equal to Expected CRR Congestion Revenue minus Fifth Percentile CRR Congestion Revenue." To flesh out the components of the definition of Credit Margin, the CAISO has added the term Expected CRR Congestion Revenue, which means "[t]he net projected revenue of a CRR for the term of the CRR as calculated by the ISO based on CRR Auction Prices," and the term Fifth Percentile CRR Congestion Revenue, which means "[t]he calculated amount associated with a CRR that performs at the fifth percentile level with regard to a probabilistic determination of the Expected CRR Congestion Revenue." The CAISO has also added the term CRR Auction Price, which means "[t]he positive or negative price to pay or be paid for a CRR at auction."

Section 12.6.3.4, which concerns the calculation of Credit Margin, is a modified and re-numbered version of current Section 12.6.2. Section 12.6.3.4 states that the Credit Margin will be based on variability of historical LMP data, when available, and proxy values, including LMP study data, until such time as historical LMP data is available, with the details of such calculation published in a Business Practice Manual.[29] As discussed below, the BPM for Credit Management is provided, for informational purposes, as Attachment E to this Amendment. The section also states that the CAISO may reassess its Credit Margin at any time and will require additional Financial Security if the reassessment results in an increase in a CRR Holder's Estimated Aggregate Liability that is not covered by a CRR Holder's Aggregate Credit Limit.

E. Changes to Section 12.5 – CAISO Enforcement Actions Regarding Under-Secured Market Participants

In order to address potential violations of credit policy requirements concerning CRRs, the CAISO proposes modifications to Section 12.5 to establish that, if a Market Participant's Estimated Aggregate Liability, as calculated by the

[29] For the first year of the operation under MRTU, no historical LMP will be data available. Therefore, initially the prices simulated in CAISO LMP will therefore be used to calculate Credit Margin. In the future, actual LMP data will be used to calculate Credit Margin.

CAISO, at any time exceeds its Aggregate Credit Limit, the CAISO may take actions that include the following:

- The CAISO may limit trading, which may include limiting CAISO market activity, including limiting eligibility to participate in a CRR Allocation or CRR Auction. In such a case, the CAISO will notify the Market Participant of its action and the Market Participant will not be entitled to participate in the CRR Auctions or otherwise participate in the CAISO's markets until the Market Participant posts an additional Financial Security Amount that is sufficient to ensure that the Market Participant's Aggregate Credit Limit is at least equal to its Estimated Aggregate Liability.

- The CAISO may restrict, suspend, or terminate the Market Participant's CRR Entity Agreement or Service Agreement.

- The CAISO may resell the CRR Holder's CRRs in whole or in part, including any Long Term CRRs, in a subsequent CRR Auction or bilateral transaction, as appropriate.

- The CAISO will not implement the transfer of a CRR if the transferee or transferor has an Estimated Aggregate Liability in excess of its Aggregate Credit Limit.

III. BUSINESS PRACTICE MANUAL FOR CREDIT MANAGEMENT

In the May 8 Order, as relevant here, the Commission directed the CAISO to finalize and file, for informational purposes, the BPM for Credit Management within 30 days of the issuance of that Order.[30] On May 21, 2007, the CAISO filed a status report and motion for extension of time that included a request that the Commission grant the CAISO an extension of time to file the BPM for Credit Management until the date on which the CAISO submitted ISO Tariff language relating to CRR credit requirements, which the CAISO stated it would do no later than June 22, 2007. The Commission granted the CAISO's request in the June 7 Order.[31] Pursuant to that Commission directive, the CAISO provides the BPM for Credit Management, for informational purposes, in Attachment E to this Amendment.

In determining the level of detail to be included in the proposed Tariff language and which additional details could be included in the BPM for Credit Management, the CAISO followed the Commission's guidance in its April 19, 2007, order concerning a compliance filing the CAISO submitted in another proceeding on CAISO credit policy. In that order, the Commission found that the

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30 May 8 Order at P 70.

31 June 7 Order at P 7.

CAISO could include some details in its credit procedures rather than the ISO Tariff, so long as the information contained in those credit procedures would be available to Market Participants on the CAISO's Open-Access Same-Time Information System ("OASIS") and the ISO Website.[32] The BPM for Credit Management will be maintained for Market Participants' reference on the ISO Website.

IV. EFFECTIVE DATE AND INITIAL IMPLEMENTATION OF CRR CREDIT REQUIREMENTS

The CAISO requests that the Commission make this Amendment effective sixty days after submittal of the instant filing, *i.e.*, on August 22, 2007, which will permit the Amendment to go into effect prior to the initial implementation of the CRR credit requirements described herein. The initial allocation of CRRs is scheduled for July of this year. Pursuant to Section 12.6.3.1(a) of the attached ISO Tariff language, CRR Holders obtaining CRRs in the initial CRR Allocation will be required to comply with the applicable credit requirements after completion of the initial CRR Auction, which is scheduled to take place in October. Therefore, the proposed August 22 effective date for this Amendment will occur prior to the time that LSEs that obtain CRRs in the initial CRR Allocation are required to comply with the CRR credit requirements, and will also be implemented prior to the time that Market Participants obtain CRRs in the first CRR Auction.

V. COMMUNICATIONS

Communications regarding this filing should be addressed to the following individuals, whose names should be placed on the official service list established by the Secretary with respect to this submittal:

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[32] April 19 Order at PP 15, 37.

VI. SERVICE

The CAISO has served copies of this transmittal letter, and all attachments, on the California Public Utilities Commission, the California Energy Commission, the California Electricity Oversight Board, all parties with effective Scheduling Coordinator Service Agreements under the ISO Tariff, and all parties in Docket No. ER07-613 (*i.e.*, the docket in which the June 7 Order was issued). In addition, the CAISO is posting this transmittal letter and all attachments on the ISO Website.

VII. ATTACHMENTS

The following documents, in addition to this transmittal letter, support the instant filing:

Attachment A	Revised ISO Tariff sheets that incorporate the June 2007 Congestion Revenue Rights Credit Policy Amendment
Attachment B	The June 2007 Congestion Revenue Rights Credit Policy Amendment shown in black-line format
Attachment C	Description of the CAISO stakeholder and ISO Governing Board process employed in developing the June 2007 Congestion Revenue Rights Credit Policy Amendment (including appendices containing particularly relevant documents supporting the development of the Amendment)
Attachment D	Declaration of Dr. Scott M. Harvey
Attachment E	Business Practice Manual for Credit Management, provided for informational purposes

VIII. CONCLUSION

For all the foregoing reasons, the Commission should approve the June 2007 CRR Credit Policy Amendment as filed. Please feel free to contact the undersigned if you have any questions concerning this matter.

Respectfully submitted,

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Attachment A – Clean Sheets

June 2007 Congestion Revenue Rights Credit Policy Amendment

12 CREDITWORTHINESS.

12.1 Credit Requirements.

The creditworthiness requirements in this section apply to the ISO's acceptance of Schedules, to all transactions in an ISO Market, to the payment of charges pursuant to the ISO Tariff (including the Grid Management Charge), and to establish credit limits for participation in any ISO auction of FTRs or CRRs and to CRR Holders for the holding of CRRs. Each Market Participant (including each Scheduling Coordinator, UDC, MSS, CRR Holder, or Candidate CRR Holder) or FTR Bidder shall secure its financial transactions with the ISO (including its participation in any auction of FTRs or CRRs and for the holding of CRRs) by maintaining an Unsecured Credit Limit and/or by posting Financial Security, the level of which constitutes the Market Participant's or FTR Bidder's Financial Security Amount. For each Market Participant or FTR Bidder, the sum of its Unsecured Credit Limit and its Financial Security Amount shall represent its Aggregate Credit Limit. Each Market Participant or FTR Bidder shall have the responsibility to maintain an Aggregate Credit Limit that is at least equal to its Estimated Aggregate Liability.

12.1.1 Unsecured Credit Limit.

Each Market Participant or FTR Bidder requesting an Unsecured Credit Limit shall submit an application to the ISO in the form specified on the ISO Home Page. The ISO shall determine the Unsecured Credit Limit for each Market Participant or FTR Bidder in accordance with the procedures set forth in the ISO Credit Policy & Procedures Guide posted on the ISO Home Page. The maximum Unsecured Credit Limit for any Market Participant or FTR Bidder shall be $250 million. In accordance with the procedures described in the ISO Credit Policy & Procedures Guide, each Market Participant or FTR Bidder requesting or maintaining an Unsecured Credit Limit is required to submit to the ISO or its agent financial statements and other information related to its overall financial health as directed by the ISO. Each Market Participant or FTR Bidder is responsible for the timely submission of its latest financial statements as well as other information that may be reasonably necessary for the ISO to conduct its evaluation. The ISO shall determine the Unsecured Credit Limit for each Market Participant or FTR Bidder as described in Sections 12.1.1A, 12.1.1A.1, 12.1.1A.2.

12.5 ISO Enforcement Actions Regarding Under-Secured Market Participants.

If a Market Participant's Estimated Aggregate Liability, as calculated by the ISO, at any time exceeds its Aggregate Credit Limit, the ISO may take any or all of the following actions:

(a) The ISO may withhold a pending payment distribution.

(b) The ISO may limit trading, which may include rejection of Schedules and/or limiting other ISO market activity, including limiting eligibility to participate in a CRR Allocation or CRR Auction. In such case, the ISO shall notify the Market Participant of its action and the Market Participant shall not be entitled to participate in the ISO's markets or CRR Auctions or submit further Schedules or otherwise participate in the ISO's markets until the Market Participant posts an additional Financial Security Amount that is sufficient to ensure that the Market Participant's Aggregate Credit Limit is at least equal to its Estimated Aggregate Liability.

(c) The ISO may require the Market Participant to post an additional Financial Security Amount in lieu of an Unsecured Credit Limit for a period of time.

(d) The ISO may restrict, suspend, or terminate the Market Participant's CRR Entity Agreement or Service Agreement.

(e) The ISO may resell the CRR Holder's CRRs in whole or in part, including any Long Term CRRs, in a subsequent CRR Auction or bilateral transaction, as appropriate.

(f) The ISO will not implement the transfer of a CRR if the transferee or transferor has an Estimated Aggregate Liability in excess of their Aggregate Credit Limit.

In addition, the ISO may restrict or suspend a Market Participant's right to schedule or require the Market Participant to increase its Financial Security Amount if at any time such Market Participant's potential additional liability for Imbalance Energy and other ISO charges is determined by the ISO to be excessive by comparison with the likely cost of the amount of Energy scheduled by the Market Participant.

12.6 Credit Obligations Applicable to CRRs.

12.6.1 Credit Requirements for CRR Allocations.

Subject to applicable requirements of Section 36.9.2 concerning the prepayment of Wheeling Access Charges, Load-Serving Entities eligible to participate in any CRR Allocation are not required to provide additional Financial Security in advance of a CRR Allocation.

12.6.2 Credit Requirements for CRR Auctions.

To establish available credit for participating in any CRR Auction, each Candidate CRR Holder must have an Unsecured Credit Limit or have provided Financial Security in a form consistent with Section 12.1.2 of this ISO Tariff. Each Candidate CRR Holder that participates in a CRR Auction shall ensure that its Aggregate Credit Limit in excess of its Estimated Aggregate Liability is the greater of $500,000 or the sum of the absolute values of all of its bids for CRRs submitted in the relevant CRR Auction. A Candidate CRR Holder that fails to satisfy this requirement shall not be permitted to participate in the relevant CRR Auction.

12.6.3 Credit Requirements for the Holding of CRRs.

12.6.3.1 Credit Requirements Generally.

(a) Each CRR Holder, whether it obtains CRRs through a CRR Allocation or a CRR Auction, must maintain an Aggregate Credit Limit in excess of its Estimated Aggregate Liability including the credit requirement of the CRR portfolio determined as described in this Section 12.6.3. CRR Holders obtaining CRRs in the initial CRR Allocation will be required to comply with the credit requirements associated with such CRRs as determined by the ISO after completion of the initial CRR Auction. The ISO shall issue a market notice after completion of the initial CRR Auction to announce that CRR Holders obtaining CRRs in the initial CRR Allocation must comply with such credit requirements.

(b) Each CRR Holder shall be required to ensure that its Aggregate Credit Limit is sufficient to satisfy the credit requirements described in this Section 12.6.3. CRRs are evaluated on a portfolio basis as follows. If a CRR Holder owns more than one 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. 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.

(c) The ISO shall reevaluate the credit requirements for holding CRRs, and shall adjust the credit requirements accordingly, not less than monthly. The ISO may adjust the credit requirements for holding CRRs with terms of one year or less more frequently than monthly at the ISO's discretion to account for changes in the monthly auction prices for CRRs. The ISO may also adjust the credit requirements for holding Long Term CRRs annually to reflect the number of years remaining in the term of any Long Term CRR, to reflect the changes in auction prices of one-year CRRs in annual auctions, and to reflect updates to Credit Margins based on actual Locational Marginal Price data derived from market operations.

(d) In cases where the ownership of a CRR is to be transferred through either the Secondary Registration System or through load migration, the ISO 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 ISO.

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 Expected CRR Congestion Revenue for such CRR plus the Credit Margin for such CRR.

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 (i) the negative of the one-year Expected CRR Congestion Revenue of the same CRR (same source and sink) as the Long Term CRR but with only a one-year term, multiplied by the number of years remaining in the term of the Long Term CRR, plus (ii) the Credit Margin calculated for the one-year CRR multiplied by the square root of the number of years remaining in the term of the Long Term CRR. In conducting calculations pursuant to this Section 12.6.3.3, the number of years remaining in the term of a Long Term CRR shall be rounded up to the nearest whole number, except that the whole number shall not be zero until the term of the Long Term CRR has expired.

12.6.3.4 Calculation of Credit Margin.

The Credit Margin for a CRR is equal to (i) the net projected revenue of the CRR for the term of the CRR as calculated by the ISO based on CRR Auction Prices (*i.e.*, Expected CRR Congestion Revenue) minus (ii) the calculated amount associated with the CRR that performs at the fifth percentile level with regard to a probabilistic determination of the Expected CRR Congestion Revenue (*i.e.*, Fifth Percentile CRR Congestion Revenue). The Credit Margin will be based on variability of historical Locational Marginal Price data, when available, and proxy values, including Locational Marginal Price study data, until such time as historical Locational Marginal Price data is available, with the details of such calculation published in a Business Practice Manual. The ISO 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 Estimated Aggregate Liability that is not covered by a CRR Holder's Aggregate Credit Limit (consisting of the CRR Holder's Unsecured Credit Limit and/or Financial Security).

Control Area Operator	The person responsible for managing the real-time operations of a Control Area.
Converted Rights	Those transmission service rights as defined in Section 16.21A.1 of the ISO Tariff.
Core Reliability Services - Demand Charge	A component of the Grid Management Charge that provides for the recovery of the ISO's costs of providing a basic, non-scalable level of reliable operation for the ISO Control Area and meeting regional and national reliability requirements. The formula for determining the Core Reliability Services – Demand Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.
Core Reliability Services – Energy Export Charge	A component of the Grid Management Charge that provides for the recovery of the ISO's costs of providing a basic, non-scalable level of reliable operation for the ISO Control Area and meeting regional and national reliability requirements. The formula for determining the Core Reliability Services – Energy Exports Charge is set forth in Appendix F, Schedule 1, Part A of this Tariff.
CPUC	The California Public Utilities Commission, or its successor.
Credit Margin	The quantity equal to Expected CRR Congestion Revenue minus Fifth Percentile CRR Congestion Revenue.
Credit Rating Default Probability	The 5 Year Median Default Probability based on a rating agency's credit rating as listed in the Credit Rating Default Probabilities table in Section A-2.2 of the ISO Credit Policy & Procedures Guide.
CRR Auction Price	The positive or negative price to pay or be paid for a CRR at auction.
CRR Holder	As defined in Appendix BB.
Critical Protective System	Facilities and sites with protective relay systems and Remedial Action Schemes that the ISO determines may have a direct impact on the ability of the ISO to maintain system security and over which the ISO exercises Operational Control.
CTC (Competition Transition Charge)	A non-bypassable charge that is the mechanism that the California Legislature and the CPUC mandated to permit recovery of costs stranded as a result of the shift to the new market structure.

Curtailable Demand Demand from a Participating Load that can be curtailed at the direction of the ISO in the real-time Dispatch of the ISO Controlled Grid. Scheduling Coordinators with Curtailable Demand may offer it to the ISO to meet Non-Spinning Reserve or Replacement Reserve requirements.

Day 0 The Trading Day to which the Settlement Statement or Settlement

Existing Contract Import Capability	The quantity of Available Import Capability reserved for Existing Contracts and Transmission Ownership Rights held by Load Serving Entities that serve Load within the ISO Control Area under Step 3 of ISO Tariff Section 40.5.2.2.1.
Existing High Voltage Facility	A High Voltage Transmission Facility of a Participating TO that was placed in service on or before the Transition Date defined in Section 4.2 of Schedule 3 of Appendix F.
Existing Rights	Those transmission service rights defined in Section 16.2.1.1 of the ISO Tariff.
Expected CRR Congestion Revenue	The net projected revenue of a CRR for the term of the CRR as calculated by the ISO based on CRR Auction Prices.
Facility Owner	An entity owning transmission, Generation, or distribution facilities connected to the ISO Controlled Grid.
Facility Study	An engineering study conducted by a Participating TO to determine required modifications to the Participating TO's transmission system, including the cost and scheduled completion date for such modifications that will be required to provide needed services.

Facility Study Agreement	An agreement between a Participating TO and either a Market Participant, Project Sponsor, or identified principal beneficiaries pursuant to which the Market Participants, Project Sponsor, and identified principal beneficiaries agree to reimburse the Participating TO for the cost of a Facility Study.
Fed-Wire	The Federal Reserve Transfer System for electronic funds transfer.
FERC	The Federal Energy Regulatory Commission or its successor.
FERC Annual Charges	Those charges assessed against a public utility by the FERC pursuant to 18 C.F.R. § 382.201 and any related statutes or regulations, as they may be amended from time to time.
FERC Annual Charge Recovery Rate	The rate to be paid by Scheduling Coordinators for recovery of FERC Annual Charges assessed against the ISO for transactions on the ISO Controlled Grid.
FERC Annual Charge Trust Account	An account to be established by the ISO for the purpose of maintaining funds collected from Scheduling Coordinators for FERC Annual Charges and disbursing such funds to the FERC.
FERC Must-Offer Generator	All entities defined by Section 40.7.1 of this ISO Tariff.
Fifth Percentile CRR Congestion Revenue	The calculated amount associated with a CRR that performs at the fifth percentile level with regard to a probabilistic determination of the Expected CRR Congestion Revenue.
Final Approval	A statement of consent by the ISO Control Center to initiate a scheduled Outage.
Final Day-Ahead Schedule	The Day-Ahead Schedule which has been approved as feasible and consistent with all other Schedules by the ISO based upon the ISO's Day-Ahead Congestion Management procedures.
Final Hour-Ahead Schedule	The Hour-Ahead Schedule of Generation and Demand that has been approved by the ISO as feasible and consistent with all other Schedules based on the ISO's Hour-Ahead Congestion Management procedures.
Final Invoice	The invoice due from a RMR Owner to the ISO at termination of the RMR Contract.
Final Schedule	A Schedule developed by the ISO following receipt of a Revised Schedule from a Scheduling Coordinator.

[NOT USED]

Attachment B – Blacklines

June 2007 Congestion Revenue Rights Credit Policy Amendment

12 CREDITWORTHINESS.

12.1 Credit Requirements.

The creditworthiness requirements in this section apply to the ISO's acceptance of Schedules, to all transactions in an ISO Market, to the payment of charges pursuant to the ISO Tariff (including the Grid Management Charge), and to establish credit limits for participation in any ISO auction of FTRs or CRRs and to CRR Holders for the holding of CRRs. Each Market Participant (including each Scheduling Coordinator, UDC, ~~or~~ MSS, CRR Holder, or Candidate CRR Holder) or FTR Bidder shall secure its financial transactions with the ISO (including its participation in any auction of FTRs or CRRs and for the holding of CRRs) by maintaining an Unsecured Credit Limit and/or by posting Financial Security, the level of which constitutes the Market Participant's or FTR Bidder's Financial Security Amount. For each Market Participant or FTR Bidder, the sum of its Unsecured Credit Limit and its Financial Security Amount shall represent its Aggregate Credit Limit. Each Market Participant or FTR Bidder shall have the responsibility to maintain an Aggregate Credit Limit that is at least equal to its Estimated Aggregate Liability.

* * *

12.5 ISO Enforcement Actions Regarding Under-Secured Market Participants.

~~Following the date on which a Market Participant commences trading, i~~If a Market Participant's Estimated Aggregate Liability, as calculated by the ISO, at any time exceeds its Aggregate Credit Limit, the ISO may take any or all of the following actions:

(a) The ISO may withhold a pending payment distribution.

(b) The ISO may limit trading, which may include rejection of Schedules and/or limiting other ISO market activity, including limiting eligibility to participate in a CRR Allocation or CRR Auction. In such case, the ISO shall notify the Market Participant of its action and the Market Participant shall not be entitled to participate in the ISO's markets or CRR Auctions or submit further Schedules or otherwise participate in the ISO's markets~~to the ISO~~ until the Market Participant posts an additional Financial Security Amount that is

sufficient to ensure that the Market Participant's Aggregate Credit Limit is at least equal to its Estimated Aggregate Liability.

(c) The ISO may require the Market Participant to post an additional Financial Security Amount in lieu of an Unsecured Credit Limit for a period of time.

(d) The ISO may restrict, suspend, or terminate athe Market Participant's CRR Entity Agreement or Service Agreement.

(e) The ISO may resell the CRR Holder's CRRs in whole or in part, including any Long Term CRRs, in a subsequent CRR Auction or bilateral transaction, as appropriate.

(f) The ISO will not implement the transfer of a CRR if the transferee or transferor has an Estimated Aggregate Liability in excess of their Aggregate Credit Limit.

In addition, the ISO may restrict or suspend a Market Participant's right to schedule or require the Market Participant to increase its Financial Security Amount if at any time such Market Participant's potential additional liability for Imbalance Energy and other ISO charges is determined by the ISO to be excessive by comparison with the likely cost of the amount of Energy scheduled by the Market Participant.

12.6 Credit Obligations Applicable to CRRs.

12.6.1 Credit Requirements for CRR Allocations.

Subject to applicable requirements of Section 36.9.2 concerning the prepayment of Wheeling Access Charges, Load-Serving Entities eligible to participate in any CRR Allocation are not required to provide additional Financial Security in advance of a CRR Allocation.

12.6.2 Credit Requirements for CRR Auctions.

To establish available credit for participating in any CRR Auction, each Candidate CRR Holder must have an Unsecured Credit Limit or have provided Financial Security in a form consistent with Section 12.1.2 of this ISO Tariff. Each Candidate CRR Holder that participates in a CRR Auction shall ensure that its Aggregate Credit Limit in excess of its Estimated Aggregate Liability is the greater of $500,000 or the sum of the absolute values of all of its bids for CRRs submitted in the relevant CRR Auction. A Candidate

CRR Holder that fails to satisfy this requirement shall not be permitted to participate in the relevant CRR Auction.

12.6.3 Credit Requirements for the Holding of CRRs.

12.6.3.1 Credit Requirements Generally.

(a) Each CRR Holder, whether it obtains CRRs through a CRR Allocation or a CRR Auction, must maintain an Aggregate Credit Limit in excess of its Estimated Aggregate Liability including the credit requirement of the CRR portfolio determined as described in this Section 12.6.3. CRR Holders obtaining CRRs in the initial CRR Allocation will be required to comply with the credit requirements associated with such CRRs as determined by the ISO after completion of the initial CRR Auction. The ISO shall issue a market notice after completion of the initial CRR Auction to announce that CRR Holders obtaining CRRs in the initial CRR Allocation must comply with such credit requirements.

(b) Each CRR Holder shall be required to ensure that its Aggregate Credit Limit is sufficient to satisfy the credit requirements described in this Section 12.6.3. CRRs are evaluated on a portfolio basis as follows. If a CRR Holder owns more than one 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. 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.

(c) The ISO shall reevaluate the credit requirements for holding CRRs, and shall adjust the credit requirements accordingly, not less than monthly. The ISO may adjust the credit requirements for holding CRRs with terms of one year or less more frequently than monthly at the ISO's discretion to account for changes in the monthly auction prices for CRRs. The ISO may also adjust the credit requirements for holding Long Term CRRs annually to reflect the number of years remaining in the term of any Long Term CRR, to reflect the changes in auction prices of one-year CRRs in annual auctions, and to reflect updates to Credit Margins based on actual Locational Marginal Price data derived from market operations.

(d) In cases where the ownership of a CRR is to be transferred through either the Secondary Registration System or through load migration, the ISO 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 ISO.

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 Expected CRR Congestion Revenue for such CRR plus the Credit Margin for such CRR.

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 (i) the negative of the one-year Expected CRR Congestion Revenue of the same CRR (same source and sink) as the Long Term CRR but with only a one-year term, multiplied by the number of years remaining in the term of the Long Term CRR, plus (ii) the Credit Margin calculated for the one-year CRR multiplied by the square root of the number of years remaining in the term of the Long Term CRR. In conducting calculations pursuant to this Section 12.6.3.3, the number of years remaining in the term of a Long Term CRR shall be rounded up to the nearest whole number, except that the whole number shall not be zero until the term of the Long Term CRR has expired.

12.6.3.4 Calculation of Credit Margin.

The Credit Margin for a CRR is equal to (i) the net projected revenue of the CRR for the term of the CRR as calculated by the ISO based on CRR Auction Prices (*i.e.*, Expected CRR Congestion Revenue) minus (ii) the calculated amount associated with the CRR that performs at the fifth percentile level with regard to a probabilistic determination of the Expected CRR Congestion Revenue (*i.e.*, Fifth Percentile CRR Congestion Revenue). The Credit Margin will be based on variability of historical Locational Marginal Price data, when available, and proxy values, including Locational Marginal Price study data, until such

time as historical Locational Marginal Price data is available, with the details of such calculation published in a Business Practice Manual. The ISO 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 Estimated Aggregate Liability that is not covered by a CRR Holder's Aggregate Credit Limit (consisting of the CRR Holder's Unsecured Credit Limit and/or Financial Security).

* * *

ISO TARIFF APPENDIX A
Master Definitions Supplement

Credit Margin	The quantity equal to Expected CRR Congestion Revenue minus Fifth Percentile CRR Congestion Revenue.

* * *

CRR Auction Price	The positive or negative price to pay or be paid for a CRR at auction.

* * *

Expected CRR Congestion Revenue	The net projected revenue of a CRR for the term of the CRR as calculated by the ISO based on CRR Auction Prices.

* * *

Fifth Percentile CRR Congestion Revenue	The calculated amount associated with a CRR that performs at the fifth percentile level with regard to a probabilistic determination of the Expected CRR Congestion Revenue.

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Appendix BB

PART D. CANDIDATE CRR HOLDER AND CRR HOLDER REQUIREMENTS

~~**12.6 Credit Obligations for CRR Holders and Candidate CRR Holders.**~~

~~**12.6.1 Credit Limits for CRR Auctions.**~~

~~To establish available credit for participating in any CRR Auction, each Candidate CRR Holder must have an Unsecured Credit Limit or have provided Financial Security in a form consistent with Section 12.1.2 of~~

this ISO Tariff. The amount of available credit for participating in a CRR Auction shall not exceed the difference between (i) the value of the Candidate CRR Holder's Unsecured Credit Limit and any Financial Security posted in accordance with Section 12.1.2 of the ISO Tariff and (ii) the Candidate CRR Holder's Estimated Aggregate Liability.

12.6.2 Credit Requirements for CRR Obligations upon CRR Allocation, CRR Auction or Transfer.

The CAISO shall not release any CRR Obligations allocated in a CRR Allocation, awarded in a CRR Auction, or proposed to be transferred to a Candidate CRR Holder through the Secondary Registration System, except upon establishment of an Unsecured Credit Limit or receipt of Financial Security, in a form consistent with this Section 12.1.2 of the ISO Tariff, equal to the value of the net projected obligation of the CRR for the entire term of the CRR. The CAISO will determine the value of the net projected obligation of each CRR Obligation using appropriate methods, including proxy values or values based on experience, which shall be published in a Business Practice Manual. For negatively priced CRR Obligations awarded in a CRR Auction, the minimum value of the net projected obligation shall be set at the price determined in the CRR Auction. The CAISO may reassess its net projected obligation determinations at any time during the term of the CRR and shall require additional Financial Security if the reassessment results in an increase in a CRR Holder's Estimated Aggregate Liability that is not covered by a CRR Holder's Unsecured Credit Limit or Financial Security.

* * *

ATTACHMENT C

Description of the CAISO Stakeholder and ISO Governing Board Process Employed in Developing the June 2007 Congestion Revenue Rights Credit Policy Amendment

The CAISO held a stakeholder meeting on CRR issues, including CRR credit policy issues, on February 27, 2007. In advance of that meeting, the CAISO posted on the ISO Website for stakeholder review a white paper entitled "CAISO CRR Credit Requirements," prepared for the CAISO by Dr. Harvey of LECG, which was discussed at the meeting.[1] The CAISO requested any stakeholder comments on CRR issues by March 9, 2007. A total of ten stakeholders provided comments, which were posted on the ISO Website.

On March 27, 2007, the CAISO held a conference call to discuss CRR credit policy issues. In advance of that conference call, the CAISO posted on the ISO Website for stakeholder review a document entitled "CAISO CRR Credit Policy – Initial Draft," which was discussed on the conference call.[2] On April 3, 2007, the CAISO held a meeting to discuss CRR issues, including CRR credit policy issues. The CAISO requested any stakeholder comments on CRR issues by April 6, 2007. A total of fifteen stakeholders provided comments, which were posted on the ISO Website.

On May 4, 2007, the CAISO held a conference call to discuss CRR credit policy issues. In advance of that conference call, the CAISO posted on the ISO Website a document entitled "California ISO Straw Proposal – Congestion Revenue Rights Credit Policy," which was discussed on the conference call.[3] The CAISO requested any stakeholder comments on issues arising out of the May 4 conference call by May 11, 2007. A total of five stakeholders provided comments. Those comments were included, along with CAISO responses, in an appendix to a white paper the CAISO posted on the ISO Website on May 14 entitled "California ISO White Paper – Congestion Revenue Rights Credit Policy."[4]

On May 16, 2007, the CAISO held another conference call to discuss CRR credit policy issues. Pursuant to discussion on the conference call, on May 21, 2007, the CAISO posted on the ISO Website a revised version of the white paper it had posted on May 14.[5]

In advance of the May 30-31, 2007 meeting of the ISO Governing Board, the CAISO posted on the ISO Website materials that included the white paper posted on May 14, 2007 and a memorandum discussing CRR credit policy

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1 This white paper is provided in Appendix C-1 to this attachment.
2 This document is provided in Appendix C-2 to this attachment.
3 This document is provided in Appendix C-3 to this attachment.
4 This white paper is provided in Appendix C-4 to this attachment.
5 This revised white paper is provided in Appendix C-5 to this attachment.

issues dated May 21, 2007.[6] *Inter alia*, the memorandum noted that members of the CAISO's Department of Market Monitoring had participated in the stakeholder process and discussions on CRR credit policy matters, and that their opinions were reflected in the memorandum. On May 30, 2007, the ISO Governing Board issued a unanimous motion stating that "[t]he ISO Board of Governors authorize Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement this proposal."[7]

On June 6, 2007, the CAISO posted on the ISO Website a draft version of the ISO Tariff language to implement the CRR credit policies approved by the ISO Board. On that same day, the CAISO issued a market notice requesting any stakeholder comments on the draft ISO Tariff language by June 13, 2007, and stating that the CAISO would hold another stakeholder conference call on June 15, 2007. A total of two stakeholders provided comments. On June 15, 2006, the CAISO held a conference call to discuss the comments and any other issues that stakeholders wanted to raise. On June 20, 2007, the CAISO posted on the ISO Website responses to the stakeholder comments that required written answers, and a revised draft of the ISO Tariff language that incorporated these responses.[8]

On June 22, 2007, the CAISO filed the June 2007 Congestion Revenue Right Credit Policy Amendment.

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[6] This memorandum is provided in Appendix C-6 to this attachment. The full set of materials posted in advance of the meeting of the ISO Governing Board is available at http://www.caiso.com/1be6/1be680f3450.html.

[7] This motion is provided in Appendix C-7 to this attachment.

[8] The CAISO's responses are provided in Attachment C-8 to this attachment.

Appendix C-1

CAISO CRR Credit Requirements

Prepared by

Scott M. Harvey

Prepared for

California ISO

February 20, 2007

Table of Contents

CAISO CRR Credit Requirements

Scott M. Harvey
February 20, 2007

I. OVERVIEW

CRRs are point-to-point financial instruments that hedge congestion charges on the California ISO transmission system. A CRR entitles and obligates the holder to be paid or to pay the difference between the congestion component of the LMP price in the day-ahead market at the sink and at the source of the CRR. Because CRR holders will be obligated to make payments to the CAISO covering hours in which the congestion component at the sink is lower, or more negative, than the congestion component at the source, CRR holdings can potentially give rise to payment obligations.

The CAISO faces two slightly different kinds of credit risk stemming from the CRR holdings of market participants. First, some CRR auction participants will likely buy CRRs that are negatively priced in the CRR auctions.[1] In essence, these auction participants are selling congestion management in the forward market, which is desirable from the standpoint of overall market performance. In the case of a generator, these counterflow CRR holdings may be hedged by the ability of the generator to offer its resource in the day-ahead market in which CRRs are settled. Absent credit requirements there would be a risk that the holder of such negatively priced CRRs would be unable to make payments when required, inflicting losses on the CAISO congestion rent account that would ultimately be borne by other market participants. In effect, if the holder of a counterflow CRR were to default, the counterflow CRR would be removed from the outstanding CRRs and the remaining CRRs would not satisfy the simultaneous feasibility test. This would create a potential for the CAISO CRR settlements as a whole to be revenue-inadequate.[2]

Second, there is a potential for CRR auction participants to buy CRRs at positive prices, i.e., CRRs that are expected at the time of the auction to entail payments from the CAISO congestion rent account to the CRR holder, but which turn out in practice, as a result of unexpected changes in market conditions, to require payments by the CRR holder to the CAISO congestion rent account. As in the first case, absent credit requirements there would be a risk that the CRR holder would be unable to make these payments when required, thus reducing the payments into the CAISO congestion rent account.[3]

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[1] I.e., the CRR buyer is paid to hold the CRR because the CRRs are expected to entail payments by the holder to the CAISO settlements rather than payments from the CAISO congestion rent account to the CRR holder.

[2] It is noteworthy that absent the counter flow (i.e., negatively priced) CRR, it is necessarily case that the remaining CRRs will not satisfy the simultaneous feasibility condition (i.e., it is not the case that they might not satisfy this test; they will not satisfy a simultaneous feasibility test). The price of the CRR in the auction would not be negative unless this was the case.

[3] There is a somewhat subtle distinction in this case, however, in that while the CAISO congestion rent account will necessarily have a lower balance by the amount of money which is not received due to the default, it is

The determination of the initial post-auction credit requirement, i.e., the credit that must be maintained once the auction results are known, is discussed in Section IV. The term "uncollateralized CRR payment" is used to refer to a situation in which the holder of a particular CRR would be required to make a payment to the CAISO in excess of the initial credit requirement for holding that CRR.

The simplest form of CAISO credit policy would address the first risk by requiring holders of negatively priced CRRs to maintain credit sufficient to pay back the price of the CRR in the auction (i.e., to cover the expected value of CRR payments). While such a CAISO credit policy would ensure the ability of CRR holders to cover their obligations if actual congestion levels equal those anticipated in auction prices, such a credit policy would not ensure that CRR holders would be able to cover their obligations in the event that actual congestion charges in the day-ahead market were higher than expected. Since one reason LSEs hold positively priced CRRs is to hedge them against the possibility that congestion charges in the day-ahead market may be higher than expected, the potential for the holders of negatively priced CRRs to be called upon to make payments in excess of the expected level is not remote and should be accounted for in the CAISO credit policy. Moreover, such a credit requirement would not entail any coverage for potential uncollateralized CRR payments by the holders of positively priced CRRs.

A more sophisticated credit requirement would require the holders of negatively priced CRRs to provide credit coverage in excess of the expected payments and also require credit coverage for some positively priced CRRs, ensuring that the probability of uncollateralized CRR payments does not exceed a threshold set by the CAISO, based on the observed volatility of CRR payments. While PJM and the NYISO have several years of historic CRR payments that can be analyzed in assessing the level of credit coverage required to provide the intended level of credit coverage given historic volatility, the CAISO has no such historic data on variations in overall congestion patterns.

Ideally, the credit requirements will be based on the probability of uncollateralized CRR payment obligations at the level of individual CRRs that are simple enough to be applied in a spreadsheet, depending only on the CRR auction price, and the month or season in the case of monthly or seasonal CRRs. Such a probabilistic standard would also permit the CAISO to take account of the value of high priced positively priced CRRs in determining credit requirements for market participants holding portfolios of CRRs. That is, if the payments to the holder of a positively priced CRR would exceed $1,000 with a 97% probability, this value could be used as an offset to the credit requirement for holding other negatively priced CRRs. The actual impact of such an offset would depend on the specific pattern of CRR portfolios held by market participants.

Section V discusses how the initial credit requirement might be adjusted over time as the CRR holder makes or receives payments. One approach would be to require that the entire

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quite possible, in fact likely, in the case of CRRs having positive values in the auction which turn to have negative values in the day-ahead market, that the remaining set of CRRs will still satisfy the simultaneous feasibility test, so the CAISO will still collect enough congestion rents to pay all CRR holders despite the default. Indeed, in the event of such a change in congestion patterns that causes CRRs with positive auction prices to have negative values in the day-ahead market, the CAISO might have a large surplus in its congestion rent account.

initial collateral requirement be maintained over the duration of the CRR. Such a credit policy tends to raise the effective credit requirement over time for negatively priced CRRs. Another approach would be to gradually reduce the credit coverage requirement over time.

II. COMPARISON TO CREDIT REQUIREMENTS OF OTHER ISOS

On a superficial level there is considerable variation across the RTOs in the credit requirement applied to the holding of both negatively priced and positively priced CRRs. Much of the apparent difference in credit policies, however, actually reflects differences in the timing of payments to and by CRR holders, rather than differences in coverage against default risk.

A critical first step in comparing credit policies across ISOs is, therefore, to identify the differences in CRR settlement timing.[4] The NYISO and MISO settle CRR purchases at the end of the auction, while PJM and ISO-NE settle the purchases over the term of the CRRs. Thus, buyers of counterflow CRRs in New York and MISO must meet credit requirements at the end of the auction but have also been paid for the counterflow CRR. In PJM and ISO-NE, no credit coverage may be required at the end of the auction, but the buyer of counterflow FTRs also has not been paid for holding the counterflow CRR. These differences are discussed in greater detail below.

Consider first positively priced CRRs. Current NYISO credit and settlement policies require a buyer to pay for the CRR at the end of the auction. In addition, the CRR holder must maintain credit coverage based on the CRR price. Under current PJM rules, on the other hand, a CRR holder does not pay for the CRR at the end of the auction. Instead, payments due to the CRR holder are offset against the auction price and the net difference settled. CRR buyers in PJM therefore need to provide financial assurance over the term of the CRR that they will be able to make this final payment. In calculating the credit coverage for this payment, however, PJM provides an offset to the CRR purchase price reflecting the likely payments to the CRR holder based on historic congestion patterns. Under ISO-New England credit and settlement rules payments for CRRs purchased in the auction are not made at the time of the auction, so the credit requirement provides assurance over the term of the CRR that the holder will be able to cover the price paid for the CRR in the auction. Unlike PJM, ISO-NE does not provide an offset for expected payments to the CRR holder.

To illustrate the differences, consider a CRR with a price of $1,000 in a monthly auction and historic payments of $990. In the NYISO, the CRR holder would have to pay $1,000 at the end of the auction and maintain credit coverage for an additional $1,000. In PJM, the CRR holder would not pay anything at the end of the auction. It would have to provide credit coverage for the $1,000 price of the CRR it purchased. This credit coverage would be reduced by 70 percent of the $990 historic payments to the CRR, or $693, for a net credit requirement of $307. In New England, the CRR holder would not have to pay anything at the end of the auction but it would have to maintain credit coverage for the $1,000 purchase price, with no offset for expected CRR payments.

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[4] To avoid confusion, we will consistently refer to financial rights as CRRs, although they are referred to as FTRs in PJM, MISO and ISO-NE, and TCCs in New York.

Alternatively, consider a CRR with an auction price of $100 and historic payments of -$50 (i.e., historically the CRR was a counterflow CRR). In New York the CRR holder would have to pay $100 for the CRR and would also have to maintain credit coverage for $100. In PJM, the CRR holder would not have to pay for the CRR at the end of the auction but would have to maintain credit coverage for the price of the CRR ($100) plus the expected CRR payments to PJM ($50) for a total credit requirement of $150. The PJM credit coverage superficially appears higher than the NYISO requirement in this instance but it is actually lower since the NYISO CRR holder would have paid for the CRR and be required to maintain $100 in credit coverage. In New England, the CRR holder would simply have to maintain credit coverage for $100.

Now consider a negatively priced TCC. Under current NYISO credit and settlement policies the TCC holder would be paid for holding the TCC at the end of the TCC auction. It would, however, be required to maintain credit coverage equal to this payment over the term of the CRR. Under PJM credit and settlement policies the FTR holder would not receive any payments at the end of the auction but would also only have to maintain credit coverage over the term of the CRR to the extent that the historic payments differed from the auction price. Under ISO-New England credit and settlement policies, the FTR holder would not receive any payment at the end of the auction but also would not have any credit coverage requirement over the term of the CRR.

To illustrate the differences, consider a CRR with a price of -$1,000 in a monthly auction and historic payments of -$990. In the NYISO, the CRR holder would be paid $1,000 at the end of the auction and would have to maintain credit coverage for the same $1,000 over the term of the CRRs. In effect, there is no credit burden. In PJM, the CRR holder would not receive any payments at the end of the auction. Since in the hypothetical the historic payments are less than the CRR price, the CRR holder would not have to maintain any credit coverage. In ISO New England, there would be no credit requirement for holding this CRR. The PJM, NYISO and ISO New England credit policies for negatively priced CRR are actually very similar, therefore, once differences in the timing of auction settlements are taken into account.

III. CAISO CREDIT REQUIREMENT FOR BIDDING

An initial credit issue in the CAISO CRR markets is assuring that market participants submitting bids in the various auctions have the financial ability to cover their purchases. While CRRs can be withheld from entities that fail to make the payments required to cover their auction awards, this is an undesirable outcome because the invalid purchases would potentially have affected other CRR prices and might have caused offers for counterflow CRRs to be accepted at high price levels. All ISOs therefore require that CRR bidders have adequate credit to cover the purchase of all of the CRRs on which they submit offers, up to their offer price. This will generally exceed the level of required payments because low bids will not win and other bids will be accepted at price levels well below the offer cap. It is recommended that the CAISO require a similar level of credit coverage. No credit coverage would be required to purchase CRRs with negative offer caps, as no payment by the CRR holder would be required.

IV. CAISO INITIAL CREDIT REQUIREMENT

A. Negatively Priced CRRs

An obvious credit risk associated with the sale of CRRs in the CAISO CRR auctions is the possibility that thinly capitalized entities could buy counterflow (negatively priced) CRRs, take the auction payments and default when payments on the counterflow CRR are due.[5] A CRR credit requirement can address this risk in part by requiring that entities purchasing CRRs at negative prices in the auction maintain credit equal to the absolute value of the CRR auction price. Thus, an entity that buys a counterflow CRR in an auction in exchange for receipt of a payment of $10,000,000 would be required to maintain credit coverage for $10,000,000, which would cover the expected value of the required future payments by the CRR holder.

If the CRR payment (R_{ijt}) is a normally distributed random variable with a mean (μ_{ij}) and a standard deviation (σ_{ij}), then for each CRR_{ij} there is an associated probability of observing a payment to the CAISO being required in month t ($R_{ijt} < 0$), as illustrated by the shaded region in Figure 1.

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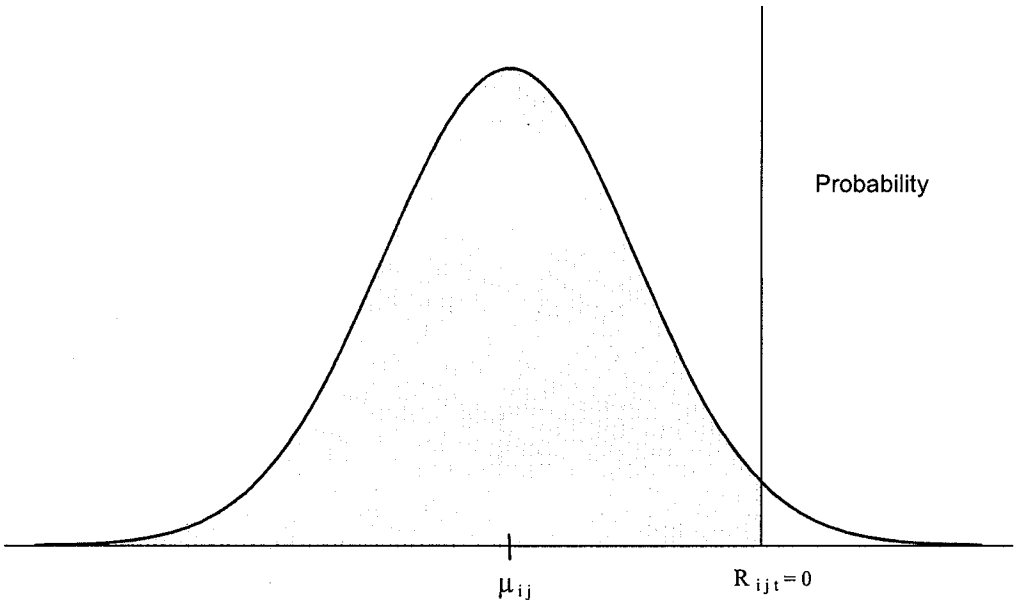
[5] This risk exists because the CAISO proposes to settle CRR auctions prior to settling payments to CRR holders for the relevant period. If payments and charges for the purchase of CRRs in an auction were settled at the same time that payments to CRR holders were settled, this risk would not be present and less credit would be needed to protect the CAISO against uncollateralized CRR payments. Under such a settlement system, however, the buyer of the counterflow CRR would lose the value of the cash for the period of the time between the auction and the settlement of CRR charges for the month, which would result in a foregone value at least as large and probably larger than the cost of maintaining an equivalent amount of credit coverage. In drawing comparisons of credit policies across ISOs it is essential to take account of these differences in settlement timing as the settlement system with a lower credit requirement may impose a larger overall financial burden on CRR holders.

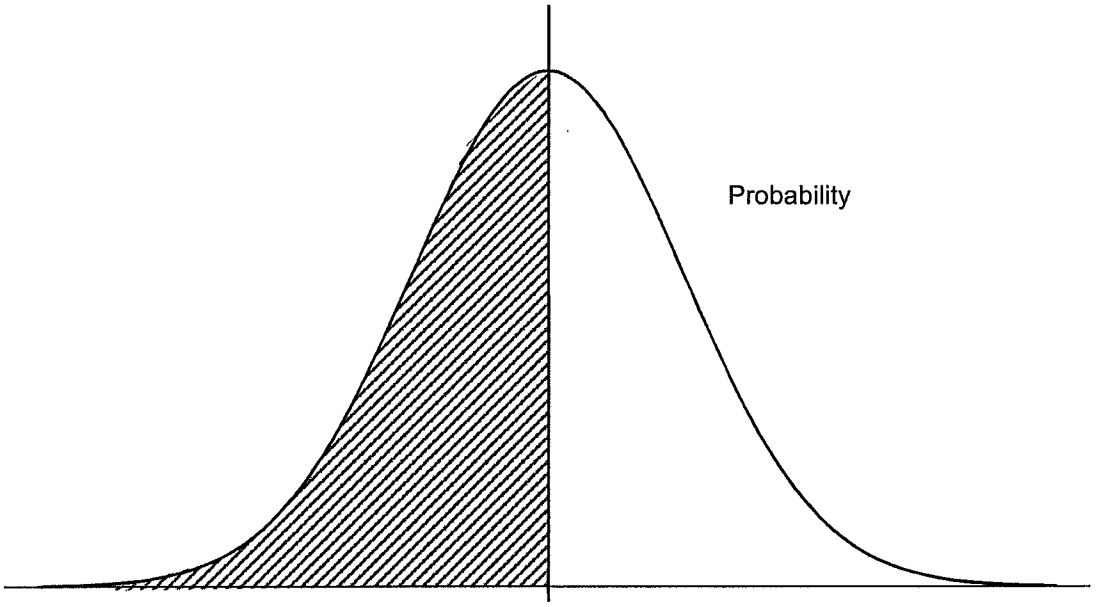
If the mean of the distribution of CRR payments were negative as portrayed in Figure 1, there would be a substantial likelihood that the CRR holder would incur an obligation to make payments to the CAISO. Absent a credit requirement, the expected value of an uncollateralized TCC payment for this CRR would be (μ_{ij}).

Figure 1
Distribution of Payments by Holders of Negatively Priced CRRs



By imposing a credit requirement of K_{ij} ($K > 0$), the value of uncollateralized CRR payments would be $R_{ij} + K_{ij}$ ($R_{ij} < 0$ implying an obligation to make payments to the CAISO). If K_{ij} were set equal to the expected level of CRR payments for a negatively priced CRR, the expected value of uncollateralized payments would be reduced to zero, as illustrated in Figure 2.

Figure 2
Distribution of Payments by Negatively Priced CRR Holders



$$R_{ijt} + K_{ij} = 0; K_{ij} = -\mu_{ij}$$

A limitation of a credit policy that only requires credit coverage for the expected level of CRR payments is that there would be a considerable likelihood (50 percent of the distribution is symmetric) that the CRR holder will be obligated to make CRR payments in excess of its credit coverage (i.e., $Rijt + K_{ij} < 0$, as illustrated by the shaded area in Figure 2.

Thus, such a CRR credit requirement would not directly protect the CAISO against default should the required payments by the CRR holder turn out to be larger, i.e., more negative, than the CRR price in the auction. While the holder of a counterflow CRR would have credit coverage for the expected value of payments to the CAISO, there would be no initial credit requirement covering potential payments in excess of the expected value of the CRR.[6] Since the reason for holding positively valued CRRs is to hedge against the volatility of congestion charges, there is an underlying expectation that actual payments may differ significantly from the expected payment, implying that holders of negatively priced CRRs may be required to make

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[6] To the extent that such negatively priced CRRs are held by generators with resources located at the CRR source, the potential payment due on the CRR is potentially backed not only by the CAISO initial credit requirement but also by the potentially offsetting payments to the supplier in the day-ahead market. Whether the generator ownership actually hedges the CRR holding depends, however, on the other forward positions taken by the supplier.

