California ISO
Your Link to Power

California Independent
System Operator Corporation

March 30, 2007

The Honorable Phillis J. Posey
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

RE: Congestion Revenue Rights Dry Run Report, Docket No. ER06-615-___; Filing Contains a Request for Confidential Treatment for Attachment B, see Section IV of this Transmittal Letter

Dear Secretary Posey:

In compliance with the directive of the Federal Energy Regulatory Commission ("Commission" or "FERC") in its September 21, 2006 order in the above referenced proceeding,[1] the California Independent System Operator Corporation ("CAISO") hereby submits for informational purposes its report on its most recent simulation regarding the allocation and auction of Congestion Revenue Rights ("CRRs") (hereinafter referred to as the "CRR Dry Run") in preparation for its first annual actual CRR allocation and auction under its Market Redesign and Technology Upgrade ("MRTU") program.

I. BACKGROUND

The CAISO's market redesign efforts can be traced back to a series of Commission orders, commencing in the year 2000, directing the CAISO first to overhaul its approach to managing transmission congestion and then to engage in a more comprehensive redesign of its market structure, including the creation of a Day-Ahead Energy market to replace the defunct markets of the California Power Exchange. Based on those directives, the CAISO developed a series of conceptual proposals that were filed for Commission review. Since 2002, the Commission has issued a series of orders on conceptual market design filings made by the CAISO in what became known as the MRTU project.

After a lengthy stakeholder process, and with the directives of the Commission in mind, the CAISO filed its MRTU Tariff on February 9, 2006 ("MRTU Tariff Filing"). After

[1] *See California Indep. System Operator,* 116 FERC ¶ 61,274 at P 741 (2006) (hereinafter "MRTU Order").

reviewing comments on and protests of the MRTU Tariff filing by numerous stakeholders, the Commission accepted the MRTU Tariff for filing on September 21, 2006 to become effective November 1, 2007, subject to a number of modifications.[2]

In the MRTU Order, in addition to tariff changes, the Commission also directed the CAISO to take various other actions, including providing additional details concerning several of its proposals, filing with the Commission status reports on specific issues, and making certain information available to Market Participants. The Commission provided several timeframes for the CAISO to comply with these various requirements. The CAISO filed compliance filings required by the MRTU Order on November 20, 2006, December 20, 2006, March 20, 2007.[3]

The MRTU market design is based on the use of Locational Marginal Pricing ("LMP"), which has been successfully employed in other regions of the country to allocate Congestion costs and provide appropriate short-term and long-term price signals. LMP determines marginal Energy prices or "LMPs" for each Settlement period that accurately reflect the cost of serving the next MWh of Demand at each Location on the CAISO Controlled Grid, including the Marginal Cost of Congestion and Marginal Cost of Losses, based on Market Participants' submitted Bids for Supply and Demand or the CAISO Forecast of CAISO Demand.

A core component of the MRTU design is the provision of CRRs, financial instruments which enable their holders to manage their exposure to Congestion costs associated with LMP. CRRs entitle the holder to receive revenues or make payments based on the Congestion components of the LMPs (*i.e.*, Marginal Cost of Congestion) calculated for each hour in the Integrated Forward Market ("IFM"). Under the MRTU Tariff, the CAISO first allocates CRRs to load serving entities based on the volume of load they serve, and then conducts auctions to enable all creditworthy parties to bid to obtain CRRs at auction-clearing prices. In compliance with the Commission's Final Rule in Docket RM06-8-000, on January 29, 2007 the CAISO filed its proposal to make available Long-Term CRRs that span over ten years, in addition to the previously proposed annual and monthly CRRs.[4]

II. DISCUSSION

The CAISO conducted the CRR Dry Run between July 2006 and January 2007, which consists of a process through which the CAISO and market participants performed, on a non-binding market simulation basis, the complete sequence of activities for the allocation and auction of one-year Seasonal and Monthly CRRs based on the rules specified in the CAISO's February 9, 2006 MRTU Tariff.