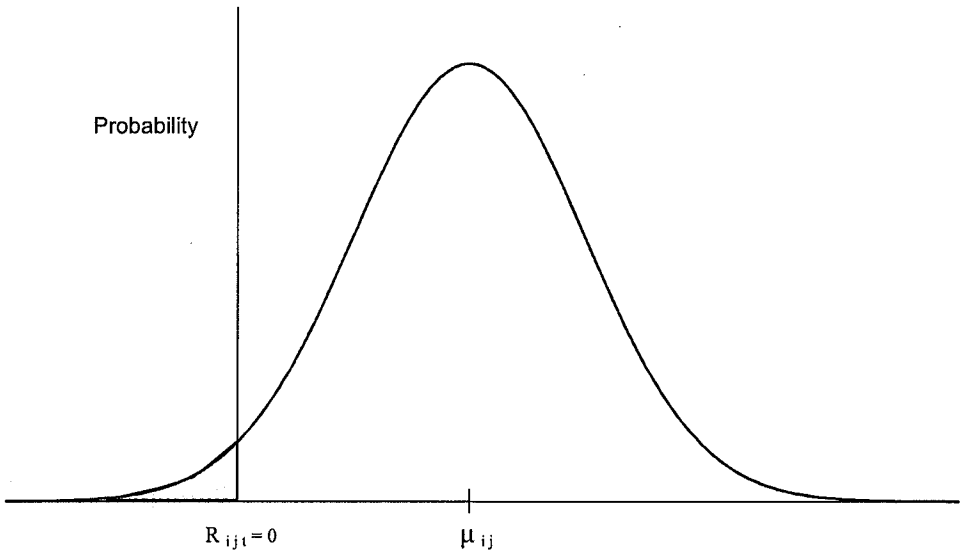
payments for their CRR holdings that are in excess of the expected level, i.e., in excess of the absolute value of the price of the counterflow CRR and thus in excess of such a credit requirement. It is precisely because of the potential for higher than expected congestion payments that CRRs are available as hedges against the volatility of congestion charges.

B. Positively Priced CRRs

A second kind of credit risk that the CAISO's CRR credit policies should address is the possibility that a CRR which is positively priced in the CRR auction in which it is purchased subsequently becomes negatively valued in the day-ahead market, requiring net payments by the CRR holder to the CAISO's congestion rent account. While the probability of negative returns is likely so low as to be negligible for some CRRs, such as CRRs sourced outside the Bay Area and sinking in the San Francisco sub-LAP, this will not be the case for all positively priced CRRs.

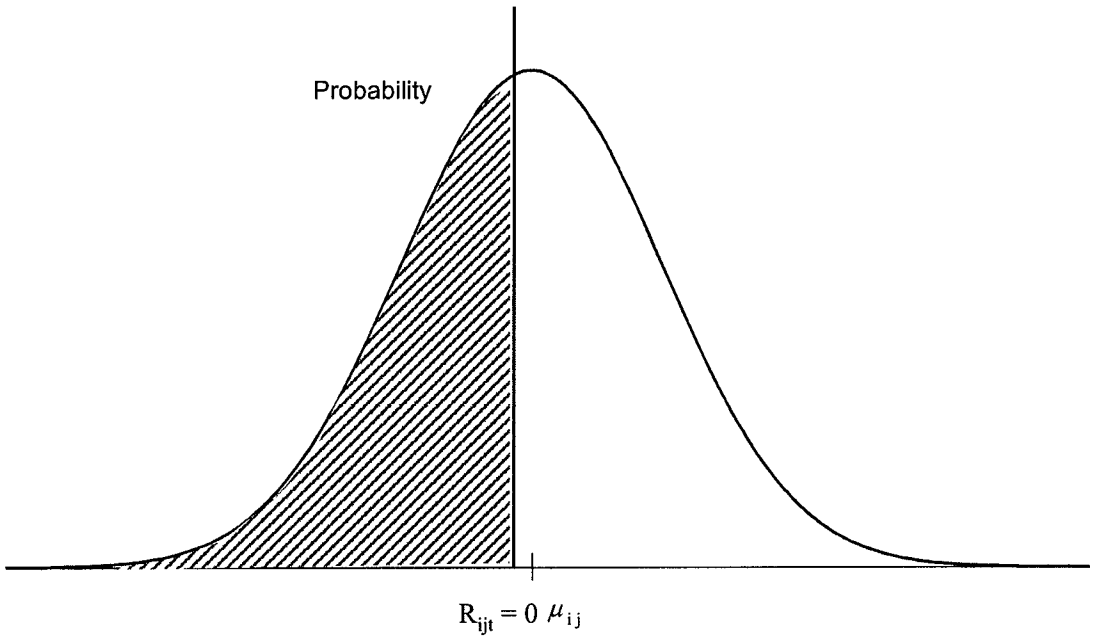
If the mean of the returns (μ_{ij}) is significantly positive, then the probability of the CRR holder being required to make a payment may be relatively small, as shown in Figure 3, and the maximum value of the potential payment by the CRR holder may also be small.

Figure 3
Distribution of payments to Positively Priced CRR



For some positively priced CRRs, however, there may be a significant probability that the CRR values in the day-ahead market could become negative as a result of slight variations in congestion patterns. This is illustrated in Figure 4, in which the expected CRR payment is positive but close to zero, and the shaded area portrays the probability that the CRR holder will be obligated to make payments to the CAISO.

Figure 4
Distribution of Payments to Positively Priced CRR



If no credit coverage were required of holders of CRRs with positive but low prices, there would be a potential exposure to uncollateralized CRR payments by the holders of positively priced CRRs, particularly those having auction prices that are near zero.

Another element of the CAISO's credit policy is how it will account for CRRs with negative credit requirements (CRRs found to have such a large positive expected value that the calculated credit requirement is negative because the distribution of CRR payments is such that even low probability outcomes result in payments to the CRR holder) in determining the overall credit requirement for the CRR holder's portfolio. Thus, a further credit policy choice for the CAISO is whether to set these negative credit requirements to zero or to allow them to offset the credit requirement on other CRRs held by the same entity. Under such a policy, the CAISO would not zero out negative credit requirements calculated for particular CRRs but would add them to the credit requirement for the other CRRs held by that entity. Such a policy has the potential to materially reduce market participant credit requirements but the actual impact would depend on the specific CRR portfolios held by particular market participants. While such an offset would reduce or perhaps eliminate the credit requirement for market participants holding a

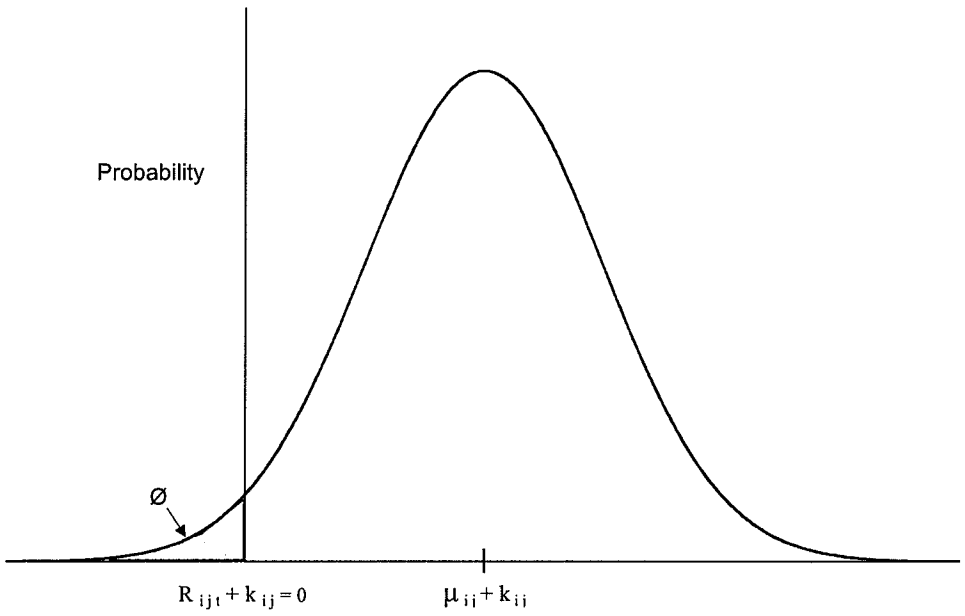
variety of positively priced CRRs and a few negatively valued CRRs, it would not affect the credit requirement for market participants holding only negatively valued CRRs.[7]

C. Analytical Framework for Defining CRR Credit Requirements

Conceptually, the CAISO seeks to define a credit requirement for each CRR that provides a specified level of assurance of payment by the CRR holder (i.e., a given probability of uncollateralized CRR payments or expected value of uncollateralized CRR payments).

By setting an appropriate credit requirement (K_{ijt}) for each CRR_{ij} in auction t, the ISO can in principle assure that the probability of uncollateralized CRR payments ($R_{ijt} + K_{ijt} < 0$) is less than or equal to a defined threshold (ϕ) for all CRRs. This is illustrated in Figure 5, where the imposition of a credit requirement K_{ijt} reduces the probability of an uncollateralized CRR payment ($R_{ijt} + K_{ijt} < 0$) for a negatively priced CRR from the shaded area in Figure 1 to the shaded area ϕ in Figure 5.

Figure 5
Distribution of Payments Net of Credit Requirement for Negatively Priced CRR



Under this approach, the credit requirement (K_{ijt}) needed to assure that the probability of uncollateralized CRR payments is less than the threshold value may be zero for CRRs with substantial positive expected values (high positive auction prices). CRRs with large negative

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[7] The credit offset value would decline over time as payments are made to the holder, and remaining payments fall. Thus, at the end of the term the credit value of the CRR would be much lower than at the beginning. This could be accounted for either through an explicit process for reducing the credit offset over time or by limiting the offset to the credit requirement for other CRRs of the same duration, so both the credit exposure and offset would decline in parallel.

expected values, on the other hand, would likely have credit requirements in excess of the absolute value of their auction price, as would CRRs with small positive auction prices.

Given this role of credit requirements for CRR holders, empirical questions for the CAISO are how to determine the appropriate credit threshold (ϕ,) and how given the credit threshold (ϕ), the appropriate credit requirement for each CRR should be set. If the credit requirement that is required to reduce the probability of uncollateralized CRR payments on the CRR whose returns are portrayed in Figure 1were also required of the entity holding the CRR whose returns are portrayed in Figure 3, the credit requirement would be greatly excessive for the holder of the CRR portrayed in Figure 3 and the probability of uncollateralized CRR payments would be zero. It is therefore desirable to set credit requirements that reflect the riskiness of individual CRR holdings but this goal is counterbalanced by a need for reasonable administrative ease in setting and applying the credit requirements to the thousands of CRRs sold on hundreds of paths in a typical auction.

Ideally, the CAISO credit coverage for negatively priced and low priced positively priced CRRs should cover the expected payments due for holding the CRRs plus a margin to cover the variability of the payment stream and the resulting potential for payment obligations in excess of the expected level.

In the long run the CAISO will be able to utilize data on the historic variability of TCC payments around the auction price to develop credit requirements that cover payment obligations at the desired probability level. At MRTU start-up, however, the historical data required for such an analysis will obviously not be available. Three potential approaches to defining the credit requirements for CRRs have been identified. One approach would be to base the initial credit requirement solely on the auction price. This approach would be easy to apply but has the disadvantage that it would provide no credit protection for payment obligations in excess of the expected level during a period in which auction prices will be based on limited information.

A second approach to defining A CRR credit requirement would be to base the estimate of CRR payment variability on the historical level of variability in congestion on path 15. This measure of payment variability would not capture the full range of CRR payment variability under MRTU, but has the advantage of being based on actual market outcomes and the California transmission system.

A third possible approach to defining the initial credit requirement would be to base the estimate of CRR payment variability on the historical level of FTR payment variability and FTR prices on actual FTR auction purchases in one of the eastern ISOs, such as PJM. This approach would have the advantage of basing the variability analysis on the kind of CRRs actually purchased by market participants, but the variability would not reflect California conditions.

D. Initial Credit Requirement for Longer-Term CRRs

In the future, the CAISO may begin selling CRRs with a duration of more than one year. Until such time as adequate data are available, the simplest option would be to assume that successive annual returns are independent, so the standard deviation of the two year returns would, for example, be 1.44 times the standard deviation of the one year returns. Under this approach, the

credit requirement for a n year CRR would be $\sqrt{n}$ times the credit requirement for a one-year CRR.

V. CAISO CREDIT REQUIREMENT ADJUSTMENTS OVER TIME

An important component of the CAISO's overall CRR credit requirement is the potential for the CAISO to require additional credit support during the term of a CRR if the expected level of payments due the CAISO increases after the initial credit requirement is determined before payments are made by the CRR holder. One feature of CRRs that constrains the CAISO CRR credit policy is that because CRRs are not continuously traded, the CAISO cannot observe changes in the market value of a CRR between auctions. The CAISO therefore cannot continuously mark CRR values to market, which limits its ability to require additional credit support as the change in market value occurs over time. The CAISO could track the net CRR obligations of individual CRR holders on a daily basis, including a rough projection of payments over the remaining term of the CRR based on the payment obligation incurred on the CRR portfolio to date during the month and require additional credit coverage but there is not a straightforward method for projecting future payments on a daily basis.

Another complication affecting CAISO credit policy for CRRs is how the credit requirement is adjusted as payments are made and the CRR approaches its expiration. The source of the potential problem is that if the CAISO credit requirement does not decline over time on long-term CRRs, there could be a large credit requirement even when there is little remaining exposure to congestion payments. Such a feature of CAISO collateral policies would reduce the potential for adverse credit exposure for the CAISO, but would go too far in the other direction. If an entity sold a one-year counterflow CRR for $10 million and had paid $8 million to the CAISO congestion account over the first ten months of the term absent any adjustment, the market participant would have to maintain the full $10 million in credit on this CRR during the last two months despite the small likely remaining exposure to congestion charges.

As noted above, in conventional forward energy contract and financial derivative markets the issues arising from changes in the market value of contracts over time are addressed through mark-to-market accounting and credit requirements whereby the credit requirements are periodically adjusted based on the change in value of the contract over its remaining term. A difficulty for the CAISO in directly applying these principles to the CRR market is that CRRs are not continuously traded, so that there is not a readily available market price to use in reassessing the relationship between the current credit coverage and the current value of the contract.

Despite the lack of continuous trading of CRRs, it might be possible for the CAISO to apply market-to-market principles to one-year CRRs in a manner that would adjust the credit requirement for annual CRRs at the conclusion of the next seasonal auction, as long as their were reconfiguration rounds covering the remaining duration of the annual CRRs. The valuation in the auction could be used to increase or reduce credit requirements and the same probabilistic analysis of the required credit would be applied to the remaining term of the annual CRRs.

Appendix C-2

CAISO CRR Credit Policy – Initial Draft

March 20, 2007

I. CRR AUCTION CREDIT REQUIREMENTS

The CAISO credit requirements for participation in the CRR auction and allocation process will have five elements:

1. Bidders will post credit prior to the auction covering for each CRR bid, the higher of their CRR bid (bid price times quantity) or the pre-auction credit coverage margin for those CRRs. Bids lacking sufficient credit coverage will not be included in the auction.[1]

2. The pre-auction credit coverage margin will be determined using the same formula used to determine the post auction credit coverage margin applied to a zero price CRR.

3. CRRs will be paid for at the conclusion of the auction.

4. Once a CRR holder has paid for all CRRs it purchased in the auction, the CRR holder's credit coverage in excess of that needed to hold the purchased CRRs will be released. No payments will be made to the CRR holder for the purchase of negatively priced CRRs until the credit coverage required to hold the CRR is in place.

5. No credit coverage will be required to participate in the annual and seasonal CRR allocation processes, but credit coverage may be required for holding some CRRs acquired in these processes.

The credit coverage requirement for participation in the CRR auction by entities submitting bids for a portfolio of CRRs will typically exceed the payments ultimately made by the CRR holder for the purchase of CRRs in the auction. This will be the case both because auction participants will generally not be the high bidder for every MW of CRRs on which they submit a bid and because the clearing price in the auction will be lower than the bid price of all but the marginal purchaser.

Once the auction is complete, market participants awarded CRRs in the auction will be required to pay for the CRRs which they were awarded in the auction and to post

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[1] The CAISO will need to specify rules to handle the situation in which the credit is sufficient to cover some but not all of a market participant's bids.

any required credit coverage for holding the awarded CRRs. The credit requirement established for auction participation will not be reduced until the market participant has paid for the awarded CRRs and will be reduced only to the extent that the credit coverage requirement exceeds that required to hold the awarded CRRs.

II. CREDIT REQUIREMENTS FOR HOLDING CRRS

A. Credit Requirement

Entities holding CRRs may be required to post credit coverage for their potential liability for payments associated with the CRRs they hold. For CRRs that are negatively priced in the auction, the required coverage will be equal to the absolute value of the price of the CRR in the auction, plus a credit coverage margin. [2] For CRRs that are positively priced in the auction, credit coverage will be required only to the extent that the credit coverage margin for that CRR exceeds the CRR's price in the auction. CRRs with positive auction prices in excess of the credit coverage margin will provide credit coverage for other CRRs held by the same entity.

Thus, CRRs with substantial positive prices in the auction will generally not require any credit coverage to hold and will provide credit coverage for the holding of other CRRs. CRRs with auction prices that are negative or positive but close to zero, on the other hand, are likely to require credit coverage by the holder.

It is possible that some CRR holders could be required to provide additional credit coverage beyond that required to participate in the CRR auction in order satisfy the credit coverage margin for holding the CRRs they are awarded in the auction. This is most likely for entities that purchase CRRs at negative prices in the auction. In most cases, however, the additional credit coverage required should not be materially more than the payment due to the CRR holder for the negatively priced CRR.

B. Determination of the Credit Coverage Margin

The purpose of the credit coverage margin is to provide reasonable assurance that if CRR payments differ from the expected level, the CRR holder will be able to satisfy its financial responsibilities.[3] While the numerical parameters used to determine the credit coverage margin have not yet been set, the general structure of the formula determining the credit coverage margin will be a function of the CRR auction price, the term of the

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[2] It is important to keep in mind that the CRR auction will be conducted using the full network model and therefore all possible CRRs will be priced in the auction, even if no CRR with exactly the same source and sink was sold in the auction. This principle is common to all CRR auctions and underlies the use of auction revenue rights in PJM, ISO-New England and New York.

[3] Futures exchanges and clearing exchanges such as NYMEX impose margin requirements for the same reason; see, for example, www.nymex.com/ewd_marginsaspx.

CRR, and the month or season covered. This discussion focuses on the formulation of the credit coverage margin to be used at the initial implementation of MRTU.[4]

Since the base credit requirement is determined by the auction price, one measure of the prospective variability is the historic variability of CRR payments relative to the auction price. At the initial implementation of LMP pricing in California, however, there will be no historical data on the actual variability of CRR payments, and there will be no historic auction prices to be compared to the CRR payments. Moreover, there will be no historical data on the sources and sinks of CRRs that might be typically purchased in the auction. Three general approaches have been identified for addressing this lack of historic data for estimating an appropriate credit coverage margin.

1. LMP Study Price Data

One set of data that could be used to assess the likely variability of CRR payments relative to CRR auction prices is the congestion data generated for historical periods in the LMP studies. While these studies are not based on the outcomes of actual day-ahead market bidding, they reflect the historical variation in load and weather conditions.[5]

The LMP studies provide a potential set of returns for analysis of the variability of congestion payments but do not provide a set of auction prices to which the congestion payments can be compared in order to assess the variability of the net returns. If there were many months of auction prices with the same expected level of congestion charges one could calculate the mean value of the simulated congestion charges for a set of CRRs and then calculate the variation of the simulated auction returns around the assumed mean. One problem in applying this methodology in practice is that the expected level of congestion charges would certainly not have been the same from month to month over the simulated period, so calculating the variation of the simulated monthly congestion charges around the mean for the period covered by the LMP simulations would have the potential to greatly overstate the actual variability in CRR returns around the auction price.[6]

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[4] After the MRTU markets have been in operation for a period of a year or two it will likely be appropriate to reexamine the credit coverage margin based on the observed variability of CRR payments and auction prices. At that time, it is possible that the formula determining the credit coverage margin might be elaborated to depend on factors such as whether the CRR sources or sinks at a LAP and in which LAP the CRR sources or sinks, if it is observed that greater variability appears to be associated with such factors.

[5] It should be kept in mind that the LMP studies are based on a simulation of real-time loads and prices. CRRs will settle against day-ahead prices. It is expected that day-ahead prices will be less variable relative to forward expectations than would be real-time prices.

[6] That is, the expected level of congestion payments and thus CRR prices would likely have been high in many of the months with high simulated CRR payments and lower in the months with low simulated CRR payments, so calculating variability relative to the overall mean tends to overstate the variability of payments relative to CRR prices that reflect expected payments in each period.

This problem could be addressed to a degree by calculating the mean CRR payments separately for each month of the year, to reflect the seasonal variations that would likely be reflected in CRR auction prices. There would still be only two or three months of data for each month of the year, however. The deviation around the mean for each month would therefore have very few degrees of freedom. Estimating the variance around the monthly means over the year would have relatively few degrees of freedom. There would in consequence be a potential to understate the variance of CRR returns because of the very few degrees of freedom in estimating the mean.

A slightly different approach would calculate a summer, winter and shoulder month mean CRR price and then compute the deviation of the monthly returns relative to the means, then calculate an overall estimated variance. This approach would tend to overstate the variance because the mean would be estimated over seasons rather than for months. Perhaps an average based on the two calculations might provide a balance, keeping in mind the reality that very limited information is available for estimating the prospective variability of CRR returns. Moreover, the process of calculating hypothetical auction prices based on simulated returns and then comparing the hypothetical auction prices to the same simulated returns is different from the actual process generating uncertain payment obligations for annual CRRs.

It also must be kept in mind that the CAISO LMP simulations covered only a few years and the actual prospective variation in market conditions may be much greater than the variability observed over such a short historical period.

Once the variability of monthly returns is computed, it would need to be projected to an estimate of the variability of annual returns. This could be done assuming that the monthly returns are independent and normally distributed.[7]

Another issue in applying this methodology would be the choice of the set of CRR paths over which the variability of returns would be calculated. It is suggested as a starting point that these variability measures be calculated for CRRs from each generator in NP 15 to the NP-15 hub and to the PG&E LAP, and for CRRs from each generator in SP-15 to the SP-15 hub and the SCE and SDGE LAPs. A single variability measure would be calculated for all CRRs.

2. Historical California Congestion and FTR Prices

A second approach to estimating the likely variability of CRR payments relative to CRR auction prices that could be used as a check would be to develop an estimate of CRR payment variability based on the historic level of variability in congestion on path 15 and

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[7] It is likely that the actual variation of CRR payments around the CRR auction price will not be normally distributed. In view of the approximations being used to derive the estimated variability of CRR returns prior to CAISO LMP implementation, it is not thought to be useful to test more complicated distributions.

the CAISO external ties relative to the auction prices of FTRs on these paths. Thus, this approach would compare the auction price and CRR payments for these hedges and estimate the distribution of the payments relative to the auction prices. This measure of payment variability would not capture the full range of CRR payment variability under MRTU, but would have the advantages of being based on actual auction prices, actual market congestion outcomes and the California transmission system.[8]

3. Historical Non-CAISO CRR Data

A third approach to estimating the variability of CRR payments would be to develop an estimate of CRR payment variability based on the historical level of FTR payment variability and FTR prices in one of the eastern ISOs. This approach would have the advantage of basing the variability analysis on actual point-to-point CRR obligation prices and returns for the kind of CRRs actually purchased by market participants, but the returns would not reflect California conditions. While this kind of returns analysis would not be sufficient for determining CAISO CRR credit requirements, it would provide a useful check on the validity of the simulation based analysis.

4. Conclusions

Whichever approach is used to estimate an appropriate credit coverage margin it is envisioned that these calculations will be undertaken prior to the start of the MRTU market and the parameters used to determine the credit coverage margin will be calculated and input to the CAISO billing and settlement system. These parameters would remain fixed until the CAISO and its market participants find it appropriate to reexamine the determination of the credit coverage margin based on actual experience under MRTU market operation.

There is an inherent tradeoff between the size of the credit coverage margin and the likelihood of defaults by CRR holders that results in losses to the CAISO congestion account. Defaults in the CRR market have the feature that the shortfall may potentially continue over the remaining term of the CRR that produced the default and therefore have ongoing consequences for CAISO settlements.

In the event of a payment shortfall due to a market participant default, all market participants who are net creditors in a CAISO trade month are "short-paid" on a pro-rata basis – i.e., if CAISO creditors are to collectively receive $10,000,000, and the CAISO collects only $9,900,000 after liquidating the collateral of the defaulting party, the

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[8] The fact that the historic FTRs were options with returns calculated in a different manner than CRRs would likely tend to reduce the volatility of the historic FTRs relative to the variability of payments to CRRs in the future. If it were found that the variability of returns calculated from historic FTR data was much higher than the variability calculated under the first method, this would suggest that the first methodology might be understating the variability of CRR payments.

creditors would be paid 99% of the amount due to them and are provided a claim against the defaulter for the balance. In the event of a default on a CRR, this short payment would potentially continue over the remaining term of the CRR. Accordingly, a default by a CRR holder could have an ongoing negative impact on participation in CAISO's markets and the price at which supply is offered.

The CAISO will therefore seek to ensure that the credit coverage provided for CRRs is sufficient to reduce the likelihood of potential losses from default on CRR payments to a very low level. In addition, the CAISO may study alternatives to address the "recurring" default problem posed by CRRs. Such alternatives may include:

1. Re-valuing a defaulting market participant's CRR portfolio at the time of default, and liquidating the portfolio by unwinding the positions at the next available CRR auction.

2. More broadly reconsidering the shortfall allocation methodology used by CAISO in the event of a payment default.

The CAISO believes these alternatives cannot be adequately discussed and developed for implementation by the January 31, 2008 MRTU "go-live" date, but intends to further discuss these ideas with stakeholders over the near-to-intermediate term.

C. Adjustments in Required Credit Coverage

It is proposed that there will be three types of adjustment over time in the required CRR credit coverage. The first will be a gradual reduction in the required credit coverage for holding CRRs as the CRR approaches termination and CRR payment obligations or receipts are accounted for in EAL components 1 through 4 (actual and estimated settlements data) and updates of the required credit coverage based on the most recent auction prices for CRRs covering the remaining term of the CRR. The second will be a shift in the credit requirement for holding a CRR in the event that the CRR is transferred to a different creditworthy entity for the entire remaining duration of the CRR. The third will be an adjustment in the credit requirement to account for transactions in which only a portion of the settlement responsibility for a CRR is transferred to another entity, i.e., a situation in which the holder of an annual CRR transfers the settlement responsibility for a particular month, day or hour to another entity.

1. Adjustments Based on Termination Date and Updated Prices

The credit requirement for holding CRRs will initially be reduced as the CRRs approach their termination date using an approximation based on the remaining duration of the CRR. Since this approximation does not account for potential seasonal differences in the variability of returns, the reduction will only be applied to the base credit requirement, not the credit coverage margin. Thus, for a CRR with a negative price of –P in the auction and a credit coverage margin of M, the initial credit coverage requirement would

be P + M. It is proposed that the required credit coverage would be θP + M, where θ is the ratio of the CRR's remaining duration to the CRR duration for which P and M were calculated. Thus, for an annual CRR, it is proposed that after the first two months covered by the CRR have passed, the CRR credit requirement (EAL-5) would fall to 5/6 P + M.

In addition, the credit requirement for holding a CRR would be periodically redetermined for its remaining term based on more recent auction valuations.

2. Adjustments to Reflect Permanent CRR Transfer

In the event that a CRR holder transfers financial responsibility for a CRR for the entire remaining term of the CRR, the credit coverage requirement for the remaining term will be transferred to the acquiring party on the effective date of the transfer. The transfer will not occur until the required credit coverage is in place for the new holder.

3. Adjustments to Reflect Partial CRR Transfers

While the proposed methodology for establishing CRR credit requirements would assess the variability of payments associated with a CRR over the term of the CRR, it is not proposed to attempt to assess the variability of CRR payments on an hour-by-hour basis. If CRR holders are permitted to permanently transfer, without recourse, the CRR settlement obligations associated with a subset of hours to another entity, it is essential that the CRR credit requirement established by the CAISO for the entity acquiring these rights reasonably reflect the payment risk associated with the carved out hours. Simple prorata credit requirement rules such as prorating the credit requirement based on the proportion of hours transferred could give rise to material uncollateralized positions and the potential for material losses in the CAISO settlements.

One type of partial transfer that could seriously undermine the CAISO settlements would be the transfer of the responsibility for a subset of hours that are likely to have the bulk of the payment obligations for a given CRR, such as the afternoon hours in the summer component of an annual CRR, to an entity with minimal assets.

For example, consider an annual CRR acquired by entity A in the auction at a negative price of $1,000,000 for which the CAISO calculates a credit coverage margin of $250,000. Suppose that the holder in turn transferred the CRR obligation associated with hours 14 through 20 for the summer weekdays for 10 weeks beginning June 15 to entity B. The transfer would account for 300 out of 8760 hours, so if the CAISO applied a proportional credit requirement to entity B, the underlying credit requirement for entity B would be $34, 247 plus a credit coverage margin of $8,562, while entity A would have a credit requirement of $965,753 and a credit coverage margin of $241,438.

Suppose, however, that the expected value of the payments due on this CRR during the hours transferred to entity B were $900,000. Even if the payments due on the

negatively priced CRR were consistent with expectations, the CAISO would be substantially undercollateralized for entity B's CRR payment obligations, while it would be substantially overcollateralized for entity A's remaining obligations. Such a simple proration rule for setting credit requirements for partial CRR transfers would therefore invite transfers designed to shift the payment obligation to entities that would be unable to cover the payments due. A second type of transfer that could undermine the CAISO settlements would be the transfer to an entity with minimal assets of the responsibility for a set of hours for which it can be foreseen at the time of the transfer that the required payments will be particularly large. For example, suppose entity A acquired a CRR for July at a negative price of -$400,000 and had a credit coverage margin of $150,000. The negative price for the CRR would reflect the expected level of payments given likely weather conditions, recognizing that some weeks might be very hot with high congestion, while other weeks might be cool. If entity A could transfer responsibility for the CRR to a poorly capitalized entity B when the short-term weather forecast predicted extreme weather conditions, the original CRR holder might be able to transfer liability for $200,000 of its obligations to entity B. If the CAISO only required a proportional credit requirement of say $100,000 plus $37,500 of credit margin from entity B, the CAISO would have uncollateralized CRR payment obligations if the weather were as hot as expected. Similar problems could arise if a transmission forced outage occurred which could be foreseen to raise congestion charges for the next week, and the CRR holder were able to transfer CRR responsibility to a financially weak entity after learning of the outage.

Given the potential for these types of transfers to give rise to material uncollateralized CRR payment obligations under a simple prorata credit requirement allocation rule, much more complex methods would be necessary to determine credit requirements for partial CRR transfers if such partial transfers completely released the original CRR holder from its payment obligations.[9] While it would in principle be possible for the CAISO to develop hour specific credit requirement criteria, this would be very difficult to implement in practice and is not a realistic option at the time of MRTU implementation.

Since it is impracticable to develop sufficiently accurate hour-by-hour CRR credit requirements of the necessary sophistication to cover partial CRR transfers for the initial MRTU implementation, a simple prorata rule will be employed to reallocate the CRR credit requirement between the original holder and the entity making such a partial acquisition. However, it is proposed that the original holder will remain obligated to cover any payments due on the CRR for the transferred hours, should the acquiring entity fail to make any required payments.

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[9] Partial transfers also have some more subtle effects on the appropriate credit policy for the two components depending on the correlation in the variability of payments in the divested and retained hours but these effects are less likely to have material adverse financial affects on the CAISO.

Thus, in the examples above, entity A's credit requirement for holding the CRRs would be reduced and shifted to entity B on a prorata basis as described in the example, however, the shift in credit requirement would not eliminate entity A's financial responsibility for the CRR should entity B be unable to make the required payments.[10]

III. LONG-TERM CRR CREDIT ISSUES

There are two credit policy issues relating to long-term CRRs. The first concerns the appropriate credit policy for long-term CRRs that are acquired either in the allocation process or auction. The second concerns the appropriate credit policy for the long-term payment obligations of external LSEs that choose to participate in the allocation process for long-term CRRs by prepaying the transmission access charge.

A. Long-Term CRRs Allocated to Internal LSEs

It is anticipated that the allocation of long-term CRRs to LSEs will be carried out prior to the implementation of a long-term auction. This will foreclose the initial use of auction prices for these long-term CRRs in determining the required amount of credit coverage. Three approaches are under consideration for determining the required credit coverage during the period prior to implementation of a long-term CRR auction.

The first approach would be require the CRR holder to maintain coverage for a CRR with n remaining years equal to n times the credit coverage requirement for a one-year CRR with the same source and sink. Thus, for a 10 year CRR with an expected value of -$500,000 in the first year and a credit coverage margin for the first year of $100,000, the total credit requirement would be $6,000,000 (10 * [$500,000 + $100,000]). Alternatively, for a 10 year CRR with an expected value of $50,000 in the first year and a credit coverage margin of $75,000, the total credit requirement would be $250,000 (10* $25,000).

This approach would have two principle limitations. First, the expected value of the CRR over the year covered by the current annual auction need not be equal to its expected value in subsequent years. The value of the CRR in the current year might be much lower or higher than in subsequent years because of expected changes in load, expected generation additions or expected transmission expansions.[11] Second, unless the variability of CRR payments was perfectly correlated over the term of the CRR, the

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[10] It is important to recognize the source of credit problem in the example is that the prorata rule assigns too little credit coverage requirement to the acquiring entity and leaves to much with the original CRR holder. As long as the credit coverage of the transferring entity remains available to the CAISO in the event of a default by the acquiring entity, the CAISO's overall credit coverage would not be undermined by such partial transfers.

[11] In addition, even if the expected value of the CRR in the current year were exactly equal to its expected value in subsequent years, the present value of the expected CRR payments would not equal n times the current auction price because of the time value of money. This discounting could be relevant in some circumstances.

variance of the CRR payments relative to the auction price over an n-year period would be less than n times the variance over a single year, so multiplying the credit coverage margin by n would very likely overstate the appropriate credit coverage margin.

A second approach would require the CRR holder to maintain credit coverage for a CRR with n remaining years equal to n times the expected value based on the auction price plus the square root of n times the credit coverage margin for the corresponding one year CRR. Thus, for a 10-year CRR with an expected value in the first year of -$500,000 and a credit coverage margin of $100,000, the total credit requirement would be $5,000,000 and a credit margin of $316, 228, for a total credit requirement of $5,316,228. Conversely, for the positively valued CRR with a first year expected value of $50,000 and a credit coverage margin of $75,000, the credit coverage requirement would be 10 times the expected values, +$500,000, and a credit cover margin of $237,171, for a net of -$62,829, implying a credit requirement offset.

This approach attempts to correct the second limitations of the first approach by multiplying the credit coverage margin by the square root of n. The calculation thereby reflects the likelihood that the year to year variations in payments would not be perfectly correlated. While it is possible that the actual returns will turn to be somewhat positively or negatively correlated over time, the assumption that they will be uncorrelated is a reasonable starting point.

A third approach would require the CRR holder to maintain credit coverage for a CRR with n year remaining on the same basis as if it were an annual CRR, except that the required coverage would not be adjusted down based on the termination date until the CRR enters the final year of its term. Thus, the LSE would maintain one year's credit coverage on a continuing basis until the final year. For the examples above, this would require the holder of the negatively valued CRR to maintain credit coverage of $600,000, while the holder of the positively valued CRR would be required to maintain credit coverage of $25,000.

Under all three approaches, the required level of coverage would potentially be redetermined periodically based on the price in the most recent auction of a CRR covering the same period with the same source and sink.

B. Long-term CRRs Held by External LSEs

Long-term CRRs held by external entities will be subject to the same credit coverage requirement for holding CRRs as would internal LSEs, i.e., either option one, two or three above, depending on which is selected for internal LSEs, , subject to the same year to year adjustments based on year-to-year changes in auction prices.

In addition, external LSEs acquiring long-term CRRs through the allocation process must maintain credit coverage for one year of transmission access charge payments beyond the current prepaid year.

Appendix C-3

California ISO Straw Proposal

Congestion Revenue Rights Credit Policy

April 27, 2007

CAISO Straw Proposal

Congestion Revenue Rights Credit Policy

Table of Contents

CAISO Straw Proposal for CRR Credit Policy

Introduction

The CAISO has held a series of stakeholder meetings and posted white papers and initial policy proposal on CRR credit requirements.[1] Since then, the CAISO has received comments from stakeholders and conducted further studies. This paper discusses the latest changes and expansions to the previously posted policy proposal. It also presents some numerical examples to illustrate the methodologies used to determine credit requirements for holding CRRs.

CAISO Proposals

There are two types of credit requirements. One is the credit required for obtaining CRRs through the CAISO CRR allocation and auction processes. The other is the credit required for holding CRRs.

I. CRR Allocation Credit Requirement

The CRRs distributed to LSEs through allocation process are free of charge. There is no credit deposit required for the LSEs to participate in the CRR allocation process.

II. CRR Auction Credit Requirement

There will be pre-auction credit requirements for participating in the CAISO CRR auction process. The amounts of credit required depend on the CRRs the participants intend to bid for. The following are the policies proposed.

1. Bidders will post credit prior to the auction in order to bid for positively priced CRRs. The credit has to be sufficient to cover the bid (bid price times quantity). Bids lacking sufficient credit coverage will not be included in the auction.

[1] CRR stakeholder meeting: 4/3/07: http://www.caiso.com/1bb5/1bb5875027a50.pdf
CRR Conference call: 3/27/07: http://www.caiso.com/1bad/1badda6459b00.pdf
Posting of LECG's revised draft: 3/20/07: http://www.caiso.com/1ba7/1ba788da74450.pdf
Stakeholder Meeting Presentation on 2/27/07: http://www.caiso.com/1b92/1b928c9e2d2a0.pdf
Posting of LECG white paper: 2/21/07: http://www.caiso.com/1b8c/1b8cdb4c74ab0.pdf

2. There will not be a pre-auction credit margin. (i.e. during the auction, only the cost of the bids for positive CRRs, without an additional margin, will be counted against the bidder's maximum credit limit for the CRR auction)
3. Once a CRR holder has paid for all CRRs it purchased in the auction, the CRR holder's credit coverage in excess of that needed to hold the purchased CRRs will be released. The valuation of the CRRs used in this determination will include a margin.
4. There will be no pre-auction credit requirement for participating in the auction for negatively priced CRRs.
5. No payments will be made to the CRR holder for the purchase of negatively priced CRRs until the credit coverage required (including a margin) for holding the CRRs is in place. Failing to maintain adequate credit coverage is considered a default and is subject to penalties described under the compliance policies.
6. CRRs will be paid for at the conclusion of the auction.

III. Credit Requirements for Holding CRRs

Entities holding CRRs may be required to post credit coverage for their potential liability for payments associated with the CRRs they hold. For CRRs that are negatively priced in the auction, the required coverage will be equal to the absolute value of the price of the CRR in the auction, plus a credit coverage margin. For CRRs that are positively priced in the auction, credit coverage will be required only to the extent that the credit coverage margin for that CRR exceeds the CRR's price in the auction. CRRs with positive auction prices in excess of the credit coverage margin will provide credit coverage for other CRRs held by the same entity.

The credit requirements are determined according to the following policies:

1. Credit coverage is required to hold CRRs, regardless how the CRRs are obtained (through allocation or auction).
2. Credit requirement is determined for the whole CRR portfolio of each holder. The excess credits from CRRs with high positive expected value can offset up to the same amount of the credit requirements of other CRRs in the same portfolio. This may reduce total credit requirements for some CRR holders. The downside is that it

increases the financial risk if the CRRs with excess credits have shorter terms than the CRRs requiring credit coverage. In such cases, when the positive CRRs expire, the CRR holder would be required to post/maintain adequate credit coverage for the negative CRR.

The other option is to assess credit requirement of each individual CRR separately, rather than for the whole portfolio of a holder. Credit offset is not allowed within a CRR portfolio with this approach. It may increase total credit requirements for some CRR holders, but it may simplify the process of assessing credit requirements and reduce financial risk caused by default of certain CRR holders. The methodologies and some numerical examples of this approach are discussed in the Appendix of this paper.

3. Credit margin and credit requirement

The credit requirement of a CRR consists of two components, the expected value of the CRR and a credit margin.

CRR expected value is the auction price of the CRR. For CRRs directly allocated to LSEs the CRR expected value is the market clearing price calculated by the CRR auction model. The inclusion of CRR expected value in the credit requirement is intended to cover the negative auction price of a CRR paid by the CAISO to the CRR holders. It also measures the excess credit a positively priced CRR may poses that can be used to offset credit requirements of other CRRs owned by the same holder.

The credit requirement of a CRR for a term of 1 year or shorter is defined as:

$$Credit\ Requirement = -CRR\ Expected\ Value + Credit\ Margin$$

Due the uncertainties of the market, the actual value of a CRR could be very volatile. A credit margin included in the credit requirement ensures sufficient credit coverage under the market uncertainty. The credit margin of a CRR is defined as the difference between the expected value and the fifth percentile value of the CRR.[2] That is:

$$Credit\ Margin = CRR\ Expected\ Value - 5th\ Percentile\ CRR\ Value$$

[2] See Appendix for detail discussion. Examples based on the 1st and 2.5th percentile values are also included in the Appendix.

5^{th} Percentile CRR Value is determined according to the probability distribution of the value of the CRR. This value is selected so that the likelihood the credit requirement fails to fully cover a possible default of the CRR holder is less than or equal to five percent.

Then we have:

$$Credit\ Requirement = -5th\ Percentile\ CRR\ Value$$

Other percentile values may also be considered. In the Appendix, the examples based 1^{st}, 2.5^{th}, and 5^{th} percentile values are presented.

4. Calculation of credit margins

For the first year of the CAISO MRTU, there is no historical LMP data available. The data from LMP study by the CAISO will be used to calculate the credit margins for all CRRs. In the future, actual historical LMP data will be used to update the credit margins.

In addition, the CRR data of other ISOs will be used as references for validating the calculated CRR credit margins.

IV. Long-Term CRR Credit Issues

There are several issues related to the credit requirements for holding Long-Term-CRR (LT-CRR, CRRs with terms longer than 1 year), including how the credit requirements are determined based on the 1-year CRR expected value and credit margin, how the credit requirements are adjusted over time, and lastly how much the additional credit requirements are for external LSEs.

1. Long-Term CRR credit requirement

The CAISO developed four options for consideration that could be used to determine credit requirement for holding LT-CRRs.

Option 1: $n*(-1\ year\ CRR\ Expected\ Value + 1\ year\ Credit\ Margin)$

Option 2: $n*(-1\ year\ CRR\ Expected\ Value) + \sqrt{n}*(1\ year\ Credit\ Margin)$

Option 3: $-1\ year\ CRR\ Expected\ Value + 1\ year\ Credit\ Margin$

Option 4: $n*(-1\ year\ CRR\ Expected\ Value) + 1\ year\ Credit\ Margin$

Option 1, among the four options, requires the largest credit deposit for holding the CRRs. It could discourage participation in CRR allocation and auction, which could eventually reduce the liquidity and effectiveness of the CRR market. On the other hand, Option 3 may not be able to adequately protect the CAISO and other CRR holders form default of certain holders. The CAISO therefore has a preference toward Option 2 and Option 4. The final decision will be made based on the feedbacks from the stakeholders.

In the Appendix numerical examples of all four options with three different percentile values are presented to help evaluate the impacts of each of the options.

2. Adjustment to LT-CRR credit requirements

The credit requirements for holding LT-CRRs will be adjusted not less than annually. The adjustment will account for the change of remaining terms of the LT-CRRs. The CRR credit margins and expected values will also be re-assessed based on the actual LMP data from the market operation of the past year.

Credit requirements will also be adjusted when the ownership of a CRR has changed through either secondary market trading or load migration. The new owner is subject to the CRR credit requirements in order to assume the ownership.

3. Additional credit requirement for Long-Term CRR held by external LSEs

External LSEs will be subject to the same credit requirements for holding LT-CRRs as other Market Participants. Additionally, external LSEs will be required to maintain one year of credit coverage for their Wheeling Access Charge (WAC) prepayment beyond the current period. Although the 1 year credit coverage for the WAC prepayment will increase the EAL, the external LSE will not need to post additional credit as long as their overall available credit position (Available Credit Limit less their EAL including WAC prepayment) remains positive.

V. Compliance Measures

For failure to meet credit requirements for holding CRRs, the following compliance measures are proposed:

- Terminate all CRR agreements with the default holder.

- Retain all payments due to the CRRs and resell seasonal CRRs for their remaining duration in subsequent monthly auctions.
- Retain all financial security.
- Exclude the holder from future CAISO CRR allocation and auctions processes.
- Prohibit the holder from acquiring CRRs in the secondary market and through any other means.

VI. Market Monitoring and Mitigation

The CAISO market rules prohibit Market Manipulation (37.7), including:

- Actions or transactions that are without legitimate business a purpose and that intended to or foreseeably could manipulate market prices, market conditions …" (37.7.1.1)
- Collusion with another party for purposes of manipulating market prices, market conditions …(37.7.4.2)

FERC's own market rules also prohibit provision of false information to and ISO, and make it unlawful to:

> (1) use or employ of any device, scheme, or artifice to defraud, (2) make material false statement or omit material facts, or (3) engage in any act, practice or course of business that operate or would operate as a fraud or deceit upon any person.

The CAISO Department of Market Monitoring will monitor any unusual activities in the CRR allocation and auction processes. A variety of action might be taken to deter or monitor the type of conduct described above, including:

- Require disclosure of affiliations.
- Explicitly warn participants that the CAISO will monitor and refer such behavior to FERC.
- Refer to FERC.

Appendix: Methodologies and Examples

I. CRR Credit Margin and Credit Requirement

Assuming that credit requirement is assessed for the whole CRR portfolio of each holder (allowing credit offset), the credit requirement of a CRR for a term of 1 year or shorter is defined as:

$$Credit\ Requirement = -CRR\ Expected\ Value + Credit\ Margin$$

Credit margin of a CRR is defined as the difference between the expected value and the fifth percentile value of the CRR.[3] That is:

$$Credit\ Margin = CRR\ Expected\ Value - 5th\ Percentile\ CRR\ Value$$

That is, $Credit\ Requirement = -5th\ Percentile\ CRR\ Value$

CRR Expected Value is the auction price of the CRR. For CRRs directly allocated to LSEs the *CRR Expected Value* is the market clearing price calculated by the CRR auction model. The inclusion of *CRR Expected Value* in the credit requirement is intended to cover the negative auction price of a CRR paid by the CAISO to the CRR holders. It also measures the excess credit a positively priced CRR may poses that can be used to offset credit requirements of other CRRs owned by the same holder.

5th Percentile CRR Value is determined according to the probability distribution of the value of the CRR. This value is selected so that the likelihood the credit requirement fails to fully cover a possible default of the CRR holder is less than or equal to five percent.

There are three kinds of probability distributions of CRR value with which the credit requirements are different. They are discussed below.

1. Credit requirement for CRR with high positive expected value

A CRR with high positive expected value almost certainly entitles the holder to a stream of revenues from the CAISO. In such case, the fifth percentile value on its probability distribution is greater or equal to zero. The likelihood for this CRR to have negative

[3] A percentile is a value on a scale of one hundred that indicates the percent of a distribution that is equal to or below it. For example, the probability the variable's value is less than or equal to the 5th percentile value is 5 percent.

value, that is to require payments by the holder to the CAISO, is very small. The risk of default by the holder is therefore negligible. There is no need for the holder to post a credit requirement. Besides that, the CRR may possess excess credit that can be used to offset the credit requirements on other CRRs in the holder's portfolio.

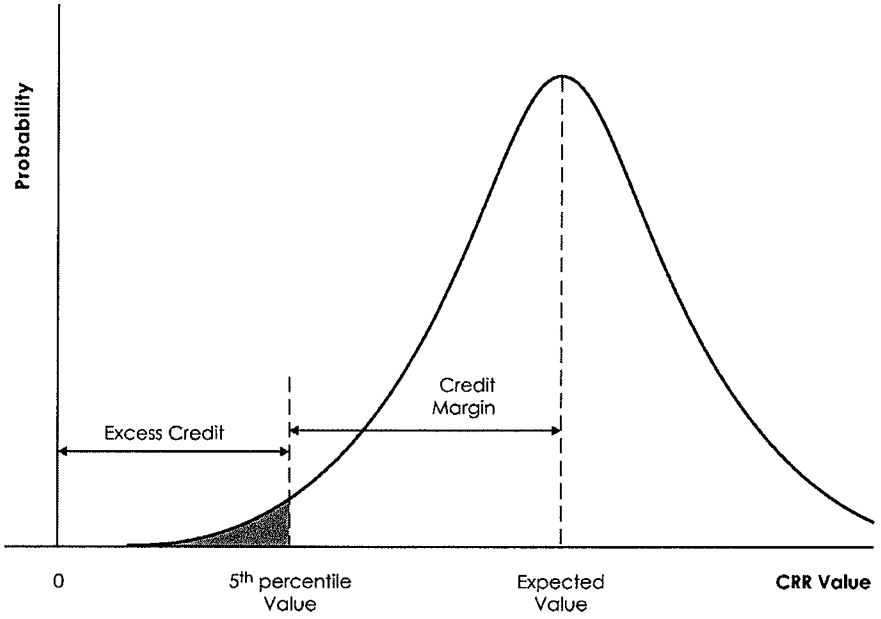

Figure 1. Distribution of CRR with High Positive Expected Value

2. Credit requirement for CRR with low positive expected value

A CRR with low positive expected value likely will result in a positive revenue steam for the holder. It is, however, also possible for the CRR to result in a payment obligation for the CRR holder because the probability distribution of CRR payments stretches to the negative side, as shown in Figure 2. For such CRRs, a credit requirement is needed to cover the possible loss if the holder were unable or unwilling to make the required payments to the CAISO, although the likelihood of payments by the holder to the CAISO is less than 50-50.

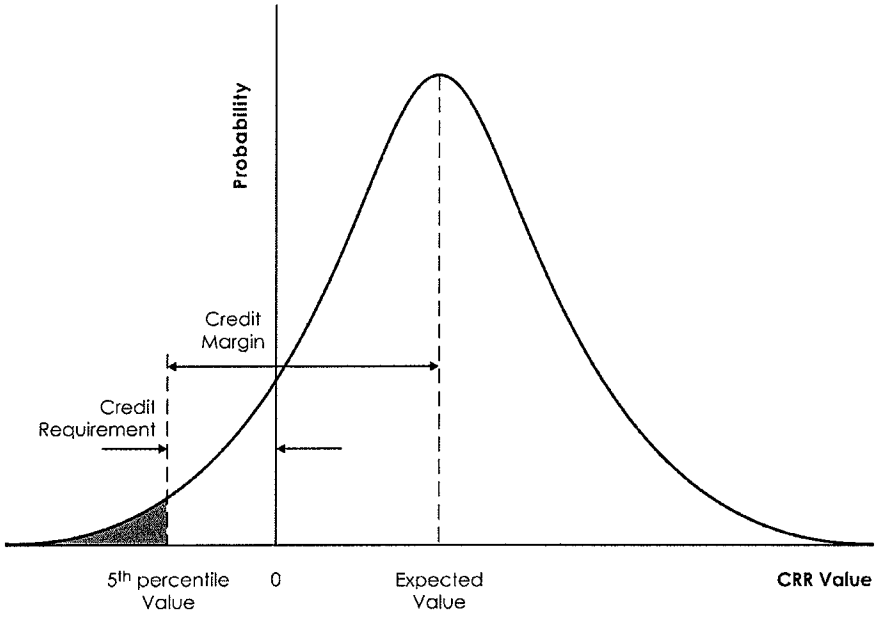

Figure 2. Distribution of CRR with Low Positive Expected Value

3. Credit requirement for CRR with negative expected value

A CRR with negative expected value is a liability. The holder is paid to hold the CRR. The holder, on the other hand, is expected to make payments to the CAISO. It is still possible that the CRR will generate positive cash flow for the holder, but it is much less likely compared to the probability of making payments to the CAISO. While the holder is willing to hold the CRR because the holder believes that the expected value of the required payments is less than the payment for holding the CRR, these expectations may be incorrect. It is precisely because the payments may turn out to be much higher that LSEs may wish to buy positively priced CRRs to hedge their congestion costs and that the CAISO needs to require credit coverage of holders of negatively priced CRRs. In such case the loss caused by default by the holder may be more significant than in the other two cases. To properly limit the financial risk, a greater credit requirement is needed for this type of CRR.

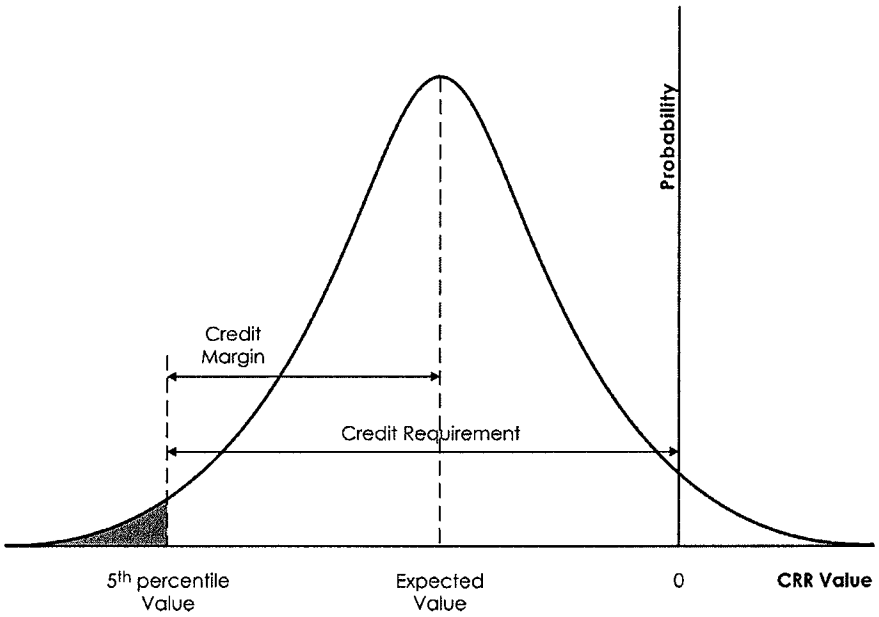

Figure 3. Distribution of CRR with Negative Expected Value

II. Long-Term CRR Credit Requirement

Long-Term CRR (LT-CRR) credit requirement is determined based on the credit requirement for CRR of a single term (1 year or shorter).

The CAISO has developed four options for calculating the LT-CRR credit requirement. With the assumption that credit requirement is set for the whole CRR portfolio of each holder (allowing credit offset), the options are:

Option 1: $n*(-1\ year\ CRR\ Expected\ Value + 1\ year\ Credit\ Margin)$

Option 2: $n*(-1\ year\ CRR\ Expected\ Value) + \sqrt{n}*(1\ year\ Credit\ Margin)$

Option 3: $-1\ year\ CRR\ Expected\ Value + 1\ year\ Credit\ Margin$

Option 4: $n*(-1\ year\ CRR\ Expected\ Value) + 1\ year\ Credit\ Margin$

Of the four, Option 1 is the most conservative and Option 3 is the least conservative.

III. Examples of CRR Credit Requirement

4 CRR examples are listed in Table 1. The expected value and percentile values in Statistics section have been derived based on the CAISO LMP study data. Then credit margins and credit requirements are calculated based on the definitions discussed in this appendix.

Table 1. Credit Margin and Credit Requirement for a 1-Year CRR ($/MW-Year)

CRR	A	B	C	D	Portfolio
Statistics					
Expected Value	-6,807	-13,556	21,298	316	
1 Percentile	-8,281	-19,786	19,919	-290	
2.5 Percentile	-7,723	-16,385	20,050	-63	
5 Percentile	-7,235	-15,162	20,076	296	
Credit Margin					
1 Percentile	1,473	6,230	1,379	606	
2.5 Percentile	916	2,829	1,248	379	
5 Percentile	428	1,605	1,222	20	
Credit Requirement					
1 Percentile	8,281	19,786	-19,919	290	8,438
2.5 Percentile	7,723	16,385	-20,050	63	4,121
5 Percentile	7,235	15,162	-20,076	-296	2,025

Here are the step-by-step calculations of credit margin and credit requirement of CRR A at 5^{th} percentile values.

$$\begin{aligned} \textit{Credit Margin} &= \textit{CRR Expected Value} - \textit{5th Percentile CRR Value} \\ &= -6807 - (-7235) \\ &= 428 \end{aligned}$$

$$\begin{aligned} \textit{Credit Requirement} &= -\textit{5th Percentile Value} \\ &= 7235 \end{aligned}$$

And for CRR C at 2.5^{th} percentile value:

$$\begin{aligned} \textit{Credit Margin} &= 21298 - 20050 \\ &= 1248 \end{aligned}$$

$$\textit{Credit Requirement} = -20050$$

The credit requirement for the portfolio is the sum of credit requirements of all CRRs in the portfolio or zero, whichever is larger. That is:

$$Portfolio\ Crdit\ Requirement = \max(0, \sum CRR_i\ Credit\ Requirement)$$

The credit requirements for a 10-year CRR calculated with all four options for LT-CRR credit requirement are presented in Table. 2.

Table 2. Credit Requirement for a 10-Year CRR

($/MW)

CRR	A	B	C	D	Portfolio
Statistics					
1-Year Expected Value	-6,807	-13,556	21,298	316	1,251
Option 1: *n*(–1 year CRR Expected Value + 1 year Credit Margin)*					
1 Percentile	82,809	197,861	-199,194	2,901	84,377
2.5 Percentile	77,231	163,854	-200,501	626	41,209
5 Percentile	72,347	151,619	-200,761	-2,957	20,249
Option 2: $n*(-1\ year\ CRR\ Expected\ Value)+\sqrt{n}*(1\ year\ Credit\ Margin)$					
1 Percentile	72,734	155,264	-208,624	-1,243	18,131
2.5 Percentile	70,970	144,510	-209,037	-1,963	4,480
5 Percentile	69,421	140,641	-209,119	-3,096	0
Option 3: *–1 year CRR Expected Value+ 1 year Credit Margin*					
1 Percentile	8,281	19,786	-19,919	290	8,438
2.5 Percentile	7,723	16,385	-20,050	63	4,121
5 Percentile	7,235	15,162	-20,076	-296	2,025
Option 4: *n* (– 1 year CRR Expected Value) + 1 year Credit Margin*					
1 Percentile	69,548	141,794	-211,605	-2,554	0
2.5 Percentile	68,990	138,393	-211,736	-2,781	0
5 Percentile	68,497	137,170	-211,762	-3,140	0

Option 1 is simply the ten times of the credit requirement for the 1-year CRR, and Option 3 is exactly the same as the 1-year CRR credit requirement.

The credit requirements for CRR A at 5th percentile value are calculated as the following:

Option 2:

$$\begin{aligned} Credit\ \text{Re}quirement &= n*(-1\ year\ CRR\ Expected\ Value)+\sqrt{n}*(1\ year\ Credit\ Margin) \\ &= 10*(-6807)+\sqrt{10}*427 \\ &= 68070+1351 \\ &= 69421 \end{aligned}$$

Option 4:

$$\begin{aligned} Credit\ \text{Re}quirement &= 10*-(-6807)+427 \\ &= 68070+427 \\ &= 68497 \end{aligned}$$

IV. CRR Credit Requirement without Credit Offset

This section discusses the methodologies to determine CRR credit margin and credit requirements based on the assumption that no credit offset within a CRR portfolio is allowed. This is an option to be considered to address the situation of a CRR portfolio having positive and negative CRRs with differing terms. The expiration of positive CRRs could result in an increase in the credit requirement for a CRR holder that it may be unable to meet.

Credit Margin:

$$Credit\ Margin = CRR\ Expected\ Value - 5th\ Percentile\ CRR\ Value$$

Credit Requirement:

$$Credit\ Requirement = \max(0, -CRR\ Expected\ Value + Credit\ Margin)$$

That is: $Credit\ Requirement = \max(0, -5th\ Percentile\ CRR\ Value)$

LT-CRR Credit Requirement

Option 1: $n * \max(0, -1\ year\ CRR\ Expected\ Value + 1\ year\ Credit\ Margin)$

Option 2: $n * \max(0, -1\ year\ CRR\ Expected\ Value) + \sqrt{n} * (1\ year\ Credit\ Margin)$

Option 3: $\max(0, -1\ year\ CRR\ Expected\ Value + 1\ year\ Credit\ Margin)$

Option 4: $n * \max(0, -1\ year\ CRR\ Expected\ Value) + 1\ year\ Credit\ Margin$

Table 3. Credit Margin and Credit Requirement for a 1-Year CRR ($/MW-Year)

CRR	A	B	C	D	Portfolio
Statistics					
Expected Value	-6,807	-13,556	21,298	316	
1 Percentile	-8,281	-19,786	19,919	-290	
2.5 Percentile	-7,723	-16,385	20,050	-63	
5 Percentile	-7,235	-15,162	20,076	296	
Credit Margin					
1 Percentile	1,473	6,230	1,379	606	
2.5 Percentile	916	2,829	1,248	379	
5 Percentile	427	1,605	1,222	20	
Credit Requirement					
1 Percentile	8,281	19,786	0	290	28,357
2.5 Percentile	7,723	16,385	0	63	24,171
5 Percentile	7,235	15,162	0	0	22,397

The credit requirement for the portfolio is the sum of credit requirements of all CRRs. That is:

$$Portfolio\,Crdit\,Requirement = \sum CRR_i\,Credit\,Requirement$$

Compared to Table 1, there is no negative credit requirement in Table 3. The credit requirement for the CRR portfolio is therefore higher than that when credit offset is allowed within a CRR portfolio.

Table 4. Credit Requirement for a 10-Year CRR

($/MW)

CRR	A	B	C	D	Portfolio
Statistics					
1-Year Expected Value	-6,807	-13,556	21,298	316	3,251
Option 1: $n * \max(0, -1\,year\,CRR\,Expected\,Value + 1\,year\,Credit\,Margin)$					
1 Percentile	82,809	197,861	0	2,901	283,571
2.5 Percentile	77,231	163,854	0	626	241,710
5 Percentile	72,347	151,619	0	0	223,966
Option 2: $n * \max(0, -1\,year\,CRR\,Expected\,Value) + \sqrt{n} * (1\,year\,Credit\,Margin)$					
1 Percentile	72,734	155,264	4,361	1,917	234,276
2.5 Percentile	70,970	144,510	3,948	1,197	220,625
5 Percentile	69,421	140,641	3,866	64	213,992
Option 3: $\max(0, -1\,year\,CRR\,Expected\,Value + 1\,year\,Credit\,Margin)$					
1 Percentile	8,281	19,786	0	290	28,357
2.5 Percentile	7,723	16,385	0	63	24,171
5 Percentile	7,235	15,162	0	0	22,397
Option 4: $n * \max(0, -1\,year\,CRR\,Expected\,Value) + 1\,year\,Credit\,Margin$					
1 Percentile	69,548	141,794	1,379	606	213,327
2.5 Percentile	68,990	138,393	1,248	379	209,010
5 Percentile	68,497	137,170	1,222	20	206,909

As can be seen from Table 4, Option 2 and Option 4 overstate the credit requirements for CRRs with high positive expected values (CRR 3). In such cases, these two options are more conservative. They are less conservative compared to Option 1 for CRRs with negative expected values.

Appendix C-4

California ISO White Paper

Congestion Revenue Rights Credit Policy

May 14, 2007

CAISO White Paper

Congestion Revenue Rights Credit Policy

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CAISO White Paper

Congestion Revenue Rights Credit Policy

Executive Summary

Congestion Revenue Rights (CRR), as a financial instrument to hedge transmission congestion charges, may bring revenue to its holder, but it may also become a financial obligation for the holder. In case of default by the CRR holder, the financial losses will be shared by other market participants. Effective credit policy to protect financial interests of market participants is therefore crucial to the success of the CAISO CRR market.

CRR credit policy must balance the interests of CRR Holders that must demonstrate creditworthiness or provide Financial Security, on the one hand, and Market Participants that bear the risk of non-payment, on the other hand. In other words, the CAISO's credit requirements must limit the risk to Market Participants of non-payment but must not be excessive so as to discourage participation of credit worthy Market Participants.

After a series of stakeholder meetings, the CAISO has proposed the following CRR credit policies based on the feedback from stakeholders and internal consideration.

There will be no credit requirement for LSEs to participate in CRR allocation, as LSEs will not be required to pay for positively valued CRRs and will not be paid to hold negatively valued CRRs. These CRRs will be subsequently valued for credit purposes in the same manner as CRRs obtained through the auction. In order to bid in the CRR auction, each participant has to demonstrate a minimum $500,000 Available Credit with the CAISO. The actual requirement for Available Credit is the sum of absolute value of all bids by the participant or $500,000, whichever is larger. At the end of auction, once all payments due to the CAISO for CRRs have been paid for in full and the credit requirement for holding the CRRs is in place, the CAISO will release payments due to CRR buyers and sellers and any excess Available Credit will be released.

The credit requirement for holding a Short-Term CRR (with a term up to one year) consists of two components: auction price and a credit margin of the Short-Term CRR. It

is designed such that in case of default by the holder, the likelihood the credit requirement cannot fully cover the loss is 5 percent or less.

Credit requirement for holding Long-Term CRR (with a term of ten years) covers financial risk for the whole term of the Long-Term CRR. It is determined by the auction price of a one year CRR, the number of years of the Long-Term CRR, and a cumulative credit margin based on the Short-Term CRR credit margin.

If a holder owns more than one CRR, the overall credit requirement is assessed for the whole portfolio of CRRs of this holder. After each monthly CRR auction, the credit requirement will be reassessed using the new auction prices. Credit margin will be updated annually using the actual LMP data from market operation..

Out-of-Control Area Load Serving Entities must also maintain one year credit coverage of Wheeling Access Charge prepayment. The CAISO will require prepayment of the WAC prior to trade month, consistent with the FERC April 20, 2007 Order.

The CAISO Department of Market Monitoring will provide a warning to participants about possible consequences of any apparent misconduct prior to the auction, and may refer any questionable conduct in the auction to FERC.

In case of default or bankruptcy, the CAISO will terminate all CRR contracts with the defaulting holders, retain any financial security or payments related to the CRRs until the CAISO determines that no sums are due, and resell the CRRs in subsequent auctions. Finally, the CAISO proposes to prohibit the defaulting holders from owning CRRs for five years

Introduction

Congestion Revenue Rights (CRR) are financial instruments introduced with the CAISO MRTU. They are designed to hedge transmission congestion charges under the locational marginal pricing (LMP) system. The CAISO distributes CRRs to market participants primarily through allocation and auction processes. Unlike Firm Transmission Rights in the CAISO's current market, CRRs are obligations.[1]

[1] The CAISO also allocate CRRs to sponsors of merchant transmission facilities or upgrades, which can be either CRR Obligation or CRR Option. There is no credit requirement with regard to CRR Option.

A CRR Obligation (CRR in short in the rest of this white paper) entitles its holder to receive a payment from the CAISO if the congestion in a given trading hour is in the same direction as the CRR, and requires the holder to pay a charge to the CAISO if the congestion in a given trading hour is in the opposite direction of the CRR. In case a CRR holder is unable or unwilling to make the required payment (default or bankruptcy) the uncovered financial loss will be shared by other market participants. In order to avoid such situation, credit policies governing the financial requirements for obtaining and holding CRRs need to be established and enforced.

The objective of the credit policy is to protect the financial interests of all market participants by reducing the likelihood of default and mitigating the losses to other market participants if a default happens. At the same time the policy should not create an inefficient barrier to entering the CRR market for credit worthy market participants. Policy defects in either way will discourage the participation of market participants and eventually reduce the liquidity and effectiveness of the CRR market.

The CAISO is committed to designing an effective CRR credit policy. In the past several months, the CAISO has held a series of stakeholder meetings and posted white papers and policy proposals on CRR credit policy.[2] The proposals were revised over time based on the feedbacks from stakeholders and continuous consideration by the CAISO. This white paper is the final policy proposal for CRR credit policy.

CRR Credit Policy

CRR credit risk exists in two separate phases, in the process of obtaining CRRs and in the process of holding CRRs. The corresponding credit policies needed to be designed to manage the two different kinds of risk.

I. Credit Requirement for Obtaining CRRs

There are two ways to obtain CRRs from the CAISO. One is through the CRR allocation process and the other is through the CRR auction.

CRR allocation is open to LSEs only. It is intended for the LSEs to hedge transmission congestion charges. The CRRs will be nominated by the LSEs and approved by the

[2] See References

CAISO. The nominated CRRs are subject to verification. The LSEs do not pay to the CAISO nor are paid by the CAISO to hold the CRRs. Therefore the LSEs do not need to have Available Credit[3] to participate in the CRR allocation. However, the LSEs do have to have sufficient Available Credit to assume the ownership of allocated CRRs.

On the other hand, all market participants can participate in auction, where they can bid for any CRRs up for sale. Absent credit requirements for participation in the CRR auction, a participant could potentially submit bids to purchase positively priced CRRs that would be beyond his financial capability to pay for. If such a participant were awarded the CRRs in the auction, he would not be able to pay for the awarded CRRs. A participant may also bid for negatively priced CRRs, take the payments by the CAISO and then default on subsequent payment obligations to the CAISO. Due to the fact that the volumes (MW) of CRRs are dependent on each other because of the special characteristics of the transmission system and the full-funding requirement, there would be opportunities for risky speculation absent appropriate credit requirements and gaming if market rules are not properly designed. In addition, while the purchase of negatively priced CRRs does not require a payment by the CRR purchaser at the conclusion of the auction, the holding of such CRRs will require satisfying a credit requirement for holding those CRRs. Absent some form of credit requirement for acquiring negatively priced CRRs in the auction, there would be a potential for a market participant to submit bids to buy negatively priced CRRs that would be beyond the market participants ability to satisfy the CAISO credit requirement for holding, leading to a default after being awarded the negatively priced CRRs in the auction. This default would expose the CAISO to a shortfall on the CRR Balancing Account from covering the positively priced CRRs made possible by the awarded of the negatively priced CRRs on which credit was not posted.

To avoid this potential the CAISO proposes the following credit policies.

There will be pre-auction credit requirements for participating in the CAISO CRR auction. Each participant has to demonstrate a $500,000 minimum Available Credit in order to submit a bid for either positively valued or negatively valued CRRs.

[3] Available Credit = Unsecured Credit Limit + Collateral – Estimated Aggregate Liability

Accordingly, the participant will need to have Available Credit greater than or equal to the sum of the absolute value of all his bids. Otherwise, all the bids made by the participant will be rejected. [4]

The $500,000 minimum Available Credit requirement and the absolute value of bids requirement are intended in combination to limit the likelihood that market participants will be awarded CRRs in the auction for which they would be unable to pay for and or meet the credit requirement for holding the CRRs.

At the end of the auction, winners will pay full amounts (sum of auction market clearing price times MW quantities awarded) to the CAISO for the positively priced CRRs they were awarded in the auction. And the CAISO will pay full amounts to market participants awarded negatively priced CRRs.[5] However, these payments for the awarded of negatively priced CRRs will not be made until the credit requirements for holding the CRRs are satisfied. Failing to meet the credit requirement is considered a default and is subject to enforcement actions described under the compliance measures.

After the auction is settled, any excess of Available Credit used to support participant in the CRR auction will be released and be returned to the participant.

II. Credit Requirements for Holding Short-Term CRRs

The value embedded in a Short-Term CRR (ST-CRR, with a term up to one year) can be divided into two parts. The first part is the auction price.[6] For a negatively priced ST-CRR, the auction price equals the payment due to the CRR holder at the end of the auction in exchange for a stream of expected congestion revenue payments the holder will make to the CAISO. The auction price of a positively priced ST-CRR is the payment due to the CAISO at the end of the auction in exchange for a stream of expected congestion revenue payments to the holder.[7]

The second part is the congestion revenue of the ST-CRR. By definition, congestion revenue of a ST-CRR is the difference between the congestion component of the LMP at

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[4] The minimum Available Credit requirement and absolute value approach are proposed in responding to the request by SCE, PG&E, and CDWR. See Appendix for summary of stakeholder written comments.
[5] Commerce Energy suggest pay incrementally to reduce financial burden for participants. Considering only short-term CRRs will be sold in auction, the CAISO propose to pay in full amount.
[6] For CRRs directly allocated to LSEs auction price is the market clearing price calculated by the CRR auction model.
[7] For CRRs allocated to LSEs, this payment is waived.

sink and the LMP at source times the megawatt quantity of CRRs held. This entails a payment to the ST-CRR holder if the congestion revenue is positive. The holder is required to pay the CAISO if the congestion revenue is negative. Since the LMPs can be potentially very volatile, the congestion revenue of a ST-CRR can vary from one holding period to the next and swing from positive to negative from period to period. A positively priced ST-CRR is likely to have positive congestion revenue over the holding period, but it is also possible that it will have negative congestion revenue. A negatively priced ST-CRR is expected to have negative congestion revenues over the holding period, but it may turn out to have positive congestion revenues or congestion revenues that are much more negative than expected. The congestion revenue of a ST-CRR is a stochastic variable. In the long-run, the CAISO and its market participants will be able to analyze the distribution of congestion revenues through statistical analysis of historical LMP data.

The credit requirement for holding a ST-CRR must be designed to cover the value of the ST-CRR in the event that actual congestion revenues differ from those expected at the time of the auction. Since the value of the ST-CRR is very volatile the credit requirement should have corresponding probabilistic characteristics. The CAISO therefore proposes a method to determine the credit requirement for holding a ST-CRR that is similar to the Value-at-Risk (VaR) method that is widely used in risk management.

With the proposed method, the credit requirement for holding a ST-CRR consists of two components: the auction price and a credit margin for holding the ST-CRR.

The auction price component of the credit requirement takes account of the expected value of CRR payments, the expected value of payments to the holder in the case of a positively priced CRR and the expected value of payments by the holder in the case of a negatively priced CRR.

The credit margin is determined based on the probability distribution of congestion revenue of the ST-CRR and reflects the potential for the actual congestion revenues due to the holder to be less than the expected value and conversely for the actual congestion revenues due to the CAISO to be greater than the expected value. The combination of the auction price component and the credit margin component is designed such that in case of default by the holder, the likelihood the credit requirement will not fully cover the payments due from the CRR holder is 5 percent or less.

The credit requirement of a ST-CRR is defined as the negative of the auction price plus the credit margin of the ST-CRR. That is:

$$Credit\ Requirement = -CRR\ Auction\ Price + Credit\ Margin$$

The credit margin of a ST-CRR is defined as the difference between the expected value and the fifth percentile value of the ST-CRR congestion revenue.[8]

$$Credit\ Margin = Expected\ CRR\ Cong.\ Reven. - 5th\ Percentile\ CRR\ Cong.\ Reven.$$

5th Percentile ST-CRR Congestion Revenue is determined according to the probability distribution of the congestion revenue of the ST-CRR.

For the first year of the CAISO MRTU operation, there will be no historical LMP data available. The prices simulated in CAISO LMP studies will therefore be used initially to calculate credit margins for all ST-CRRs. In the future, actual LMP data will be used to revise the required credit margins.

If a holder owns more than one CRR, the overall credit requirement is assessed for the whole portfolio of CRRs of this holder. The excess credits (negative credit requirements according to the formula defined above) from CRRs with high positive auction price can offset up to the same amount of the credit requirements for other CRRs in the same portfolio. [9] This may reduce total credit requirements for some CRR holders. A positively valued CRR portfolio, however, will not offset a Market Participant's credit requirements for other CAISO liabilities. This is because it would be inappropriate to allow the use of uncertain future CRR revenues to offset more certainly known liabilities have been incurred for past trade days, and because a payment default today requires adequate credit coverage to provide settle historical trade months up until the default without waiting to collect potential future offsets that might be available through positive CRRs that the defaulting market participant holds.

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[8] A percentile is a value on a scale of one hundred that indicates the percent of a distribution that is equal to or below it. For example, the probability the variable's value is less than or equal to the 5th percentile value is 5 percent.
PG&E CDWR support the use of 5th percentile value.

[9] This is requested by PG&E, AReM, and Commerce Energy. CDWR suggested assess credit requirement for each individual CRR.

After each monthly ST-CRR auction, the credit requirements for holding ST-CRRs will be reassessed using the new auction prices. [10] Credit margins will be recalculated periodically based on actual LMP data. Credit requirements will also be adjusted when the ownership of a CRR has changed through either secondary market trading or load migration. The new owner will be required to satisfy the CRR credit requirements prior to transfer of ownership, and the prior owner's CRR portfolio would be revalued without the transferred CRR and that owner would be subject to weekly collateral adjustments as required in the routine EAL-credit comparison performed by CAISO.

The same credit requirement criteria for holding CRRs apply to all CRR holders, regardless how the CRRs are obtained (through allocation or auction).

III. Credit Requirements for Holding Long-Term CRRs

All requirements for holding ST-CRRs apply for holding Long-Term CRR (LT-CRR, CRRs with terms longer than 1 year). In addition, there are some specific requirements designed for LT-CRR holders.

A LT-CRR has a multi-year term. In case of a default involving a LT-CRR, the CAISO may choose to resell it in the subsequent monthly auctions, but it may not be possible for a LT-CRR to be liquidated at the auction If the CRR is not resold in an auction, the financial loss includes not only the current period congestion revenue payments of the defaulting LT-CRR, but also the congestion revenue payments due for the CRR for all the years in the remaining term of the defaulted LT-CRR. Therefore the one period credit requirement for holding a ST-CRR does not provide all necessary coverage for holding a LT-CRR. Instead, the credit requirement for holding a LT-CRR must cover financial risk over the whole term of the LT-CRR.[11]

The CAISO proposes the following method to determine the credit requirement for holding a LT-CRR:

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[10] SCE and PG&E suggest weekly update while AReM suggest monthly. The CAISO proposes monthly for auction price annual credit margin update based on data availability and technical feasibility.

[11] SCE suggest require full-term credit coverage for CRRs with negative expected values and 12-month coverage for CRRs with positive expected value. Based on the consideration that a CRR with positive expected value does not always have a positive actual value due to the market volatilities and the complexities to implement different rules for different CRRs, the CAISO proposed to require credit coverage for full term.

$$Credit\ Requirment = n * (-1\ year\ CRR\ Auction\ Price) + \sqrt{n} * (1\ year\ Credit\ Margin)$$

where, n is the number of years remaining in the term of the LT-CRR. *1 year CRR Auction Price* is used because LT-CRRs are available only to LSEs through allocation. There is no auction price for LT-CRR available. *1 year Credit Margin* is calculated according to the ST-CRR credit margin definition. *1 year Credit Margin* times the square root of n is the cumulative credit margin of the LT-CRR.

This method is Option 2 of the four options proposed in the Straw Proposal.[12] It is an option that is not as conservative as Option 1, but does provide more coverage than Option 3 and 4 when credit offsetting within the CRR portfolio is allowed.[13]

The credit requirements for holding LT-CRRs will be adjusted not less than annually. The adjustment will account for the change of remaining terms of the LT-CRRs and the new auction prices of ST-CRRs. The credit margins will also be updated annually based on the actual LMP data from the market operation of the past year.

Credit requirements will also be adjusted when the ownership of a LT-CRR has changed through either secondary market trading or load migration. The new owner will be required to satisfy the LT-CRR credit requirements prior to the transfer of CRR ownership, and the prior owner's CRR portfolio would be revalued without the transferred CRR and that owner would be subject to weekly collateral adjustments as required in the routine EAL-credit comparison performed by CAISO.

Out-of-Control Area Load Serving Entity (OCALSE) will be subject to the same credit requirements for holding LT-CRRs as other Market Participants. Additionally, external LSEs will be required to maintain one year of credit coverage for their Wheeling Access Charge (WAC) prepayment beyond the current period. Although the 1 year credit coverage for the WAC prepayment will increase the EAL, the external LSE will not need to post additional collateral as long as they maintain an overall positive Available Credit position (Aggregate Credit Limit less EAL). Subsequently, they will be required to

[12] See References.
[13] PG&E prefer Option 1 while CDWR prefer Option 4.

prepay the WAC on a monthly basis in advance of the trade month, consistent with the FERC April 20, 2007 Order.[14]

IV. Compliance Measures

All CAISO Market participants, including CRR holders are required to comply with the CAISO credit requirements as set forth in Section 12 of the Tariff, including meeting the CAISO calls for collateral to cover CRR and other market obligations. The CAISO requires entities that have an Estimated Aggregate Liability (EAL) in excess of their Aggregate Credit Limit (unsecured credit plus collateral) to post additional Financial Security within 5 business days. Entities that delay or default in making collateral or other payments are subject to escalating enforcement provisions (Tariff Section 12.5) including:

1. The CAISO may withhold a pending payment distribution.
2. The CAISO may limit trading, which may include rejection of Bids and/or limiting other CAISO market activity. In such case, the ISO shall notify the Market Participant of its action and the Market Participant shall not be entitled to submit further Bids to the CAISO until the Market Participant posts an additional Financial Security Amount that is sufficient to ensure that the Market Participant's Aggregate Credit Limit is at least equal to its Estimated Aggregate Liability.
3. The CAISO may require the Market Participant to post an additional Financial Security Amount in lieu of an Unsecured Credit Limit for a period of time.
4. The CAISO may restrict, suspend, or terminate a Market Participant's Service Agreement or CRR Holder Agreement.

Entities that fail to comply with the CAISO credit requirements expose other market participants to potential default risk, as nonpayment by a CAISO debtor results in short-payments to the CAISO creditors. For an entity that holds CRRs, bankruptcy or other payment defaults can extend over multiple CAISO trade months for the length of the CRR term, resulting in continuing short-payments to other market participants. Due to the heightened credit risks that CRRs can therefore present, it is especially important that

[14] NCPA objected this requirement prior to the FERC April 2o Order, which allows OCALSEs make WAC prepayment monthly.

CRR holders comply with the CAISO credit requirements. CRR holders that do not comply with the CAISO credit requirements or otherwise default on payments will also be subject to the enforcement measures noted above, and the CAISO will, as appropriate:

- Retain financial security sufficient to cover the value of all of the market participant's liabilities including the future value of their CRR obligations
- Retain all payments related to the CRRs (or other market related payments otherwise due the market participant) and resell the CRRs in subsequent auctions
- Terminate all CRR agreements with the default holder
- Exclude the holder from future CRR allocation and auctions for 5 years
- Prohibit the holder from subsequently acquiring CRRs for 5 years

V. Market Monitoring and Mitigation

The CAISO market rules prohibit Market Manipulation (37.7), including:

- Actions or transactions that are without legitimate business a purpose and that intended to or foreseeably could manipulate market prices, market conditions ..." (37.7.1.1)
- Collusion with another party for purposes of manipulating market prices, market conditions ...(37.7.4.2)

FERC's own market rules also prohibit provision of false information to and ISO, and make it unlawful to:

> (1) use or employ of any device, scheme, or artifice to defraud, (2) make material false statement or omit material facts, or (3) engage in any act, practice or course of business that operate or would operate as a fraud or deceit upon any person.

The CAISO Department of Market Monitoring will actively monitor any unusual activities in the CRR allocation and auction processes. A variety of action might be taken to deter or monitor the type of conduct described above, including:

- Require disclosure of affiliations.
- Explicitly warn participants that the CAISO will monitor and refer such behavior to FERC.
- Refer to FERC.

References

1. CAISO Straw Proposal for CRR Credit Policy: (4/27/07) http://www.caiso.com/1bcd/1bcd9f52296e0.pdf
2. Presentation - CRR Credit Policy: (5/2/07) http://www.caiso.com/1bd2/1bd2e3f41c7d0.pdf
3. CRR Stakeholder Meeting: (4/3/07) http://www.caiso.com/1bb5/1bb5875027a50.pdf
4. CRR Conference Call: (3/27/07) http://www.caiso.com/1bad/1badda6459b00.pdf
3. Revised Policy Proposal: Prepared by Scott Harvey of LECG (3/20/07) http://www.caiso.com/1ba7/1ba788da74450.pdf
4. Stakeholder Meeting Presentation: (2/27/07) http://www.caiso.com/1b92/1b928c9e2d2a0.pdf
5. CRR credit white paper prepared by Scott Harvey of LECG: (2/21/07) http://www.caiso.com/1b8c/1b8cdb4c74ab0.pdf

Stakeholder Written Comments and the CAISO Responses

May 9, 2007

Comments of Pacific Gas and Electric to CAISO
Regarding
CAISO Straw Proposal for CRR Credit Policy

PG&E appreciates the efforts of the CAISO to develop a Credit Policy for holders of Congestion Revenue Rights (CRRs) under MRTU. On April 27, 2007 the CAISO posted a straw proposal for CRR Credit Policy and on May 4, 2007 the CAISO conducted a stakeholder Conference Call to discuss the straw proposal. The CAISO has requested comments by May 11, 2007 and PG&E is pleased to offer the following comments on both the straw proposal and issues discussed during the conference call.

Long-Term CRR Credit Options

The CAISO's straw proposal outlined four alternatives for establishing the credit requirements for holding Long-Term CRRs. As the CAISO has observed, the value of CRRs in a newly established LMP market may be quite volatile. Accordingly, PG&E endorses Option 1, as a means of addressing uncertainties associated with valuation. PG&E feels it is prudent to establish an initial credit policy which is conservative. If, after some experience with MRTU and nodal pricing, it becomes clear that the initial policy is excessively conservative, the CAISO could explore less conservative options with stakeholders and a less conservative option could be implemented expeditiously. If, on the other hand, the CAISO initially chose a less conservative approach and in the future wanted to become more conservative it could negatively impact some market participants who would not, or could not, meet a more conservative credit requirement.

PG&E is concerned that CRR holders may take speculative positions and then not meet the obligations associated with the CRRs they hold. Failure to meet these obligations would then result in higher costs to the load serving entities.

The methodology for determining credit requirements is quite difficult because of lack of historic data and no reported market of transactions. Because of this lack of data and market information, the CAISO needs to be conservative.

Actual CRRs may be surprising to the CAISO and market participants. With no historic record of either 1) actual CRRs or 2) CRR auctions, the results could be quite different than what the CAISO might expect. Also, some CRRs may be fully allocated, thus leaving no bid prices for those CRRs from the auction. Also, it is possible counter flows of CRRs could be significantly different, hence resulting in "dual" prices which are not consistent. When the actual operation of MRTU occurs, market participants could schedule, or bid resources to impact their CRR revenues. As noted in the CRR training, market participants should not consider CRRs a sunk cost for their bidding or scheduling of a resource. Also, potentially a CRR could be "traded" for a period as short as 1 day. Because of this lack of CRRs and market participants in both the auction and in day ahead markets, the CAISO needs to be conservative.

The CAISO notes the CRRs could be quite volatile. This volatility could result in reversals of the value of CRRs which will impact the participant's total Estimated Aggregate Liability (EAL).

CAISO Response:

PG&E's comments focus on the need to adopt a conservative approach to CRRs given the uncertainty as to how volatile CRR prices may be and how entities may take actions that significantly affect costs for other market participants. CAISO agrees that given these uncertainties that a relatively conservative approach to credit standards is warranted.

With respect to the valuation alternatives for long-term CRRs, CAISO also believes that a relatively conservative approach is important given initial uncertainty as to volatility of CRR prices as compared to initial auction values, the potential for defaults to affect monthly CAISO settlements. There are several methods that can be used to provide for such conservative credit standards including:

1. Which of four alternatives to use for valuing long-term CRRs;
2. Which percentile to use for the setting the limit in the probability distribution of CRRs for setting the credit margin: (1%, 2.5%, 5%);
3. How frequently CAISO will value the CRR portfolio; and
4. Setting initial auction participation standards that ensure entities are reasonably creditworthy (for instance, minimum available credit limits to participate in auction)

Since publishing the initial draft credit whitepaper and receiving stakeholder feedback, CAISO has, with respect to the items above:

1. selected the more conservative approach of two alternatives originally put forward for consideration for long-term CRR valuation
2. Committed to investigate and attempt to implement more frequent use of CRR valuation information, such as information available from monthly auctions.
3. Set a minimum credit availability amount for entities that wish to participate in the CRR auction of $500,000.

Basis for Implementation of Credit Requirements

It is our belief that the CAISO should implement Option 1 on a portfolio basis rather than at the individual CRR level. This would conform to CAISO's practice of netting all market transactions to determine a participant's total EAL. Payments to a market participant are expected to be on a portfolio basis and the credit requirements should be made consistent with the cash flows. Additionally, if a market participant's negatively evaluated CRRs were separately required to post collateral, then the CAISO's credit requirements could essentially eliminate the holding of 10 year CRRs. Hence, for Long

Term CRR's, PG&E would recommend Option 1 with the 5 Percentile evaluation and Portfolio evaluation with Credit Offset.

CAISO Response:

CAISO's proposal provides for CRR valuation on a portfolio basis. We did raise for discussion the concept of not allowing positive CRRs to offset negative CRRs. In some cases, this would reduce risk. For example, a party acquires in the auction a positive one month CRR valued at $10, and a negative one year CRR valued at $10. As the two have offsetting values, there is no net credit requirement. At the end of the first month, the positive CRR is expired. For credit valuation purposes, only the value of the negative CRR remains in their portfolio. The party declares bankruptcy on the day CAISO asks for collateral for the value of that negative CRR, does not post such collateral, and defaults on subsequent payment obligations. This is the risk that CAISO raised for discussion. As FERC supports the concept of netting, and this is additionally the approach we use currently for other market charges, we are not proposing at this time to disallow netting for CRR portfolio valuation purposes for credit requirements.

Timeline for Establishing Credit

PG&E is also concerned with the timing of establishment of credit available to the CAISO. Entities acquiring CRRs should have credit available to the CAISO before they participate in CRRs allocations or auctions. To award a CRR to a participant, who may create counter flows in the allocation or auction, could result in CAISO awarding CRRs in excess of feasible amounts. For example, suppose Market Participant 1 obtained 1000 MW of CRRs for a counter flow, say PG&E Lap to COB. This would allow other participants to obtain 1000 MW in the normal flow direction. Now if Market Participant 1 did not post collateral and "walked away" from the obligation through bankruptcy or some other means, then the CAISO would have awarded CRRs in excess of the true transfer capability. The CAISO needs to ensure credit support early in the process. Preferably before the allocation or auction and at least before the results of allocations or auctions are made to the full market.

CAISO Response:

There will be pre-auction credit requirements for participating in the CAISO CRR auction. Each participant has to demonstrate a $500,000 minimum Available Credit in order to submit bids for either positively valued or negatively valued CRRs. Accordingly, the participant will need to have Available Credit greater than or equal to the sum of the absolute value of all his bids.

As for credit requirements for the allocation process, CAISO has not proposed to have pre-allocation credit requirements due to:

1. Lack of prices to value the CRRs allocated

2. CRRs will only be allocated to load serving entities, and quantities allocated are constrained based on quantities of forecasted load.

Rather, credit requirements will be established after CRR auction prices are available.

Review of CRR Auction Bids by Department of Market Monitoring

PG&E also proposes that the CAISO's Department of Market Monitoring (DMM) review bids into the auctions before the CAISO auctions CRRs. The DMM should disallow bids that are clearly excessive with the potential to cause market abuse. PG&E is particularly concerned with potentially excessive positions over interties and interties that have nomograms or special operating procedures. For example, bidding for capacity in excess on a path while having another associated party take the opposite position could, and should be considered a potentially excessive position. During the initial years of the CAISO and the "energy crisis" of the early part of this decade, there seemed to be particular abuse using the interties. Monitoring and potentially referring possible abuse to FERC is not adequate. Market abuse should not be allowed. There are examples of rules to prevent market abuse, such as bid caps. Hence, the DMM should develop screens to review bids in the auction, and disallow bids which did not meet the "screenings".

CAISO Response:

CAISO agrees that the concerned raised by PG&E are important, and CAISO's DMM will review tentative auction results before the results are finalized. CAISO welcomes PG&E's comments on the development appropriate screens to inappropriate bids.

Frequency of CRR Credit Review by CAISO

Lastly, while the most recent white papers did not indicate how frequently the CAISO would review and revise CRR credit requirements; PG&E would recommend a weekly update. Additionally, the White Paper indicates "credit requirements will also be adjusted when the ownership of a CRR has changed through either secondary market trading or load migration." The CAISO should not just adjust the requirements, but require the owners to revise their credit posting with the CAISO before the registrations of the changes are allowed.

CAISO Response:

CAISO currently calculates a market participant's Estimated Aggregate Liability on a weekly basis and expects to do so under MRTU as well. Under MRTU, the EAL will include the value of the CRR portfolio (if negative), and other market obligations. However, CAISO has not finalized the software and the principles related to the frequency of the valuation of the CRR portfolio. For example, the expectation of CAISO reflected in CRR credit whitepaper upon which PG&E

provided these comments, was that annual auction prices would be used to value the CRR portfolio, and that CRRs would be updated based on expiration of terms perhaps weekly or monthly, but not necessary with respect to price. However, given concerns raised by PG&E and other market participants about potentially volatile CRR prices and their affect on participant creditworthiness, CAISO is exploring what would be involved in more frequent valuations of the CRR portfolio, including potential use of monthly CRR auction data.

CAISO agrees that a credit check is necessary before transfers of CRRs will be officially registered, and plans such a check.

Summary

Thank you for the opportunity to comment. In summary, PG&E prefers Option 1 of the four options from the May 4 conference call. PG&E also recommends the CAISO 1) establish credit available to the CAISO before markets are run, 2) evaluate credit requirements on a portfolio basis, 3) review bids in the auction and not allow speculative bidding 4) regularly monitor and update the CRR credit requirements and 5) adjust credit requirements before transfers are allowed.

If you have any comments, please contact Brian Hitson (415-973-7720) or John Chiara at 415-973-1478.

COMMENTS OF THE ALLIANCE FOR RETAIL ENERGY MARKETS ON THE APRIL 27, 2007 CAISO STRAW PROPOSAL ON CRR CREDIT POLICY

The Alliance for Retail Energy Markets (AReM) appreciates the opportunity to provide comments on the CAISO's April 27th Straw Proposal on CRR credit policy. AReM is a coalition of Energy Service Providers (ESPs) who are each load-serving entities (LSEs) serving retail load in California.

Potential for Anti-Competitive Effects

CRRs are critical to the ESPs' ability to compete in the retail market and manage their congestion risk. Credit requirements that are unreasonably high will have anti-competitive effects: they could pose a barrier to entry for smaller LSEs and reduce liquidity in the CRR market in the long-run. The California Public Utilities Commission is poised to consider re-opening the retail market and these proposed credit policies must be viewed in the light of whether they will discourage retail competition or provide undue competitive advantage to certain classes of LSEs. Accordingly, AReM's comments are provided with the goal of creating a level playing field for all LSEs while reasonably balancing market risk.

CAISO Response:

CAISO agrees that finding the right balance of risk is the correct objective. CAISO is aiming for the right solution that falls somewhere in the middle of the continuum of alternatives represented by:

- no credit requirements that permit entities who are unable to meet payment obligations to hold instruments to the detriment of other market participants vs.
- onerous credit requirements that make CRRs uneconomic to holders..

The correct balance between these alternatives is where CRRs are accurately valued for credit adequacy purposes, specifically, where there is sufficient credit

coverage that in the event of a default by the holder, other market participants are not adversely affected.

All Market Participants, including CRR Holders, are required to be creditworthy or have posted adequate Financial Security to cover their Estimated Aggregate Liability to the CAISO, including any liability for CRRs that require payments from CRR Holders. Non-payments by CRR Holders will be treated the same way under the MRTU Tariff as Non-payments by Scheduling Coordinators are treated under the currently effective ISO Tariff. These provisions are set forth in ISO Tariff Sections 11.12 through 11.16. In brief summary, after exhausting available options, any revenue shortfall resulting from non-payment will be applied pro rata to net ISO Creditors for the relevant settlement period.

Because of the significant adverse impact on the confidence of suppliers that such payment shortfalls would have (and the corresponding impact on market prices for buyers due to explicit or implicit risk premiums), CAISO aims to maintain credit standards for market participants to avoid this outcome.

Netting of Credit Requirements for CRR Holders

AReM strongly supports netting the credit requirements for the CRR Holders based on their entire portfolio of CRRs. AReM does not see any value in treating CRRs individually, without netting the portfolio, as described in the alternative presented in the April 27th paper (p. 5). The costs of the additional credit burden imposed on CRR Holders from this alternative would greatly outweigh any expected benefits from simplification or reduced risk of default.

CAISO Response:

CASIO raised for discussion only the concept of not allowing positive CRRs to offset negative CRRs. In some cases, this would reduce risk. For example, a party acquires in the auction a positive one month CRR valued at $10, and a negative one year CRR valued at $10. As the two have offsetting values, there is no net credit requirement. At the end of the first month, the positive CRR is expired. For credit valuation purposes, only the value of the negative CRR remains in their portfolio. They declare bankruptcy on the day CAISO asks for collateral for the value of that negative CRR, and this is the risk that we believe was worth raising for discussion. As FERC supports the concept of netting, and this is additionally the approach we use currently for other market charges, CAISO is not proposing at this time to disallow netting for CRR portfolio valuation purposes for credit requirements.

Additive Credit Requirement for CRR Holders

AReM questions the need for additive credit requirements for CRR Holders – the CRR Expected Value PLUS the Credit Margin (p. 5). AReM is concerned that this will over-burden all LSEs. AReM requests that the CAISO use either the Expected Value or the Credit Margin as the sole credit requirement for CRR Holders. AReM requests additional stakeholder discussions about how each should be calculated and which is the most appropriate measure for the credit requirement.

CAISO Response:

CAISO's aim in establishing credit standards it to protect market participants from the consequence of a payment default by another market participant. Accordingly, we require entities to demonstrate creditworthiness and/or post collateral to cover their obligations to the CAISO market. In establishing these requirements, the objective to ensure that there is sufficient credit coverage. CAISO is mindful of the costs of collateral to parties that are required to post it, and aims to develop valuations of market obligations that are accurate to avoid the unnecessary need to collateral in excess of actual exposure of the market participant.

With CRRs, is CAISO could look forward and determine the payment streams associated with CRRs, it would use that information to value each CRR today. In the absence of such a "crystal ball", other approaches are necessary. The "day-one" (recognizing that CAISO may later improve upon this approach) proposal is to rely on auction prices, recognizing that while auction prices represent the market's best view as to current value of the payment obligation, it is likely that the actual payment stream related to any CRR will differ to some extent from the auction price. It is here where the concept of the credit margin is necessary. As described in the whitepaper, CAISO will use LMP study data to reflect the extent to which LMP prices may vary and result in volatile CRR obligations that differ significantly from auction values.

The auction price and the credit margin and are not duplicative. Together, they represent the best expectation of the expected payment obligations related to the CRR.

LT-CRR Credit Requirement

AReM requests additional stakeholder discussion of the proposed options and any new options that may be proposed. AReM is again concerned that the burdens on smaller

LSEs may force them out of the LT-CRR market thereby disadvantaging them in the competitive retail market.

CAISO Response:

CAISO is committed to involving stakeholders in developing appropriate alternatives to address policy matters such as CRRs. While we have timing constraints that are tighter than we would prefer, we will aim to continue to provide opportunities for stakeholders to provide input and help craft the best solutions.

Adjustment to LT-CRR Credit Requirements

AReM acknowledges that LT-CRRs are meant to be held over a longer term. Nonetheless, each LSE has the ability to sell LT-CRRs during the course of a year. Therefore, an annual adjustment seems inadequate (p. 7). AReM suggests a monthly review as preferable.

CAISO Response:

CAISO has intended to revise credit requirements for a CRR holder upon the sale or receipt of additional registered CRRs.

CAISO has also heard from several stakeholders that apart from trades, valuations of portfolios more frequently than annually is preferred. CAISO is discussing this internally. Matters that affect this include:

- Recognize constraints for MRTU startup involving system development timelines and budget availability
- Aim of providing accurate CRR valuations

Requested Clarifications

AReM found the paper somewhat confusing and unclear. We would appreciate the following clarifications in the revised paper:

- If a CRR Holder's CRR portfolio has a net positive value – meaning that the CRR Holder will receive congestion revenue payments from the CAISO for its CRRs – is the CRR Holder's CRR credit requirement zero?

If not, please provide additional, explicit and clear examples explaining the credit requirements under varying scenarios.