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2 MRTU Order at P 1.

3 *See generally* Docket No. ER06-615.

4 *See generally* Docket No. ER07-475. Note that the proposed procedures for allocating Long-Term CRRs could not be part of the CRR Dry Run for reasons of timing. The CRR Dry Run was fully planned and begun before the Commission's Final Rule on long-term transmission rights was issued, and was nearly concluded by the time the CAISO filed its Long-Term CRR proposal.

The objectives of the CRR Dry Run were to:

- Provide an opportunity for the CAISO and market participants to step through the filed CRR allocation and auction steps and procedures in a "practice mode" well in advance of the actual first annual CRR Allocation and Auction;
- Provide illustrative allocations and awards to demonstrate the potential for the filed rules and procedures to allocate Seasonal and Monthly CRRs to load serving entities ("LSEs") that reasonably cover dry run estimates of their exposure to congestion charges under MRTU; and
- Identify any potential problems with the filed rules and procedures that may require modifications to the filed tariff provisions, which the CAISO would then discuss with stakeholders and, depending on the outcome of these discussions, would ultimately submit any proposed changes to FERC in a post-CRR Dry Run filing.

The CAISO believes that the CRR Dry Run successfully achieved the above objectives, due in large part to the substantial commitment of time and effort on the part of its market participants. This CRR Dry Run Report describes the CRR Dry Run process in detail and presents the results, focusing mainly on the first two objectives. Regarding the third objective, as discussed further below, the CAISO is now engaged in a stakeholder process to develop certain targeted changes to the filed CRR rules and procedures, and will fully discuss these matters when it files the proposed changes.

The CRR Dry Run Report is divided into a public report, which has two major sections, plus a confidential appendix. The public report does not provide any information on the results for any identified CRR Dry Run participant. Rather, it presents aggregate results, averaged across all market participants, and describes individual results in a manner that does not allow the individual market participants to be identified. The confidential appendix identifies and provides results for all market participants. As provided in Section IV of this transmittal letter, the CAISO is seeking confidential treatment of the individual market participant CRR Dry Run results contained in Appendix 4 of the CRR Dry Run Report. The CAISO has also provided and will continue to provide each CRR Dry Run market participant the opportunity to meet with CAISO staff to discuss its individual CRR Dry Run results.

The first part of the public report describes the CRR Dry Run process in some detail and presents the CRR Dry Run allocation and auction results in terms of quantities of CRRs allocated and auctioned, as well as the CRR auction prices for the Seasonal and Monthly auction processes. For the allocation part of the CRR Dry Run, although the non-binding aspect of the CRR Dry Run was emphasized, the CAISO encouraged LSEs to nominate CRRs that reflect the CRRs they might expect to nominate into the actual production process, so that the CRR Dry Run could provide them with useful information upon which to develop their actual nominations. Of course, the CAISO does not know and cannot comment on how each LSE chose to approach the CRR Dry Run in this respect. LSEs generally did nominate close to the full quantity

of CRRs for which they were eligible, and the CRR Dry Run demonstrated the extent to which their nominations cleared the allocation process and were awarded.

For the auction portion of the CRR Dry Run, it is impossible to say how well CRR Dry Run auction participation represented what can be expected in the actual production auctions. Nevertheless the CRR Dry Run auctions provided a useful and successful test of the auction procedures, data exchanges and software.

The second part of the public portion of the CRR Dry Run Report describes the financial analysis of the CRR Dry Run allocation results, in which the value of each LSE's portfolio of allocated CRRs was estimated based on price data from the CAISO's LMP studies, and was compared to estimates of the LSE's congestion charges under MRTU. This comparison, which is performed using two different approaches to estimating LSE congestion charges under MRTU, illustrates the potential for each LSE's portfolio of allocated CRRs to generate revenues comparable to its LMP-based congestion charges.