CAISO Response:

In short, the yes, the credit requirement is zero. If the portfolio value, representing the sum of the values of each CRR including the credit margin for each is greater than zero, there is no credit requirement.

- If a CRR Holder has no negatively-valued CRRs in its portfolio, is its CRR credit requirement equal to zero?

CAISO Response:

In all likelihood, yes. However, as discussed in the CRR whitepaper, a CRR with an expected value that is positive, but close to zero, with the addition of the credit margin, may have a value of less than zero. Accordingly, if the Holder had a portfolio of many such low value CRRs, there could be a credit requirement.

- How often will credit requirements be reviewed and adjusted for each LSE? On the May 4th call, the CAISO said that credit is reviewed daily. How does this fit in with the proposed annual adjustment for LT-CRRs?

CAISO Response:

For each market participant, CAISO compares credit limits versus their Estimated Aggregate Liability (which will include CRRs) on a weekly basis.
One matter that has not been resolved at present is how often the CRR portfolio will be revalued. While CAISO will recognize that the term of each CRR is declining over time and this will be taken into account in the valuation, another matter is still under discussion, specifically, how often CAISO should revalue each CRR. To date, CAISO has contemplated using annual auction data. However, stakeholders have requested use of more timely information if possible. Accordingly, CAISO is exploring the use of monthly auction data for valuation purposes.

- We understand that the CAISO will evaluate credit in total. Therefore, for each LSE, the CRR credit requirements will be calculated in conjunction with the credit requirements for the LSE's other activities. If the LSE has unused credit, it can be applied to any CRR credit requirements it may have. Please clarify if this understanding is inaccurate.

CAISO Response:

This is correct. Example:

A Market Participant has an Aggregate Credit Limit of $2 million. Their EAL excluding CRRs is $500,000. The difference is available to support the value of the CRR portfolio.

- The paper states that the expected value of the allocated CRRs is the "market clearing price calculated by the CRR auction model" (p. 5). What if there are no auction results applicable to the particular CRR? How does the "auction model" calculate a value for holding a CRR if there are no bids for that path?

CAISO Response:

Submitted by AReM
May 11, 2007

COMMENTS OF COMMERCE ENERGY, INC. ON

CAISO STRAW PROPOSAL FOR CRR CREDIT POLICY

MAY 11, 2007

Commerce Energy, Inc. ("Commerce"), a load-serving entity, here comments on the CAISO's May 4, 2007 stakeholder conference call and the *CAISO Straw Proposal for CRR Credit Policy* dated April 27, 2007.

Commerce respectfully disagrees with the credit policy as proposed. Commerce asserts that credit requirements should be reasonable and proportional to the CAISO's risk exposure, and should compensate fairly in the event of default. Commerce offers some specific recommendations:

1. **CRRs should be paid for incrementally as used in each billing cycle, not at the conclusion of the auction.** We simply don't understand the statement on page 4 of the straw proposal that reads "CRRs will be paid for at the conclusion of the auction." If that were true, there would be zero credit exposure for CAISO, and thus no need for the credit policy as proposed. And – if that were true, few LSEs would have the financial means to pay for the CRR, in full, at the time of the auction, and would not participate. This appears anti-competitive. Please explain or delete this sentence.

   CAISO Response:

   At the conclusion of the auction, parties will pay the auction price for positive CRRs. Parties will be paid the auction price for negative CRRs.

   Thereafter, holders of positive CRRs will receive payments related to the CRRs in the monthly settlement statements. Holders of negative CRRs will be required to make payments to CAISO in their monthly settlement statements. There is credit exposure related to these payment obligations. Accordingly, we will value the CRRs and require adequate credit coverage (collateral, or other assurance of creditworthiness as demonstrated by an Unsecured Credit Limit) to provide

reasonable assurance that CRR holders can meet their prospective financial obligations.

2. **Credit requirements for holding all CRRs should use a "net position" calculation.** CAISO is proposing to add the absolute value of negatively-valued CRRs to the positively-valued CRRs in its credit requirement calculation. Negatively-valued CRRs lower the expected exposure for an LSE. However, CAISO is proposing to use the absolute value for the credit requirement calculation. This will result in artificial increases in the credit exposure calculation. Instead, CAISO should offset the holder's positively-valued CRRs with negatively-valued CRRs, for similar term durations, to calculate a portfolio-wide credit requirement.

CAISO Response:

We agree, and it appears there has been some confusion about our proposal. Negatively-valued CRRs (and low-priced positive CRRs) are the ones that can raise potential risks of holders not meeting their prospective financial obligations. We have proposed to allow positively valued obligations to be netted against these for determination of the value of the CRR portfolio for ongoing credit purposes. We believe there may be confusion on two points:

1. Parties have raised concern about allowing non-financially qualified entities to participate in the CRR auction, and then be unable to meet ongoing collateral requirements. If there were no up-front credit requirement for bidding on a negative CRR, an entity could successfully acquire these in the auction, then not be able to meet the credit requirements at the conclusion of the auction, which will be the auction value with an additional margin. While CAISO could retain the payment to the party for the negative CRR, we would still be short the margin amount. Accordingly, to provide additional assurance that only financially qualified entities will bid on negative CRRs, we will require that for purposes of determining creditworthiness during the auction process, that all bids will be checked against a pre-established credit limit for the participant. Accordingly, if the party wants to bid on 1 MW of positively valued CRR for $10, they would need to be approved for $10 of credit capacity, and, the same for a negative CRR with a bid of ($10), the would require credit capacity during the auction of $10.
2. We did raise for discussion the concept of not allowing positive CRRs to offset negative CRRs. In some cases, this would reduce risk. For example, a party acquires in the auction a positive one month CRR valued at $10, and a negative one year CRR valued at $10. As the two have offsetting values,

there is no net credit requirement. At the end of the first month, the positive CRR is expired. For credit valuation purposes, only the value of the negative CRR remains in their portfolio. They declare bankruptcy on the day CAISO asks for collateral for the value of that negative CRR, and this is the risk that we believe was worth raising for discussion. As FERC supports the concept of netting, and this is additionally the approach we use currently for other market charges, we are not proposing at this time to disallow netting for CRR portfolio valuation purposes for credit requirements.

3. **Credit requirements for holding short- and long-term CRRs should simply use a mark-to-market methodology, not a VaR-like probability calculation.** CAISO and Commerce both agree that the value of holding CRRs -- the risk exposure -- will change over time. However, the risk exposure for CAISO should be calculated from market values of the CRRs as commercially observed in the auction or absent that, in other markets including energy and capacity. CAISO should not use synthetically-determined values based on a probabilistic model. CRRs have no historical values for meaningful probability modelling. CAISO is simulating these values from a 2002-2005 study period, and this data is too outdated for practical use now.

   CAISO Response:
   CAISO recognizes that the ideal method of valuing the CRRs for credit purposes would be to have perfect insight into energy/LMP prices throughout the term of each CRR. Without that, is it appropriate to project today's (or prices over some longer historical period) energy prices throughout the term of the CRR to value each CRR? On day 1, such historical information will not be available in any event, so another method is required. Once such data becomes available, it may be practical to use it to determine projected energy values over CRR terms. CAISO anticipates examining this question in the future. As of now, given the constraints we face (lack of data, need to develop and computer software systems), the reliance on auction prices is the most viable approach.

4. **Credit requirements for long-term CRRs should use a realistic calculation of both current and potential exposures.** Current exposure is simply the amount of CRRs used (realized) in the current billing cycle that remains unpaid. Potential exposure is the value of the remaining unused CRRs, using mark-to-market valuation methodology and discounted to present value using long-term LIBOR. In this manner, CAISO will not overburden the CRR holder, and will adequately

cover the true risk. This calculation also meets standard industry practice as articulated by the Committee of Chief Risk Officers' Credit Risk Management Working Group in their whitepaper dated November 19, 2002.

CAISO Response:
CAISO agrees that this approach is conceptually appropriate. If there were a means to value the remaining unused CRRs using a realistic forecast of future market prices in a mark-to-market method, that would be the best approach. However, without such information at this time, CAISO's approach of relying on auction prices appropriately adjusted to reflect uncertainty through the margin concept, should approximate the results of this approach. We assume that we will have an efficient market and that prices parties pay for the CRRs represent the best estimate at that time of the value of the CRR.

5. **Default measures should only compensate CAISO for actual damages, not all monies collected.** CAISO's compliance measures are overly restrictive for the credit-event risk. CAISO is proposing to retain all CRR payments for the defaulting entity's positively-valued CRRs. This effectively becomes a gain for the CAISO, not merely compensation for their actual loss. And, CAISO has no provision for counterparties that leave the market – and the remaining collateral. CAISO stated during the conference call that in the event of a default on CRRs, CAISO would collect the CRRs and reallocate or re-auction them. Please clarify or articulate a policy for this situation.

CAISO Response:
To clarify, CAISO is not proposing to retain payments beyond that necessary to "close-out" the position of the defaulting party.

In conclusion, the credit requirements, as proposed by CAISO, over collateralize for the risks assumed. It poses unnecessarily high costs for market participants and ultimately, the retail load. Market participants without enough unsecured credit will have to post collateral with cash or credit facilities. This will effectively create a barrier for competitive entry, which will reduce liquidity in the CRR market. A CRR market without liquidity and robust participation will cause MRTU to fail as a model.

Commerce thanks the CAISO for considering its comments. Further questions or concerns should be directed to:

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May 11, 2007

SCE Comments on the CAISO Straw Proposal for CRR Credit dated April 27, 2007

SCE appreciates the opportunity to provide comment on the CAISO proposed credit treatment for CRRs. SCE notes that there are detailed issues relevant to the proposal that have yet to be clearly addressed. Additionally, there is an element of the proposal that SCE believes will present a very significant risk if left unaddressed.

Credit Must be Provided Prior to the Allocation and Auction

Currently, the CAISO only proposes to require credit or collateral for those rights that are positively valued. Auctioned or allocated rights that are expected to carry a negative value will not be treated similarly. For negatively valued auction rights, the CAISO proposes to simply withhold the payment of the auction revenues as collateral. For allocated rights, there is no similar treatment as there is no similar revenue to disburse. This methodology is insufficient for two reasons.

First, the methodology does not sufficiently protect against default. One can imagine a scenario in which an entity bids small negative amounts for all source sink combinations in hopes that one or more clears. The CAISO then holds the auction revenue and if at the end of the relevant CRR period, there is remaining value owed to the holder then, the holder takes the financial gain. If, on the other hand, the amount owed from congestion is greater than the amount held from the auction, then the CRR holder simply defaults and the CAISO is left with insufficient collateral to cover the damages.

Second, the methodology leaves the market vulnerable to manipulation. As an example, an LSE could execute the following strategy. Upon allocation, the LSE could sell and transfer via the Secondary Registration System (SRS) all positively valued rights leaving only a portfolio of negatively valued rights. The LSE then defaults turning all customer load back to their default provider. Since the LSE has sold all positively valued rights and only holds negatively valued rights, then the load returning to the default provider will not have CRRs sufficient to cover the expected congestion. In fact, any CRR transfer due to load migration at this point would cost the default service provider.

For these reasons, the CAISO must do the following:

1. Require credit/collateral for negatively valued CRRs at the absolute expected value of the right
2. Require the posting of sufficient collateral to address the potential of a default by an LSE that has sold off positively valued CRRs at the time of the SRS transfer including sufficient credit/collateral to cover the expected payments for negatively valued CRRs as well as to cover the revenue stream for the positively valued rights that would accrue to the load gaining LSE if load migration occurs.

Default Provisions Need More Clarity

It is difficult to completely evaluate the proposed credit provisions given the uncertainty associated with how default will be treated. Currently, the CAISO tariff appears to deal with default through general provisions that would have all CAISO creditors receive a pro-rata reduction in their amounts owed by the CAISO. This would potentially mean that CRR holders as well as other market participants would be impacted by inadequate credit and collateral provisions for CRRs. Couple that with the full funding requirements for CRRs and the implications of a default by a CRR holder becomes further clouded.

For these reasons, SCE requests that the CAISO clarify how default of a CRR holder will be treated.

Credit Requirements for Long-Term CRRs

CAISO has recognized that long-term CRRs are volatile, yet there is no true mechanism in place if there is any change in value of the long-term CRR over time. Given the value of these CRRs are volatile, the CAISO has not adequately stated how it will monitor changing credit requirements. CAISO has also not stated how frequently they will adjust the credit requirement, except for that it will happen at least once a year. Therefore, SCE recommends that credit and collateral related to LT-CRRs be evaluated on the same basis as that of annual and monthly CRRs. That is, the CAISO will re-evaluate the value and credit requirements weekly as well as upon any CRR transfers initiated in the Secondary Registration System.

Additionally, SCE is concerned with the amount of credit/collateral that must be provided for LT-CRRs. As one option, the CAISO has suggested that a CRR holder would be required to collateralize the full term of the LT-CRR. SCE believes that this could present significant barriers to holding a LT-CRR. Additionally, SCE believes that the risk exposure for a LT-CRR is very different if the value of the right is negative versus if the value is positive. Based upon this, SCE believes that the credit requirements should also therefore be different. SCE recommends that the CAISO base the credit/collateral for LT-CRRs with a positive expected value on a rolling 12 month basis. This would be re-evaluated at regular intervals. For negatively valued CRRs, the CAISO should base credit/collateral on the remaining term of the LT-CRR.

May 9, 2007

Comments by California Department of Water Resources on CAISO Straw Proposal for CRR Credit Policy

The CDWR welcomes the opportunity to comment. We recognize and appreciate the need to strike a balance between financial requirements and risk tolerance. If left to choose between low or high financial requirements our preference leans more towards financial requirements that provide greater financial protection as opposed to a lower bar that allows ease of entry.

Credit requirement to bid on negative CRRs

During the May 4, 2007 conference call a large part of the discussion and commentary from market participates centered on the straw proposal treatment of not requiring a credit requirement to participate in bidding for negatively priced CRRs. While not having an explicit recommendation as to what is an appropriate credit requirement for bidding on negatively priced CRRs CDWR shares the same concerns of those that spoke during the conference call that some level of collateral should be posted prior to bidding on negative CRRs.

Short-term CRR credit requirements

With respect to the decision of which percentile value to use; 1, 2.5, or 5 CDWR is okay with using the fifth percentile.

Long-term CRR credit requirements

With respect to the four options proposed for determining long-term CRR credit requirements, CDWR agrees with the CAISO preference toward either Option 2 or 4 with a slight preference towards Option 4.

Compliance

The measures outlined seem sufficient though we are wondering what the time horizon is to meet the credit requirement. We wouldn't want to be excluded forever from holding and acquiring CRRs if we had a margin call and missed the payment deadline for some reason (an administrative issue on our end for instance) not due to insolvency.

Credit Offsets

CDWR favors assessing credit requirements fore each individual CRR.

Appendix C-5

California ISO White Paper

Congestion Revenue Rights Credit Policy

May 14, 2007

CAISO White Paper

Congestion Revenue Rights Credit Policy

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CAISO White Paper

Congestion Revenue Rights Credit Policy

Executive Summary

Congestion Revenue Rights (CRR), as a financial instrument to hedge transmission congestion charges, may bring revenue to its holder, but it may also become a financial obligation for the holder. In case of default by the CRR holder, the financial losses will be shared by other market participants. Effective credit policy to protect financial interests of market participants is therefore crucial to the success of the CAISO CRR market.

CRR credit policy must balance the interests of CRR holders that must demonstrate creditworthiness or provide Financial Security, on the one hand, and market participants that bear the risk of non-payment, on the other hand. In other words, the CAISO's credit requirements must limit the risk to market participants of non-payment but must not be excessive so as to discourage participation of credit worthy market participants.

After a series of stakeholder meetings, the CAISO has proposed the following CRR credit policies based on the feedback from stakeholders and internal consideration.

There will be no credit requirement for LSEs to participate in CRR allocation, as LSEs will not be required to pay for positively valued CRRs and will not be paid to hold negatively valued CRRs. These CRRs will be subsequently valued for credit purposes in the same manner as CRRs obtained through the auction. In order to bid in the CRR auction, each participant has to demonstrate a minimum $500,000 Available Credit with the CAISO. The actual requirement for Available Credit is the sum of absolute value of all bids by the participant or $500,000, whichever is larger. At the end of auction, once all payments due to the CAISO for CRRs have been paid for in full and the credit requirement for holding the CRRs is in place, the CAISO will release payments due to CRR buyers and sellers and any excess Available Credit will be released.

The credit requirement for holding a Short-Term CRR (with a term up to one year) consists of two components: auction price and a credit margin of the Short-Term CRR. It

is designed such that in case of default by the holder, the likelihood the credit requirement cannot fully cover the loss is 5 percent or less.

Credit requirement for holding Long-Term CRR (with a term of ten years) covers financial risk for the whole term of the Long-Term CRR. It is determined by the auction price of a one year CRR, the number of years of the Long-Term CRR, and a cumulative credit margin based on the Short-Term CRR credit margin.

If a holder owns more than one CRR, the overall credit requirement is assessed for the whole portfolio of CRRs of this holder. After each monthly CRR auction, the credit requirement will be reassessed using the new auction prices. Credit margin will be updated annually using the actual LMP data from market operation.

Out-of-Control Area Load Serving Entities must also maintain one year credit coverage of Wheeling Access Charge (WAC) prepayment. The CAISO will require prepayment of the WAC prior to trade month, consistent with the FERC April 20, 2007 Order.

The CAISO Department of Market Monitoring will provide a warning to participants about possible consequences of any apparent misconduct prior to the auction, and may refer any questionable conduct in the auction to FERC.

In case of default or bankruptcy, the CAISO will terminate all CRR contracts with the defaulting holders, retain any Financial Security or payments related to the CRRs until the CAISO determines that no sums are due, and resell the CRRs in subsequent auctions. Finally, the CAISO proposes to prohibit the defaulting holders from owning CRRs for five years

Introduction

Congestion Revenue Rights (CRR) are financial instruments introduced with the CAISO MRTU. They are designed to hedge transmission congestion charges under the locational marginal pricing (LMP) system. The CAISO distributes CRRs to market participants primarily through allocation and auction processes. Unlike Firm Transmission Rights in the CAISO's current market, CRRs are obligations.[1]

[1] The CAISO also allocate CRRs to sponsors of merchant transmission facilities or upgrades, which can be either CRR Obligation or CRR Option. There is no credit requirement with regard to CRR Option.

A CRR Obligation (CRR in short in the rest of this white paper) entitles its holder to receive a payment from the CAISO if the congestion in a given trading hour is in the same direction as the CRR, and requires the holder to pay a charge to the CAISO if the congestion in a given trading hour is in the opposite direction of the CRR. In case a CRR holder is unable or unwilling to make the required payment (default or bankruptcy) the uncovered financial loss will be shared by other market participants. In order to ~~avoid~~ reduce the possibility such situation, credit policies governing the financial requirements for obtaining and holding CRRs need to be established and enforced.

The objective of the credit policy is to protect the financial interests of all market participants by reducing the likelihood of default and mitigating the losses to other market participants if a default happens. At the same time the policy should not create an inefficient barrier to entering the CRR market for credit worthy market participants. Policy defects in either way will discourage the participation of market participants and eventually reduce the liquidity and effectiveness of the CRR market.

The CAISO is committed to designing an effective CRR credit policy. In the past several months, the CAISO has held a series of stakeholder meetings and posted white papers and policy proposals on CRR credit policy.[2] The proposals were revised over time based on the feedbacks from stakeholders and continuous consideration by the CAISO. This white paper is the final policy proposal for CRR credit policy.

CRR Credit Policy

CRR credit risk exists in two separate phases, in the process of obtaining CRRs and in the process of holding CRRs. The corresponding credit policies needed to be designed to manage the two different kinds of risk.

I. Credit Requirement for Obtaining CRRs

There are two ways to obtain CRRs from the CAISO. One is through the CRR allocation process and the other is through the CRR auction.

CRR allocation is open to LSEs only. It is intended for the LSEs to hedge transmission congestion charges. The CRRs will be nominated by the LSEs and approved by the

[2] See References

CAISO. The nominated CRRs are subject to verification. The LSEs do not pay to the CAISO nor are paid by the CAISO to hold the CRRs. Therefore the LSEs do not need to have Available Credit[3] to participate in the CRR allocation. However, the LSEs do have to have sufficient Available Credit to assume the ownership of allocated CRRs.

On the other hand, all market participants can participate in auction, where they can bid for any CRRs up for sale. Absent credit requirements for participation in the CRR auction, a participant could potentially submit bids to purchase positively priced CRRs that would be beyond his financial capability to pay for. If such a participant were awarded the CRRs in the auction, he would not be able to pay for the awarded CRRs. A participant may also bid for negatively priced CRRs, take the payments by the CAISO and then default on subsequent payment obligations to the CAISO. Due to the fact that the volumes (MW) of CRRs are dependent on each other because of the special characteristics of the transmission system and the full-funding requirement, there would be opportunities for risky speculation absent appropriate credit requirements and gaming if market rules are not properly designed. In addition, while the purchase of negatively priced CRRs does not require a payment by the CRR purchaser at the conclusion of the auction, the holding of such CRRs will require satisfying a credit requirement for holding those CRRs. Absent some form of credit requirement for acquiring negatively priced CRRs in the auction, there would be a potential for a market participant to submit bids to buy negatively priced CRRs that would be beyond the market participants ability to satisfy the CAISO credit requirement for holding, leading to a default after being awarded the negatively priced CRRs in the auction. This default would expose the CAISO to a shortfall on the CRR Balancing Account from covering the positively priced CRRs made possible by the awarded of the negatively priced CRRs on which credit was not posted.

To ~~avoid~~ reduce this potential the CAISO proposes the following credit policies.

There will be pre-auction credit requirements for participating in the CAISO CRR auction. Each participant has to demonstrate a $500,000 minimum Available Credit in order to submit a bid for either positively priced or negatively priced CRRs. Accordingly,

[3] Available Credit = Unsecured Credit Limit + Collateral – Estimated Aggregate Liability

the participant will need to have Available Credit greater than or equal to the sum of the absolute value of all his bids. Otherwise, all the bids made by the participant will be rejected.[4]

The $500,000 minimum Available Credit requirement and the absolute value of bids requirement are intended in combination to limit the likelihood that market participants will be awarded CRRs in the auction for which they would be unable to pay for or meet the credit requirement for holding the CRRs.

At the end of the auction, winners will pay full amounts (sum of auction market clearing price times MW quantities awarded) to the CAISO for the positively priced CRRs they were awarded in the auction. And the CAISO will pay full amounts to market participants awarded negatively priced CRRs.[5] However, these payments for the awarded of negatively priced CRRs will not be made until the credit requirements for holding the CRRs are satisfied. Failing to meet the credit requirement is considered a default and is subject to enforcement actions described under the compliance measures.

After the auction is settled, any excess of Available Credit used to support participant in the CRR auction will be released and be returned to the participant.

II. Credit Requirements for Holding Short-Term CRRs

The value embedded in a Short-Term CRR (ST-CRR, with a term up to one year) can be divided into two parts. The first part is the auction price.[6] For a negatively priced ST-CRR, the auction price equals the payment due to the CRR holder at the end of the auction in exchange for a stream of expected congestion revenue payments the holder will make to the CAISO. The auction price of a positively priced ST-CRR is the payment due to the CAISO at the end of the auction in exchange for a stream of expected congestion revenue payments to the holder.[7]

The second part is the congestion revenue of the ST-CRR. By definition, congestion revenue of a ST-CRR is the difference between the congestion component of the LMP at

[4] The minimum Available Credit requirement and absolute value approach are proposed in responding to the request by SCE, PG&E, and CDWR. See Appendix for summary of stakeholder written comments.
[5] Commerce Energy suggest pay incrementally to reduce financial burden for participants. Considering only short-term CRRs will be sold in auction, the CAISO propose to pay in full amount.
[6] For CRRs directly allocated to LSEs auction price is the market clearing price calculated by the CRR auction model.
[7] For CRRs allocated to LSEs, this payment is waived.

sink and the LMP at source times the megawatt quantity of CRRs held. This entails a payment to the ST-CRR holder if the congestion revenue is positive. The holder is required to pay the CAISO if the congestion revenue is negative. Since the LMPs can be potentially very volatile, the congestion revenue of a ST-CRR can vary from one holding period to the next and swing from positive to negative from period to period. A positively priced ST-CRR is likely to have positive congestion revenue over the holding period, but it is also possible that it will have negative congestion revenue. A negatively priced ST-CRR is expected to have negative congestion revenues over the holding period, but it may turn out to have positive congestion revenues or congestion revenues that are much more negative than expected. The congestion revenue of a ST-CRR is a stochastic variable. In the long-run, the CAISO and its market participants will be able to analyze the distribution of congestion revenues through statistical analysis of historical LMP data.

The credit requirement for holding a ST-CRR must be designed to cover the value of the ST-CRR in the event that actual congestion revenues differ from those expected at the time of the auction. Since the value of the ST-CRR is very volatile the credit requirement should have corresponding probabilistic characteristics. The CAISO therefore proposes a method to determine the credit requirement for holding a ST-CRR that is similar to the Value-at-Risk (VaR) method that is widely used in risk management.

With the proposed method, the credit requirement for holding a ST-CRR consists of two components: the auction price and a credit margin for holding the ST-CRR.

The auction price component of the credit requirement takes account of the expected value of CRR payments, the expected value of payments to the holder in the case of a positively priced CRR and the expected value of payments by the holder in the case of a negatively priced CRR.

The credit margin is determined based on the probability distribution of congestion revenue of the ST-CRR and reflects the potential for the actual congestion revenues due to the holder to be less than the expected value and conversely for the actual congestion revenues due to the CAISO to be greater than the expected value. The combination of the auction price component and the credit margin component is designed such that in case of default by the holder, the likelihood the credit requirement will not fully cover the payments due from the CRR holder is 5 percent or less.

The credit requirement of a ST-CRR is defined as the negative of the auction price plus the credit margin of the ST-CRR. That is:

$$Credit\ Requirement = -CRR\ Auction\ Price + Credit\ Margin$$

The credit margin of a ST-CRR is defined as the difference between the expected value and the fifth percentile value of the ST-CRR congestion revenue.[8]

$$Credit\ Margin = Expected\ CRR\ Cong.Reven. - 5th\ Percentile\ CRR\ Cong.Reven.$$

5th Percentile ST-CRR Congestion Revenue is determined according to the probability distribution of the congestion revenue of the ST-CRR.

For the first year of the CAISO MRTU operation, there will be no historical LMP data available. The prices simulated in CAISO LMP studies will therefore be used initially to calculate credit margins for all ST-CRRs. In the future, actual LMP data will be used to revise the required credit margins.

If a holder owns more than one CRR, the overall credit requirement is assessed for the whole portfolio of CRRs of this holder. The excess credits (negative credit requirements according to the formula defined above) from CRRs with high positive auction price can offset up to the same amount of the credit requirements for other CRRs in the same portfolio.[9] This may reduce total credit requirements for some CRR holders. A positively valued CRR portfolio, however, will not offset a Market Participant's credit requirements for other CAISO liabilities. This is because it would be inappropriate to allow the use of uncertain future CRR revenues to offset more certainly known liabilities have been incurred for past trade days, and because a payment default today requires adequate credit coverage to provide settle historical trade months up until the default without waiting to collect potential future offsets that might be available through positive CRRs that the defaulting market participant holds.

[8] A percentile is a value on a scale of one hundred that indicates the percent of a distribution that is equal to or below it. For example, the probability the variable's value is less than or equal to the 5th percentile value is 5 percent.
PG&E CDWR support the use of 5th percentile value.

[9] This is requested by PG&E, AReM, and Commerce Energy. CDWR suggest assess credit requirement for each individual CRR.

After each monthly ST-CRR auction, the credit requirements for holding ST-CRRs will be reassessed using the new auction prices.[10] Credit margins will be recalculated periodically based on actual LMP data. Credit requirements will also be adjusted when the ownership of a CRR has changed through either secondary market trading or load migration. The new owner will be required to satisfy the CRR credit requirements prior to transfer of ownership, and the prior owner's CRR portfolio would be revalued without the transferred CRR and that owner would be subject to weekly collateral adjustments as required in the routine EAL-credit comparison performed by CAISO.

The same credit requirement criteria for holding CRRs apply to all CRR holders, regardless how the CRRs are obtained (through allocation or auction).

Out-of-Control Area Load Serving Entity (OCALSE) who is allocated ST-CRRs will be subject to the same credit requirements for holding ST-CRRs as other market participants. Additionally, OCALSE will be required to maintain one year of credit coverage for their Wheeling Access Charge (WAC) prepayment beyond the current period. Although the 1 year credit coverage for the WAC prepayment will increase the EAL, the OCALSE will not need to post additional collateral as long as they maintain an overall positive Available Credit position (Aggregate Credit Limit less EAL). Subsequently, they will be required to prepay the WAC on a monthly basis in advance of the trade month, consistent with the FERC April 20, 2007 Order.[11]

III. Credit Requirements for Holding Long-Term CRRs

All credit requirements for holding ST-CRRs apply for holding Long-Term CRR (LT-CRR, CRRs with terms longer than 1 year). In addition, there are some specific requirements designed for LT-CRR holders.

A LT-CRR has a multi-year term. In case of a default involving a LT-CRR, the CAISO may choose to resell it in the subsequent monthly auctions, but it may not be possible for a LT-CRR to be liquidated at the auction. If the CRR is not resold in an auction, the financial loss includes not only the current period congestion revenue payments of the defaulting LT-CRR, but also the congestion revenue payments due for the CRR for all

[10] SCE and PG&E suggest weekly update while AReM suggest monthly. The CAISO proposes monthly for auction price annual credit margin update based on data availability and technical feasibility.
[11] NCPA objected this requirement prior to the FERC April 20, 2007 Order, which allows OCALSE make WAC prepayment monthly.

the years in the remaining term of the defaulted LT-CRR. Therefore the one period credit requirement for holding a ST-CRR does not provide all necessary coverage for holding a LT-CRR. Instead, the credit requirement for holding a LT-CRR must cover financial risk over the whole term of the LT-CRR.[12]

The CAISO proposes the following method to determine the credit requirement for holding a LT-CRR:

$$Credit\ Requirment = n * (-1\ year\ CRR\ Auction\ Price) + \sqrt{n} * (1\ year\ Credit\ Margin)$$

where, n is the number of years remaining in the term of the LT-CRR. *1 year CRR Auction Price* is used because LT-CRRs are available only to LSEs through allocation. There is no auction price for LT-CRR available. *1 year Credit Margin* is calculated according to the ST-CRR credit margin definition. *1 year Credit Margin* times the square root of n is the cumulative credit margin of the LT-CRR.

This method is Option 2 of the four options proposed in the Straw Proposal.[13] It is an option that is not as conservative as Option 1, but does provide more coverage than Option 3 and 4 when credit offsetting within the CRR portfolio is allowed.[14]

The credit requirements for holding LT-CRRs will be adjusted not less than annually. The adjustment will account for the change of remaining terms of the LT-CRRs and the new auction prices of ST-CRRs. The credit margins will also be updated annually based on the actual LMP data from the market operation of the past year.

Credit requirements will also be adjusted when the ownership of a LT-CRR has changed through either secondary market trading or load migration. The new owner will be required to satisfy the LT-CRR credit requirements prior to the transfer of CRR ownership, and the prior owner's CRR portfolio would be revalued without the transferred CRR and that owner would be subject to weekly collateral adjustments as required in the routine EAL-credit comparison performed by CAISO.

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[12] SCE suggest require full-term credit coverage for CRRs with negative expected values and 12-month coverage for CRRs with positive expected value. Based on the consideration that a CRR with positive expected value does not always have a positive actual value due to the market volatilities and the complexities to implement different rules for different CRRs, the CAISO proposed to require credit coverage for full term.

[13] See References.

[14] PG&E prefer Option 1 while CDWR prefer Option 4.

~~Out-of-Control Area Load Serving Entity (OCALSE) will be subject to the same credit requirements for holding LT-CRRs as other market participants. Additionally, OCALSE will be required to maintain one year of credit coverage for their Wheeling Access Charge (WAC) prepayment beyond the current period. Although the 1 year credit coverage for the WAC prepayment will increase the EAL, the OCALSE will not need to post additional collateral as long as they maintain an overall positive Available Credit position (Aggregate Credit Limit less EAL). Subsequently, they will be required to prepay the WAC on a monthly basis in advance of the trade month, consistent with the FERC April 20, 2007 Order.~~[15]

IV. Compliance Measures

All CAISO market participants, including CRR holders are required to comply with the CAISO credit requirements as set forth in Section 12 of the Tariff, including meeting the CAISO calls for collateral to cover CRR and other market obligations. The CAISO requires entities that have an Estimated Aggregate Liability (EAL) in excess of their Aggregate Credit Limit (ACL, unsecured credit plus collateral) to post additional Financial Security within 5 business days. Entities that delay or default in making collateral or other payments are subject to escalating enforcement provisions (Tariff Section 12.5) including:

1. The CAISO may withhold a pending payment distribution.
2. The CAISO may limit trading, which may include rejection of Bids and/or limiting other CAISO market activity. In such case, the ISO shall notify the market participant of its action and the market participant shall not be entitled to submit further bids to the CAISO until the market participant posts an additional Financial Security Amount that is sufficient to ensure that the market participant's ACL is at least equal to its EAL.
3. The CAISO may require the market participant to post an additional Financial Security Amount in lieu of an Unsecured Credit Limit for a period of time.

[15] NCPA objected this requirement prior to the FERC April 20, 2007 Order, which allows OCALSE make WAC prepayment monthly.

4. The CAISO may restrict, suspend, or terminate a market participant's Service Agreement or CRR Holder Agreement.

Entities that fail to comply with the CAISO credit requirements expose other market participants to potential default risk, as nonpayment by a CAISO debtor results in short-payments to the CAISO creditors. For an entity that holds CRRs, bankruptcy or other payment defaults can extend over multiple CAISO trade months for the length of the CRR term, resulting in continuing short-payments to other market participants. Due to the heightened credit risks that CRRs can therefore present, it is especially important that CRR holders comply with the CAISO credit requirements. CRR holders that do not comply with the CAISO credit requirements or otherwise default on payments will also be subject to the enforcement measures noted above, and the CAISO will, as appropriate:

- Retain Financial Security sufficient to cover the value of all of the market participant's liabilities including the future value of their CRR obligations
- Retain all payments related to the CRRs (or other market related payments otherwise due the market participant) and resell the CRRs in subsequent auctions
- Terminate all CRR agreements with the default holder
- ~~Exclude the holder from future CRR allocation and auctions for 5 years~~
- ~~Prohibit the holder from subsequently acquiring CRRs for 5 years~~
- Exclude CRR Holder from eligibility to participate in the allocation or auction until all defaults have been cured and require the CRR Holder to post additional Financial Security Amount in lieu of an Unsecured Credit Limit for future ~~particpation~~participation

V. Market Monitoring and Mitigation

The CAISO market rules prohibit Market Manipulation (37.7), including:

- Actions or transactions that are without legitimate business a purpose and that intended to or foreseeably could manipulate market prices, market conditions …" (37.7.1.1)
- Collusion with another party for purposes of manipulating market prices, market conditions …(37.7.4.2)

FERC's own market rules also prohibit provision of false information to and ISO, and make it unlawful to:

> (1) use or employ of any device, scheme, or artifice to defraud, (2) make material false statement or omit material facts, or (3) engage in any act, practice or course of business that operate or would operate as a fraud or deceit upon any person.

The CAISO Department of Market Monitoring will actively monitor any unusual activities in the CRR allocation and auction processes. A variety of action might be taken to deter or monitor the type of conduct described above, including:

- Require disclosure of affiliations.
- Explicitly warn participants that the CAISO will monitor and refer such behavior to FERC.
- Refer to FERC.

References

1. CAISO Straw Proposal for CRR Credit Policy: (4/27/07) http://www.caiso.com/1bcd/1bcd9f52296e0.pdf
2. Presentation - CRR Credit Policy: (5/2/07) http://www.caiso.com/1bd2/1bd2e3f41c7d0.pdf
3. CRR Stakeholder Meeting: (4/3/07) http://www.caiso.com/1bb5/1bb5875027a50.pdf
4. CRR Conference Call: (3/27/07) http://www.caiso.com/1bad/1badda6459b00.pdf
3. Revised Policy Proposal: Prepared by Scott Harvey of LECG (3/20/07) http://www.caiso.com/1ba7/1ba788da74450.pdf
4. Stakeholder Meeting Presentation: (2/27/07) http://www.caiso.com/1b92/1b928c9e2d2a0.pdf
5. CRR credit white paper prepared by Scott Harvey of LECG: (2/21/07) http://www.caiso.com/1b8c/1b8cdb4c74ab0.pdf

Stakeholder Written Comments and the CAISO Responses

May 9, 2007

Comments of Pacific Gas and Electric to CAISO
Regarding
CAISO Straw Proposal for CRR Credit Policy

PG&E appreciates the efforts of the CAISO to develop a Credit Policy for holders of Congestion Revenue Rights (CRRs) under MRTU. On April 27, 2007 the CAISO posted a straw proposal for CRR Credit Policy and on May 4, 2007 the CAISO conducted a stakeholder Conference Call to discuss the straw proposal. The CAISO has requested comments by May 11, 2007 and PG&E is pleased to offer the following comments on both the straw proposal and issues discussed during the conference call.

Long-Term CRR Credit Options

The CAISO's straw proposal outlined four alternatives for establishing the credit requirements for holding Long-Term CRRs. As the CAISO has observed, the value of CRRs in a newly established LMP market may be quite volatile. Accordingly, PG&E endorses Option 1, as a means of addressing uncertainties associated with valuation. PG&E feels it is prudent to establish an initial credit policy which is conservative. If, after some experience with MRTU and nodal pricing, it becomes clear that the initial policy is excessively conservative, the CAISO could explore less conservative options with stakeholders and a less conservative option could be implemented expeditiously. If, on the other hand, the CAISO initially chose a less conservative approach and in the future wanted to become more conservative it could negatively impact some market participants who would not, or could not, meet a more conservative credit requirement.

PG&E is concerned that CRR holders may take speculative positions and then not meet the obligations associated with the CRRs they hold. Failure to meet these obligations would then result in higher costs to the load serving entities.

The methodology for determining credit requirements is quite difficult because of lack of historic data and no reported market of transactions. Because of this lack of data and market information, the CAISO needs to be conservative.

Actual CRRs may be surprising to the CAISO and market participants. With no historic record of either 1) actual CRRs or 2) CRR auctions, the results could be quite different than what the CAISO might expect. Also, some CRRs may be fully allocated, thus leaving no bid prices for those CRRs from the auction. Also, it is possible counter flows of CRRs could be significantly different, hence resulting in "dual" prices which are not consistent. When the actual operation of MRTU occurs, market participants could schedule, or bid resources to impact their CRR revenues. As noted in the CRR training, market participants should not consider CRRs a sunk cost for their bidding or scheduling of a resource. Also, potentially a CRR could be "traded" for a period as short as 1 day. Because of this lack of CRRs and market participants in both the auction and in day ahead markets, the CAISO needs to be conservative.

The CAISO notes the CRRs could be quite volatile. This volatility could result in reversals of the value of CRRs which will impact the participant's total Estimated Aggregate Liability (EAL).

CAISO Response:

PG&E's comments focus on the need to adopt a conservative approach to CRRs given the uncertainty as to how volatile CRR prices may be and how entities may take actions that significantly affect costs for other market participants. CAISO agrees that given these uncertainties that a relatively conservative approach to credit standards is warranted.

With respect to the valuation alternatives for long-term CRRs, CAISO also believes that a relatively conservative approach is important given initial uncertainty as to volatility of CRR prices as compared to initial auction values, the potential for defaults to affect monthly CAISO settlements. There are several methods that can be used to provide for such conservative credit standards including:

1. Which of four alternatives to use for valuing long-term CRRs;
2. Which percentile to use for the setting the limit in the probability distribution of CRRs for setting the credit margin: (1%, 2.5%, 5%);
3. How frequently CAISO will value the CRR portfolio; and
4. Setting initial auction participation standards that ensure entities are reasonably creditworthy (for instance, minimum available credit limits to participate in auction)

Since publishing the initial draft credit whitepaper and receiving stakeholder feedback, CAISO has, with respect to the items above:

1. selected the more conservative approach of two alternatives originally put forward for consideration for long-term CRR valuation
2. Committed to investigate and attempt to implement more frequent use of CRR valuation information, such as information available from monthly auctions.
3. Set a minimum credit availability amount for entities that wish to participate in the CRR auction of $500,000.

Basis for Implementation of Credit Requirements

It is our belief that the CAISO should- implement Option 1 on a portfolio basis rather than at the individual CRR level. This would conform to CAISO's practice of netting all market transactions to determine a participant's total EAL. Payments to a market participant are expected to be on a portfolio basis and the credit requirements should be made consistent with the cash flows. Additionally, if a market participant's negatively evaluated CRRs were separately required to post collateral, then the CAISO's credit requirements could essentially eliminate the holding of 10 year CRRs. Hence, for Long

Term CRR's, PG&E would recommend Option 1 with the 5 Percentile evaluation and Portfolio evaluation with Credit Offset.

CAISO Response:

CAISO's proposal provides for CRR valuation on a portfolio basis. We did raise for discussion the concept of not allowing positive CRRs to offset negative CRRs. In some cases, this would reduce risk. For example, a party acquires in the auction a positive one month CRR valued at $10, and a negative one year CRR valued at $10. As the two have offsetting values, there is no net credit requirement. At the end of the first month, the positive CRR is expired. For credit valuation purposes, only the value of the negative CRR remains in their portfolio. The party declares bankruptcy on the day CAISO asks for collateral for the value of that negative CRR, does not post such collateral, and defaults on subsequent payment obligations. This is the risk that CAISO raised for discussion. As FERC supports the concept of netting, and this is additionally the approach we use currently for other market charges, we are not proposing at this time to disallow netting for CRR portfolio valuation purposes for credit requirements.

Timeline for Establishing Credit

PG&E is also concerned with the timing of establishment of credit available to the CAISO. Entities acquiring CRRs should have credit available to the CAISO before they participate in CRRs allocations or auctions. To award a CRR to a participant, who may create counter flows in the allocation or auction, could result in CAISO awarding CRRs in excess of feasible amounts. For example, suppose Market Participant 1 obtained 1000 MW of CRRs for a counter flow, say PG&E Lap to COB. This would allow other participants to obtain 1000 MW in the normal flow direction. Now if Market Participant 1 did not post collateral and "walked away" from the obligation through bankruptcy or some other means, then the CAISO would have awarded CRRs in excess of the true transfer capability. The CAISO needs to ensure credit support early in the process. Preferably before the allocation or auction and at least before the results of allocations or auctions are made to the full market.

CAISO Response:

There will be pre-auction credit requirements for participating in the CAISO CRR auction. Each participant has to demonstrate a $500,000 minimum Available Credit in order to submit bids for either positively valued or negatively valued CRRs. Accordingly, the participant will need to have Available Credit greater than or equal to the sum of the absolute value of all his bids.

As for credit requirements for the allocation process, CAISO has not proposed to have pre-allocation credit requirements due to:

1. Lack of prices to value the CRRs allocated at the initial allocation

2. CRRs will only be allocated to load serving entities, and quantities allocated are constrained based on quantities of forecasted load.

3. No revenues will be paid out for negatively valued CRRs that have been allocated.

Rather, credit requirements will be established after CRR auction prices are available.

Review of CRR Auction Bids by Department of Market Monitoring

PG&E -also proposes that the CAISO's Department of Market Monitoring (DMM) review bids into the auctions before the CAISO auctions CRRs. The DMM should disallow bids that are clearly- excessive with the potential to cause market abuse. PG&E is particularly concerned with potentially excessive positions over interties and interties that have nomograms or special operating procedures. For example, bidding for capacity in excess on a path while having another associated party take the opposite position could, and should be considered a potentially excessive position. During the initial years of the CAISO and the "energy crisis" of the early part of this decade, there seemed to be particular abuse using the interties. Monitoring and potentially referring possible abuse to FERC is not adequate. Market abuse should not be allowed. There are examples of rules to prevent market abuse, such as bid caps. Hence, the DMM should develop screens to review bids in the auction, and disallow bids which did not meet the "screenings".

CAISO Response:

CAISO agrees that the concerned raised by PG&E are important, and CAISO's DMM will review tentative auction results before the results are finalized. CAISO welcomes PG&E's comments on the development appropriate screens to inappropriate bids.

Frequency of CRR Credit Review by CAISO

Lastly, while the most recent white papers did not indicate how frequently the CAISO would review and revise CRR credit requirements; PG&E would recommend a weekly update. Additionally, the White Paper indicates "credit requirements will also be adjusted when the ownership of a CRR has changed through either secondary market trading or load migration." The CAISO should not just adjust the requirements, but require the owners to revise their credit posting with the CAISO before the registrations of the changes are allowed.

CAISO Response:

CAISO currently calculates a market participant's Estimated Aggregate Liability on a weekly basis and expects to do so under MRTU as well. Under MRTU, the EAL will include the value of the CRR portfolio (if negative), and other market

obligations. However, CAISO has not finalized the software and the principles related to the frequency of the valuation of the CRR portfolio. For example, the expectation of CAISO reflected in CRR credit whitepaper upon which PG&E provided these comments, was that annual auction prices would be used to value the CRR portfolio, and that CRRs would be updated based on expiration of terms perhaps weekly or monthly, but not necessary with respect to price. However, given concerns raised by PG&E and other market participants about potentially volatile CRR prices and their affect on participant creditworthiness, CAISO is exploring what would be involved in more frequent valuations of the CRR portfolio, including potential use of monthly CRR auction data.

CAISO agrees that a credit check is necessary before transfers of CRRs will be officially registered, and plans such a check.

Summary

Thank you for the opportunity to comment. In summary, PG&E prefers Option 1 of the four options from the May 4 conference call. PG&E also recommends the CAISO 1) establish credit available to the CAISO before markets are run, 2) evaluate credit requirements on a portfolio basis, 3) review bids in the auction and not allow speculative bidding, 4) regularly monitor and update the CRR credit requirements and 5) adjust credit requirements before transfers are allowed.

If you have any comments, please contact Brian Hitson (415-973-7720) or John Chiara at 415-973-1478.

COMMENTS OF THE ALLIANCE FOR RETAIL ENERGY MARKETS ON THE APRIL 27, 2007 CAISO STRAW PROPOSAL ON CRR CREDIT POLICY

The Alliance for Retail Energy Markets (AReM) appreciates the opportunity to provide comments on the CAISO's April 27th Straw Proposal on CRR credit policy. AReM is a coalition of Energy Service Providers (ESPs) who are each load-serving entities (LSEs) serving retail load in California.

Potential for Anti-Competitive Effects

CRRs are critical to the ESPs' ability to compete in the retail market and manage their congestion risk. Credit requirements that are unreasonably high will have anti-competitive effects: they could pose a barrier to entry for smaller LSEs and reduce liquidity in the CRR market in the long-run. The California Public Utilities Commission is poised to consider re-opening the retail market and these proposed credit policies must be viewed in the light of whether they will discourage retail competition or provide undue competitive advantage to certain classes of LSEs. Accordingly, AReM's comments are provided with the goal of creating a level playing field for all LSEs while reasonably balancing market risk.

CAISO Response:

CAISO agrees that finding the right balance of risk is the correct objective. CAISO is aiming for the right solution that falls somewhere in the middle of the continuum of alternatives represented by:

- no credit requirements that permit entities who are unable to meet payment obligations to hold instruments to the detriment of other market participants vs.
- onerous credit requirements that make CRRs uneconomic to holders.

The correct balance between these alternatives is where CRRs are accurately valued for credit adequacy purposes, specifically, where there is sufficient credit

coverage that in the event of a default by the holder, other market participants are not adversely affected.

All Market Participants, including CRR Holders, are required to be creditworthy or have posted adequate Financial Security to cover their Estimated Aggregate Liability to the CAISO, including any liability for CRRs that require payments from CRR Holders. Non-payments by CRR Holders will be treated the same way under the MRTU Tariff as Non-payments by Scheduling Coordinators are treated under the currently effective ISO Tariff. These provisions are set forth in ISO Tariff Sections 11.12 through 11.16. In brief summary, after exhausting available options, any revenue shortfall resulting from non-payment will be applied pro rata to net ISO Creditors for the relevant settlement period.

Because of the significant adverse impact on the confidence of suppliers that such payment shortfalls would have (and the corresponding impact on market prices for buyers due to explicit or implicit risk premiums), CAISO aims to maintain credit standards for market participants to avoid this outcome.

Netting of Credit Requirements for CRR Holders

AReM strongly supports netting the credit requirements for the CRR Holders based on their entire portfolio of CRRs. AReM does not see any value in treating CRRs individually, without netting the portfolio, as described in the alternative presented in the April 27th paper (p. 5). The costs of the additional credit burden imposed on CRR Holders from this alternative would greatly outweigh any expected benefits from simplification or reduced risk of default.

CAISO Response:

CASIO raised for discussion only the concept of not allowing positive CRRs to offset negative CRRs. In some cases, this would reduce risk. For example, a party acquires in the auction a positive one month CRR valued at $10, and a negative one year CRR valued at $10. As the two have offsetting values, there is no net credit requirement. At the end of the first month, the positive CRR is expired. For credit valuation purposes, only the value of the negative CRR remains in their portfolio. They declare bankruptcy on the day CAISO asks for collateral for the value of that negative CRR, and this is the risk that we believe was worth raising for discussion. As FERC supports the concept of netting, and this is additionally the approach we use currently for other market charges, CAISO is not proposing at this time to disallow netting for CRR portfolio valuation purposes for credit requirements.

Additive Credit Requirement for CRR Holders

AReM questions the need for additive credit requirements for CRR Holders – the CRR Expected Value PLUS the Credit Margin (p. 5). AReM is concerned that this will over-burden all LSEs. AReM requests that the CAISO use either the Expected Value or the Credit Margin as the sole credit requirement for CRR Holders. AReM requests additional stakeholder discussions about how each should be calculated and which is the most appropriate measure for the credit requirement.

CAISO Response:

CAISO's aim in establishing credit standards ~~it~~s to protect market participants from the consequence of a payment default by another market participant. Accordingly, we require entities to demonstrate creditworthiness and/or post collateral to cover their obligations to the CAISO market. In establishing these requirements, the objective to ensure that there is sufficient credit coverage. CAISO is mindful of the costs of collateral to parties that are required to post it, and aims to develop valuations of market obligations that are accurate to avoid the unnecessary need to collateral in excess of actual exposure of the market participant.

With CRRs, is CAISO could look forward and determine the payment streams associated with CRRs, it would use that information to value each CRR today. In the absence of such a "crystal ball", other approaches are necessary. The "day-one" (recognizing that CAISO may later improve upon this approach) proposal is to rely on auction prices, recognizing that while auction prices represent the market's best view as to current value of the payment obligation, it is likely that the actual payment stream related to any CRR will differ to some extent from the auction price. It is here where the concept of the credit margin is necessary. As described in the whitepaper, CAISO will use LMP study data to reflect the extent to which LMP prices may vary and result in volatile CRR obligations that differ significantly from auction values.

The auction price and the credit margin and are not duplicative. Together, they represent the best expectation of the expected payment obligations related to the CRR.

LT-CRR Credit Requirement

AReM requests additional stakeholder discussion of the proposed options and any new options that may be proposed. AReM is again concerned that the burdens on smaller

LSEs may force them out of the LT-CRR market thereby disadvantaging them in the competitive retail market.

CAISO Response:

CAISO is committed to involving stakeholders in developing appropriate alternatives to address policy matters such as CRRs. While we have timing constraints that are tighter than we would prefer, we will aim to continue to provide opportunities for stakeholders to provide input and help craft the best solutions.

Adjustment to LT-CRR Credit Requirements

AReM acknowledges that LT-CRRs are meant to be held over a longer term. Nonetheless, each LSE has the ability to sell LT-CRRs during the course of a year. Therefore, an annual adjustment seems inadequate (p. 7). AReM suggests a monthly review as preferable.

CAISO Response:

CAISO has intended to revise credit requirements for a CRR holder upon the sale or receipt of additional registered CRRs.

CAISO has also heard from several stakeholders that apart from trades, valuations of portfolios more frequently than annually is preferred. CAISO is discussing this internally. Matters that affect this include:

- Recognize constraints for MRTU startup involving system development timelines and budget availability
- Aim of providing accurate CRR valuations

Requested Clarifications

AReM found the paper somewhat confusing and unclear. We would appreciate the following clarifications in the revised paper:

- If a CRR Holder's CRR portfolio has a net positive value – meaning that the CRR Holder will receive congestion revenue payments from the CAISO for its CRRs – is the CRR Holder's CRR credit requirement zero?

If not, please provide additional, explicit and clear examples explaining the credit requirements under varying scenarios.

CAISO Response:

In short, the yes, the credit requirement for the portfolio is zero—. -If the portfolio value, representing the sum of the values of each CRR including the credit margin for each is greater than zero, there is no credit requirement. Positively valued CRR portfolios, however, will not offset a Market Participant's other liabilities captured in the Estimated Aggregate ~~Liablity~~Liability.

- If a CRR Holder has no negatively-valued CRRs in its portfolio, is its CRR credit requirement equal to zero?

CAISO Response:

In all likelihood, yes. However, as discussed in the CRR whitepaper, a CRR with an expected value that is positive, but close to zero, with the addition of the credit margin, may have a value of less than zero. Accordingly, if the Holder had a portfolio of many such low value CRRs, there could be a credit requirement.

- How often will credit requirements be reviewed and adjusted for each LSE? On the May 4th call, the CAISO said that credit is reviewed daily. How does this fit in with the proposed annual adjustment for LT-CRRs?

CAISO Response:

For each market participant, CAISO compares credit limits versus their Estimated Aggregate Liability (which will include CRRs) on a weekly basis.
One matter that has not been resolved at present is how often the CRR portfolio will be revalued. While CAISO will recognize that the term of each CRR is declining over time and this will be taken into account in the valuation, another matter is still under discussion, specifically, how often CAISO should revalue each CRR. To date, CAISO has contemplated using annual auction data. However, stakeholders have requested use of more timely information if possible. Accordingly, CAISO is exploring the use of monthly auction data for valuation purposes.

- We understand that the CAISO will evaluate credit in total. Therefore, for each LSE, the CRR credit requirements will be calculated in conjunction with the credit requirements for the LSE's other activities. If the LSE has

unused credit, it can be applied to any CRR credit requirements it may have. Please clarify if this understanding is inaccurate.

CAISO Response:

This is correct. Example:

A Market Participant has an Aggregate Credit Limit of $2 million. Their EAL excluding CRRs is $500,000. The difference is available to support the value of the CRR portfolio.

- The paper states that the expected value of the allocated CRRs is the "market clearing price calculated by the CRR auction model" (p. 5). What if there are no auction results applicable to the particular CRR? How does the "auction model" calculate a value for holding a CRR if there are no bids for that path?

CAISO Response:

The software used to conduct the allocation creates prices for all CRRs whether or not there are bids.

Submitted by AReM

May 11, 2007

COMMENTS OF COMMERCE ENERGY, INC. ON

CAISO STRAW PROPOSAL FOR CRR CREDIT POLICY

MAY 11, 2007

Commerce Energy, Inc. ("Commerce"), a load-serving entity, here comments on the CAISO's May 4, 2007 stakeholder conference call and the *CAISO Straw Proposal for CRR Credit Policy* dated April 27, 2007.

Commerce respectfully disagrees with the credit policy as proposed. Commerce asserts that credit requirements should be reasonable and proportional to the CAISO's risk exposure, and should compensate fairly in the event of default. Commerce offers some specific recommendations:

1. **CRRs should be paid for incrementally as used in each billing cycle, not at the conclusion of the auction.** We simply don't understand the statement on page 4 of the straw proposal that reads "CRRs will be paid for at the conclusion of the auction." If that were true, there would be zero credit exposure for CAISO, and thus no need for the credit policy as proposed. And – if that were true, few LSEs would have the financial means to pay for the CRR, in full, at the time of the auction, and would not participate. This appears anti-competitive. Please explain or delete this sentence.

   CAISO Response:

   At the conclusion of the auction, parties will pay the auction price for positive CRRs. Parties will be paid the auction price for negative CRRs subject to compliance with the CAISO's credit policies.

   Thereafter, holders of positive CRRs will receive payments related to the CRRs in the monthly settlement statements. Holders of negative CRRs will be required to make payments to CAISO in their monthly settlement statements. There is credit exposure related to these payment obligations. Accordingly, we will value the CRRs and require adequate credit coverage (collateral, or other assurance of

creditworthiness as demonstrated by an Unsecured Credit Limit) to provide reasonable assurance that CRR holders can meet their prospective financial obligations.

2. **Credit requirements for holding all CRRs should use a "net position" calculation.** CAISO is proposing to add the absolute value of negatively-valued CRRs to the positively-valued CRRs in its credit requirement calculation. Negatively-valued CRRs lower the expected exposure for an LSE. However, CAISO is proposing to use the absolute value for the credit requirement calculation. This will result in artificial increases in the credit exposure calculation. Instead, CAISO should offset the holder's positively-valued CRRs with negatively-valued CRRs, for similar term durations, to calculate a portfolio-wide credit requirement.

CAISO Response:

We agree, and it appears there has been some confusion about our proposal. Negatively-valued CRRs (and low-priced positive CRRs) are the ones that can raise potential risks of holders not meeting their prospective financial obligations. We have proposed to allow positively valued obligations to be netted against these for determination of the value of the CRR portfolio for ongoing credit purposes. We believe there may be confusion on two points:

1. Parties have raised concern about allowing non-financially qualified entities to participate in the CRR auction, and then be unable to meet ongoing collateral requirements. If there were no up-front credit requirement for bidding on a negative CRR, an entity could successfully acquire these in the auction, then not be able to meet the credit requirements at the conclusion of the auction, which will be the auction value with an additional margin. While CAISO could retain the payment to the party for the negative CRR, we would still be short the margin amount. Accordingly, to provide additional assurance that only financially qualified entities will bid on negative CRRs, we will require that for purposes of determining creditworthiness during the auction process, that all bids will be checked against a pre-established credit limit for the participant. Accordingly, if the party wants to bid on 1 MW of positively valued CRR for $10, they would need to be approved for $10 of credit capacity, and, the same for a negative CRR with a bid of ($10), the would require credit capacity during the auction of $10.
2. We did raise for discussion the concept of not allowing positive CRRs to offset negative CRRs. In some cases, this would reduce risk. For example, a party acquires in the auction a positive one month CRR valued at $10, and a

negative one year CRR valued at $10. As the two have offsetting values, there is no net credit requirement. At the end of the first month, the positive CRR is expired. For credit valuation purposes, only the value of the negative CRR remains in their portfolio. They declare bankruptcy on the day CAISO asks for collateral for the value of that negative CRR, and this is the risk that we believe was worth raising for discussion. As FERC supports the concept of netting, and this is additionally the approach we use currently for other market charges, we are not proposing at this time to disallow netting for CRR portfolio valuation purposes for credit requirements.

3. **Credit requirements for holding short- and long-term CRRs should simply use a mark-to-market methodology, not a VaR-like probability calculation.** CAISO and Commerce both agree that the value of holding CRRs -- the risk exposure -- will change over time. However, the risk exposure for CAISO should be calculated from market values of the CRRs as commercially observed in the auction or absent that, in other markets including energy and capacity. CAISO should not use synthetically-determined values based on a probabilistic model. CRRs have no historical values for meaningful probability modelling. CAISO is simulating these values from a 2002-2005 study period, and this data is too outdated for practical use now.

   CAISO Response:
   CAISO recognizes that the ideal method of valuing the CRRs for credit purposes would be to have perfect insight into energy/LMP prices throughout the term of each CRR. Without that, is it appropriate to project today's (or prices over some longer historical period) energy prices throughout the term of the CRR to value each CRR? On day 1, such historical information will not be available in any event, so another method is required. Once such data becomes available, it may be practical to use it to determine projected energy values over CRR terms. CAISO anticipates examining this question in the future. As of now, given the constraints we face (lack of data, need to develop and computer software systems), the reliance on auction prices is the most viable approach.

4. **Credit requirements for long-term CRRs should use a realistic calculation of both current and potential exposures.** Current exposure is simply the amount of CRRs used (realized) in the current billing cycle that remains unpaid. Potential exposure is the value of the remaining unused CRRs, using mark-to-market valuation methodology and discounted to present value using long-term LIBOR.

In this manner, CAISO will not overburden the CRR holder, and will adequately cover the true risk. This calculation also meets standard industry practice as articulated by the Committee of Chief Risk Officers' Credit Risk Management Working Group in their whitepaper dated November 19, 2002.

CAISO Response:
CAISO agrees that this approach is conceptually appropriate. If there were a means to value the remaining unused CRRs using a realistic forecast of future market prices in a mark-to-market method, ~~that~~ it would be the best approach. However, without such information at this time, CAISO's approach of relying on auction prices appropriately adjusted to reflect uncertainty through the margin concept, should approximate the results of this approach. We assume that we will have an efficient market and that prices parties pay for the CRRs represent the best estimate at that time of the value of the CRR.

5. **Default measures should only compensate CAISO for actual damages, not all monies collected.** CAISO's compliance measures are overly restrictive for the credit-event risk. CAISO is proposing to retain all CRR payments for the defaulting entity's positively-valued CRRs. This effectively becomes a gain for the CAISO, not merely compensation for their actual loss. And, CAISO has no provision for counterparties that leave the market – and the remaining collateral. CAISO stated during the conference call that in the event of a default on CRRs, CAISO would collect the CRRs and reallocate or re-auction them. Please clarify or articulate a policy for this situation.

CAISO Response:
To clarify, CAISO is not proposing to retain payments beyond that necessary to "close-out" the position of the defaulting party.

In conclusion, the credit requirements, as proposed by CAISO, over collateralize for the risks assumed. It poses unnecessarily high costs for market participants and ultimately, the retail load. Market participants without enough unsecured credit will have to post collateral with cash or credit facilities. This will effectively create a barrier for competitive entry, which will reduce liquidity in the CRR market. A CRR market without liquidity and robust participation will cause MRTU to fail as a model.

Commerce thanks the CAISO for considering its comments. Further questions or concerns should be directed to:

Nick Cioll
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Commerce Energy Inc.
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714.259.2564

Ann Hendrickson
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May 11, 2007

SCE Comments on the CAISO Straw Proposal for CRR Credit dated April 27, 2007

SCE appreciates the opportunity to provide comment on the CAISO proposed credit treatment for CRRs. SCE notes that there are detailed issues relevant to the proposal that have yet to be clearly addressed. Additionally, there is an element of the proposal that SCE believes will present a very significant risk if left unaddressed.

Credit Must be Provided Prior to the Allocation and Auction

Currently, the CAISO only proposes to require credit or collateral for those rights that are positively valued. Auctioned or allocated rights that are expected to carry a negative value will not be treated similarly. For negatively valued auction rights, the CAISO proposes to simply withhold the payment of the auction revenues as collateral. For allocated rights, there is no similar treatment as there is no similar revenue to disburse. This methodology is insufficient for two reasons.

First, the methodology does not sufficiently protect against default. One can imagine a scenario in which an entity bids small negative amounts for all source sink combinations in hopes that one or more clears. The CAISO then holds the auction revenue and if at the end of the relevant CRR period, there is remaining value owed to the holder then, the holder takes the financial gain. If, on the other hand, the amount owed from congestion is greater than the amount held from the auction, then the CRR holder simply defaults and the CAISO is left with insufficient collateral to cover the damages.

Second, the methodology leaves the market vulnerable to manipulation. As an example, an LSE could execute the following strategy. Upon allocation, the LSE could sell and transfer via the Secondary Registration System (SRS) all positively valued rights leaving only a portfolio of negatively valued rights. The LSE then defaults turning all customer load back to their default provider. Since the LSE has sold all positively valued rights and only holds negatively valued rights, then the load returning to the default provider will not have CRRs sufficient to cover the expected congestion. In fact, any CRR transfer due to load migration at this point would cost the default service provider.

For these reasons, the CAISO must do the following:

1. Require credit/collateral for negatively valued CRRs at the absolute expected value of the right
2. Require the posting of sufficient collateral to address the potential of a default by an LSE that has sold off positively valued CRRs at the time of the SRS transfer including sufficient credit/collateral to cover the expected payments for negatively valued CRRs as well as to cover the revenue stream for the positively valued rights that would accrue to the load gaining LSE if load migration occurs.

CAISO Response:

The CAISO will not be requiring LSEs that obtain CRRs through the initial allocation to provide Financial Security for negatively values CRRs until the CAISO determines the credit requirements following the initial auction. LSEs are not required to pay for allocated CRRs that are positively valued and LSEs will not be paid for negatively valued CRRs. In addition, CRRs allocated in the initial auction cannot be transferred until credit requirements are in place and entities have sufficient Unsecured Credit or Financial Security to cover net liability for their CRR portfolio.

The CAISO will be requiring parties participating in the CRR auction to post the greater of $500,000 or the absolute value of their bids.

Default Provisions Need More Clarity

It is difficult to completely evaluate the proposed credit provisions given the uncertainty associated with how default will be treated. Currently, the CAISO tariff appears to deal with default through general provisions that would have all CAISO creditors receive a pro-rata reduction in their amounts owed by the CAISO. This would potentially mean that CRR holders as well as other market participants would be impacted by inadequate credit and collateral provisions for CRRs. Couple that with the full funding requirements for CRRs and the implications of a default by a CRR holder becomes further clouded.

For these reasons, SCE requests that the CAISO clarify how default of a CRR holder will be treated.

CAISO Response:

In response to the Commission's directive in its Order on long-term firm transmission rights to require full funding of long-term CRRs, the CAISO modified its tariff language pertaining to the operation of the CRR Balancing Account as part of its January 29, 2007 compliance filing in RM06-8. Under this latest proposal, the Balancing Account is cleared on a monthly basis with no carry over to subsequent months. The funds going into the Balancing Account are: (1) revenues from the CRR auctions (monthly shares of the annual auction proceeds, plus individual monthly auction proceeds); offset by (2) any hourly surplus or deficit from the hourly clearing of the IFM with respect to the congestion components of energy and CRR charges (i.e. congestion charges + charges for negatively valued CRRs – credits for positively valued CRRs).

An important objective of the CAISO with respect to the release of CRRs is to release the correct amount of CRRs such that item (2) be as close to zero as possible at the end of the month so that the auction revenues can be allocated back to Measured Demand as fully as possible at the end of the month. If the Balancing Account is nevertheless negative at the end of the month, there will be an uplift charge to Measured Demand for the month, so that the charges and credits invoiced to CRR Holders are at full value (except in cases of extraordinary events). In this way CRRs are "fully funded".

The full-funding requirement for CRRs does not guaranty that CRR Holders that have charges in any given settlement period pay their invoiced amounts, nor does it guaranty that CRR Holders that are owed money based on their entire settlement statement for any given settlement period, of which their CRR holdings are only one element, will receive 100% of that amount. The CAISO's credit policies are intended to guard against these occurrences. Accordingly, all Market Participants, including CRR Holders, are required to be creditworthy or have an adequate Unsecured Credit Limit or posted adequate Financial Security to cover their Estimated Aggregate Liability to the CAISO, including any liability for CRRs that require payments from CRR Holders. Non-payments by CRR Holders will be treated the same way under the MRTU Tariff as Non-payments by Scheduling Coordinators are treated under the currently effective ISO Tariff. These provisions are set forth in ISO Tariff Sections 11.12 through 11.16. In brief summary, after exhausting available options, any revenue shortfall resulting from non-payment will be applied pro rata to net ISO Creditors for the relevant settlement period.

The Commission asked the CAISO to clarify this issue in its September 21, 2006 MRTU Order at P 854. The CAISO has not yet made this compliance filing but has posted draft MRTU tariff language at http://www.caiso.com/1bbb/1bbb13cef298f0.doc that clarifies that defaults by CRR Holders are handled like defaults by Scheduling Coordinators. See MRTU Tariff Sections 11.29.13 through 11.29.17.

Credit Requirements for Long-Term CRRs

CAISO has recognized that long-term CRRs are volatile, yet there is no true mechanism in place if there is any change in value of the long-term CRR over time. Given the value of these CRRs are volatile, the CAISO has not adequately stated how it will monitor changing credit requirements. CAISO has also not stated how frequently they will adjust the credit requirement, except for that it will happen at least once a year. Therefore, SCE recommends that credit and collateral related to LT-CRRs be evaluated on the same basis as that of annual and monthly CRRs. That is, the CAISO will re-evaluate the value and credit requirements weekly as well as upon any CRR transfers initiated in the Secondary Registration System.

Additionally, SCE is concerned with the amount of credit/collateral that must be provided for LT-CRRs. As one option, the CAISO has suggested that a CRR holder would be required to collateralize the full term of the LT-CRR. SCE believes that this could present significant barriers to holding a LT-CRR. Additionally, SCE believes that the risk exposure for a LT-CRR is very different if the value of the right is negative versus if the value is positive. Based upon this, SCE believes that the credit requirements should also therefore be different. SCE recommends that the CAISO base the credit/collateral for LT-CRRs with a positive expected value on a rolling 12 month basis. This would be re-evaluated at regular intervals. For negatively valued CRRs, the CAISO should base credit/collateral on the remaining term of the LT-CRR.

CAISO Response:

As noted above, the CAISO will be developing means to evaluate the projected value of CRRs more often thean yearly and will likely evaluate them on a monthly basis using auction results.

May 9, 2007

Comments by California Department of Water Resources on CAISO Straw Proposal for CRR Credit Policy

The CDWR welcomes the opportunity to comment. We recognize and appreciate the need to strike a balance between financial requirements and risk tolerance. If left to choose between low or high financial requirements our preference leans more towards financial requirements that provide greater financial protection as opposed to a lower bar that allows ease of entry.

Credit requirement to bid on negative CRRs

During the May 4, 2007 conference call a large part of the discussion and commentary from market participates centered on the straw proposal treatment of not requiring a credit requirement to participate in bidding for negatively priced CRRs. While not having an explicit recommendation as to what is an appropriate credit requirement for bidding on negatively priced CRRs CDWR shares the same concerns of those that spoke during the conference call that some level of collateral should be posted prior to bidding on negative CRRs.

CAISO Response:

As noted above, the CAISO will be proposing that bidders provide security equal to the greater of $500,000 or the absolute value of their bids.

Short-term CRR credit requirements

With respect to the decision of which percentile value to use; 1, 2.5, or 5 CDWR is okay with using the fifth percentile.

Long-term CRR credit requirements

With respect to the four options proposed for determining long-term CRR credit requirements, CDWR agrees with the CAISO preference toward either Option 2 or 4 with a slight preference towards Option 4.

Compliance

The measures outlined seem sufficient though we are wondering what the time horizon is to meet the credit requirement. We wouldn't want to be excluded forever from holding and acquiring CRRs if we had a margin call and missed the payment deadline for some reason (an administrative issue on our end for instance) not due to insolvency.

Credit Offsets

CDWR favors assessing credit requirements fore each individual CRR.

CAISO Response:

Consistent with established FERC policy and CAISO policy, the CAISO will net the value of CRRs in a CRR Holder's portfolio. The CAISO will not net the positive valued of a CRR portfolio against a Market Participant's other liabilities to determine their EAL.

Appendix C-6

California ISO
Your Link to Power

California Independent
System Operator Corporation

Memorandum

To: ISO Board of Governors

From: Charles King, Vice President, Market Development and Program Management
Shucheng Liu, Principal Market Developer
Phil Leiber, Treasurer and Director of Financial Planning
Sidney Davies, Assistant General Counsel -Tariff and Compliance

Date: May 21, 2007

Re: ***Decision on Proposed Congestion Revenue Rights Credit Policy***

This memorandum requires Board action

INTRODUCTION

Congestion Revenue Rights (CRR) is a central component of the CAISO MRTU project. It is a financial instrument designed to hedge transmission congestion charges under the locational marginal pricing (LMP) system. Like a Firm Transmission Right (FTR) in today's market, a CRR entitles its holder to receive a payment from the CAISO if the congestion in a given trading hour is in the same direction as the CRR. Unlike today's FTRs, however, a CRR requires the holder to pay a charge to the CAISO if the congestion in a given trading hour is in the opposite direction of the CRR. In case a CRR holder is unable or unwilling to make the required payment (default or bankruptcy) the uncovered financial loss will be shared by other market participants, potentially for the entire term of the CRR. In order to minimize the occurrence and the impact of such situations, credit policies governing the financial requirements for obtaining and holding CRRs need to be established and enforced.

The objective of the CRR credit policy is to protect the financial interests of all market participants by reducing the likelihood of default and mitigating the losses to other market participants if a default happens. At the same time, the policy should not be overly conservative so as to create an inefficient barrier to entering the CRR market for creditworthy market participants. A policy imbalance in either direction will discourage the participation of market participants and eventually reduce the liquidity and effectiveness of the CRR market.

The initial CRR allocation will take place in June, with the first auction following in October 2007. Accordingly, it is necessary for the CRR credit policy to be filed with FERC in June to allow for the effectiveness of these provisions by those dates.

The framework for the credit policy already exists. Under the currently effective ISO Tariff, market participants must have sufficient Aggregate Credit to cover their Estimated Aggregate Liabilities. The MRTU Tariff filed in February 2006 requires CRR holders to have Aggregate Credit to cover the net projected value of their CRRs for the term of

the CRR instruments. Over the past several months, the CAISO has been working with stakeholders to flesh out the specific details concerning credit policies applicable to CRRs. The details discussed in the memorandum strike a balance between the goal of mitigating the effect of defaults affecting creditors due to potential payment defaults by CRR holders while allowing creditworthy entities to hold CRR without onerous credit requirements. The CAISO gained valuable insight from the practices of peer ISOs and feedback from stakeholders and these insights have shaped Management's recommendation.

KEY ELEMENTS OF THE CAISO CRR CREDIT POLICY

1. CRR Credit Requirement Generally

There are two ways to obtain CRRs from the CAISO. One is through the CRR allocation process and the other is through the CRR auction. All CRR holders—regardless of whether the CRRs are allocated or purchased in the auction-- will be subject to the CAISO's credit policies for holding the CRRs. In addition, market participants will be subject to credit requirements to participate in any CRR auction.

The CRR allocation is open to Load-Serving Entities (LSEs) only, to enable them to better manage the exposure of their end-use customers to transmission congestion charges in the MRTU markets. For CRRs obtained through the allocation process the LSEs do not make any payment to the CAISO nor are paid by the CAISO to hold these CRRs. Once the CRR allocation process is complete, however, LSEs will have to have sufficient Available Credit[1] to assume the ownership of allocated CRRs.

On the other hand, all market participants can participate in CRR auction by submitting bids to purchase positively or negatively valued CRRs. Just like any other market, there are potential opportunities for speculation and gaming that could have adverse impacts on other parties if market rules and credit requirements are not properly designed. Absent credit requirements for participation in the CRR auction, a participant could potentially submit bids to purchase positively priced CRRs that would be beyond its financial capability to pay for, and then fail to pay the purchase price for CRRs won in the auction. Alternatively, a participant could bid for negatively priced CRRs, take the payments by the CAISO and then default on subsequent payment obligations to the CAISO to the detriment of market creditors in the months of the defaults. To limit the likelihood of this occurring, the CAISO proposes the following credit policies.

2. Auction Credit Requirements

The CAISO proposes to require a $500,000 minimum Available Credit amount to participate in the auction. Available Credit must also exceed the absolute value of all bids for either positively priced or negatively priced CRRs. Otherwise, all the bids made by the participant will be rejected.

After the conclusion of the auction, and subject to the credit requirements applicable to CRR holders (discussed subsequently), winners will pay the full amounts (sum of auction market clearing price times MW quantities awarded) to the CAISO for positively priced CRRs awarded, and CAISO will pay the full amounts to market participants awarded for negatively priced CRRs.

3. Credit Requirement to Hold Short-Term CRRs

[1] Available Credit is defined as the Aggregate Credit Limit (which consists of Unsecured Credit Limit and/or Collateral) less their Estimated Aggregate Liability (the value of unpaid obligations to CAISO).

Due to many unpredictable factors, such as load, generation resource availability, transmission outage, etc, the power flow on the transmission grid as well as congestion pattern changes constantly. LMPs are potentially very volatile

By definition, congestion revenue of a CRR is the difference between the congestion components of the LMP at sink and the LMP at the source times the megawatt quantity of the CRR, based on the LMPs of the Day Ahead Integrated Forward Market. The congestion revenue of a CRR can vary from one hour to the next and could also swing from positive to negative from hour to hour. Thus the congestion revenue of a CRR over its specified term is a stochastic variable. These properties of CRRs apply irrespective of whether the CRR is short-term or long-term in nature. Consequently, the credit requirement for holding a CRR must be designed to reasonably cover the potential actual congestion revenues in the event that actual congestion revenues differ from those expected at the time of the auction.

The CAISO therefore proposes a method to determine the credit requirement for holding a Short-Term CRR (ST-CRR, with a term of one year or less). It is similar to the Value-at-Risk (VaR) method that is widely used in risk management. Specifically, the credit requirement for holding a ST-CRR is the negative of the auction price plus a credit margin of the ST-CRR.

The auction price component of the credit requirement reflects the expected value of ST-CRR, i.e., the expected value of payments to the holder in the case of a positively priced ST-CRR and the expected value of payments by the holder to the CAISO in the case of a negatively priced ST-CRR. The credit margin is calculated as the difference between the expected value and 5th percentile value from the probability distribution of congestion revenue of the ST-CRR. The combination of the auction price component and the credit margin is designed such that in case of default by the holder, the likelihood that the credit requirement will not fully cover the payments due from the ST-CRR holder is five percent or less. Accordingly, entities will be required to maintain Available Credit to support these prospective obligations.

With respect to deterging the credit margin, for the first year of the CAISO MRTU operation, there will be no historical LMP data available. The prices simulated in CAISO LMP studies will therefore be used initially to calculate credit margins for all ST-CRRs. In the future, actual LMP data will be used to revise the required credit margins.

If a holder owns more than one CRR, the overall credit requirement is assessed for the whole portfolio of CRRs of this holder. The excess credits from CRRs with high positive auction prices can offset up to the same amount of the credit requirements for other CRRs in the same portfolio. However, the excess credits of a CRR portfolio will not offset any other component of the participant's Estimated Aggregate Liability, as it would be inappropriate to permit speculative future cash flows to offset credit requirements necessary to support payment obligations for transactions that have already occurred, and for which financial clearing must take place prior to the availability of such future CRR payment streams.

An Out of Control Area Load Serving Entity (OCALSE) who is allocated ST-CRRs will be subject to the same credit requirements for holding ST-CRRs as other market participants. Additionally, OCALSE will be required to maintain one period of credit coverage for their Wheeling Access Charge (WAC) prepayment beyond the current period. Per the FERC April 20, 2007 Rehearing Order OCALSEs will be required to prepay the WAC on a monthly basis in advance of the trade month.

4. Credit Requirement to Hold Long-Term CRRs

All requirements for holding ST-CRRs apply to Long-Term CRR (LT-CRR, CRRs with terms longer than 1 year). In case of a default involving a LT-CRR, the CAISO may choose to resell it in the subsequent monthly auctions, but it

may not be possible for a LT-CRR to be fully liquidated at the auction. If the LT-CRR is not resold in an auction, the financial loss includes not only the current period congestion revenue payments of the defaulting LT-CRR holder, but also the congestion revenue payments due for all the years in the remaining term of the defaulted LT-CRR. Therefore the one period credit requirement for holding a ST-CRR does not provide all necessary coverage for holding a LT-CRR. Instead, the credit requirement for holding a LT-CRR must cover financial risk over the whole term of the LT-CRR.

Accordingly, the CAISO must value the long-term CRRs in a manner that reasonably reflects the payment obligations over the term of the CRR. CAISO proposes the following method for such valuation and to determine the credit requirement for holding a LT-CRR:

- The credit requirement for holding a LT-CRR is the negative of the one-year CRR auction price times the number of years remaining in the term of the LT-CRR plus the one-year CRR credit margin times the square root of the number of remaining years of the LT-CRR term.

The credit requirements for holding LT-CRRs will be adjusted not less than annually. The adjustment will account for the change of remaining terms of the LT-CRRs and the new auction prices of ST-CRRs. The credit margins will also be updated no less than annually based on the actual LMP data from the market operation of the past year.

5. COMPLIANCE MEASURES

To help ensure that CRR holders maintain sufficient Available Credit to cover the credit risk of their CRR portfolios, the CAISO will reassess the value of CRRs on a monthly basis using the latest monthly auction prices. In addition, the CAISO will recalculate the credit margin periodically based on actual LMP data. Credit requirements for both the current owner and prospective new owner will be evaluated and adjusted if necessary when the ownership of a CRR is to be transferred through either secondary market trading or through load migration.

All CAISO market participants, including CRR holders are required to comply with the CAISO credit requirements as set forth in Section 12 of the Tariff, including meeting CAISO calls for additional Financial Security to cover CRR and other market obligations. CRR holders that do not comply with the CAISO credit requirements or otherwise default on payments will also be subject to the following, as appropriate:

- Retain Financial Security sufficient to cover the value of all of the market participant's liabilities including the future value of their CRR obligations
- Retain all payments related to the CRRs (or other market related payments otherwise due the market participant) and resell the CRRs in subsequent auctions
- Terminate all CRR agreements with the default holder
- Exclude the holder from eligibility to participate in the allocation or auction until all defaults have been cured and require the holder to post an additional Financial Security Amount in lieu of an Unsecured Credit Limit for future participation, and
- Resell the CRR, including Long-Term CRRs (either the remaining term or through the monthly or seasonal auctions).

6. MARKET MONITORING

The credit policies described above represent the primary mechanism by which the CAISO may deter potential detrimental behavior by market participants. Other steps to deter detrimental behavior that can be taken by the CAISO Department of Market Monitoring (DMM) include:

- Requiring that auction participants disclosure affiliations with any other entities bidding in the auction.
- Providing a warning to participants that CAISO and FERC market rules prohibit provision of false information to the CAISO, or manipulative trading practices involving fraudulent or collusive behavior.
- Referring any behavior that may appear – based on information available to DMM - to potentially violate any CAISO or FERC market rules prohibiting false information or market manipulation to FERC.

STAKEHOLDER PROCESS

The following dates and milestones provide an overview of the larger CRR stakeholder process CAISO staff have conducted since mid 2006, as well as an indication of certain key upcoming milestones in this process.

Stakeholder Process:

- Stakeholder Meetings – February 27 and April 3, 2007
- Stakeholder Conference Calls – March 27, May 4 and May 16, 2007
- Stakeholder written comments submitted – March 9, April 6, and May 11, 2007

Key Upcoming Milestones:

- Planned filing on CRR Credit Policy –June 2007

Also attached are the matrix of stakeholder written comments and responses by the CAISO.

DMM OPINION

Members of the CAISO Department of Market Monitoring have participated in the stakeholder process and discussions on these CRR credit policy matters. Their options are reflected in this memorandum.

MANAGEMENT RECOMMENDATION

Management recommends that the Board approve this proposal and authorize Management to file the associated tariff with FERC, and to implement the CRR credit policy as needed to achieve the scheduled startup of the CRR auctions.

Motion

Moved, that the ISO Board of Governors approve the credit policy for Congestion Revenue Rights as outlined in the memorandum dated May 21, 2007; and

That the ISO Board of Governors authorize Management to make all the necessary and appropriate filings with the Federal Energy Regulatory Commission to implement this proposal.

Appendix C-7

Board of Governors 5/30/2007 **Decision on CRR Credit Policy**

Moved, that the ISO Board of Governors approve the credit policy for Congestion Revenue Rights as outlined in the memorandum dated May 21, 2007; and

That the ISO Board of Governors authorize Management to make all the necessary and appropriate filings with the Federal Energy Regulatory Commission to implement this proposal.

Moved: Gage Second: Capuano

Board Action: **Passed** Vote Count: **5-0-0**	
Capuano	Y
Gage	Y
Lowe	Y
Page	Y
Willrich	Y

Motion Number: 2007-05-G1

Appendix C-8

SCE Comments on the Draft CRR Credit Requirement Tariff Language Dated June 6, 2007

CAISO Reponses ADDED

SCE appreciates the opportunity to provide comment on the proposed tariff language governing CRR credit terms. SCE generally believes that the proposed tariff language is in concert with the direction established in the stakeholder process and ultimately approved by the CAISO Board. SCE does believe however that certain areas of the tariff could benefit from modification and/or clarification. SCE submits the following for your consideration.

Credit Requirement Formula

Calculation of credit requirement

SCE understands and appreciates the intent of the formula utilized to calculate the credit requirement for both short-term and long-term CRRs. However, SCE remains concerned that if the CRR Auction Price and the CAISO calculated Expected CRR Congestion Revenue differ substantially, such a difference could cause dramatic and potentially unnecessary credit obligations. Worse yet, those obligations would apply to allocated rights for which the allocation process preceded the auction process and for which entities made requests without being able to ascertain the credit obligations prior to their request. This is particularly concerning in the first year where entities will have no experience with LMP nor with the auction of CRRs and therefore will have little basis to estimate their credit exposure prior to the allocation and auction.

At a minimum, SCE requests that the CAISO implement some process that would ensure that if the CRR Auction Price differs significantly from the CAISO calculated Expected CRR Congestion Revenue, the impact on credit obligations will be mitigated. Take for example, a scenario in which the CRR Auction Price clears at $1 while the CAISO calculated Expected CRR Congestion Revenue is $10 and the Fifth Percentile CRR Congestion Revenue is $-1. Under these circumstances, for a one year right, the credit obligation would be $10/MW (-1 + 10 – (-1)). On the other hand, had the auction cleared at the CAISO calculated Expected CRR Congestion Revenue, the credit obligation would have been $1/MW (-10 + 10 – (-1)). This unanticipated eight fold increase in credit obligation would likely have significant consequences on the entity holding this right.

It is not clear that the auction result provides sufficient evidence that the CAISO calculated Expected CRR Congestion Revenue should be adjusted as it is in this formula. In fact, the CRR process developed by stakeholders relies primarily on an allocation of rights and may have a very small auction market. SCE understands that even with a small number of bids, the CAISO can calculate auction results for all source sink pairs. However, it is not clear that a small number of bids will produce economically efficient results.

Based upon these observations, SCE recommends that the auction price be restricted to be ± 20% of the CAISO calculated Expected CRR Congestion Revenue. In the example above where the auction cleared at $1, this would equate to a credit obligation of $3 (-8 +10 –(-1)). By utilizing such a process, a CRR holder will be able to reasonably estimate and bound their credit exposure of holding a CRR prior to that close of the auction process.

CAISO Response

The CAISO's intention is to calculate Expected CRR Congestion Revenue based on the CRR Auction Prices and will clarify the definition of Expected CRR Congestion Revenue accordingly. SCE's question in this regard appears to be based on an assumption that the CAISO would be forecasting Expected CRR Congestion Revenues or using LMP study data to calculate Expected CRR Congestion Revenues. This is not the case. The CAISO believes the only reasonable basis for calculating the Expected CRR Congestion Revenues are the CRR Auction Prices. The Credit Margin, on the other hand, is based on LMP study data but is based on the *variability* between LMPs and not on the LMPs themselves. The CAISO has revised the tariff language to reflect these distinctions.

SCE is correct that LSEs will not know their credit requirements for their allocated CRR proposals until after the auction but believe this is a risk that LSEs can manage by selecting CRRs with positive expected value and electing to purchase some CRRs in the auction. The CAISO believes this is the right approach due to the lack of any other reasonable alternative. Since the CAISO will be calculating the Credit Margins based on the variability of LMPs in the LMP studies, the CAISO can and will publish the Credit Margins in advance of the CRR allocation.

Formulaic consistency

Taken in context, it appears that the tariff language intends to calculate credit requirements on a dollar per megawatt basis. However, the tariff language and additional definitions are not completely clear in this matter. Notably, the Credit Margin is defined as Expected CRR Congestion Revenue minus Fifth Percentile CRR Congestion Revenue. The use of the term revenue here implies price multiplied by quantity (or dollars per megawatt multiplied by megawatts).

SCE recommends therefore that section 12.6.3.4, and the definitions of Credit Margin, Expected CRR Congestion Revenue, Fifth Percentile CRR Congestion Revenue be clarified so that they are evaluated on a dollars per megawatt basis and are on consistent terms with the CRR Auction Price.

CAISO Response

The CAISO agrees that the tariff language requires modification to be consistent and has revised the tariff language accordingly.

Frequency of Evaluation

As drafted, section 12.6.3.1(c) states:

> The ISO shall reevaluate the credit requirements for holding CRRs, and shall adjust the credit requirements accordingly, not less than annually. The ISO may adjust the credit requirements for holding CRRs with terms of one year or less more frequently than annually at the ISO's discretion to account for changes in the monthly auction prices for CRRs. The ISO may adjust the credit requirements for holding long-term CRRs annually to reflect the number of years remaining in the term of any Long Term CRR, to reflect the changes in auction prices of one-year CRRs in annual auctions, and to reflect updates to Credit Margins based on actual Locational Marginal Price data derived from market operations.

SCE notes that the CAISO allocation and auction processes operate annually and monthly. SCE believes that it is likely that a significant portion of CRR holders will participate in the monthly allocation and/or auction process. Further, the CAISO will evaluate the credit obligation of a CRR holder based upon the entire portfolio of their CRR holdings. Since it is likely that a majority of the holders will obtain additional CRRs in the monthly allocation and auction process, the CAISO will necessarily have to re-evaluate credit on a monthly basis.

Given this, SCE does not believe it would be a significant burden for the CAISO to re-evaluate the credit obligation of all CRR holders on a monthly basis. As such, SCE recommends section 12.6.3.1(c) be modified as follows:

> The ISO shall reevaluate the credit requirements for holding CRRs, and shall adjust the credit requirements accordingly, not less than monthly. The ISO may adjust the credit requirements for holding CRRs with terms of one year or less more frequently than monthly at the ISO's discretion to account for changes in the monthly auction prices for CRRs. The ISO may adjust the credit requirements for holding long-term CRRs annually to reflect the number of years remaining in the term of any Long Term CRR, to reflect the changes in auction prices of one-year CRRs in annual auctions, and to reflect updates to Credit Margins based on actual Locational Marginal Price data derived from market operations.

CAISO Response

The CAISO accepts the suggestion change.

Credit Evaluation for Transfers in the Secondary Registration System (SRS)

As drafted, Section 12.6.3.1(d) states:

> In cases where the ownership of a CRR is to be transferred through either the Secondary Registration System or through load migration, the ISO shall, if necessary, evaluate and adjust the credit requirements for both the current owner of the CRR and the prospective owner of the CRR as appropriate.

SCE notes that there is no timing requirement in the current draft of this section. SCE continues to advocate that such credit evaluation and any necessary posting of additional credit should take place before the CAISO approves any SRS transfer. Therefore, SCE recommends modification to 12.6.3.1(d) as follows:

> In cases where the ownership of a CRR is to be transferred through either the Secondary Registration System or through load migration, the ISO shall, if necessary, evaluate and adjust the credit requirements for both the current owner of the CRR and the prospective owner of the CRR as appropriate. Such evaluation and any incremental credit requirements resulting must be met prior to the transfer becoming effective.

CAISO Response

The CAISO agrees to add tariff language to require credit requirements be satisfied as a condition precedent to the transfer of CRRs.

Publication of Data

In order to provide market participants with a means to evaluate their credit obligation with respect to planned allocation requests and/or auction bids, the CAISO should post the Expected CRR Congestion Revenue, and the Fifth Percentile CRR Congestion Revenue. Such posting should be made in a manner to allow ample time for market participants to evaluate the impacts of their requests and/or bids prior to the allocation and auction process. The commitment to publish such data should be included in the tariff.

CAISO Response

As discussed above, the Expected CRR Congestion Value will be based on the CRR Auction Prices and, therefore, cannot be known in advance. The Credit Margins can be published in advance and the CAISO agrees to publish the Credit Margins in advance of the first CRR Allocation, which is scheduled to begin on July 20.

Potential Typographical Error

SCE believes that there is a typographical error in section 12.5(d). Currently, the section reads:

> The ISO may restrict, suspend, or terminate the Market Participant's CRR Entity Agreement of Service Agreement.

SCE believes that this should read:

> The ISO may restrict, suspend, or terminate the Market Participant's CRR Entity Agreement and/or Service Agreement.

CAISO Response

The CAISO will make the correction changing "of" to "or".

ATTACHMENT D

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation	))	**Docket Nos. ER07-613-___ and ER07-____-000**

DECLARATION OF SCOTT M. HARVEY

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UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation	))	**Docket Nos. ER07-613-___ and ER07-____-000**

DECLARATION OF SCOTT M. HARVEY

I, Scott M. Harvey, declare:

I. QUALIFICATIONS

1. I am currently a director in the Cambridge office of LECG. I have a B.A. in economics from the University of Illinois and a PhD in economics from the University of California Berkeley. I have a detailed understanding of the design of electricity markets based on locational marginal pricing (LMP). I participated in the development of the LMP–based electricity markets currently operating in PJM, New York, New England, and the Midwest ISO and am currently assisting the California ISO with the development and implementation of electricity markets based on locational marginal pricing and financial transmission rights (congestion revenue rights or CRRs in California terminology).

2. During the past winter and spring, I have assisted the CAISO with the development of its initial credit policy for the purchase and holding of CRRs, preparing background white papers and participating in stakeholder conference calls on CRR credit issues.[1]

II. OVERVIEW

3. CRRs are point-to-point financial instruments that hedge congestion charges on the California ISO transmission system. A CRR entitles and obligates the holder to be paid or to pay the difference between the congestion component of the LMP price in the day-ahead market at the sink and at the source of the CRR. Because CRRs are obligations, not options, CRR holders will be obligated to make payments to the CAISO covering hours in which the congestion component at the sink is lower, or more negative, than the congestion component at the source. CRR holdings thus can potentially give rise to payment obligations.[2]

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[1] I have also been assisting the NYISO with the analysis of credit issues since November 2006, including analysis of credit requirements for the holding of financial rights in NYISO markets (transmission congestion contracts or TCCs). My testimony here draws upon my prior work for the NYISO and benefits from past discussions of these issues with David Babbel of the Wharton School and Charles Garber, Sheri Prevratil, and Kyla Douglas of the NYISO. The views expressed in this testimony are not necessarily attributable to any of those mentioned, and any remaining errors are solely the responsibility of the author.

[2] No credit coverage is required for the holding of firm transmission rights (FTRs) in the current CAISO market design because these FTRs are defined as options so there is no potential for payments being required of the holder once the FTR is acquired.

4. If a CRR is held to hedge congestion charges on generation at the CRR source used to meet load at the CRR sink, then any CRR payment obligation (i.e., a negative CRR payment) would be offset by a negative transmission usage charge, resulting in no net payments to the CAISO by the CRR holder.

5. Experience in eastern LMP markets has shown, however, that not all CRRs (FTRs in PJM, MISO and ISO New England, TCCs in New York) will be held by loads to hedge congestion charges on the generation used to meet their load. It is likely that some CRRs, particularly negatively priced CRRs, will be held by entities that are not holding the CRR to hedge their congestion risk, but are accepting congestion risk by holding the CRR in exchange for an expected, but uncertain, return. This is, in principle, a desirable outcome and a benefit of LMP-based competitive markets. If load-serving entities (LSEs) have a demand for congestion hedges that exceeds the transfer capability of the transmission system and are willing to pay a risk premium for such hedges, other entities that are better able to bear this kind of risk may be willing to acquire counterflow (i.e., negatively priced) CRRs in the auction in exchange for this risk premium. For such entities, the CRR payment will not be offset by a transmission usage charge and it is essential that the CAISO credit policy ensure that entities taking such positions are, in fact, better able to bear risk.

6. The CAISO faces two different kinds of credit risk stemming from the CRR holdings of market participants. First, some CRR auction participants will likely buy CRRs that are negatively priced in the CRR auctions.[3] In essence, these auction participants are selling congestion management in the forward market, which is desirable from the standpoint of overall market performance. It will necessarily be the case that the award of a negatively priced CRR in the auction will make possible the award of positively priced CRRs that otherwise would not satisfy the simultaneous feasibility test. The payments to the holders of negatively priced CRRs will be funded by payments for the positively priced CRRs whose award is made feasible by the sale of the negatively priced CRRs.

7. In the case of a generator that holds such counterflow CRRs, these holdings may be hedged by the ability of the generator to offer its resource into the day-ahead market in which CRRs are settled. However, counterflow CRRs may also be held by financial players that are not hedged against variations in spot market prices and congestion charges. Absent credit requirements, there would be a risk that the holder of such negatively priced CRRs could be unable or unwilling to make payments when required, inflicting losses on the CAISO congestion rent account that would ultimately be borne by other market participants. In effect, if the holder of a counterflow CRR were to default, the counterflow CRR would be removed from the outstanding CRRs and the remaining CRRs would not satisfy the simultaneous feasibility test. This would create a potential for the CAISO CRR settlements as a whole to be revenue-inadequate.[4]

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[3] I.e., the CRR buyer is paid to hold the CRR because the CRRs are expected to entail payments by the holder to the CAISO settlements account rather than payments from the CAISO congestion rent account to the CRR holder.

[4] It is noteworthy that absent the counterflow (i.e., negatively priced) CRR, it is necessarily the case that the remaining CRRs will not satisfy the simultaneous feasibility condition (i.e., it is not the case that they might not

8. Second, there is a potential for CRR auction participants to buy CRRs at positive prices, i.e., CRRs that are expected at the time of the auction to entail payments from the CAISO congestion rent account to the CRR holder, but which turn out in practice, as a result of unexpected changes in market conditions, to require payments by the CRR holder to the CAISO congestion rent account. This outcome is particularly likely in the case of CRRs with relatively low, but positive, prices in the auction. As in the first case if these CRRs are not held to hedge congestion risk but to accept congestion risk, absent credit requirements there would be a risk that the CRR holder would be unable or unwilling to make these payments when required, thus reducing the payments into the CAISO congestion rent account.[5]

9. The determination of the initial post-auction credit requirement, i.e., the credit that must be maintained once the auction results are known, is discussed in Section IV. The term "uncollateralized CRR payment" is used to refer to a situation in which the holder of a particular CRR would be required to make a payment to the CAISO in excess of the initial credit requirement for holding that CRR.

10. The CAISO credit policy could address the first risk of non-payment by holders of negatively priced CRRs by requiring holders of negatively priced CRRs to maintain credit sufficient to pay back the price of the CRR in the auction (i.e., to cover the expected value of CRR payments). While such a CAISO credit policy would ensure the ability of CRR holders to cover their obligations if actual congestion levels equal those anticipated in auction prices, such a credit policy would not ensure that CRR holders would be able to cover their obligations in the event that actual congestion charges in the day-ahead market were higher than expected. Since one reason LSEs hold positively priced CRRs is to hedge them against the possibility that congestion charges in the day-ahead market may be higher than expected, the potential for the holders of negatively priced CRRs to be called upon to make payments in excess of the expected level is not remote and should be accounted for in the CAISO credit policy. Moreover, such a credit requirement would not entail any coverage for potential uncollateralized CRR payments by the holders of positively priced CRRs.

11. A more appropriate credit requirement would require the holders of negatively priced CRRs to provide credit coverage in excess of the expected payments and also require credit coverage for some positively priced CRRs, ensuring that the probability of uncollateralized CRR payments does not exceed a threshold set by the CAISO, based on the expected variability of CRR payments. While the imposition of such a credit requirement may deter participation in the CRR auction by some entities, that is a pro-competitive and efficient outcome if the credit requirement is reasonably related to the

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satisfy this test; they will not satisfy a simultaneous feasibility test). The price of the CRR in the auction would not be negative unless this was true.

[5] There is a somewhat subtle distinction in this case, however, in that while the CAISO congestion rent account will necessarily have a lower balance by the amount of money which is not received due to the default, it is possible, in the case of CRRs having positive values in the auction which turn out to have negative values in the day-ahead market, that the remaining set of CRRs will still satisfy the simultaneous feasibility test, so the CAISO will still collect enough congestion rents to pay all CRR holders despite the default. Indeed, in the event of such a change in congestion patterns that causes CRRs with positive auction prices to have negative values in the day-ahead market, the CAISO might have a large surplus in its congestion rent account.

CAISO's potential exposure. Economic efficiency is enhanced by allowing broad participation in CRR auctions, potentially facilitating the shifting of congestion risk from LSEs to financial entities better able to bear some of that risk. If the entities acquiring risky CRRs in the auction are actually not better able to bear congestion risk but are allowed to acquire CRRs as a result of lax credit requirements, LSEs pay a premium to avoid congestion risk but do not actually avoid the congestion risk because the risk is transferred back to them when the uncreditworthy CRR holder fails to cover its obligations. Such an outcome would be neither procompetitive nor efficient. Preventing entities from taking on more congestion risk than they are capable of bearing is efficient and does not reduce either competition or liquidity in the auction.

12. While PJM and the NYISO have several years of historic CRR payments that can be analyzed in assessing the level of credit coverage required to provide the intended level of payment assurance given the historic variability of CRR payments, the CAISO has no such historic data on variations in overall congestion patterns. The CAISO has established preliminary credit coverage based on simulation analyses of historical load and generation data and will revise the credit coverage margin as warranted by actual experience.

13. Section V discusses how the initial credit requirement might be adjusted over time as the CRR holder makes or receives payments. One approach would be to require that the entire initial collateral requirement be maintained over the duration of the CRR. Such a credit policy tends to raise the effective credit requirement over time for negatively priced CRRs. Another approach would be to gradually reduce the credit coverage requirement over time.

III. INITIAL CREDIT REQUIREMENT FOR HOLDING CRRS

A. Negatively Priced CRRs

14. An obvious credit risk associated with the sale of CRRs in the CAISO CRR auctions is the possibility that thinly capitalized entities could buy counterflow (negatively priced) CRRs, take the auction payments and default when payments on the counterflow CRR are due.[6] A CRR credit requirement can address this risk in part by requiring that entities purchasing CRRs at negative prices in the auction maintain credit equal to the absolute value of the CRR auction price. Thus, an entity that buys a counterflow CRR in an auction in exchange for receipt of a payment of $10,000,000 would be required to

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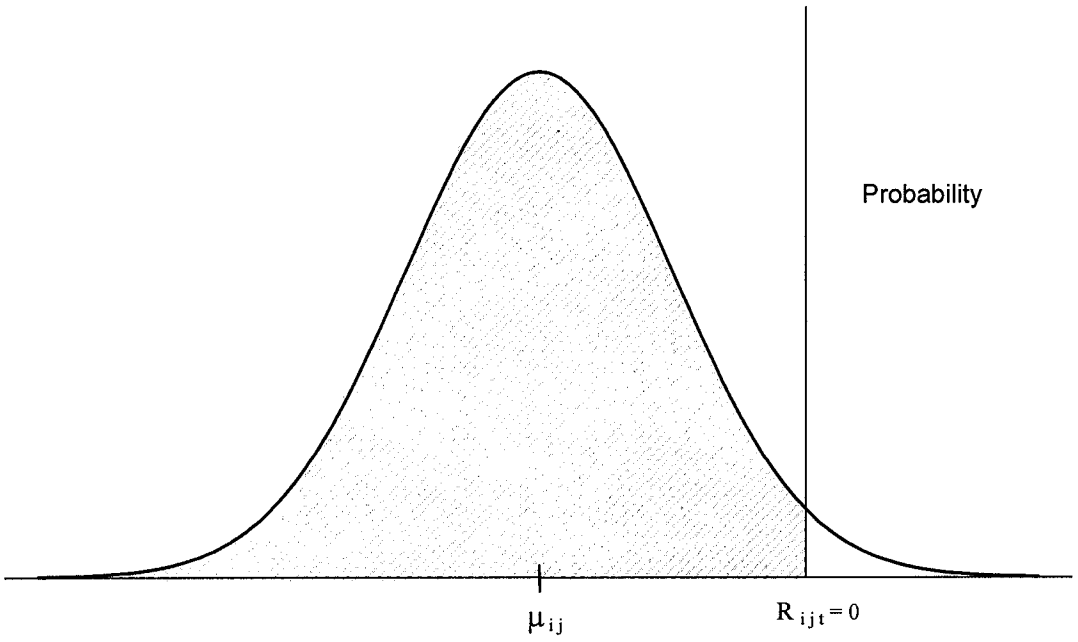
[6] This risk exists because the CAISO proposes to settle CRR auctions prior to settling payments to CRR holders for the relevant period. If payments and charges for the purchase of CRRs in an auction were settled at the same time that payments to CRR holders were settled, this risk would not be present and less credit would be needed to protect the CAISO against uncollateralized CRR payments. Under such a settlement system, however, the buyer of the counterflow CRR would lose the value of the cash for the period of the time between the auction and the settlement of CRR charges for the month, which would result in a foregone value at least as large and probably larger than the cost of maintaining an equivalent amount of credit coverage. In drawing comparisons of credit policies across ISOs/RTOs it is essential to take account of these differences in settlement timing as a settlement system with a lower credit requirement may impose a larger overall financial burden on CRR holders.

maintain credit coverage for $10,000,000, which would cover the expected value of the required future payments by the CRR holder.

15. For example, if the CRR payment (R_{ijt}) were a normally distributed random variable with a mean (μ_{ij}) and a standard deviation (σ_{ij}), then for each CRR_{ij} there would be an associated probability of observing a payment to the CAISO being required in month t ($R_{ijt} < 0$), as illustrated by the shaded region in Figure 1.

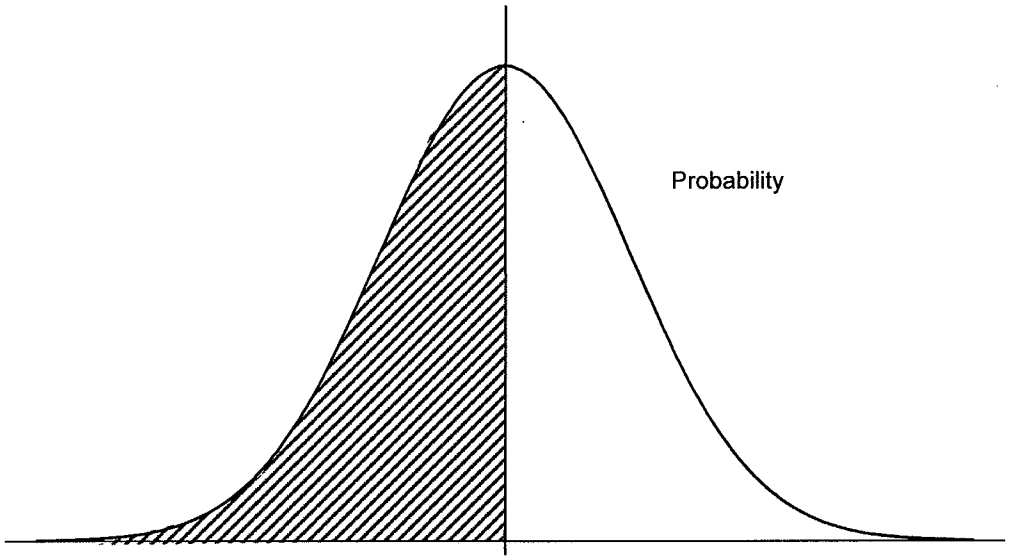
16. If the mean of the distribution of CRR payments were negative as portrayed in Figure 1, there would be a substantial likelihood that the CRR holder would incur an obligation to make payments to the CAISO. Absent a credit requirement, the expected value of an uncollateralized TCC payment for this CRR would be (μ_{ij}).

Figure 1
Distribution of Payments by Holders of Negatively Priced CRRs



17. By imposing a credit requirement of K_{ij} ($K > 0$), the value of uncollateralized CRR payments would be $R_{ij} + K_{ij}$ ($R_{ij} < 0$), implying an obligation to make payments to the CAISO. If K_{ij} were set equal to the expected level of CRR payments for a negatively priced CRR, there would be no uncollateralized payments if actual returns equaled the expected value. As illustrated in Figure 2, however, the limitation of a credit policy that only requires credit coverage for the expected level of CRR payments is that there would be a considerable likelihood (50 percent if the distribution is symmetric) that the CRR holder would be obligated to make CRR payments in excess of its credit coverage (i.e., $Rijt + K_{ij} < 0$), as illustrated by the shaded area in Figure 2.

Figure 2
Distribution of Payments by Negatively Priced CRR Holders



$R_{ijt} + K_{ij} = 0$; $K_{ij} = -\mu_{ij}$

18. Thus, a CRR credit requirement that required coverage for the expected value of CRR payments would not directly protect the CAISO against default should the required payments by the CRR holder turn out to be larger, i.e., more negative, than the CRR price in the auction. While the holder of a counterflow CRR would have credit coverage for the expected value of payments to the CAISO, there would be no initial credit requirement covering potential payments in excess of the expected value of the CRR.[7] Since the reason for holding positively valued CRRs is to hedge against the volatility of congestion charges, there is an underlying expectation that actual payments may differ significantly from the expected payment, implying that holders of negatively priced CRRs may be required to make payments for their CRR holdings that are in excess of the expected level, i.e., in excess of the absolute value of the price of the counterflow CRR and thus in excess of such a credit requirement. It is precisely because of the potential for

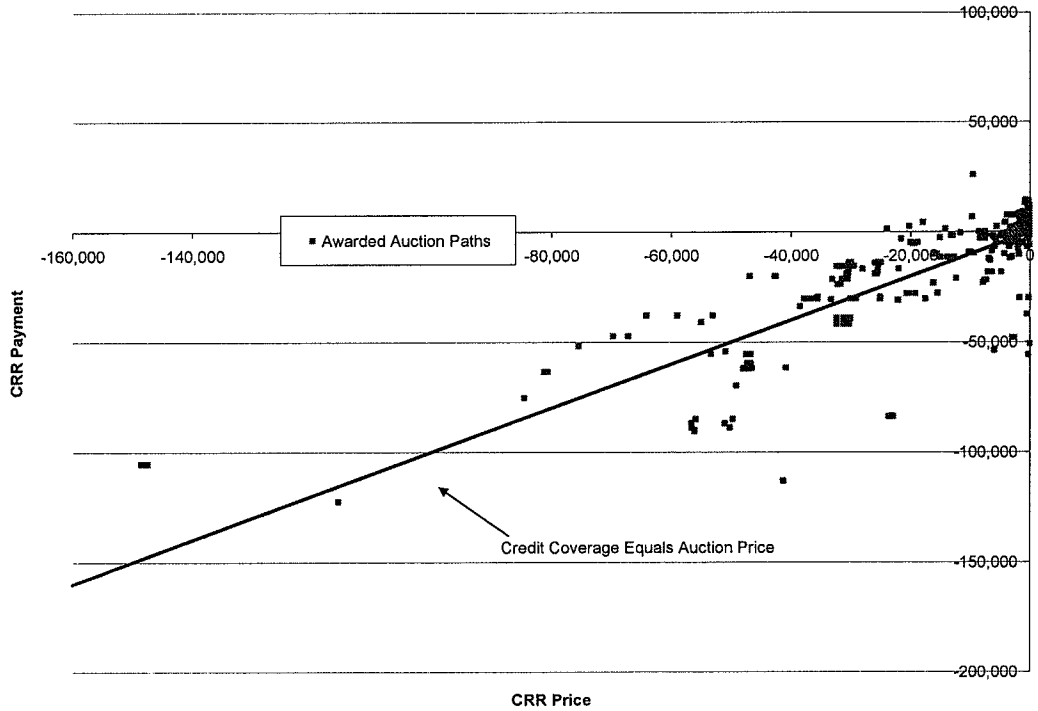
[7] To the extent that such negatively priced CRRs are held by generators with resources located at the CRR source, the potential payment due on the CRR is potentially backed not only by the CAISO initial credit requirement but also by the potentially offsetting payments to the supplier in the day-ahead market. Whether the generator ownership actually hedges the CRR holding depends, however, on the other forward positions taken by the supplier.

higher than expected congestion payments that CRRs are available as hedges against the volatility of congestion charges.

19. This potential for negatively priced CRRs to entail payments in excess of the expected value is not hypothetical; it can be seen in the patterns of financial right auction prices and payments for the eastern ISOs/RTOs.

20. Figure 3 portrays the relationship between uncollateralized CRR payments and CRR price for negatively priced annual CRRs in NYISO annual auctions.[8] The 45-degree line portrays the credit requirement under a policy requiring credit coverage for the expected value of CRR payments. It can be seen that there would be many instances of uncollateralized CRR payments in excess of $10,000/MW under a credit policy that did not require credit coverage in excess of the expected value of CRR payments (i.e., a credit policy that did not include a credit margin as proposed by the CAISO). While such uncollateralized payments may not result in defaults (the CRRs may be held by financially strong market participants or offset by positive returns to other CRRs in the market participants' CRR portfolios), they hold the potential for default if such CRRs were held by entities unable to meet credit requirements that include a credit margin.

Figure 3
CRR Returns and Prices
Negatively Priced NYISO Annual CRRs



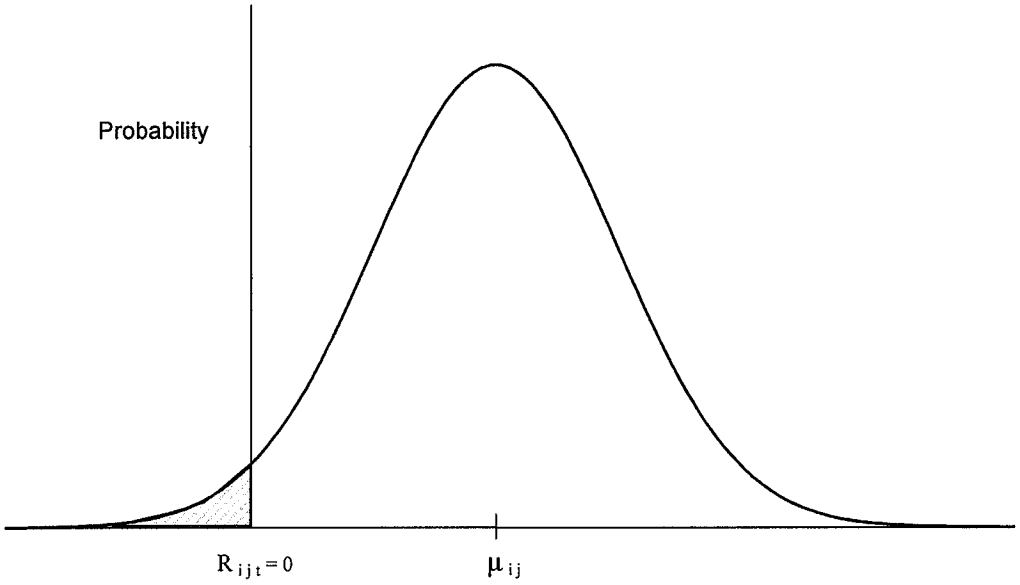
[8] Financial transmission rights are called TCCs in the NYISO. We use the CAISO term for financial transmission rights (CRRs) when referring to TCCs in this testimony to reduce confusion.

B. Positively Priced CRRs

21. A second kind of credit risk that the CAISO's CRR credit policies should address is the possibility that a CRR which is positively priced in the CRR auction in which it is purchased subsequently becomes negatively valued in the day-ahead market, requiring net payments by the CRR holder to the CAISO's congestion rent account. While the probability of negative returns is likely so low as to be negligible for some CRRs, such as CRRs sourced outside the Bay Area and sinking in the San Francisco sub-load aggregation point (sub-LAP), this will not be the case for all positively priced CRRs.

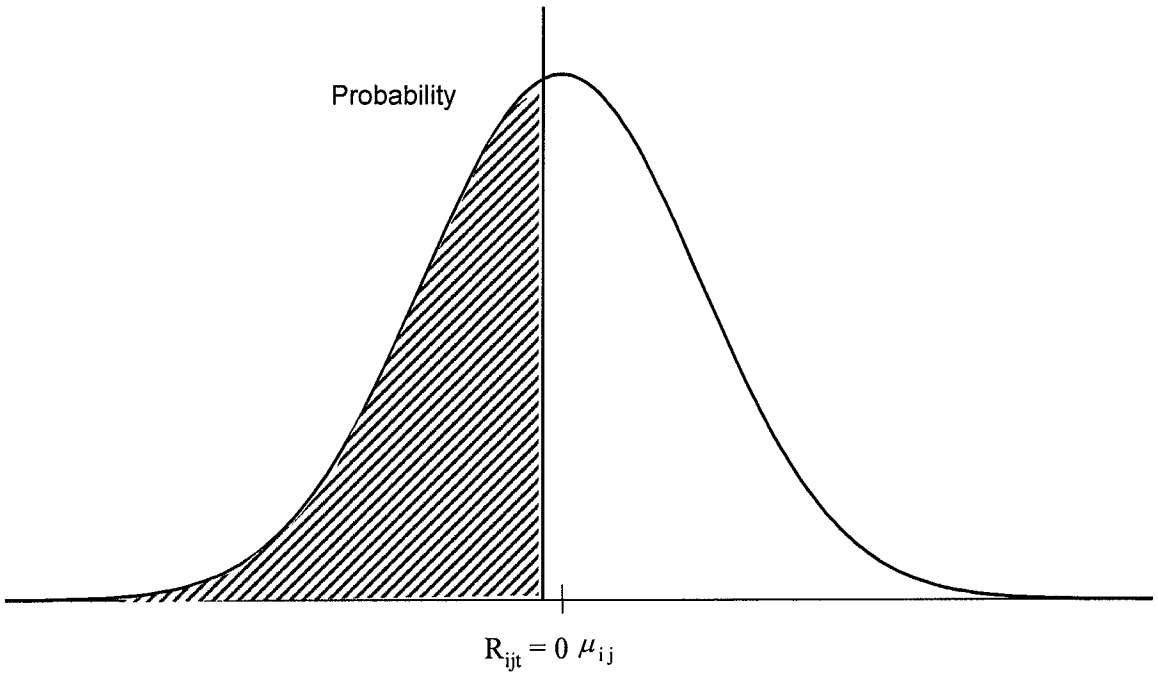
22. If the mean of the returns (μ_{ij}) is significantly positive, then the probability of the CRR holder being required to make a payment may be relatively small, as shown in Figure 4, and the maximum value of the potential payment by the CRR holder may also be small.

Figure 4
Distribution of payments to Positively Priced CRR



23. For some positively priced CRRs, however, there may be a significant probability that the CRR values in the day-ahead market could become negative as a result of slight variations in congestion patterns. This is illustrated in Figure 5, in which the expected CRR payment (μ_{ij}) is positive but close to zero, and the shaded area portrays the probability that the CRR holder will be obligated to make payments to the CAISO.

Figure 5
Distribution of Payments to Positively Priced CRR

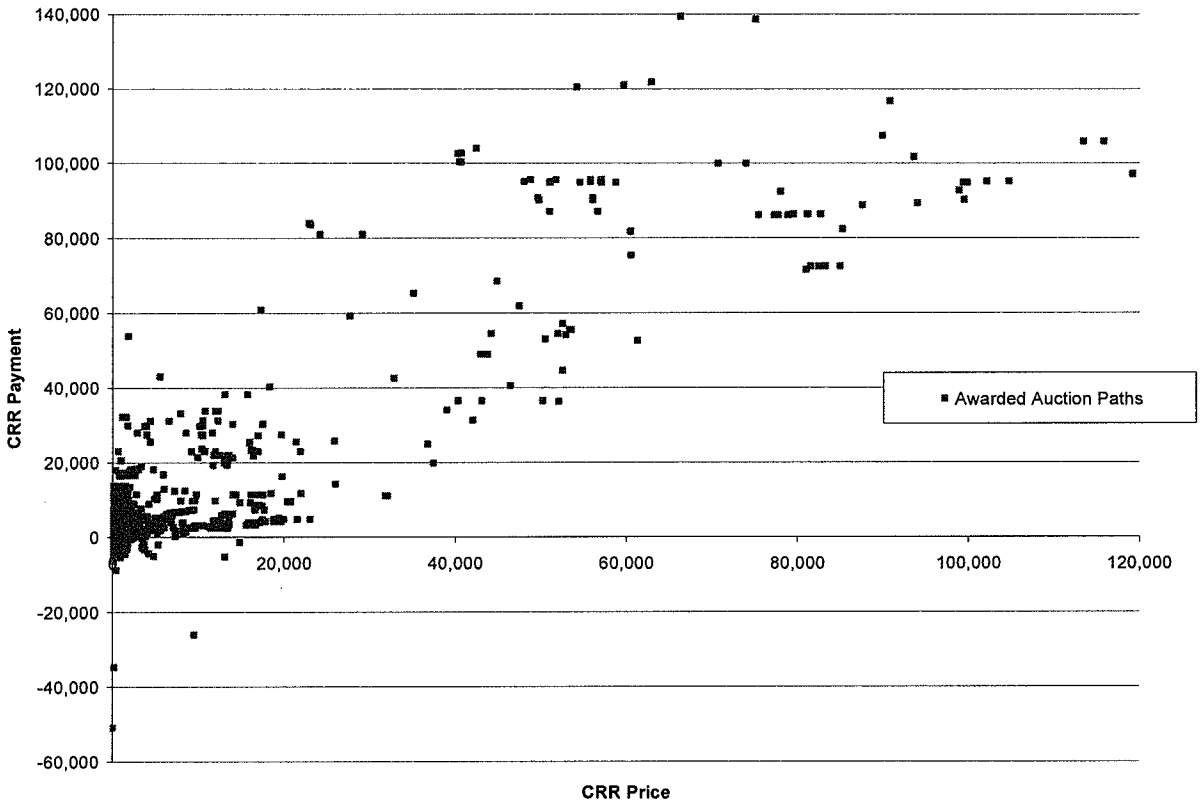


24. If no credit coverage were required of holders of CRRs with positive but low prices, there would be a potential exposure to uncollateralized CRR payments by the holders of positively priced CRRs, particularly those having auction prices that are near zero.

25. Similarly, the potential for positively priced CRRs, particularly those with low prices, to entail payments by the holder, rather than payments to the holder, is also seen in the congestion data of the eastern ISOs/RTOs.

26. Figure 6 shows that the payment obligation on positively priced CRRs in NYISO auctions of annual CRRs has been concentrated on CRRs with prices near zero. It is seen that very large payments have been required on some low valued CRRs, with a few instances of payments in excess of $20,000/MW up to about $50,000/MW. If no credit coverage were required for holding CRRs with low positive prices, there would be a substantial potential for uncollateralized CRR payments. This potential for uncollateralized payments and for default if these risky CRRs were held by entities with limited ability to bear risk is addressed in principle by the credit margin that the CAISO will apply to determining the credit coverage required to hold positively priced CRRs.

Figure 6
Awarded CRR Payments and Prices, NYISO Annual CRRs
Positively Priced CRRs



C. Credit Offsets

27. Another element of the CAISO's credit policy is how it will account for CRRs with negative credit requirements (i.e., CRRs found to have such a large positive expected value that the calculated credit requirement is negative because the distribution of CRR payments is such that even low probability outcomes result in payments to the CRR holder) in determining the overall credit requirement for the CRR holder's portfolio. The CAISO proposes to allow negative credit requirements to offset the credit requirement on other CRRs held by the same entity. Under this policy, the CAISO will not zero out negative credit requirements calculated for particular CRRs but would add them to the

credit requirement for the other CRRs held by that entity.[9] Such a policy has the potential to materially reduce market participant credit requirements but the actual impact would depend on the specific CRR portfolios held by particular market participants. While such an offset would reduce or perhaps eliminate the credit requirement for market participants holding a variety of positively priced CRRs and a few negatively valued CRRs, it would not affect the credit requirement for market participants holding only negatively valued CRRs.[10]

28. There are several considerations underlying the decision not to allow the credit offset for positively priced CRRs to be applied to market participant credit requirements other than the holding of CRRs. First, the credit offset for CRRs derives from payments that will be due to the holder over a period of time, not in the current billing period. The value reflected in the credit offset is therefore not available to the CAISO to cover a default by a market participant in the current period. Moreover, until the CAISO implements a balance-of-period CRR auction, the CAISO will not have a mechanism for monetizing this value prior to the expiration of the CRRs held by the defaulting market participant.

29. Second, it needs to be kept in mind that the initial determination of CAISO CRR credit requirements and the credit offset is based on very limited information regarding the actual variability of CRR payments. Moreover, the prices of CRRs in the initial auctions will be based on limited information regarding the potential distribution of congestion charges. This introduces an unavoidable element of uncertainty into the assessment of the potential for default by CRR holders. Given the uncertainty as to the reliability of the estimated credit offset, the CAISO has limited the potential impact on the overall settlements process of understated assessments of CRR payment volatility by limiting the CRR offset to the credit requirement for the CRR market.

30. Third, while the expected value of each CRR will be defined at the time of the auction by the auction price, the CAISO will not have a fully reliable method for revaluing the expected value of each CRR over its remaining term as time passes. The accuracy of this revaluation mechanism is not critical for the CRR market as a whole as the value of all CRRs – positive and negative – will be declining as the term of the CRRs passes. If the valuation of the CRRs over their remaining term is to provide a credit offset for other non-CRR liabilities, however, it is important that the assessment not materially overstate the actual value of the CRRs over their remaining term. Until the CAISO implements balance-of-period auctions, this valuation would be difficult to carry out.

D. Credit Margins and Credit Calls

31. If CRRs were priced daily like exchange traded contracts, the CAISO could base its credit coverage requirement on the volatility of these daily prices, and liquidate any

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[9] See Section 12.6.3.1(b) of the ISO Tariff.

[10] The credit offset value would decline over time as payments are made to the holder, and remaining payments fall. Thus, at the end of the term the credit value of the CRR would be much lower than at the beginning. This could be accounted for either through an explicit process for reducing the credit offset over time or by limiting the offset to the credit requirement for other CRRs of the same duration, so both the credit exposure and offset would decline in parallel.

positions for which a market participant failed to meet a demand for credit support. A limitation of the CRR market that also limits the CAISO's credit coverage policy options is that the CAISO cannot continuously observe changes in market values for CRRs, particularly seasonal and annual CRRs. The CAISO will be able to observe the actual accumulation of payment obligations during a week or month, and the overall historical difference between the actual and expected payments to a CRR over its term, but the CAISO will not be able to observe the change in the expected market value of the CRR or know if the value changed suddenly or gradually.

32. Since the CAISO will not be able to observe these changes in CRR market value, it will not be able to make margin calls based on the change in CRR market value over its remaining term or even estimate the distribution of these changes in the expected future payments for seasonal CRRs over periods such as a month. In addition, the CAISO does not plan to administer balance-of-period auctions in the near term, so if a market participant failed to meet a margin call to maintain credit coverage on a seasonal CRR, the CAISO would have to either resell the CRR in each monthly auction and offset losses with the credit coverage or to use the credit coverage to offset the losses over the remaining term of the CRR.

33. Some market participants appeared to take the view in stakeholder discussions of CRR credit policy that CAISO CRR markets would be adequately collateralized against default if the CAISO were to establish a credit requirement that was sufficient to cover the CRR payments likely to be due in the current month of the CRR term.

34. The apparent premise for such a credit policy is an assumption that in the event that a CRR holder failed to meet a credit call for the current month, the CAISO would be able to extinguish its default risk for payments due in subsequent months by, in effect, liquidating the remaining position of the defaulting entity (i.e., selling the CRR in a balance of period auction). One immediate shortcoming of such a policy is that the CAISO will not initially be administering balance-of-period auctions. A second and more fundamental shortcoming is the premise that the payment obligations in the out-months of the CRR will be uncorrelated with the outcome in the current month. If instead the market expects that the factors that produced large losses in the current period will persist in some degree in the following months, then the CAISO would incur an additional loss beyond the loss in the initial month when the CAISO sold the CRR in a balance-of-period auction.

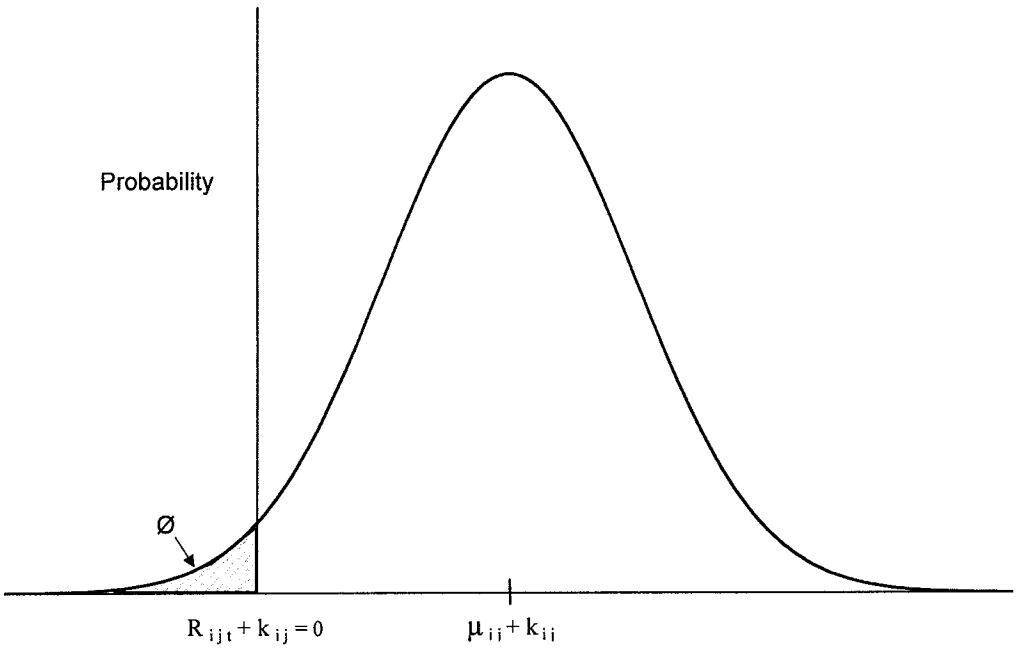
35. Consider an analogy in gas futures. Suppose an entity took a large short position in June for gas delivered in the months of January, February and March. Further suppose that the clearing organization set its margin requirement considering only the potential losses on the January contract on the premise that if the entity failed to cover losses in the January position the clearing organization would then close out the February and March positions. This clearing organization's margin requirement would likely prove to be inadequate to cover losses on such positions as the unfavorable movement on the January contract that produced the margin call would likely also produce losses on the February and March contracts; the total losses exceeding the margin set taking into account only the variability of the January contract.

E. Analytical Framework for Defining CRR Credit Requirements

36. Conceptually, the CAISO seeks to define a credit requirement for each CRR that provides a specified level of assurance of payment by the CRR holder (i.e., a given probability of uncollateralized CRR payments or expected value of uncollateralized CRR payments).

37. By setting an appropriate credit requirement (K_{ijt}) for each CRR_{ij} in auction t, the ISO can in principle assure that the probability of uncollateralized CRR payments ($R_{ijt} + K_{ijt} < 0$) is less than or equal to a defined threshold (ϕ) for all CRRs. This is illustrated in Figure 7, where the imposition of a credit requirement K_{ijt} reduces the probability of an uncollateralized CRR payment ($R_{ijt} + K_{ijt} < 0$) for a negatively priced CRR from the shaded area in Figure 1 to the shaded area ϕ in Figure 7.

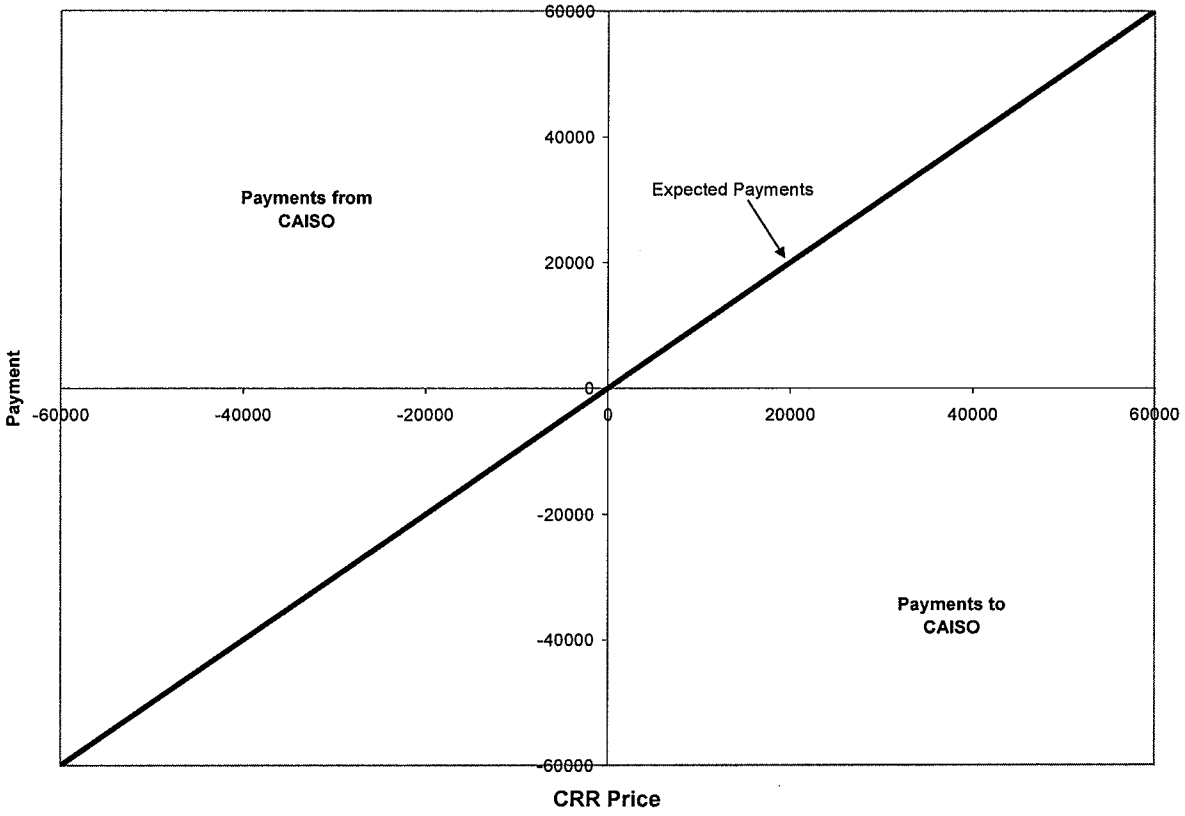
Figure 7
Distribution of Payments Net of Credit Requirement for Negatively Priced CRR



38. Under this approach, the credit requirement (K_{ijt}) needed to assure that the probability of uncollateralized CRR payments is less than the threshold set by the CAISO may be zero for CRRs with substantial positive expected values (high positive auction prices). CRRs with large negative expected values, on the other hand, would likely have credit requirements in excess of the absolute value of their auction price, as would CRRs with small positive auction prices.

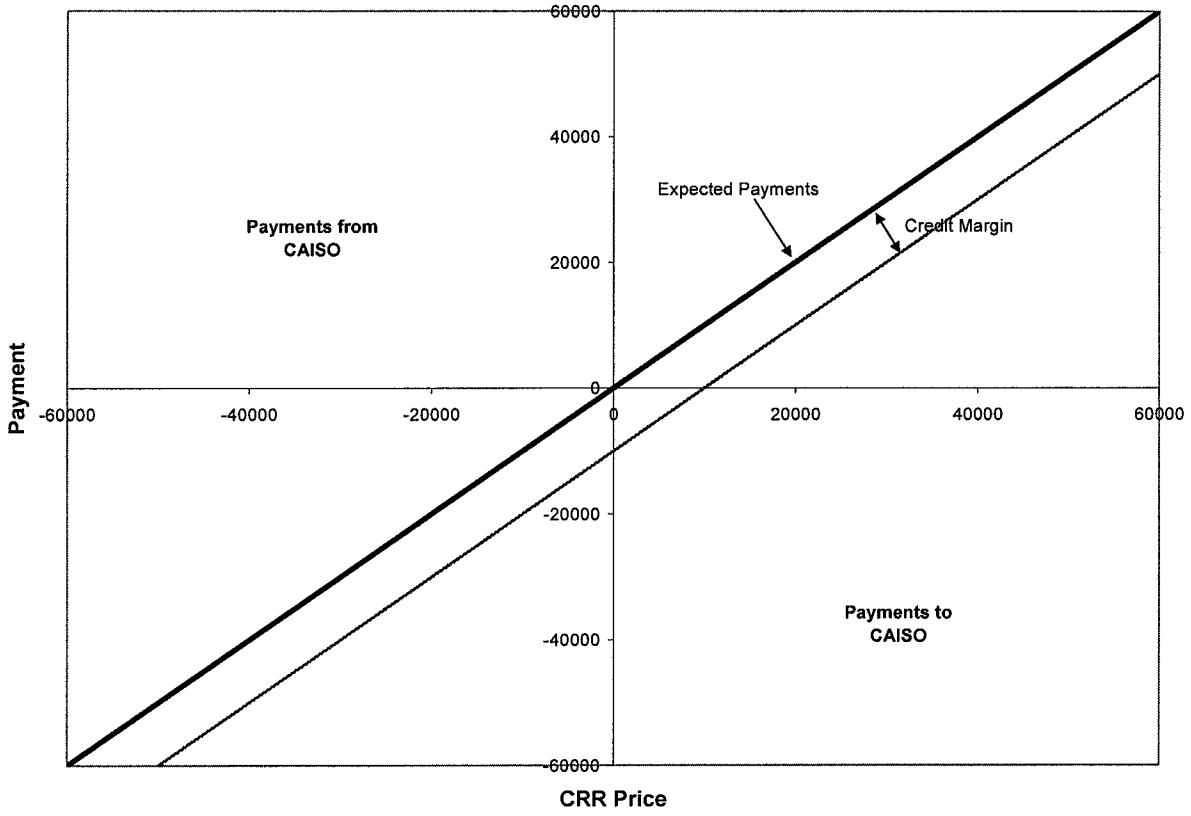
39. The application of this conceptual approach to defining credit coverage can be shown in terms of the relationship between CRR prices, payments and credit coverage. Figure 8 portrays the expected payments due to the CAISO on CRRs solid in an auction. The region below the x-axis reflects payments due to the CAISO.

Figure 8
Expected Annual CRR Payments and Credit Coverage



40. Figure 9 portrays a probabilistic credit requirement under which the required credit coverage reflects both the expected level of payments for each CRR and the dispersion of actual payments around the expected level. The credit margin provides some assurance that the market participant will be able to cover its liabilities in the event actual payments due to the CAISO are greater than the expected value of payments due to the CAISO. The larger the credit margin, the smaller the likelihood of uncollateralized CRR payments (i.e., smaller ϕ).

Figure 9
Probabilistic Credit Requirement for CRRs

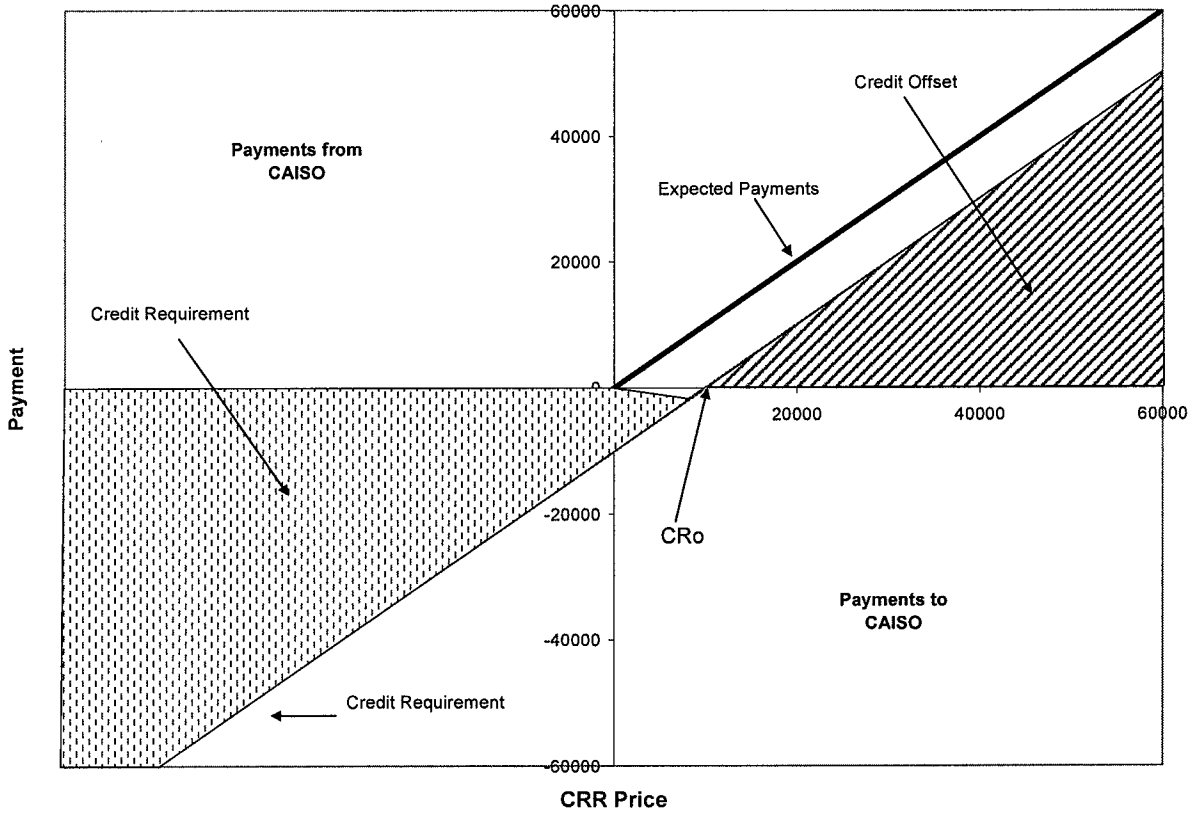


41. As illustrated in Figure 9 for a hypothetical credit margin, a negatively priced annual CRR with a price of -$40,000 in the auction would require credit coverage of around $50,000 to hold (i.e., about $10,000 more than the expected payments due to the CAISO). A CRR with a zero price in the auction would have a credit coverage requirement of roughly $10,000, compared to the zero credit coverage today. Conversely, a positively priced annual CRR with a price of $60,000 in the auction would provide a credit offset of roughly $50,000 (which could be used to reduce the credit coverage required to hold the market participant's overall portfolio of CRRs), or about $10,000 less than the expected value of the payments to the CRR holder.

42. Figure 10 further illustrates the distinction between the CRRs for which market participants must provide credit coverage to hold and the CRRs which provide a credit offset that reduces the credit coverage required to hold the market participant's overall portfolio of CRRs. The red (dotted) region on the left of Figure 10 labeled "Credit Requirement" shows the range of CRR auction prices over which credit coverage would be required for market participants to hold those CRRs. The required credit coverage is largest for CRRs with large negative prices in the auction but is non-zero even for CRRs with zero and low positive auction prices.

43. The green (striped) region on the right of Figure 10 labeled "Credit Offset" shows the range of RR auction prices over which a credit offset would be provided by holding these CRRs for a hypothetical credit margin. Thus, no credit coverage would be required to hold any CRR with an auction price above the "Payment" line, and the holding would potentially provide an offset against other CRR credit requirements.

Figure 10
Credit Requirements and Offset for CRRs



44. To summarize the rules for determining credit requirements under such a probabilistic credit requirement:

1. All CRRs with a price less than point "CRo" as shown in Figure 10 (a low positively priced CRR) would have a credit requirement as defined by the "Credit Requirement" line]to the left of point CRo in Figure 10 on the credit requirement line. The required credit coverage would be largest for CRRs with large negative prices in the auction but would be non-zero even for CRRs with zero and low positive prices.

2. All CRRs with a price higher than CRo would receive a credit offset, the amount of which would also be determined by the "Credit Requirement" line to the right of CRo in Figure 10. The credit offset would be largest for CRRs with high positive prices in the auction, reflecting the very high probability that the CAISO would be making large payments to the CRR holder.

45. Given this role of credit requirements for CRR holders, empirical questions for the CAISO are how to determine the appropriate credit threshold (ϕ,) and how given the credit threshold (ϕ), the appropriate credit requirement for each CRR should be set. If the credit requirement that is required to reduce the probability of uncollateralized CRR payments on the CRR whose returns are portrayed in Figure 1 were also required of the entity holding the CRR whose returns are portrayed in Figure 4, the credit requirement would be greatly excessive for the holder of the CRR portrayed in Figure 4 and the probability of uncollateralized CRR payments would be zero. It is therefore desirable to set credit requirements that reflect the riskiness of individual CRR holdings but this goal is counterbalanced by a need for reasonable administrative ease in setting and applying the credit requirements to the thousands of CRRs sold on hundreds of paths in a typical auction.

46. Ideally, the CAISO credit coverage for negatively priced and low priced positively priced CRRs should cover the expected payments due for holding the CRRs plus a margin to cover the variability of the payment stream and the resulting potential for payment obligations in excess of the expected level. The expected payments for holding CRRs will be measured by the auction price, which will be known at the time the credit requirement for holding CRRs is applied.[11] The determination of an appropriate credit margin for the initial auction is more difficult.

47. In the long run, the CAISO will be able to utilize data on the historic variability of CRR payments around the auction price to develop credit requirements that cover payment obligations at the desired probability level.[12] At the start-up of CAISO's Market

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[11] A concern has been expressed by Southern California Edison Company (SCE), in the "SCE Comments on the Draft CRR Credit Tariff Language dated June 6, 2007," that auction prices might not accurately reflect expected congestion payments. Actual future congestion payments will always be unknown at the time of the auction and there will be particular uncertainty at the time of the initial auction, as there will be no history of actual congestion patterns to guide market participant expectations for prospective congestion patterns. Nevertheless, the auction price is the best measure of expected congestion payments.

The SCE comments appear to be based on a misunderstanding that the CAISO will be calculating "Expected CRR Congestion Revenue" for each CRR This will not be the case. The CAISO will be using its simulations of past congestion patterns to assess the potential variability of CRR payments, not to estimate the prospective level of these payments. Moreover, the CAISO's LMP simulations of LMP prices for historic periods are not forecasts of future CRR prices. The historic simulations are based on historic fuel prices, not the fuel prices expected at the time of the auction, they are based on historic demand levels and patterns, not those that are expected to prevail in the future, and the simulations were based on historic generation assets. (LMP studies cover the period of November 2002 to April 2005, and the results are posted to the CAISO website at http://www.caiso.com/docs/2004/01/29/2004012910361428106.html. Market participants can factor the results of the CAISO LMP simulations into their auction bids, but the CAISO simulations themselves do not provide an assessment of expected future CRR payments.

[12] It is important to understand that it will take a substantial period of time before the CAISO accumulates material experience with the variability of CRR payments relative to their expected values. Even if the CAISO ignored the potential seasonal differences in payment variability, a year's operation would provide very limited

Redesign and Technology Upgrade (MRTU), however, the historical data required for such an analysis is obviously not available. Four potential approaches to defining the credit requirements for CRRs were identified in the process of developing the CAISO proposal. One approach would be to base the initial credit requirement solely on the auction price. This approach would be easy to apply but has the disadvantage that it would provide no credit protection for payment obligations in excess of the expected level during a period in which auction prices will be based on limited information. This approach is unsatisfactory because it does not provide CAISO market participants with adequate protection against default by uncreditworthy entities.

48. A second approach to defining a CRR credit requirement would be to base the estimate of CRR payment variability on the historical level of variability of FTR payments relative to auction prices in the existing CAISO market. This measure of payment variability would not capture the full range of CRR payment variability under MRTU, but would have the advantage of being based on actual market outcomes and the California transmission system. Review of these data revealed that historical auction prices greatly exceeded average FTR payments, apparently for reasons relating to the rate treatment of auction payments and revenues. It was therefore concluded that these data provided no useful information to guide judgments regarding the potential variability of CRR auction prices and payments in a competitive LMP market.

49. A third possible approach to defining the initial credit requirement, in particular the credit margin, would be to base the estimate of CRR payment variability on the historical level of FTR payment variability and FTR prices on actual FTR auction purchases in one of the eastern ISOs/RTOs, such as PJM. This approach would have the advantage of basing the variability analysis on the kind of CRRs actually purchased by market participants, but the variability would not reflect California conditions.

50. A fourth possible approach to defining the initial CRR credit requirement would be to base the estimate of CRR payment variability on the results of the various LMP price simulations that the CAISO has undertaken using historical real-time load and generation data. The CAISO has initially adopted this approach. While this approach has a number of limitations, neither the CAISO nor the CAISO stakeholders were able to identify a preferred alternative. It is important to emphasize that the CAISO proposes to use its simulations of historical CRR payments to make a rough assessment of the prospective variability of CRR payments in order to determine the credit margin.; the CAISO does not propose to attempt to estimate the expected future payments to each CRR.

IV. CREDIT REQUIREMENT FOR BIDDING

51. A further credit issue in the CAISO CRR markets is assuring that market participants submitting bids in the various auctions have the financial ability to cover their purchases.

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information regarding the potential variability. The difference between actual payments and auction prices over twelve monthly auctions would provide useful empirical information, but would provide very limited insights into the potential dispersion in returns over market conditions different than those experienced in this single year. Moreover, since market participants will be gaining experience with the market and congestion patterns during the initial year of CAISO operation, the relationship between auction prices and actual CRR payments is likely to be changing over the year.

While CRRs can be withheld from entities that fail to make the payments required to cover their auction awards, this is an undesirable outcome because the invalid purchases would potentially have affected other CRR prices and might have caused offers for counterflow CRRs to be accepted at high price levels. All ISOs/RTOs therefore require that CRR bidders have adequate credit to cover the purchase of all of the CRRs on which they submit offers, up to their offer price. The CAISO will also impose such a requirement (Section 12.6.2 of the ISO Tariff). This credit coverage will generally exceed the level of payments for CRRs that is ultimately required because low bids will not win and other bids will be accepted at price levels well below the offer cap.

52. The ability of market participants to buy CRRs in an auction gives rise to another kind of credit coverage requirement, the need to ensure that market participants both have the ability to pay for the CRRs they purchase in the auction and have the ability to post sufficient credit coverage for any CRRs they acquire in the auction.

53. Ideally, the CAISO would require market participants bidding for CRRs in the auction to provide sufficient credit coverage prior to the auction to cover both their payments for CRRs they purchase in the auction and their net credit coverage requirement for holding the CRRs they are awarded. Such a credit coverage validation must be built into the auction bid software in order to be applied prior to the auction. Unfortunately, the CAISO has determined that it will not be possible to implement a credit validation for the CRR holding requirement in the auction bid process prior to the running of the first CRR auction.

54. Several market participants expressed concerns in discussion of credit policy that, absent a pre-auction credit requirement covering the credit margin for the purchase of low-priced and negatively priced CRRs, entities with minimal assets could bid to acquire large portfolios of CRRs with low or negative prices in the auction and then be unable to post the required credit coverage. Moreover, there was a concern that, absent an appropriate credit requirement for bidding in the auction, such behavior could be orchestrated between affiliates so as to depress CRR auction prices by the offer of substantial quantities of counterflow CRRs at artificially low prices by entities with little or no assets. This concern has been addressed by several features of the CAISO proposal, in particular, the requirement that entities that participate in the CRR auction have a minimum of $500,000 credit coverage, and that entities bidding to acquire negatively priced CRRs have credit coverage equal to the absolute value of their bid price to acquire the negatively priced CRRs.[13] These requirements will be in place only until the auction is completed and any required credit coverage for holding CRRs is in place.

V. CREDIT REQUIREMENT ADJUSTMENTS OVER TIME

55. An important component of the CAISO's overall CRR credit requirement is the potential for the CAISO to require additional credit support during the term of a CRR if the expected level of future payments to the CAISO increases after the initial credit requirement is determined and before payments are made by the CRR holder. One feature of CRRs that constrains the CAISO CRR credit policy is that because CRRs are

[13] See Section 12.6.2 of the ISO Tariff.

not continuously traded, the CAISO cannot observe changes in the market value of a CRR between auctions. The CAISO therefore cannot continuously mark CRR values to market, which limits its ability to require additional credit support as the change in market value occurs over time. The CAISO could track the net CRR obligations of individual CRR holders on a daily basis, for example, by making a rough projection of payments over the remaining term of the CRR based on the payment obligation incurred on the CRR portfolio to date during the month, and require additional credit coverage, but no straightforward method exists for projecting changes in future payments on a daily basis.

56. Another element of CAISO credit policy for CRRs is how the credit requirement will be adjusted as payments are made and the CRR approaches its expiration. If the CAISO credit requirement does not decline over time on CRRs with a multi-settlement period durations, there could be a large credit requirement even when there is little remaining exposure to congestion payments. Such a feature of CAISO collateral policies would reduce the potential for adverse credit exposure for the CAISO, but could go too far in the other direction. If an entity sold a one-year counterflow CRR for $10 million and had paid $8 million to the CAISO congestion account over the first ten months of the term, absent any adjustment in credit coverage, the market participant would have to maintain the full $10 million in credit on this CRR during the last two months despite the small likely remaining exposure to congestion charges.

57. As noted above, in conventional forward energy contract and financial derivative markets the issues arising from changes in the market value of contracts over time are addressed through mark-to-market accounting and credit requirements whereby the credit requirements are periodically adjusted based on the change in value of the contract over its remaining term. A difficulty for the CAISO in directly applying these principles to the CRR market is that CRRs are not continuously traded, so that there is not a readily available market price to use in reassessing the relationship between the current credit coverage and the current value of the contract.

58. Despite the lack of continuous trading of CRRs, the CAISO will apply mark-to-market principles to multi-period CRRs to adjust the credit requirement for annual CRRs at the conclusion of the next seasonal auction, as long as there were reconfiguration rounds covering the remaining duration of the CRRs. The valuation in the auctions will be used to increase or reduce credit requirements. At a minimum, as seasonal CRRs reach their final month, the credit coverage requirement can be adjusted based on the price of the CRR in the monthly CRR auction.[14]

59. Market participants' credit coverage requirements for holding CRRs will also be adjusted for transfers of CRR payment obligations between market participants. Such transfers of settlement responsibility will not be carried out until and unless the entity to which the CRRs would be transferred has sufficient credit coverage in place to satisfy the credit requirement for holding the transferred CRRs, in addition to its other credit coverage requirements.[15]

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[14] See Section 12.6.3.1(c) of the ISO Tariff.

[15] Section 12.6.3.1(d) of the ISO Tariff.

VI. LONG-TERM CRR CREDIT REQUIREMENTS

60. The CAISO has filed revisions to its tariff with the Federal Energy Regulatory Commission to provide CRRs that have terms of ten years. If the tariff revisions are approved, the CAISO may begin selling these long-term CRRs in auctions, making both auction prices and observed returns available to begin making assessments of the variability of long-term CRRs relative to their expected value (auction price). In the case of long-term CRRs, however, it will obviously be several years before any empirical data are available to assess the actual variability of returns and quite a number of years before there is data covering multiple periods.

61. Prior to the implementation of a long-term auction, long-term CRRs may be acquired through the allocation process. While most long-term CRRs acquired through the allocation process will be positively priced CRRs sinking at LAPs, it is conceivable that some CAISO LSEs could request long-term CRRs sourced at generator locations that are potentially high-priced locations, resulting in the allocation of long-term CRRs with negative or low positive prices.

62. In addition, LSEs outside the CAISO control area could seek to acquire long-term CRRs with negative or low positive prices in the auction that are low priced because of the potential for the CRR to require payments by the holder.

63. Not only might such long-term CRRs turn out to require payments by the CRR holder but these CRRs might provide counterflow to other long-term CRRs awarded in the long-term CRR allocation process and a default by the CRR holder would make the remaining CRRs infeasible, producing a shortfall in the CAISO's CRR settlements. It is therefore desirable to have some credit support for long-term CRR holdings of negatively priced CRRs and for low priced positive CRRs (should any be acquired) that covers potential payment obligations beyond the first year.

64. Until such time as adequate data are available to estimate the variability of returns to or prices of such instruments, the CAISO proposes that the credit margin for a CRR with a remaining term of n years (rounded up to the nearest whole number) would be $\sqrt{n}$ times the credit margin for a one-year CRR with the same source and sink.

65. If an entity defaulted on a long-term CRR obligation partway through year 1, under the basic CAISO CRR credit policy, the CAISO market participants would be covered at a fairly high level of probability against losses during that first year. Unlike defaults that occurred during months, the CAISO could resell this capacity in the next annual auction. If the events causing the losses and the default in year 1 did not affect the expected payments due from holding the CRR in years 2 through 10, then additional credit coverage equal to the expected value of the payments due over the term of the CRR would be sufficient to protect CAISO market participants against losses in the subsequent years.

66. As noted above, however, it cannot be assumed that the losses in year 1 will necessarily be uncorrelated with the payments in years 2 through 10 and thus the expected value of the CRR may be different in the year 2 auction than in the year 1 auction. If the returns were perfectly correlated over the 10 years, then the change in value in year 1 would

change the expected value in all subsequent years by the same amount and a credit margin equal to 10 times the one-year credit margin would be necessary to protect CAISO market participants.

67. Such an extreme assumption of perfect correlation between current and expected future returns is very unlikely to reflect actual conditions, however, as many potential causes of transmission congestion will be transitory and not persist from year to year, let alone over 10 years. On the other hand, there is no data on the actual degree of persistence of the average kind of unexpected congestion shock. Given the very limited information available, the CAISO's policy of multiplying the one-year credit margin by the square root of the remaining term of a long-term CRR in years is a reasonable starting point.

I declare under penalty of perjury that the foregoing is true and correct to the best of my knowledge.

Executed this 19th day of June, 2007.

Scott M. Harvey

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BIO/SUMMARY

Dr. Harvey has consulted on competition and market design in the electric power industry; gas pipeline rate and pricing issues; contract and transfer pricing; private antitrust litigation; and numerous mergers and acquisitions, particularly in the oil, gas pipeline and electric utility industries.

EDUCATION

Ph.D., Economics, University of California, Berkeley, with fields in industrial organization, econometrics and advanced theory

B.A., Economics, University of Illinois-Champaign-Urbana

PRESENT POSITION

LECG, Cambridge, MA, 1998 – present
Director

OTHER POSITIONS HELD

Putnam, Hayes & Bartlett, Inc., 1987 - 1998
Director

Bureau of Economics, U.S. Federal Trade Commission, 1977-1987

CONSULTING EXPERIENCE

Electric Utility

- Assisted in the preparation of the pool-based open access transmission tariffs of the Member Systems of the New York Power Pool and the PJM Supporting Companies, based on locational marginal pricing (LMP) and financial transmission rights.
- Worked with a coalition supporting the development of an LMP-based congestion management system in NEPOOL to reform NEPOOL's congestion management system.

- Assisted ISO New England with the development and implementation of a multi-settlement system for energy and ancillary services and a congestion management system based on LMP and financial transmission rights.
- Tested the pricing software of the NYISO prior to startup. After startup responsible for identification and correction of erroneous prices in NYISO settlements, and support of NYISO market monitoring unit, regulatory affairs and market relations.
- Assisted Midwest ISO with the development of its LMP-based long-term congestion management system.
- Worked with ISOs on interregional coordination and pricing issues.
- Advised electricity traders, retailers and IPPs on participation in restructured electricity markets in the United States.
- Assisted investors to evaluate the acquisition, utilization and marketing of electricity generating assets.
- Worked with groups opposing creation of barriers to the entry of new generators in NEPOOL and California.
- Worked with a coalition supporting reform of the California congestion management system.
- Participated in the review of electricity restructuring arrangements and market rules in New Zealand and Australia.
- Assisted market participants with the development of electricity price forecasts based on locational pricing.
- Analyzed competitive pricing and valuation of electric generation and transmission assets.
- Worked with electric utilities to develop, evaluate and simulate the impacts of alternative methods of transmission pricing.
- Analyzed the potential for, and evidence of, the exercise of market power in deregulated electric generation markets.
- Analyzed the competitive effects of market power mitigation policies for electricity generation assets.

Gas

- Analyzed the competitive forces affecting gas pipeline rates, both in the context of pipeline pricing strategies and in the context of FERC review of gas pipeline rates.
- Analyzed the competitive and price effects of price fixing agreements in the natural gas pipeline industry.
- Analyzed the actual and potential value of firm pipeline transmission capacity.
- Estimated the cost of abrogating natural gas contracts.
- Analyzed the competitive effects of actual and proposed acquisitions in the gas pipeline industry.
- Analyzed the accuracy of gas price indices.

Oil Industry

- Analyzed the competitive effects of actual or proposed acquisitions and joint ventures in the oil terminaling and marketing, oil refining and oil pipeline industries, including the Amoco-BP merger; the Texaco-Shell joint venture; the proposed Phillips-Conoco and Philips-Ultramar joint ventures; Sun Cos acquisition of Chevron's Philadelphia refinery and Atlantic Refining Co.; Williams Cos acquisition of the Oklahoma Mississippi River System and Marathon's acquisition of Rock Island Refining.
- Developed economic principles for the allocation of joint costs in the oil and gas producing industry.
- Developed estimates of the market price for ANS-type crude oil processed at refineries operated by ANS producers.
- Estimated the passthrough of crude oil price increases into refined product prices.

Other Antitrust and Merger Consulting Experience

- Analyzed the competitive effects of actual or proposed acquisitions and joint ventures in the float glass; residential and commercial roofing; electrical equipment; industrial controls; and chemical industries.
- Analyzed the competitive effects of partial equity interests and joint ventures in a variety of industries.
- Estimated the magnitude of alleged price fixing overcharges in a variety of industries.

GOVERNMENT EXPERIENCE

- Analyzed the competitive impact of many oil industry mergers and acquisitions, including Mobil Corporation's proposed acquisition of Marathon Oil; Gulf Oil's proposed acquisition of Cities Service Company; Texaco's acquisition of Getty Oil; and Chevron's acquisition of Gulf Oil.
- Analyzed the competitive impact of gas pipeline mergers and acquisitions including Internorth's acquisition of HNG; Midcon's acquisition of United Gas Pipe Line; and Occidental Petroleum's acquisition of Midcon.
- Participated in non-public investigations of predatory pricing, non-price predation, price fixing, monopolization and sham litigation in a variety of industries.
- Served as an economic advisor to Commissioner Azcuenaga.

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Scott M. Harvey and Andrew P. Hartshorn, *New York Independent System Operator* Docket Nos. EL00-70-000, EL00-67-000, May 31, 2000 (on behalf of New York ISO) "Comment on Scheduling of External Transactions and Price Volatility."

Scott M. Harvey, *New York Independent System Operator* Docket Nos. ER97-1523-011, OA97-470-010, ER97-4234-008, ER97-1523-018, OA97-401-017, ER97-4234-015, ER97-1523-019, OA97-470-018, ER97-4234-016, Direct, May 8, 2000, Reply, August 25, 2000, Rebuttal, September 8, 2000, Cross-Examination, September 13-14, 2000 (on behalf of Member Systems and New York ISO) RE: Pricing of Marginal Losses.

Scott M. Harvey and William W. Hogan, *New England PowerPool,* Docket No. ER00-2016-000, "Comment on Congestion Management and Multi-settlement System Proposal," April 20, 2000 (on behalf of ISO New England).

Scott M. Harvey, FERC Docket EL00-49-000, *NRG Power Marketing, Inc. v. New York Independent System Operator, Inc.*, Affidavit re: Price Corrections (on behalf of New York Independent System Operator, Inc.), March 3, 2000.

Scott M. Harvey and William W. Hogan, *California Independent System Operator Corporation,* Docket No. ER00-703-000, "Nodal and Zonal Congestion Management and the Exercise of Market Power: Further Comment," February 11, 2000 (on behalf of Sempra Energy).

Scott M. Harvey and William W. Hogan, *California Independent System Operator Corporation,* Docket No. ER00-703-000, "Nodal and Zonal Congestion Management and the Exercise of Market Power," January 10, 2000 (on behalf of Sempra Energy).

Scott M. Harvey and William W. Hogan, *California Independent System Operator Corporation,* Docket No. ER99-3339-000, "Comment on the California ISO's Request for Rehearing," October 29, 1999 (on behalf of Coalition Supporting Pro-Competitive Interconnection Policies), Re Amendment 19.

Scott M. Harvey and William W. Hogan, *California Independent System Operator Corporation*, Docket No. ER99-3339-000, "Further Comments on the California ISO's NewGen Policy," August 23, 1999 (on behalf of Calpine), Re Amendment 19.

Scott M. Harvey and William W. Hogan, *California Independent System Operator Corporation*, Docket No. ER99-3339-000, "Comments on the California ISO's NewGen Policy," July 27, 1999 (on behalf of Coalition Supporting Pro-Competitive Interconnection Policies), Re Amendment 19.

PJM Interconnection, L.L.C.; Docket No. ER98-3527-000, Before FERC, April 1999 (on behalf of PJM Market Participant Group), Re Bid Disclosure Requirement.

Scott M. Harvey and William W. Hogan, *Old Dominion Electric Cooperative v. PJM Interconnection*, L.L.C., Docket No. EL99-000, 1998 (on behalf of PJM supporting companies).

Sunrise Energy Management, Inc., Sunrise Energy Marketing Co., Consolidated Fuel Corp., and Sunrise Energy Co.; Case No. 394-36780-SAF-11, U.S. Bankruptcy Court, Northern District of Texas, Dallas Division, 1995 (on behalf of Northwest Pipeline).

Chateaugay et al., Debtors; Case No. 86 B 11270, U.S. Bankruptcy Court, Southern District of New York, 1992 (on behalf of LTV secured bondholders).

ATTACHMENT E

California ISO
Your Link to Power

Business Practice Manual for Credit Management

Version 1

Last Revised: June 6, 2007

Approval History

Approval Date:

Effective Date:

BPM Owner: Philip Leiber

BPM Owner's Title: Treasurer / Director, Financial Planning

Revision History

Version	Date	Description
4	MM-DD-YYYY	
3	MM-DD-YYYY	
2	MM-DD-YYYY	
1	06-06-2007	Initial Version Release. This BPM is based on the Credit Policy and Procedures Guide that was last updated May 31, 2007. The updated Credit Policy & Procedures Guide was revised to reflect CAISO's complance filing for FERC's April 19, 2007 order on CAISO's June 2006 credit filing. This BPM reflects the following changes from the May 31, 2007 Credit Policy & Procedures Guide: • Conform to BPM section numbering format. • Add CRR provisions (affecting Section 6, 7, 8, 9) • Revise EAL calculation to include CRRs, availability of estimated settlements data in CAISO's Settlements system, elimination of the "level posting period". Add provisions for WAC prepayment for Out of Control Area Load Serving Entities to the EAL calculation and as described in 6.2.4 • List RMR financial requirements in Section 11 • For new SCs, require 45 days of initial security rather than 14. • Reorganize Section 3-Unsecured Credit Limits. • Change references to "ISO" to "CAISO"

Version	Date	Description
		• Provide for a transition period to the new EAL calculation, described in Section 6.4. • Added to Enforcement Actions (Section 8) limit on transfer of CRRs through SRS for undersecured Market Participants. • Described in Section 9.3 credit information published monthly in CAISO's monthly financial report.

TABLE OF CONTENTS

1. Introduction

Welcome to the CAISO *BPM for Credit Management*. In this Introduction you will find the following information:

- The purpose of CAISO BPMs
- What you can expect from this CAISO BPM
- Other CAISO BPMs or documents that provide related or additional information

1.1 Purpose of California ISO Business Practice Manuals

The Business Practice Manuals (BPMs) developed by CAISO are intended to contain implementation detail, consistent with and supported by the CAISO Tariff, including: instructions, rules, procedures, examples, and guidelines for the administration, operation, planning, and accounting requirements of CAISO and the markets. Exhibit 1-1 lists CAISO BPMs.

Exhibit 1-1: CAISO BPMs

Title
BPM for Market Operations
BPM for Market Instruments
BPM for Settlements & Billing
BPM for Scheduling Coordinator Certification & Termination
BPM for Congestion Revenue Rights
BPM for Candidate CRR Holder Registration
BPM for Managing Full Network Model
BPM for Rules of Conduct Administration
BPM for Outage Management
BPM for Metering
BPM for Reliability Requirements
BPM for Credit Management
BPM for Compliance Monitoring
BPM for Definitions & Acronyms
BPM for BPM Change Management

1.2 Purpose of this Business Practice Manual

The *BPM for Credit Management* describes the credit-related policies and processes used at CAISO to protect the financial integrity and effectiveness of the CAISO markets. This BPM complements and further describes credit provisions primarily contained in Section 12 of the Tariff.

In this BPM you will find:

- The purpose of the credit management policy at CAISO
- How unsecured credit is granted by CAISO
- Forms of financial security (collateral) CAISO accepts
- How a market participant's net position is determined and how this position is compared against their credit limit.
- Procedures CAISO uses to request additional financial security
- Enforcement procedures CAISO may use if a market participant fails to comply with the credit policy

The provisions of this BPM are intended to be consistent with the CAISO Tariff. If the provisions of this BPM nevertheless conflict with the CAISO Tariff, the CAISO is bound to operate in accordance with the CAISO Tariff. Any provision of the CAISO Tariff that may have been summarized or repeated in this BPM is only to aid understanding. Even though every effort will be made by CAISO to update the information contained in this BPM and to notify Market Participants of changes, it is the responsibility of each Market Participant to ensure that he or she is using the most recent version of this BPM and to comply with all applicable provision of the CAISO Tariff.

A reference in this BPM to the CAISO Tariff, a given agreement, any other BPM or instrument, is intended to refer to the CAISO Tariff, that agreement, BPM or instrument as modified, amended, supplemented or restated.

Section number references refer to sections of this BPM unless specifically stated otherwise. The captions and headings in this BPM are intended solely to facilitate reference and not to have any bearing on the meaning of any of the terms and conditions of this BPM.

1.3 References

Note to Reader: The definition of acronyms and words beginning with capitalized letters are provided in the *BPM for Definitions & Acronyms*, and in the following table.

TERM	DEFINITION
Affiliated Entities	Legally distinct business units that are Affiliates, as defined in the CAISO Tariff.
Aggregate Credit Limit (ACL)	The sum of a Market Participant's Unsecured Credit Limit and its Financial Security Amount, as provided for in Section 12 of the CAISO Tariff.
Available Credit	Aggregate Credit Limit less Estimated Aggregate Liability
Average Rating Default Probability (ARDP)	The sum of Credit Rating Default Probabilities divided by the total number of Credit Rating Default Probabilities used.
Business Association Identification Number (BAID)	An identification code used by CAISO to represent a Market Participant. A Market Participant may have more than one BAID.
Credit Rating Default Probability	The 5 Year Median Default Probability based on a rating agency's credit rating as listed in the Credit Rating Default Probability table in Section 4.3.1.3 of this BPM.
Day or Trading Day	A reference to a day or Trading Day is to a calendar day unless otherwise specified.
Collateral	See Financial Security.
Combined Default Probability (CDP)	A Market Participant's blended probability of default based on credit agencies' Average Rating Default Probability and MKMV Default Probability according to rules established for different entity types.
Credit Margin	The quantity equal to Expected CRR Congestion Revenue minus Fifth Percentile CRR Congestion Revenue. Credit Margin is used as a component of the value of each CRR in a CRR portfolio.
CRR Auction Price	The price paid for a CRR at auction.
Estimated Aggregate Liability (EAL)	The sum of a Market Participant's known and reasonably estimated potential liabilities for a specified time period arising from charges described in the CAISO Tariff, as provided for in Section 12 of the CAISO Tariff.
Expected CRR Congestion Revenue	The amount of expected Congestion revenue associated with a CRR, as calculated by CAISO.
Fifth Percentile CRR Congestion Revenue	The amount of Congestion revenue associated with a CRR that performs at the fifth percentile level with regard to a probabilistic

	determination of value for that CRR, as calculated by CAISO.
Financial Security	Any of the types of financial instruments listed in Section 12 of the CAISO Tariff that may be posted by a Market Participant.
Financial Security Amount	The level of Financial Security posted in accordance with Section 12 of the CAISO Tariff by a Market Participant.
Material Change in Financial Condition	A change in or potential threat to the financial condition of a Market Participant that increases the risk that the Market Participant will be unlikely to meet some or all of its financial obligations. The types of Material Change in Financial Condition include but are not limited to the following: (a) A credit agency downgrade; (b) Being placed on a credit watch list by a major rating agency; (c) A bankruptcy filing; (d) Insolvency; (e) The filing of a material lawsuit that could significantly adversely affect past, current or future financial results; or any change in the financial condition of the Market Participant which exceeds a five percent (5%) reduction in the Market Participant's tangible net worth for the Market Participant's preceding fiscal year, calculated in accordance with generally accepted accounting practices.
MKMV Default Probability	The Moody's KMV default probability determined in accordance with step 3 of Section 4.3.2 of this BPM.
Nationally Recognized Statistical Rating Organizations (NRSRO)	National credit rating agencies as designated by the U.S. Securities & Exchange Commission.
Net Assets (NA)	For governmental or not-for-profit entities, defined as total assets less total liabilities.
Rated Governmental Entity	A municipal utility or state or federal agency that holds an issuer, counterparty or underlying credit rating by a Nationally Recognized Statistical Rating Organization.
Rated Public/Private Corporation	An investor owned or privately held entity that holds an issuer, counterparty or underlying credit rating by a Nationally Recognized Statistical Rating Organization.
Scheduling Coordinator	An entity certified by CAISO for the purposes of undertaking the functions specified in Section 4.5.3 of the CAISO Tariff.
Scheduling Coordinator Identification Number (SCID)	A unique number assigned to each Scheduling Coordinator by CAISO.
Tangible Net Worth (TNW)	Total Assets minus Intangibles (e.g., Good Will) minus Total Liabilities.
Unrated Governmental Entity	A municipal utility or state or federal agency that does not hold an issuer, counterparty or underlying credit rating by a Nationally Recognized Statistical Rating Organization.
Unrated Public/Private	An investor owned or privately held entity that does not hold an

Corporation	issuer, counterparty or underlying credit rating by a Nationally Recognized Statistical Rating Organization.
Unsecured Credit Limit (UCL)	The level of credit established for a Market Participant that is not secured by any form of Financial Security, as provided for in Section 12 of the CAISO Tariff.

Any term defined in the Master Definitions Supplement to the CAISO Tariff shall have the same meaning where used in this BPM. In any instances where a definition in this document conflicts with a definition in the CAISO Tariff, CAISO Tariff definition will prevail.

In addition to the CAISO FERC Electric Tariff and other CAISO BPMs, the following references are related to this BPM:

- Other CAISO BPMs
- CAISO FERC Electric Tariff, Amended and Restated Second Replacement

Current versions of these documents are posted on the CAISO Website.

2. Credit Policy Overview

In this section you will find the following information:

- Who is subject to the credit policy and the goal of the policy
- The principles of credit policy operation
- Who to contact with questions on the credit policy
- An overview of the sections of this BPM

2.1 Credit Policy Applicability and Goal

All Market Participants requesting transmission services with CAISO are subject to the credit policy as documented in Section 12 of the CAISO Tariff, and as further detailed in this BPM. The credit policy is designed to protect Market Participants from undue exposure to default risk by other Market Participants.

Each Market Participant is to maintain an Aggregate Credit Limit (Unsecured Credit Limit ("UCL" – See Section 4) plus Financial Security Amount (see Section 5)) in excess of its Estimated Aggregate Liability (see Section 6).

2.2 Principles

CAISO intends to maintain the confidence of Market Participants in the CAISO Markets and to sustain CAISO's mission of ensuring an adequate supply of power at a reasonable cost, by equitably, consistently and strictly enforcing these credit procedures.

CAISO recognizes that Market Participants want credit-related practices that are appropriate and transparent. CAISO endeavors to maintain an accurate Business Process Manual that describes credit-related practices and administrative procedures. CAISO invites and appreciates feedback of Market Participants to further improve the efficiency and effectiveness of CAISO's credit policy.

2.3 Contacts

Please direct comments and inquiries about CAISO's credit policy to:

KEVIN KING: SR. FINANCIAL ANALYST / CREDIT MANAGER.
PHONE: (916) 608-1247 ♦ EMAIL: kking@caiso.com

PHILIP LEIBER: TREASURER & DIRECTOR OF FINANCIAL PLANNING
PHONE: (916) 351-2168 ♦ EMAIL: pleiber@caiso.com

2.4 Overview of this BPM

- **Section 3: Unsecured Credit**
  Provides an overview of the CAISO procedures for determining Unsecured Credit Limits for new and existing Market Participants.

- **Section 4: Unsecured Credit Calculation**
  Provides an overview of the calculation of Unsecured Credit Limit for Rated/Unrated Public/Private Corporations and for Rated/Unrated Governmental Entities.

- **Section 5: Approved Forms of Financial Security Instruments**
  Provides information about each of the seven different types of financial instruments that may be used to provide Financial Security.

- **Section 6: Estimated Aggregate Liability Calculation**
  Provides an overview how the CAISO calculates the outstanding position of each Market Participant.

- **Section 7: Comparison of Estimated Aggregate Liability to Credit Limits and Requests for Additional Financial Security**
  Describes the process for determining when additional Financial Security is required and how requests for additional Financial Security are communicated to Market Participants.

- **Section 8: Credit Policy Enforcement**
  Describes the actions that may be taken by the CAISO when a Market Participant's Estimated Aggregate Liability exceeds its Aggregate Credit Limit.

- **Section 9: Notifications**
  Summarizes credit notifications from CAISO to Market Participants and vice-versa.

- **Section 10: Dispute Procedures**
  Describes the process for Market Participants to dispute Financial Security requests related to CAISO's comparison of the Estimated Aggregate Liability with their Aggregate Credit Limit.

- **Section 11: Financial Responsibility Related to RMR Contracts**
  Describes the financial requirements related to RMR contracts.

3. Unsecured Credit

In this section you will find the following information:

- A description of the information that is needed to apply for unsecured credit
- A discussion of the Financial Statements that are needed for unsecured credit evaluation
- A discussion of the Rating Agency reports that are needed for unsecured credit evaluation
- A description of the other credit strength indications needed for unsecured credit evaluation

3.1 Unsecured Credit Assessment Requirements

As provided in Section 12.1.1 of CAISO Tariff, an approved Application for Unsecured Credit must be on file with CAISO for those Market Participants seeking an Unsecured Credit Limit ("UCL") with CAISO. Market Participants must only file an Application for Unsecured Credit once. A Market Participant should subsequently inform CAISO of changes to their contact or other relevant information contained in the Application. A copy of the Application for Unsecured Credit can be found at the CAISO Website as follows: Operations Center/Markets/Settlements/Credit Policy/CAISO Credit Application or at the following URL: http://www.caiso.com/17b3/17b371e06a2b0.doc.

As provided in Section 12.1 of CAISO Tariff, each Market Participant must cover its outstanding financial obligations to the CAISO market by maintaining a UCL and/or by posting Financial Security. The combination of the UCL and the Financial Security Amount represents the Market Participant's Aggregate Credit Limit ("ACL"). CAISO periodically calculates a Market Participant's liabilities and notifies it in the event its ACL needs to be increased through posting of additional Financial Security (Section 7 of this BPM). It is the Market Participant's responsibility to maintain a sufficient ACL to cover its estimated financial obligations.

As provided in Section 12.1.1, 12.1.5 and 12.4 of CAISO Tariff, each Market Participant requesting or having unsecured credit is required to submit to CAISO or its designee financial statements and other information related to the overall financial health of the Market Participant. These are reviewed by CAISO or its agent in determining the Market Participant's creditworthiness and its ability to meet its financial obligations. Market Participants are responsible for the timely submission of their latest financial statements either directly or by indicating where the material can be located on their company website and/or on the U.S. Security Exchange Commission's website as well as other information that may be reasonably

necessary for CAISO to conduct its evaluation. CAISO may also rely on financial reporting agencies and the financial press as part of the credit evaluation process.

As provided in Sections 12.1.1 and 12.1.2 of CAISO Tariff, a Market Participant may be denied a UCL with CAISO as a result of the credit evaluation. Market Participants who are denied a UCL may submit other forms of Financial Security acceptable to CAISO that are sufficient to cover their Estimated Aggregate Liabilities (EAL). See Section 5, Approved Forms of Financial Security Instruments, for more information.

3.2 Financial Statements

As provided in Section 12.1.1 of the CAISO Tariff, Market Participants requesting unsecured credit are required to provide financial statements to be used by CAISO in its credit assessment process.

Based on availability, the Market Participant must submit a financial statement for the most recent financial quarter, as well as audited financial statements for the most recent three fiscal years, or the period of existence of the Market Participant, if shorter, to CAISO or CAISO's designee. If audited financial statements are not available, financial statements, as described below, should be submitted, signed and attested to by an officer of the Market Participant as a fair representation of the financial condition of the Market Participant in accordance with generally accepted accounting principles.

The information should include, but is not limited to, the following:

a. If publicly traded:
    i. Annual and quarterly reports on Form 10-K and Form 10-Q, respectively
    ii. Form 8-K reports, if any
b. If privately held or governmentally owned:
    i. Management's Discussion & Analysis (if available)
    ii. Report of Independent Accountants (if available)
    iii. Financial Statements, including:
        - Balance Sheet
        - Income Statement
        - Statement of Cash Flows
        - Statement of Stockholder's Equity
    iv. Notes to Financial Statements

If the above information is available electronically on the Internet, the Market Participant may indicate in written or electronic communication where such statements are located for retrieval by CAISO or CAISO's designee.

3.3 Rating Agency Reports

Rating agency reports and credit ratings are utilized from those entities designated by the U.S. Securities & Exchange Commission as Nationally Recognized Statistical Rating Organizations (NRSROs) on their website: http://www.sec.gov/divisions/marketreg/ratingagency.htm.

The current NRSRO entities are:

- A.M. Best Company, Inc. (A.M. Best)
- Dominion Bond Rating Service Limited (DBRS)
- Fitch, Inc. (Fitch)
- Moody's Investors Service Inc. (Moody's)
- Standard & Poor's Division of the McGraw Hill Companies, Inc. (S&P)

The ratings utilized are the long-term credit ratings for the entity as a whole, on a stand-alone basis. These ratings are known as "issuer" or "underlying" ratings, and are without the benefit of third-party credit support.

Project financing ratings or insured bond ratings are not utilized, since those credit ratings are based on revenue streams or third-party funding available to bond holders but not necessarily available to trade creditors such as the suppliers to the CAISO Markets. Moreover, CAISO is advised by the credit rating agencies that these project financing ratings or insured bond ratings cannot be considered as valid measures of an entity's ability to meet its non-bond obligations.

If a Market Participant has only a "senior long-term unsecured rating" instead of an issuer rating, the rating is deemed acceptable. However, for the UCL calculation, this rating is lowered by one rating level to account for the risk that the obligations to CAISO have a lower claim priority.

If a Market Participant has only a "short-term rating" instead of an issuer rating, CAISO utilizes an equivalent long-term rating based on the highlighted rating in the long- and short-term rating correlation table, Exhibit 3-1: Long-Term - Short-Term Equivalency Ratings.

S&P		**Moody's**	
Short Term Rating	Equivalent Long Term Ratings	Short Term Rating	Equivalent Long Term Ratings
A-1+	AAA/AA+/**AA**/AA-/A+	P1	Aaa/Aa1/Aa2/**AA3**/A1/A2/A3
A-1	A+/**A**/A-	P2	A3/Baa1/**Baa2**/Baa3
A-2	A-/**BBB+**/BBB	P3	Baa3/Ba1/**Ba2**/Ba3

A-3	BBB/**BBB-**	NP	B1/B2/B3/Caa1/**Caa2**/ Caa3/Ca/C
B	BB+/**BB**/BB-		
C	B+ / B / B- / CCC+ / **CCC** / CCC- / CC / C		
D	**D**		

The highlighted rating represents a mid-range rating in the rating agencies' long- and short-term rating correlation table. Equivalent ratings from other rating agencies may also be considered. If the short-term rating is noted as being under a credit watch with negative implications, CAISO will use the lowest long-term equivalent rating in the range for its assessment.

Rating agency reports, particularly credit ratings, are reviewed and updated minimally on a quarterly basis for those Market Participants with an Unsecured Credit Limit. They are also reviewed as needed if questions arise as to changes to a Market Participant's financial health and/or credit standing. Additionally, credit rating agency reports of downgrade/upgrades are reviewed upon notice from a rating agency to determine if the Unsecured Credit Limit should be correspondingly decreased/increased.

3.4 Other Qualitative and Quantitative Credit Strength Indicators

As provided in Section 12.1.1 of the CAISO Tariff, CAISO may rely on information gathered from financial reporting agencies, the general/financial/energy press, and provided by the Market Participant to assess an entity's overall financial health and its ability to meet its financial obligations. Information considered by CAISO in this process may include the qualitative factors noted in FERC's Policy Statement on Electric Creditworthiness[1] :

a) Applicant's history;

b) Nature of organization and operating environment;

c) Management;

d) Contractual obligations;

e) Governance policies;

[1] [1] *Footnote 13 of "Policy Statement on Credit Related Issues for Electric OATT Transmission Providers, Independent System Operators and Regional Transmission Organizations" (Order E-40, Docket PL05-3-000, November 19, 2004).*

f) Financial and accounting policies;

g) Risk management and credit policies;

h) Market risk including price exposures, credit exposures and operational exposures;

i) Event risk; and

j) The state or local regulatory environment.

Material negative information in these areas may result in a reduction of up to 100% in the Unsecured Credit Limit that would otherwise be granted based on the methodology described in Section 4 of this BPM. A Market Participant, upon request, will be provided a written analysis as to how the provisions of Section 3.4 were applied in setting its Unsecured Credit Limit.

Notwithstanding the considerations described above, Market Participants are obligated to provide CAISO timely information regarding any Material Change in Financial Condition, i.e., an adverse change that could affect its or one of its affiliated entities ability to pay its debt or meet its Financial Security obligations as they become due. Examples of Material Changes in Financial Condition may include but are not limited to:

a) Credit agency downgrades;

b) Being placed on a credit watch list by a major rating agency;

c) A bankruptcy filing;

d) Insolvency;

e) The filing of a material lawsuit that could significantly and adversely affect past, current or future financial results; or

f) Any change in the financial condition of the Market Participant that exceeds a five percent (5%) reduction in the Market Participant's Tangible Net Worth or Net Assets for the Market Participant's preceding fiscal year, calculated in accordance with generally accepted accounting practices.

4. Unsecured Credit Limit Calculation

In this section you will find the following information:

- The purpose of the Unsecured Credit Limit
- A description of the components of the Unsecured Credit Limit calculation
- An explanation of the Unsecured Credit Limit calculation for each category of Market Participant

4.1 Purpose of Unsecured Credit Limit

The UCL is the level of credit established for a Market Participant that is not secured by any form of Financial Security. A maximum UCL of $250 million has been specified in CAISO Tariff. The purpose of this limit is to protect CAISO and its participants from undue exposure caused by the default of an individual Market Participant. This limit has been set based on a maximum of 95 days of charges outstanding according to the current CAISO payment calendar.[2]

4.2 Classes of Entities That May Be Eligible for Unsecured Credit

The calculation of a Market Participant's UCL depends on the entity's classification:

- **1. Rated Public/Private Corporation** - the UCL is the lesser of $250 million or an amount equal to the Market Participant's Tangible Net Worth multiplied by a calculated percentage of Tangible Net Worth. The Tangible Net Worth percentage is comprised of fifty percent (50%) of the Market Participant's Credit Rating Default Probability and fifty percent (50%) of the MKMV Default Probability. See Section 4.3.2.

- **2. Unrated Public/Private Corporation** - the UCL is the lesser of $250 million or an amount equal to the Market Participant's Tangible Net Worth multiplied by a calculated percentage of Tangible Net Worth. The Tangible Net Worth percentage is comprised of one hundred percent (100%) of the MKMV Default Probability. See Section 4.3.2.

- **3. Rated Governmental Entity** - the UCL is the lesser of $250 million or an amount equal to the Market Participant's Net Assets multiplied by a calculated percentage of Net Assets. The Net Asset percentage is comprised of one hundred percent (100%) of the Market Participant's Credit Rating Default Probability. See Section 4.3.2.

[2] With the implementation of Payment Acceleration (scheduled for late 2008), CAISO expects to propose a reduction in the $250 million limit. Any changes to the $250 million limit will require FERC approval of an amendment to the applicable provisions of CAISO Tariff.

4. **(a) Unrated Governmental Entities Other Than Those that Receive Appropriations from the Federal Government or a State Government** – The Unsecured Credit Limit is the lesser of $250 million or an amount equal to a specified percentage of the Market Participant's Net Assets if the Market Participant has a minimum of $25 million in Net Assets and its Times Interest Earned, Debt Service Coverage and Equity to Assets ratios meet or exceed minimums specified in the Section 4.4 of this BPM.

   (b) Unrated Governmental Entities that Receive Appropriations from the Federal Government or a State Government – The Unsecured Credit Limit is the lesser of $250 million dollars or the amount appropriated by the federal or relevant state government for the purpose of procuring energy and energy-related products and services for the applicable fiscal year. The Unrated Governmental Entity seeking to establish an Unsecured Credit Limit pursuant to this section shall provide documentation establishing its annual appropriations.

5. **Local Publicly Owned Electric Utilities** – A Local Publicly Owned Electric Utility with a governing body having ratemaking authority that has submitted an application for an Unsecured Credit Limit shall be entitled to an Unsecured Credit Limit of $1 million dollars without regard to its Net Assets. Additional details of this provision are provided in Section 4.5 of this BPM.

Unsecured Credit Limits established pursuant to this Section shall be subject to CAISO's consideration of the same qualitative factors that apply to all Market Participants as set forth in Section 3.4 and, accordingly, CAISO may adjust a Market Participant's Unsecured Credit Limits pursuant to Section 3.4.

4.3 Unsecured Credit Limit Calculation for Rated and Unrated Public/Private Corporations and Rated Governmental Entities

This section documents the procedures used to set unsecured credit limits for the entities in classes 1, 2, 3 as listed in Section 4.2.

4.3.1 Definitions and Variables Used in These Calculations

4.3.1.1 Maximum Percentage of Tangible Net Worth or Net Assets

For Rated and Unrated Public/Private Corporations or Rated Governmental Entities, the maximum percentage of Tangible Net Worth or Net Assets is seven and a half percent (7.5%) for the highest quality entities; that is, those Market Participant's whose Combined Default Probability is less than or equal to six hundredths percent (0.06%). The percentage a Market Participant qualifies for will be reduced as its credit risk increases.

A lesser amount of unsecured credit may be granted if CAISO becomes aware of information related to a Material Change in Financial Condition or other significant information that presents a significant risk to the creditworthiness of the entity. For more information, see Section 3.4, Other Qualitative and Quantitative Credit Strength Indicators.

4.3.1.2 Combined Default Probability

The calculation of UCL is based in part on the entity's Combined Default Probability (CDP). CDP is a Market Participant's blended probability of default based on Average Rating Default Probability (ARDP) and MKMV Default Probability (MKDP) according to the following rules established for different entity types:

- CDP for Rated Public/Private Corporations = (ARDP * 50%) + (MKDP * 50%)
- CDP for Unrated Public/Private Corporations = MKDP * 100%
- CDP for Rated Governmental Entities = ARDP * 100%
- The calculation of UCL for Unrated Governmental Entities does not involve CDP

4.3.1.3 Average Rating Default Probability

The Average Rating Default Probability (ARDP) used in the calculation of CDP is the sum of Credit Rating Default Probabilities divided by the total number of Credit Rating Default Probabilities available. Credit Rating Default Probabilities are updated periodically, and the current figures will be posted on the CAISO website under the heading "Credit Rating Default Probabilities -- Used in Unsecured Credit Limit Calculation" in the following location:
http://www.caiso.com/1bd8/1bd8b09916e50.html

The following illustrative table shows the Credit Rating Default Probabilities (labeled "5 Year Median Default Probability") from Moody's KMV (a subsidiary of Moody's Investors Service Inc.), that are determined as a function of issuer ratings (without the benefit of credit enhancement) from two of the NRSROs (Moody's and S&P). These ARDPs are based on the five-year historical median of Moody's KMV EDF™ (Expected Default Frequency).

Credit Rating Default Probabilities table follows…

CREDIT RATING DEFAULT PROBABILITIES (DP)					
Based on 5 year historical median of Moody's KMV EDF's					
(Indicative Table *)					
Maximum Allowable Percentage)				7.50%	
Base Default Probability				0.06%	
Moody's	5 Year Median Default Probability	Tangible Net Worth or Net Asset Percentage	S&P	5 Year Median Default Probability	Tangible Net Worth or Net Asset Percentage
Aaa	0.020%	7.50%	AAA	0.020%	7.50%
Aa1	0.032%	7.50%	AA+	0.033%	7.50%
Aa2	0.040%	7.50%	AA	0.042%	7.50%
Aa3	0.056%	7.50%	AA-	0.059%	7.50%
A1	0.080%	5.60%	A+	0.084%	5.38%
A2	0.114%	3.94%	A	0.119%	3.80%
A3	0.144%	3.12%	A-	0.154%	2.92%
Baa1	0.182%	2.47%	BBB+	0.200%	2.25%
Baa2	0.230%	1.95%	BBB	0.259%	1.73%
Baa3	0.307%	1.47%	BBB-	0.367%	1.23%
Ba1	0.408%	1.10%	BB+	0.518%	0.00%
Ba2	0.544%	0.00%	BB	0.733%	0.00%
Ba3	0.848%	0.00%	BB-	1.215%	0.00%
B1	1.323%	0.00%	B+	2.014%	0.00%
B2	2.064%	0.00%	B	3.338%	0.00%
B3	4.168%	0.00%	B-	5.384%	0.00%
Caa1	8.418%	0.00%	CCC+	8.682%	0.00%
Caa2	17.000%	0.00%	CCC	14.000%	0.00%
Caa3	17.946%	0.00%	CCC-	14.936%	0.00%
Ca	20.000%	0.00%	CC	17.000%	0.00%
C	20.000%	0.00%	C	18.250%	0.00%
			D	20.000%	0.00%
* Table is subject to update on a monthly basis. Current table will be on CAISO credit webpage: http://www.caiso.com/docs/2005/06/14/2005061416563264 66.html					

4.3.1.4 Moody's KMV Default Probability

The Moody's KMV Default Probability (MKDP) utilized in the calculation of CDP is obtained using one of Moody's KMV products: CreditEdge Plus™ or RiskCalc®.

4.3.2 Unsecured Credit Limit Calculation for Rated/Unrated Public/Private Corporations and Rated Governmental Entities

An eight-step process is used to determine Unsecured Credit Limits for Market Participant's UCL that are Rated Public/Private Corporations, Unrated Public/Private Corporations and Rated Governmental Entities.

Step 1 – If the Market Participant has an issuer rating (also known as "counterparty" of "underlying" rating) from one or more of the NRSROs, verify the rating(s) with the appropriate NRSRO. If issuer ratings are unavailable, see Section 3.3 for alternative ratings that may be used.

Step 2 – Calculate the Market Participant's Average Rating Default Probability (ARDP). ARDP is the sum of Credit Rating Default Probabilities from Exhibit 4-1 divided by the total number of Credit Rating Default Probabilities available.

Step 3 – Using Moody's KMV CreditEdge™ or RiskCalc® software, obtain the Market Participant's Moody's KMV Default Probability (MKDP).

Step 4 – Calculate a Combined Default Probability (CDP) based on the type of entity as described in Section 4.3.1.2.

Step 5 – Calculate the Market Participant's Tangible Net Worth Percentage (TNWP) or Net Assets Percentage (NAP):

TNWP = MAP * BDP / CDP for Rated and Unrated Public/Private Corporations

NAP = MAP * BDP / CDP for Rated Governmental Entities

Where:

MAP = Maximum allowable percentage from Exhibit 4-1

BDP = Base default probability from Exhibit 4-1

CDP = Combined Default Probability from Step 4 above.

NOTE: TNWP or NAP equals zero percent (0%) if the entities CDP is greater than 0.5%.

Step 6 – Calculate the Market Participant's Tangible Net Worth or Net Assets:

1. Tangible Net Worth (TNW) for Rated or Unrated Public/Private Corporations equals Total Assets minus Total Liabilities minus Intangible Assets. Examples of Intangible Assets include Good Will, etc.

2. Net Assets (NA) for Rated Governmental Entities equals Total Assets minus Total Liabilities.

Step 7 – Calculate the Market Participant's UCL:

1. UCL = TNW * TNWP for Rated or Unrated Public/Private Corporations

2. UCL = NA * NAP for Rated Governmental Entities.

Step 8 – Adjust UCL downward, if warranted based on CAISO's review of factors described in Section 3.4, Other Qualitative and Quantitative Credit Strength Indicators:

Final UCL = UCL from Step 7 * adjustment factor (0 - 100%)

Where the adjustment factor is determined by the CAISO Finance Department based on the qualitative and quantitative credit strength indicators discussed in Section 3.4.

4.3.3 Example Unsecured Credit Limit Calculations for Rated/Unrated Public/Private Corporations and Rated Governmental Entities

This section provides example UCL calculations for each of these entity types.

4.3.3.1 Rated Public/Private Corporations

Step 1 – Step 2: Calculate the Market Participant's Average Rating Default Probability.

If a Market Participant has a Moody's long-term rating of Baa2 and a Standard & Poor's long-term rating of BBB+, its Average Rating Default Probability is calculated as follows:

ARDP = (0.230% + 0.200%) / 2 = 0.215%.

Step 3 – Step 4: Calculate a Combined Default Probability.

If the Market Participant has a 0.240% Moody's KMV default probability, its Combined Default Probability is calculated as follows:

CDP = (50% x 0.215%) + (50% x 0.240%) = 0.228%.

Step 5: Calculate the Market Participant's Tangible Net Worth Percentage.

The Tangible Net Worth Percentage is calculated as follows:

TNWP = 7.5% x 0.06% / 0.228% = 1.97%.

Step 6 – Step 8: Calculate the Market Participant's Tangible Net Worth and UCL. Exhibit 4-3: Sample Calculation of UCL for a Rated Public/Private Corporation shows the steps for completing the UCL calculation.

Sample Calculation of UCL for a Rated Public/Private Corporation

Step 5. Tangible Net Worth Percentage (TNWP)	Step 6. Tangible Net Worth (TNW)	Step 7. Unsecured Credit Limit (UCL)	Step 8. Adjust UCL Based on Qualitative Factors
1.97%	Tangible Assets (i.e., Total Assets less Goodwill) $192,100,000 minus Total Liabilities $38,000,000 equals TNW $154,100,000	TNW $154,100,000 times TNWP 1.97% equals UCL $3,036,000	UCL $3,036,000 times Adjustment Factor based on qualitative factors as specified in Section 3.4. 80% equals Adjusted UCL $2,429,000

4.3.3.2 Unrated Public/Private Corporations

Step 1 – Step 2: Calculate the Market Participant's Average Rating Default Probability

These steps would not be applicable for an Unrated Public/Private Corporation.

Step 3 – Step 4: Calculate a Combined Default Probability

If the Market Participant has a 0.240% MKMV Default Probability, its Combined Default Probability is calculated as follows:

CDP = 100% * 0.240% = 0.240%

Step 5: Calculate the Market Participant's Allowable Tangible Net Worth Percentage.

The Tangible Net Worth Percentage is calculated as follows:

TNWP = 7.5% x 0.06% / 0.240% = 1.88%

Step 6 – Step 8: Calculate the Market Participant's Tangible Net Worth and Unsecured Credit Limit. Exhibit 4-4: Sample Calculation of UCL for an Unrated Public/Private Corporation shows the steps for completing the UCL calculation.

Sample Calculation of UCL for an Unrated Public/Private Corporation

Step 5. Tangible Net Worth Percentage (TNWP)	Step 6. Tangible Net Worth (TNW)	Step 7. Unsecured Credit Limit (UCL)	Step 8. Adjust UCL Based on Qualitative Factors
1.88%	Tangible Assets (i.e., Total Assets less Goodwill) $192,100,000 minus Total Liabilities $38,000,000 equals TNW $154,100,000	TNW $154,100,000 times TNWP 1.88% equals UCL $2,897,000	UCL $2,897,000 times Adjustment factor based on qualitative factors as specified in section A-1.3. 50% equals Adjusted UCL $1,449,000

4.3.3.3 Rated Governmental Entities

Step 1 – Step 2: Calculate the Market Participant's Average Rating Default Probability

If the Market Participant has a Moody's long-term rating of A1 and a Standard & Poor's long-term rating of AA-, its Average Rating Default Probability is calculated as follows:

ARDP = (0.080% + 0.059%) / 2 = 0.070%

Step 3 – Step 4: Calculate a Combined Default Probability

MKMV Default Probabilities are not available for Rated Governmental Entities. Therefore, the Combined Default Probability is calculated as follows:

CDP = 100% * 0.070% = 0.070%

Step 5: Calculate the Market Participant's Allowable Net Asset Percentage.

The Net Asset Percentage is calculated as follows:

NAP = 7.5% x 0.06% / 0.070% = 6.43%

Step 6 – Step 8: Calculate the Market Participant's Net Assets and Unsecured Credit Limit. Exhibit 4-5: Sample Calculation of UCL for a Rated Governmental Entity shows the steps for completing the UCL calculation.

Sample Calculation of UCL for a Rated Governmental Entity

Step 5.	Step 6.	Step 7.	Step 8.
Net Assets Percentage (NAP)	Net Assets	Unsecured Credit Limit (UCL)	Adjust UCL Based on Qualitative Factors

6.43%	Total Assets $192,100,000 minus Total Liabilities $38,000,000 equals Net Assets $154,100,000	Net Assets $154,100,000 times NAP 6.43% equals UCL $9,909,000	UCL $9,909,000 times Adjustment factor based on qualitative factors as specified in section A-1.3. 100% equals Adjusted UCL $9,909,000

4.4 Unsecured Credit Limit Calculation for Unrated Governmental Entities

4.4.1 Criteria for Unsecured Credit for Unrated Governmental Entities Other Than Those that Receive Appropriations from the Federal Government or a State Government

An Unrated Governmental Entity is eligible for Unsecured Credit if it meets the requirements set forth in the Table below.

Financial Metric	**Calculation**	**Minimum Accepted Value**
Net Assets	Total Assets – Total Liabilities	$25 million
Times Interest Earned	(Long-Term Debt Interest Expense + Change in Net Assets) / Long-Term Debt Interest Expense	1.05
Debt Service Coverage	(Depreciation & Amortization Expense + Long Term Debt Interest Expense + Change in Net Assets) / Debt Service Billed (Debt Service Interest and Principal).	1.00
Equity to Assets	Total Equity / Total Assets	0.15

For those Unrated Governmental Entities that meet all of the above criteria, the maximum amount of unsecured credit is calculated as five percent (5%) of Net Assets (i.e., five percent of Total Assets minus Total Liabilities). That percentage may be adjusted downward by up to 100% if CAISO becomes aware of significant

negative information regarding the Market Participant's operations as determined through trade publications and/or the financial press.

4.4.1.1 Example Unsecured Credit Limit Calculations for Unrated Governmental Entities Other Than Those that Receive Appropriations from the Federal Government or a State Government

The UCL calculation for an Unrated Governmental Entity not receiving appropriations requires financial data as set forth in the table above. Assume the following for purposes of this example:

Long-Term Debt Interest Expense = $7,900,000

Change in Net Assets = $4,100,000

Depreciation & Amortization Expense = $5,900,000

Debt Service Billed = $9,900,000

Total Assets = $283,600,000

Total Liabilities = $232,500,000

Based on the above information, the following financial metrics are calculated to determine if a UCL can be granted:

Net Assets = Total Equity = Total Assets – Total Liabilities = $51,100,000 ***(Acceptable)***

Times Interest Earned = (Long-Term Debt Interest Expense + Change in Net Assets) / Long-Term Debt Interest Expense = ($7,900,000 + $4,100,000) / $7,900,000 = 1.52 ***(Acceptable)***

Debt Service Coverage = (Depreciation and Amortization Expense + Long-Term Debt Interest Expense + Change in Net Assets) / Debt Service Billed = ($5,900,000 + $7,900,000 + $4,100,000) / $9,900,000 = 1.81 ***(Acceptable)***

Equity to Assets = Total Equity / Total Assets = $51,100,000 / $283,600,000 = 0.18 ***(Acceptable)***

Based on each of the financial metrics exceeding the Minimum Accepted Value as defined in Section 4.4.1, the UCL is calculated as follows:

UCL = Net Assets * 5% = $51,100,000 * 0.05 = $2,555,000

Adjusted UCL = UCL * adjustment factor based on qualitative factors = $2,555,000 * 100% = $2,555,000

It should be noted that the adjustment factor based on qualitative factors can vary between 0 – 100% based on the same qualitative factors used to assess other entity types. These qualitative factors are further described in Section 3.4 of this BPM. In addition, the entity would not be eligible for a UCL if any of the above financial metrics had not met the Minimum Accepted Value as defined in Section 4.4.1.

4.4.2 Unsecured Credit Limit for an Unrated Governmental Entity That Receives Appropriations from the Federal Government or a State Government

An Unrated Governmental Entity that receives appropriations from the federal government or a state government that has submitted an Application for Unsecured Credit shall be entitled to an Unsecured Credit Limit of the lower of the cap of 250 million dollars ($250,000,000) or the amount appropriated by the federal or relevant state government for the purpose of procuring energy and energy-related products and services for the applicable fiscal year. The Unrated Governmental Entity seeking to establish an Unsecured Credit limit pursuant to this section shall provide documentation establishing its annual appropriations. Unsecured Credit Limits established pursuant to this section or through Section 12.1.1 of the CAISO Tariff shall be subject to CAISO's consideration of the same qualitative factors that apply to all other Market Participants and, accordingly, CAISO may adjust their Unsecured Credit Limits pursuant to Section 12.1.1 of the CAISO Tariff.

4.5 Unsecured Credit Limit Calculation for Local Publicly Owned Electric Utilities

A Local Publicly Owned Electric Utility with a governing body having ratemaking authority that has submitted an application for an Unsecured Credit Limit shall be entitled to an Unsecured Credit Limit of $1 million dollars without regard to its Net Assets.

Such Local Publicly Owned Electric Utility shall be entitled to request an Unsecured Credit Limit based on Net Assets as provided in Section 4.3 or 4.4 of this BPM (corresponding to Tariff Section 12.1.1.A(3) or 12.1.1A(4)) in order to establish an Unsecured Credit Limit as the greater of $1 million dollars or the amount determined as provided in this Section (tariff Reference 12.1.1A(5)).

A public entity that is not a Local Publicly Owned Electric Utility is not entitled to an Unsecured Credit Limit of $1 million dollars under this Section 12.1.1A(5) but may seek to establish an Unsecured Credit Limit as provided in any other provision of the CAISO Tariff that may apply.

4.5.1 Public Entities Operating Through Joint Power Agreements

Public entities, including Local Publicly Owned Electric Utilities, that operate through a Joint Powers Agreement, or a similar agreement acceptable to CAISO with the same legal force and effect, shall be entitled to aggregate or assign their Unsecured Credit Limits subject to the following limitations and requirements. A public entity that is a party to a Joint Powers Agreement or similar agreement and that is also participating independently in CAISO's markets with an established Unsecured Credit Limit shall not be entitled to assign or aggregate any portion of its Unsecured Credit Limit that the public entity is using to support financial liabilities associated with its individual participation in CAISO's markets. A Local Publicly Owned Electric Utility that operates through a Joint Powers Agreement or similar agreement that desires to aggregate a portion of its Unsecured Credit Limit that is equal to or less than $1 million dollars with one or more other Local Publicly Owned Electric Utilities that operate through that Joint Powers Agreement or similar agreement or to assign a portion of its Unsecured Credit Limit that is equal to or less than $1 million dollars to the Joint Powers Authority shall be entitled to do so. A Local Publicly Owned Electric Utility that operates through a Joint Powers Agreement or similar agreement that desires to aggregate its Unsecured Credit Limit with one or more other Local Publicly Owned Electric Utilities that operate through that Joint Powers Agreement or similar agreement or to assign a portion of its Unsecured Credit Limit to the Joint Powers Authority that exceeds $1 million dollars, and any public entity that is not a Local Publicly Owned Electric Utility that operates through a Joint Powers Agreement or similar agreement that desires to aggregate its Unsecured Credit Limit with one or more other Local Publicly Owned Electric Utilities that operate through that Joint Powers Agreement or similar agreement or to assign any portion of its Unsecured Credit Limit to the Joint Powers Authority, shall provide documentation that is acceptable to CAISO and that demonstrates the Local Publicly Owned Electric Utility or public entity will assume responsibility for the financial liabilities of the Joint Powers Agency associated with the assigned or aggregated portion of the Unsecured Credit Limit. Such documentation may include a guaranty or similar instrument acceptable to CAISO.

4.6 Unsecured Credit Limit Issues for Affiliated Entities

As provided in Section 12.1.1.1 of CAISO Tariff, if any Market Participant requesting or maintaining a UCL is affiliated with one or more other entities subject to the credit requirements of Section 12 of the CAISO Tariff, CAISO may consider the overall creditworthiness and financial condition of these Affiliated Entities when determining the applicable UCL. CAISO may determine that the maximum UCL calculated in accordance with Section 4 of this BPM applies to the combined activity of these Affiliated Entities.

5. Approved Forms of Financial Security Instruments

In this section you will find information on the following topics:

- A list of the forms of Financial Security instruments CAISO accepts
- How CAISO uses the standard and non-standard forms
- A description of the acceptable debt ratings of issuing banks, financial institutions and insurance companies
- How CAISO uses Credit from Affiliates
- Issues related to prepayments
- Responsibility for losses of funds held by CAISO as a prepayment
- How CAISO treats the expiration of financial instruments

5.1 Forms of Financial Security

In accordance with Section 12.1.2 of CAISO Tariff, a Market Participant at its own expense, may submit one or more forms of Financial Security to meet or increase its Financial Security posting requirement. Pro-forma templates for each category of Financial Security may be found at the following CAISO website location:

http://www.caiso.com/docs/2005/06/14/2005061416563264 66.html

The forms of Financial Security are titled as follows:

a) An irrevocable and unconditional letter of credit issued by a bank or financial institution that is reasonably acceptable to CAISO (listed as "CAISO Form Letter of Credit" on the CAISO website)

b) An irrevocable and unconditional surety bond issued by an insurance company that is reasonably acceptable to CAISO (listed as "CAISO Form Surety Bond" on the CAISO website)

c) An unconditional guaranty issued by a company that is reasonably acceptable to CAISO (listed as "CAISO Form Guaranty" on the CAISO website)

d) A cash deposit in an escrow account maintained at a bank or financial institution that is reasonably acceptable to CAISO (listed as "CAISO Form Escrow Agreement" on the CAISO website)

e) A certificate of deposit in the name of CAISO issued by a bank or financial institution that is reasonably acceptable to CAISO (listed as "CAISO Form Certificate of Deposit" on the CAISO website)

f) A payment bond certificate issued by a bank or financial institution that is reasonably acceptable to CAISO (not on the CAISO website)

g) A prepayment to CAISO (a specific agreement related to a prepayment is not required. Prepayments are governed by Section 11.3.3 of the CAISO Tariff)

5.2 Standard & Non-Standard Forms

CAISO maintains standard agreement forms related to the types of Financial Security listed in Section 5.1, Forms of Financial Security. In accordance with Section 12.1.2.1 of CAISO Tariff, CAISO evaluates non-standard agreement forms for these types of Financial Security on a case-by-case basis. For those Market Participants that propose the use of a non-standard agreement form, the form is subject to review and approval by CAISO Finance and Legal Departments. A Market Participant is required to justify any proposed departures from CAISO standard agreement form.

Within ten (10) Business Days from receipt of any form of Financial Security, CAISO evaluates it and determines whether it is reasonably acceptable and approved. Significant departures from CAISO standard agreement forms may not be accepted. The request is denied if CAISO does not respond within ten (10) Business Days. If the need to post additional Financial Security is prompted by an additional Financial Security request based upon the latest Estimated Aggregate Liability (EAL) calculation, the review process does not defer the Market Participant's obligation to post additional Financial Security.

5.3 Minimum Debt Ratings

The standard that CAISO uses in establishing reasonable acceptability for issuing banks, financial institutions or insurance companies is that the institution has and maintains a minimum corporate debt rating of an "A-" by S&P, "A3" by Moody's, "A-" by Duff & Phelps, "A-" by Fitch or an equivalent short-term debt rating by any of these agencies.

5.4 Financial Security through Affiliates

In those cases where a Market Participant is a subsidiary or affiliate of another entity and prefers to utilize the consolidated financial statements and other relevant financial information of that entity for obtaining credit, a signed corporate guaranty is required. A guarantor is considered reasonably acceptable and a corresponding Financial Security Amount is set based on the guarantor's credit evaluation according to the same procedures that a Market Participant undergoes as described in Section 3.1, Unsecured Credit Assessment Requirements.

5.5 Prepayments as Financial Security

The CAISO Tariff (Section 11.3.3) also permits Market Participants to make a prepayment of an upcoming bill due to CAISO. A prepayment may be used as a form of Financial Security. Prepayments are held in an interest-bearing account. Interest accrues to the Market Participant's benefit and is added to the Market Participant's prepayment account on a monthly basis. Should a Market Participant become delinquent in payments, the Market Participant's outstanding account balance is satisfied using the prepayment. The Market Participant must take care to replenish used funds to ensure that it maintains a suitable level of cash to meet future financial obligations. Due to the additional administrative effort involved in tracking and posting interest on prepayments, the prepayment option is not encouraged.

5.5.1 Risk of Loss for Prepayments

CAISO is not held liable for any losses of funds held and invested by CAISO on the Market Participant's behalf. Market Participants agree to bear any risk of loss of principal and/or interest of these funds. Funds are only invested in bank accounts, high-quality money market funds or U.S. Government securities according to the Board approved CAISO investment policy, unless otherwise agreed to by the Market Participant and CAISO.

5.6 Expiration of Financial Instruments

Each Market Participant must ensure that the financial instruments it uses for the purpose of providing Financial Security do not expire and thereby cause the Market Participant's Aggregate Credit Limit to fall below the Market Participant's EAL. CAISO may treat a financial instrument that does not have an automatic renewal provision and that is not renewed or replaced within seven calendar days of its date of expiration as being out of compliance with the standards for Financial Security, will deem the value of that financial instrument to be zero, and may draw upon the Financial Security prior to its stated expiration if deemed necessary by CAISO.

6. Estimated Aggregate Liability Calculation

In this section you will find the following information:

- A description of the Estimated Aggregate Liability calculation
- How the Estimated Aggregate Liability is determined for existing Market Participants
- How the Estimated Aggregate Liability is determined for new Market Participants
- How CRRs are valued in the Estimated Aggregate Liability calculation

This section describes the approach used by CAISO to determine the outstanding position of each Market Participant, known as the Estimated Aggregate Liability. The charges CAISO shall use to calculate Estimated Aggregate Liability shall be charges described or referenced in the CAISO Tariff. Market Participants must maintain an Aggregate Credit Limit in excess of their Estimated Aggregate Liability at all times. The process CAISO uses to make this comparison is described in the Section 7 of this BPM.

6.1 Estimated Aggregate Liability (EAL) Overview

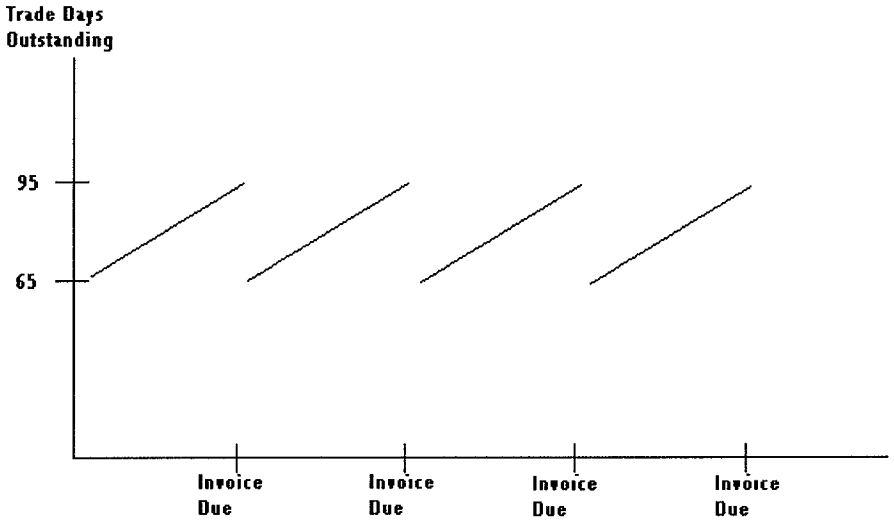
CAISO will calculate a Market Participant's Estimated Aggregate Liability which is the estimate of unpaid obligations for a specified time period arising from charges described in the CAISO Tariff. The Estimated Aggregate Liability calculation includes invoiced amounts (that are current but outstanding or past-due), settlement charges on statements that have been issued but not invoiced, and estimated settlement charges for trade days that are not yet on statements, and the prospective value of CRR obligations (if negative).

Based on the published CAISO payment calendar, there are at any given time approximately 65-95 trade days of unpaid obligations to CAISO depending on the date of the last cash settlement[3]. The EAL calculation will also include an additional 7 days of extrapolated transactions (in EAL Component #4) to provide appropriate credit coverage in recognition of the five business days that Market Participants have to post any additional required Financial Security under Section 7 of this BPM (corresponding to Section 12.4 of the Tariff).

[3] Prior to the effectiveness of MRTU, CAISO used a "Level Posting Period". The "Level Posting Period" was equal to 102 days (95 for the maximum length of the number of days transactions outstanding per the payment calendar plus 5 business days to allow a sufficient cushion of coverage given the allowed five-day response time for Market Participants to post additional Financial Security). This was used to limit frequent fluctuations in the EAL that were based on imperfect projections of available settlements data over the "blind spot" where settlements data was not yet available, and to avoid the need for frequent adjustments to posted security based on the date of the EAL calculation within the payment cycle.

The fluctuating nature of the EAL is illustrated as follows:

- Assume a Market Participant has very stable requirements resulting in level daily obligations to CAISO of $10.
- Based on the payment calendar, as few as 65 and as many as 95 days of transactions may be outstanding (unpaid) at a given time.
- The EAL for this market participant would vary between $720 and $1020. (65 days + 7 days times $10 = $720 and 95 days + 7 days times $10 = $1,020



The market participant would need an Aggregate Credit Limit of at least $1,133 ($1,020 divided by .9 see Section 7.1 of this BPM) to avoid calls for additional Financial Security by CAISO throughout this period.

CAISO's EAL calculation under MRTU will produce a liability estimate reflective of the payment calendar i.e. the EAL will fluctuate depending on the date of the calculation is made versus the payment cycle. Market Participants will typically elect to maintain an Aggregate Credit Limit sufficient to cover their EAL obligations as calculated during the peak of the payment cycle (with the highest number of days outstanding) to avoid the need for frequent calls for collateral by CAISO.

6.2 Estimated Aggregate Liability Components

CAISO shall calculate the Estimated Aggregate Liability for each Market Participant by aggregating the following obligations:

EAL Component #	Short Description	Description
1	Invoiced	Includes any published but unpaid Invoices, either preliminary or final, that are not yet due.
2	Published	Trade days for which either Preliminary (Initial) or Final (Recalculation) Settlements statements have been issued but not invoiced. The number of Trade Days contained in this component ranges from 7 to 57 days.
3	Estimated	Trade days for which settlement statements have not been issued up to T+7. Activity for these days is estimated by the Settlements System using any and all available operational data. For days with no data, the system will estimate operation levels based on historical measurements. Using available data, settlement amounts will be created for every Charge Code.
4	Extrapolated	Trade days for which settlements statements have not yet been issued. The amounts are estimated on a Charge Code by Charge Code basis by deriving daily averages for each and multiplying by the number of days between the latest published Preliminary (Initial) Settlements statement (T+38 business days) and the date of the EAL calculation plus 7 days. The Charge Code daily averages are generally based on activity over the last 60 days of published Settlement activity, although CAISO may use one month or one year of charges if deemed appropriate by CAISO
5	Value of CRR Portfolio	Prospective value of the CRR portfolio, if negative. The CRR obligation is valued as described in Section 6.2.2 of this BPM (and Section 12.6.3 of the Tariff)
6	CRR Bidding Reservation	At the start of a CRR auction, the CRR software obtains from the credit system a maximum bid amount for a CRR auction participant. This maximum bid amount will be defined as: Aggregate Credit Limit * 90% less EAL (excluding CRR Bidding Reservation). That amount is then added as a new component of the EAL entitled "CRR Bidding Reservation". That amount is retained as a component of the EAL until the end of the CRR auction. At the completion of the CRR auction, the CRR Bidding Reservation is reversed, and replaced with the "CRR Winning Bid Liability".
7	CRR Winning Bid Liability (prior to invoicing)	A Market Participant's winning bids at the completion of the CRR auction, but prior to invoicing (if there is a time lag). A market participant's winning bid amount becomes an invoiced amount. Invoiced amounts for CRRs are included in EAL Component 1.
8	Past-due	Any unpaid/past due invoices, if the Market Participant is a debtor for such invoices. This treatment is necessary if the CAISO is to maintain the integrity of the overall settlement system, which requires that each month be settled separately. Each trade month consists of creditors and debtors whose receivables and obligations vary over time. To the extent that amounts owed to an SC related to defaults in previous months are included in the liability estimation

		calculation and permitted to reduce that SC's current posting requirements, CAISO will have no means to enforce the payment obligation of that SC to pay current invoices rather than refuse payment in an attempt to recoup previous past-due amounts owed to them.
9	Annual FERC Fees	FERC fees for participants that have elected to pay such amounts on an annual basis that are owed and outstanding which are not included in EAL Components 1-4.
10	WAC-current	WAC Prepayment-current year, as specified in Tariff Section 36.9.2 Prepayment of Wheeling Access Charges
11	WAC-future	WAC Prepayment-subsequent year, as specified in Tariff Section 36.9.2 Prepayment of Wheeling Access Charges
12	EAL Adjustments	EAL Adjustments that may be necessary for a Market Participant based on an analysis performed by CAISO or as a result of a dispute by a Market Participant according to Section 10 of this BPM.
13	Extraordinary Settlements Adjustments	Adjustments to CAISO settlements amounts related to FERC proceedings, if known and estimated by CAISO.

6.2.1 EAL Is Calculated For A Market Participant on an Aggregate Basis

For a Market Participant that maintains multiple BAID numbers, the Estimated Aggregate Liability of the Market Participant as a legal entity will be calculated by summing the Estimated Aggregate Liabilities for all such BAID numbers and comparing the sum of the Estimated Aggregate Liabilities to the Aggregate Credit Limit of the Market Participant.

6.2.2 Valuation of a Market Participant's CRR Portfolio

This section provides additional detail related to the calculation of item 5 in the table above. The value of a Market Participant's CRR portfolio, if negative, is a component of the EAL. Each CRR in the portfolio is valued separately, but netting is allowed within the portfolio—i.e. the value of a positive CRR may offset the value of a negative CRR within the portfolio. Short-term and longer term CRRs are valued in a similar manner:

1. **Valuation of CRRs with a Term of One Year or Less.** Such CRRs are valued at the negative of the most recent CRR Auction Price for such CRR plus the Credit Margin for such CRR.

2. **Valuation of Long Term CRRs (Term of more than one year).** Such CRRs are valued at the negative of the Auction Price of a CRR same as

the Long Term CRR but with a one year term multiplied by the number of years remaining in the term of the Long Term CRR, plus (ii) the Credit Margin calculated for the one year CRR multiplied by the square root of the number of years remaining in the term of the Long Term CRR. In conducting calculations pursuant to this Section 12.6.3.3, the number of years remaining in the term of a Long Term CRR shall be rounded up to the nearest whole number, except that the whole number shall not be zero until the term of the Long Term CRR has expired.

Credit Margin for CRRs will be calculated based on the probability distribution of Congestion revenues as follows: Expected CRR Congestion Revenue minus Fifth Percentile CRR Congestion Revenue. Expected CRR Congestion Revenue and Fifth Percentile CRR Congestion Revenue will be based on historical LMP data, when available, and proxy values, including LMP study data, until such time as historical LMP data is available, with the details of such calculation published in a Business Practice Manual. CAISO may reassess its determinations regarding Expected CRR Congestion Revenue and Fifth Percentile CRR Congestion Revenue at any time and as a result, recalculate the CRR valuations in the EAL.

6.2.3 Estimated Aggregate Liability Adjustments

When CAISO or a Market Participant observes that the EAL calculation may be producing a liability estimate that appears to be inaccurate, CAISO may review and revise the calculation generally, and/or manually adjust the results for specific Market Participants to reflect known issues. Adjustments to a specific Market Participant's EAL are a component of the EAL as shown in the Table in Section 6.2, in row 12.

Other situations where CAISO may also adjust the EAL calculation for a specific Market Participant include the occurrence of a Market Participant bankruptcy where a new Business Association Identification Number (BAID) is established. In that case, the available settlements data for the previous BAID may be representative of ongoing activities levels, but this data is not normally accessible to the EAL calculation to estimate liabilities for the new post-bankruptcy BAID.

Market Participants may also recommend changes to their liability estimates through the dispute procedure noted in Section 10, Dispute Procedures.

6.2.4 WAC Prepayment

This section describes components 10 and 11 of the EAL components shown in Section 6.2 of this BPM. This EAL component is discussed in Tariff section 36.9.2.

Out-of-Control Area Load Serving Entities (OCALSE) who are allocated short-term CRRs will be subject to the same credit requirements for holding short-term CRRs as other market participants. Additionally, OCALSE will be required to maintain one year of credit coverage for their Wheeling Access Charge (WAC) commitment beyond the current period. Subsequently, they will be required to prepay the WAC on a monthly basis in advance of the trade month, consistent with the FERC April 20, 2007 Order.

Component 10 of the EAL shown in Section 6.2 of this BPM is the current year credit requirement that decreases with the passing of each month. During the current year, when the CRRs are allocated for the subsequent year, an additional one year of WAC requirements is added to the EAL, as shown in Component 11 of the EAL shown in Section 6.2 of this BPM.

This treatment applies to short-term CRRs allocated to OCALSE, however, CAISO expects to apply similar (or the same) treatment to long-term CRRs allocated to OCALSEs, but is awaiting FERC's ruling on long-term CRRs as of the date of the publication of this BPM.

6.2.5 Ordinary and Extraordinary Settlements Adjustments

CAISO's goal is to ensure that active as well as inactive Market Participants maintain an Aggregate Credit Limit sufficient to cover all known and reasonably estimated potential liabilities. Various charges sometimes arise which require special consideration in the EAL calculation. CAISO intends to include the following charges in the Estimated Aggregate Liability calculation, if and when such data is available, and will require Market Participants to post Financial Security accordingly.

The following two types of adjustments will be included in normal settlements statements as contained in components 1 and 2 of the EAL calculation shown in Section 6.2

- **Daily Adjustments and Disputes** – Charges associated with daily adjustments and disputes that are regularly calculated by the settlement system will be included in the liability estimation calculations as the charges are calculated. There should generally be no need to attempt to forecast these amounts since they are typically relatively small and usually affect many Market Participants.

- **Good Faith Negotiations** – In general, Good Faith Negotiations (GFN) tend to affect the transactions of an individual Market Participant, which in turn may affect a few or many other Market Participants. Transactions associated with GFNs will be handled in the same manner as transactions associated with Refund Orders.

The following type of adjustment will may be known to CAISO prior to being included in components 1 and 2 of the EAL calculation shown in Section 6.2. CAISO may include such amounts as a separate component of the EAL calculation, as shown in component 13 of the EAL calculation shown in Section 6.2.

- **Refund Orders** – CAISO will assess its ability to reasonably calculate the charges associated with a refund before CAISO's settlement system is rerun. If CAISO can reasonably apportion the refund to specific Market Participants, it will include the amounts in the liability estimation process and request security accordingly. If CAISO deems that complexities of a refund order preclude it from reasonably assessing the liabilities, it will not make a security request until the refund is processed through the settlement system. However, CAISO will make available an aggregate forecast of the refund liabilities, if at all possible, to Market Participants for informational purposes only.

6.3 Calculation of the EAL for New Market Participants

Each new Market Participant (and each Market Participant that has previously been inactive) is required to establish an initial Aggregate Credit Limit sufficient to cover a minimum of 45 Trading Days of estimated obligations. The Market Participant may then establish additional Aggregate Credit as obligations are incurred. This initial credit requirement is based on anticipated scheduling/trading practices and overall volumes, and shall be considered by CAISO to be equal to the Market Participant's Estimated Aggregate Liability until CAISO obtains data from its automated EAL calculation as described in Section 6.2.

Until the amount of time elapsed from such Market Participant's initial participation in CAISO's Market equals the maximum length of the CAISO payment cycle (i.e., 95 Trading Days), CAISO shall monitor the Market Participant's Estimated Aggregate Liability (upon the availability of Settlements data) against its Aggregate Credit Limit to determine if the Market Participant must post additional Financial Security. At all times during this initial period, the Market Participant has an obligation to maintain an Aggregate Credit Limit in excess of its Estimated Aggregate Liability.

Once the amount of time elapsed from the Market Participant's initial participation in the CAISO Market equals 95 Trading Days, CAISO shall begin calculating the Market Participant's Estimated Aggregate Liability pursuant to the procedures used for ongoing Market Participants.

CAISO has prepared a template that may be used to determine an initial posting requirement. The template is an Excel worksheet located at the New Market Participant Security Calculation link http://www.caiso.com/docs/2005/06/14/2005061416563264 66.html.

6.4 Transition to the EAL Calculation Shown in Section 6.2

The EAL components described in Section 6.2 of this document will be effective upon the cutover to MRTU and the availability of CAISO's Settlements and Market Clearing System. Prior to that date, the EAL components shown in Section 6.2 of this BPM will be modified as follows:

~~3~~	~~Estimated~~	~~Trade days for which settlement statements have not been issued up to T+7. Activity for these days is estimated by the Settlements System using any and all available operational data. For days with no data, the system will estimate operation levels based on historical measurements. Using available data, settlement amounts will be created for every Charge Code.~~
4	Extrapolated	Estimated obligations: Estimated charges for the Market Participant for the balance of the Level Posting Period. CAISO shall calculate estimated obligations for the Market Participant by multiplying (i) a daily average of published, actual Settlement charges for the Market Participant by (ii) the number of days remaining in the Level Posting Period for which actual Settlement data is unavailable. In calculating (i), above, CAISO shall separate the Market Participant's Settlement activity into daily market activity, monthly market activity, and Grid Management Charge activity, and shall determine the daily average of charges for each such type of activity separately based on the different frequencies with which charges for these types of activities are assessed. The daily average charges used in (i), above, shall normally be based on two months of available historical Settlement data for the Market Participant. CAISO may review the trend of Market Participant historical charges and determine that an alternative of one month or twelve months of historical charges would result in a more accurate estimate, and may use such data to calculate the daily average charges.

Further, prior to MRTU effectiveness, the EAL will be calculated assuming 102 trade days outstanding, using the "Level Posting Period" as described in CAISO's previous "Credit Policy and Procedures Guide"[4].

[4] "To avoid frequent changes to Financial Security posting requirements during the payment cycle, and to allow a sufficient cushion of coverage given the allowed five-day response time for Market Participants to post additional Financial Security, a "Level Posting Period" equal to 102 days (95 + 5 business days) is used as the basis for all Financial Security posting requirements."

7. Comparison of Estimated Aggregate Liability to Credit Limits and Requests for Additional Financial Security

In this section you will find the following information:

- How the CAISO compares the Estimated Aggregate Liability to the Aggregate Credit Limit for each Market Participant is determined for existing Market Participants
- Actions CAISO takes if the EAL approaches or exceeds the Aggregate Credit Limit of a Market Participant
- Credit requirements for CRRs

7.1 Comparison of EAL to Aggregate Credit Limits

CAISO calculates the EAL for each Market Participant weekly, and compares the EAL to each Market Participant's Aggregate Credit Limits. This comparison is performed by aggregating the balances of each individual BAID if a Market Participant maintains multiple accounts with CAISO. If the Estimated Aggregate Liability exceeds a Market Participant's Aggregate Credit Limit, the Market Participant must post additional Financial Security.

A Market Participant must provide additional Financial Security when its obligations reach 100% of its Aggregate Credit Limit. However, CAISO requests additional Financial Security at the 90% level. The Estimated Aggregate Liability calculated by CAISO for a Market Participant may fluctuate, and at times this may result in swings in Financial Security posting requirements. To the extent that the Estimated Aggregate Liability exceeds the Aggregate Credit Limit at any time, a Market Participant may be subject to enforcement actions as described in Section 8 of this BPM. Thus CAISO recommends that Market Participants maintain some excess Available Credit (Aggregate Credit Limit above their maximum anticipated Estimated Aggregate Liability) to avoid the enforcement actions noted in Section 8 of this BPM.

Based on a Market Participant's Aggregate Credit Limit utilization level (which is the EAL divided by Aggregate Credit Limit), the following actions will be taken at each level listed:

EAL/Aggregate Credit Limit	Action
≥70% and < 90%	Market Participant notified of a *recommended* security increase. CAISO recommends, but does not require, that an additional posting is made to maintain the EAL/Aggregate Credit ratio at or below 70%.
≥90%	CAISO requests that a Market Participant increase the posting amount within five Business Days so that the security utilization does not exceed 90 percent.
≥100%	The Market Participant is subject to any of the credit related enforcement provisions of the CAISO Tariff Section 12.5 described in Section 8 of this BPM.

7.2 Reducing the Amount of Financial Security

A Market Participant may request a reduction in its Financial Security by giving CAISO not less than fifteen calendar days notice of the reduction, provided that the Market Participant is not then in breach of Section 12.3 of the CAISO Tariff. CAISO then releases, or permits a reduction in, the amount of Financial Security.

7.2.1 Debtor/Creditor Market Participants Leaving the Market or Incurring Substantial Activity Level Changes

Those Market Participants that are exiting CAISO markets, or that have changed their business practices resulting in substantially reduced participation in CAISO markets, will be required to maintain an Aggregate Credit Limit at least equal to five percent (5%) of the absolute value of the peak monthly net charges from their beginning participation date to their last participation date or the date the substantial change occurred. CAISO will consider this 5% figure as a base amount and reserves the right to increase or decrease the base amount depending on the number of settlement reruns in the queue and the estimated value of those settlement reruns. The five percent (5%) residual Aggregate Credit Limit amount will be retained for a period of one year, unless specific circumstances warrant a change in this retention period (e.g., pending FERC ordered adjustments).

7.3 Required Market Participant Response to Financial Security Requests

CAISO's EAL calculation is used to determine Financial Security posting requirements and adjustments in a Market Participant's posted Financial Security. Within five Business Days of a CAISO Financial Security request, a Market Participant must either:

a) Post the required Financial Security Amount calculated by CAISO.

b) Demonstrate to CAISO's satisfaction that CAISO's Financial Security request is all or partially unnecessary through the dispute procedure in Section 10 of this BPM.

7.4 CRR Holder & Candidate CRR Holder Financial Security Requirements

The credit requirements related to holding CRRs are the same as for other obligations to the CAISO market. Specifically, a Market Participant must maintain an Aggregate Credit Limit in excess of their Estimated Aggregate Liability. CRR obligations are a component of the EAL calculation, as specified in Section 6.1 of this BPM.

An entity that intends to acquire CRRs (a Candidate CRR Holder) is to demonstrate prior to acquiring the CRRs that they are capable of meeting the ongoing credit requirements for holding CRRs. The entity may choose to designate a portion of their UCL and/or posted Financial Security specifically for CRR-related activities by notifying CAISO of the Candidate CRR Holder's intent, or they may post additional Financial Security to cover their participation in CRR-related activities.

7.4.1 Credit Requirements for CRR Allocations.

Subject to applicable requirements of Section 36.9.2 concerning the prepayment of Wheeling Access Charges, Load-Serving Entities eligible to participate in any CRR Allocation are not required to provide additional Financial Security in advance of a CRR Allocation.

7.4.2 Credit Requirements for CRR Auctions.

To establish available credit for participating in any CRR Auction, each Candidate CRR Holder must have an Unsecured Credit Limit or have provided Financial Security in a form consistent with Section 5 of this BPM (Section 12.1.2 of the Tariff).

Each Candidate CRR Holder that participates in a CRR Auction shall ensure that its Aggregate Credit Limit in excess of its Estimated Aggregate Liability is the greater of $500,000 or the sum of the absolute values of all of its bids for CRRs submitted in the relevant CRR Auction. A Candidate CRR Holder that fails to satisfy this requirement shall not be permitted to participate in the relevant CRR Auction.

A Market Participant that maintains multiple BAIDs with CAISO and that wishes to participate in the CRR auction will need to instruct CAISO how to allocate its Available Credit to individual BAIDs. CAISO's CRR software will limit bids per BAID to the amount of Available Credit for such BAID.

7.4.3 Credit Requirements for Holding CRRs.

7.4.3.1 Credit Requirements Generally.

Each CRR Holder, whether it obtains CRRs through a CRR Allocation or a CRR Auction, must meet the ongoing credit requirements for holding CRRs. Each CRR Holder shall be required to ensure that its Aggregate Credit Limit is in excess of its Estimated Aggregate Liability including the value of the CRR portfolio.

CRRs are evaluated on a portfolio basis as follows. If a CRR Holder owns more than one 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. 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.

CAISO shall revalue the CRR portfolio not less than annually. CAISO may adjust the credit requirements for holding CRRs with terms of one year or less more frequently than annually at CAISO's discretion to account for changes in auction prices for CRRs in monthly auctions[5]. CAISO may adjust the value of long-term CRRs included in the EAL calculation not less than annually to reflect:

a) the number of years remaining in the term of any Long Term CRR
b) changes in auction prices of one-year CRRs in annual auctions, and;
c) updates to Credit Margins based on actual Locational Marginal Price data derived from market operations

[5] CAISO aims to use monthly auction data to revalue the CRRs, and is studying the feasibility of this, and will build the software for this if viable.

7.4.3.2 Credit Check on Proposed Transfers of CRRs

As provided for in Section 12.6.2 of the Tariff, iIn cases where the ownership of a CRR is to be transferred through either the Secondary Registration System or through load migration, CAISO shall, if necessary, evaluate and adjust the credit requirements for both the current owner of the CRR and the prospective owner of the CRR as appropriate.

Accordingly, prior to implementing the transfer, CAISO will check to ensure:

a) that the transferor has an EAL excluding the CRR to be transferred less than its Aggregate Credit Limit
b) that the transferee has an EAL including the CRR to be transferred less than its Aggregate Credit Limit

If these conditions are not met, CAISO will not process the transfer until the conditions are met. CAISO will contact the appropriate party (transferor or transferee, or both) to post sufficient additional Financial Security. CAISO will then process the transfer when the conditions above are met.

8. Credit Policy Enforcement

In this section you will find the following information:

- Actions that may be taken if Aggregate Credit Limits are exceeded

8.1 Enforcement Actions

Following the date on which a Market Participant commences trading or participates in CRR activities, if a Market Participant's Estimated Aggregate Liability, as calculated by CAISO, at any time exceeds its Aggregate Credit Limit, CAISO may take any or all of the following actions:

(a) CAISO may withhold a pending payment distribution.

(b) CAISO may limit trading, which may include rejection of Bids or the unbalanced portion of ETC Self-Schedules and/or limiting other CAISO market activity, including limiting eligibility to participate in a CRR Allocation or CRR Auction. In that case, CAISO shall notify the Market Participant of its action and the Market Participant is not entitled to submit further Bids or unbalanced ETC Self-Schedules to CAISO or otherwise participate in CAISO's markets until the Market Participant posts an additional Financial Security Amount that is sufficient to ensure that the Market Participant's Aggregate Credit Limit is at least equal to its Estimated Aggregate Liability.

(c) CAISO may restrict, suspend, or terminate the Market Participant's Service Agreement, including CRR agreements.

(d) CAISO may require the Market Participant to post an additional Financial Security Amount in lieu of a UCL for at least one year.

(e) CAISO may resell a CRR Holder's CRRs in whole or in part, including any Long Term CRRs, in a subsequent CRR Auction or bilateral transaction, as appropriate.

(f) CAISO will not implement the transfer of a CRR if the transferee or transferor has an Estimated Aggregate Liability in excess of their Aggregate Credit Limit.

In addition, CAISO may restrict or suspend a Market Participant's right to Bid or require the Market Participant to increase its Financial Security Amount if at any time the Market Participant's potential additional liability for Imbalance Energy and other CAISO charges is determined by CAISO to be excessive by comparison with the likely cost of the amount of Energy scheduled by the Market Participant.

With respect to item (c) and (f) above, CAISO would provide a cure period prior to the termination of a Service Agreement or CRR Agreement, or the reselling of a CRR portfolio.

9. Notifications

In this section you will find the following information:

- A summary of the credit notifications exchanged between CAISO and Market Participants

9.1 Notifications Related to EAL vs. Aggregate Credit Limit Comparison

As described in Section 7.1 of this BPM, CAISO periodically calculates the EAL for each Market Participant and communicates this information to the Market Participant. This communication includes the following information:

- The EAL amount and any recommended increase in the Financial Security amount. The severity of the situation depends upon the ACL utilization level (EAL divided by ACL).

ACL Utilization Level	Purpose of Notice
>70% and ≤ 90%	CAISO recommends increasing Financial Security
>90% and ≤ 100%	CAISO requests an increase in Financial Security within 5 Business Days
>100%	CAISO requires an increase in Financial Security. Possible enforcement actions as shown in Section 8.1 of this BPM

- The amount of Financial Security each Market Participant must post in order to remain below the recommended 90% utilization level described in Section 7.1 of this BPM.

- The minimum amount of Financial Security that the Market Participant must post so that its EAL does not exceed its ACL.

The CAISO customer representative also communicates with Market Participants to address questions related to the notification. Any required increase in the Financial Security Amount must be resolved within five Business Days from the date of contact. Furthermore, any Market Participant that is not in compliance with the requirement that its EAL be less than its ACL is subject to enforcement procedures as described in Section 8.

9.2 Communications with CRR Holders or Candidate CRR Holders

A CRR Holder or Candidate CRR Holder may notify its CAISO customer service representative when it wishes to:

- Designate a portion of its Available Credit (UCL and/or posted Financial Security) specifically for CRR-related activities, and assign this available credits to individual BAIDs if applicable. (See Section 7.4.2 of this BPM)
- Post additional Financial Security solely to cover its participation in CRR-related activities.

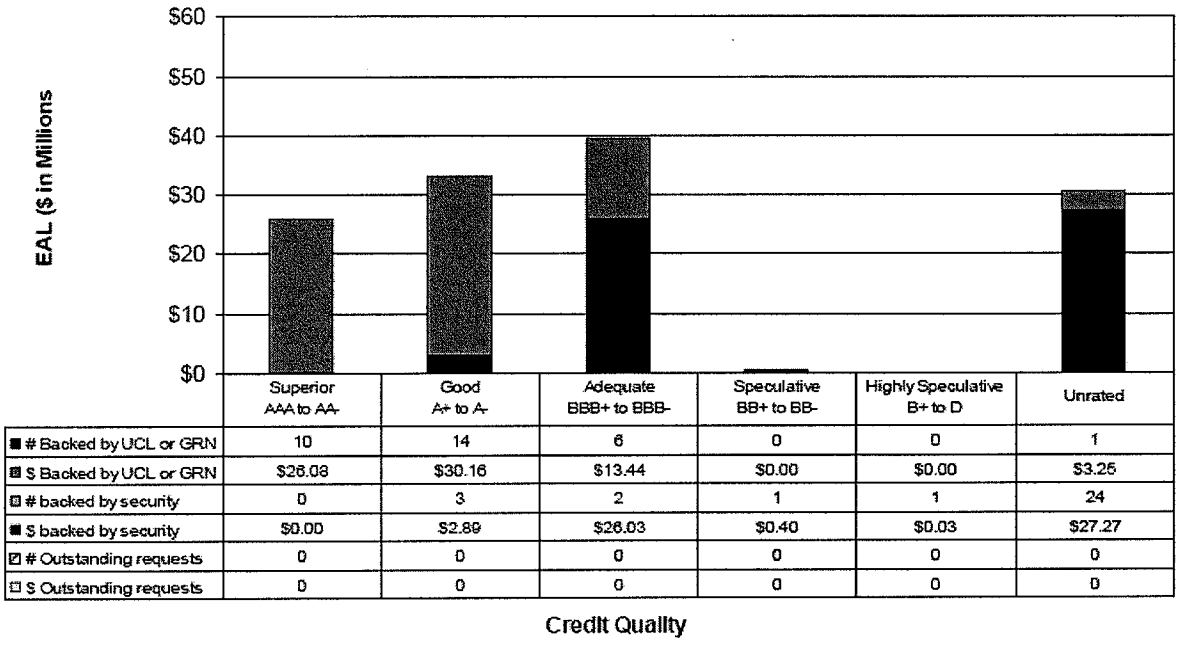
CAISO will inform CRR Holders or Candidate CRR Holders proposing to transfer CRRs of the need for additional Financial Security if one or both parties has insufficient Available Credit for CAISO to allow the transfer to take place (see Section 7.4.3.1 of this BPM).

9.3 Credit Related Information Published by CAISO

CAISO publishes in its monthly financial statements[6] information of relevance to credit analysts for creditors of the CAISO market. CAISO reports monthly on the total outstanding obligations of Market Participants, the credit backing of such obligations (whether supported by Financial Security or Unsecured Credit Limits/Guaranties), or the extent to which such obligations are in excess of a Market Participant's Aggregate Credit Limit.

[6] Monthly financial reports are posted for Board of Governors meetings with documented archived here: http://caiso.com/pubinfo/BOG/documents/other/index.html

Backing for Estimated Aggregate Liability (EAL) by Credit Quality



	Superior AAA to AA-	Good A+ to A-	Adequate BBB+ to BBB-	Speculative BB+ to BB-	Highly Speculative B+ to D	Unrated
# Backed by UCL or GRN	10	14	6	0	0	1
$ Backed by UCL or GRN	$26.08	$30.16	$13.44	$0.00	$0.00	$3.25
# backed by security	0	3	2	1	1	24
$ backed by security	$0.00	$2.89	$26.03	$0.40	$0.03	$27.27
# Outstanding requests	0	0	0	0	0	0
$ Outstanding requests	0	0	0	0	0	0

10. Dispute Procedures

In this section you will find the following information:

- The steps to use to dispute the EAL amount determined by CAISO

CAISO provides Market Participants the ability to dispute the EAL calculated by CAISO and, as a result, CAISO may reduce or cancel a requested Financial Security adjustment.

10.1 Estimated Aggregate Liability Calculation Dispute Process

The following steps are required for a Market Participant to dispute a Financial Security request resulting from CAISO's calculation of EAL:

1. Request by the Market Participant to review the CAISO's EAL calculation.

2. Present a reasonable and compelling situation, as determined by the Market Participant's CAISO client representative.

3. Document the facts and circumstances that evidence that the CAISO's calculation of EAL results in an excessive and unwarranted Financial Security posting requirement.

   a) Examples of facts and circumstances include:

      i) Issues related to non-recurring retroactive charges

      ii) Demonstrable changes in expected obligations as a result of physical changes (e.g., new capacity or loss of customers).

   b) Present a reasonable alternative calculation of the EAL.

4. In response to the dispute request, CAISO will determine whether the request for the adjustment to the EAL is warranted. Review of the request to determine validity based on facts and circumstances presented shall include consideration of:

   a) Weighing the risk of using the lower figure to the potential detriment of market creditors, if the Market Participant is under-secured and defaults, against the

desire not to impose additional potentially unwarranted costs on that Market Participant

b) Equity and consistency of treatment of Market Participants in the dispute procedure

c) The evidentiary value of the information provided by the Market Participant in the dispute procedure

d) CAISO may decline to adjust the initial EAL amount if the Market Participant has had Financial Security shortfalls in the past 12 months (i.e., it has been shown that the Market Participant's ACL at times during the preceding 12 months has been insufficient to cover its EAL).

5. Approval of the EAL adjustment and reduction or elimination of the Financial Security request shall require the approval of the CAISO Manager and/or Director of Customer Services and Industry Affairs and the CAISO Treasurer.

10.2 Timing for Dispute Procedure

Within the five (5) business days of the request for Financial Security by CAISO, the Market Participant must either demonstrate to CAISO's satisfaction that the Financial Security request is all or partially unnecessary, or post the required Financial Security Amount calculated by the CAISO.

If CAISO and Market Participant are unable to agree on the appropriate level of Financial Security during the five (5) business day review period, the Market Participant must post the additional Financial Security and continue the dispute procedure as described in Section 10.1 of this BPM. Any excess Financial Security amounts will be returned to the Market Participant if the dispute process finds in favor of the Market Participant.

11. Financial Responsibility Related to RMR Contracts

In this section you will find information on the following topics:

- Financial Requirements for new Responsible Utilities for RMR costs
- Financial Requirements for RMR owners

11.1 Responsibility for RMR Costs by New Responsible Utilities

The credit obligations for Reliability Must-Run Contracts are independent of the credit responsibilities for other CAISO activities. If a Responsible Utility first executed a Transmission Control Agreement after April 1, 1998 (a "New Responsible Utility") and if:

- The senior unsecured debt of the New Responsible Utility is rated or becomes rated at less than A- from S&P or A3 from Moody's, and
- Its rating does not improve to A- or better from S&P or A3 or better from Moody's within 60 calendar days,

then the following credit responsibilities must be observed by the New Responsible Utility:

1. The New Responsible Utility must provide to CAISO an irrevocable and unconditional letter of credit in an amount equal to three times the highest monthly payment invoiced by CAISO to the New Responsible Utility (or the prior Responsible Utility) in connection with services under Reliability Must-Run Contracts in the last three months for which invoices have been issued.
2. The letter of credit must be issued by a bank or other financial institution whose senior unsecured debt rating is not less than A from S&P and A2 from Moody's.
3. The letter of credit must be in the form that CAISO may reasonably require from time to time by notice to the New Responsible Utility and authorize CAISO or the RMR Owner to draw on the letter of credit for deposit solely into the RMR Owner Facility Trust Account in an amount equal to any amount on the CAISO invoice due and not paid by the Responsible Utility.

The security provided by the New Responsible Utility under this section is intended to cover the New Responsible Utility's outstanding liability for payments it is liable to make to CAISO under this section, including monthly payments, any reimbursement for capital improvement, termination fees and any other payments to which CAISO is liable under Reliability Must-Run Contracts. These Financial Security requirements are separate from those required for other CAISO activities.

11.2 Financial Responsibility by RMR Contract Holders

Section 12.7 of the pro-forma RMR agreement[7] provides that RMR owners shall meet certain financial requirements throughout the term of the RMR agreement. The purpose of these requirements is to provide reasonable assurance the that RMR owner has adequate financial resources to meet its obligations throughout the RMR term. RMR Owner Financial Requirements include:

(a) Through the term of the Agreement, Owner shall maintain an investment grade rating by Moody's or Standard and Poor's or provide documentation from a financial institution or corporate owner acceptable to CAISO that there is an equity position described below. CAISO shall not unreasonably withhold acceptance of the documentation.

(i) An equity to debt ratio of at least 30%, or
(ii) An equity to total asset ratio of at least 30% or
(iii) Demonstrate to CAISO's reasonable satisfaction that other factors, including, without limitations, commercial financing arrangements, and working capital positions, mitigate the risk of Owner failing to meet the performance requirements under this Agreement.

(b) If the Owner does not possess and maintain an investment grade rating, an equity position or make other arrangements as described in Section 12.7 (a), then it must provide one of the following:

(i) Proof of insurance to cover the financial exposure to CAISO for one year of Capital Items, Repairs, fuel and any other operating expenses; or
(ii) Security to cover the financial exposure to CAISO for one year of Capital Items, Repairs, fuel and any other operating expenses in one of the following forms:
    (A) standby letter of credit;
    (B) corporate guarantee;
    (C) cash deposit; or
    (D) security bond.

[7] http://www.caiso.com/docs/2000/08/24/200008241130162783.pdf

CERTIFICATE OF SERVICE

I hereby certify that I have served the foregoing document upon each of the entities described in that document 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 on this 22nd day of June, 2007.

Sidney M. Davies BRM

Sidney M. Davies