For the CRR Dry Run allocation of one-year Seasonal CRRs, the CAISO conducted simultaneous but separate nomination and award processes for each combination of four seasons (*i.e.*, calendar quarters) and two time-of-use periods (*i.e.*, on-peak and off-peak hours), thus covering an entire calendar year in exactly the same manner as will be done in production. For the allocation of Monthly CRRs, the CAISO conducted the process for two test months – April and August to reflect the peak and off-peak periods of the typical annual electricity consumption cycles – and two time-of-use periods per month.

The results and analysis discussed in this CRR Dry Run Report support the following observations:

- On average a large percentage of nominated CRRs cleared the three-tier process for allocating one-year Seasonal CRRs. Among the eight combinations of Season and Time-of-Use, the aggregate percentage of nominations that actually cleared ranged from 75 percent to 95 percent (see Section 4.1.1 of the CRR Dry Run Report, Table 3 contained in Attachment A).
- Among the four combinations of Month and Time-of-Use (for the two CRR Dry Run months) the aggregate percentage of nominations that cleared ranged from 82 percent to 91 percent (see Section 4.1.2 of the CRR Dry Run Report, Table 5, contained in Attachment A).
- Financial analysis of the one-year Seasonal CRR allocations demonstrates that LSEs on average received revenues from their allocated Seasonal CRRs (which are limited in MW quantity to 75 percent of each LSE's total CRR eligibility) that exceeded 75 percent of their estimated congestion charges (see Section 6.1 of the CRR Dry Run Report, Figures 6 and 7 contained in Attachment A).

- Financial analysis of the combined Seasonal and Monthly CRR allocations for the two CRR Dry Run months demonstrated that LSEs on average received revenues from their total allocated CRRs that exceeded their estimated congestion charges in eight of the ten Month and Time-of-Use combinations for which LMP data was available (see Figure 9 of the CRR Dry Run Report in Attachment A).
- Comparison of the total payments to allocated CRRs versus the estimated congestion revenues to be collected by the CAISO in the MRTU markets indicates that the CRRs allocated under the filed rules were revenue adequate in virtually all cases (see Figures 4, 5 and 8 of the CRR Dry Run Report in Attachment A).

In addition the CRR Dry Run provided an effective opportunity for the CAISO and the participants to: (i) become familiar with the procedures and mechanics of the CRR allocation and auction processes, (ii) test the data exchange systems, (iii) assess the needs of each party to acquire new tools and train staff to perform these processes in production mode, and (iv) identify areas where some rule changes or procedure modifications may improve either the processes or the results. As discussed below, the last area is currently under discussion with stakeholders and will be the subject of a filing by the CAISO to the Commission in early May.

III. POTENTIAL CRR RULE CHANGES

The CAISO and its stakeholders have identified several issues that require resolution. The CAISO has been working with its stakeholders to finalize the CRR structure so that the CAISO can initiate the processes to release actual CRRs that will become effective upon the start-up of MRTU. The CAISO anticipates its actual first annual CRR Allocation and CRR Auction will be launched in July 2007. For this reason, the CAISO has been working aggressively but comprehensively with its stakeholders to examine closely the key remaining issues related to CRRs that are necessary to resolve before beginning the CRR production process.

Certain potential rule changes have come about through its evaluation of the CRR Dry Run Results. Over the past several months, as results of the CRR Dry Run have become available, the CAISO has shared these results with its stakeholders, its Board of Governors and its Market Surveillance Committee to identify issues and potential solutions regarding its CRR allocation and auction rules that must be addressed before start-up.[5] The following issues have been raised within the CRR Dry

[5] The CRR Dry Run results have been discussed in the following forums: November 9, 2006 and January 9, 2007 – Preliminary CRR Dry Run results and observations discussing in the context of the stakeholder process to develop the Long-Term CRR proposal; February 13, 2007 – CRR Dry Run Results discussed in Executive Session at the Market Surveillance Committee (MSC); February 27. 2007 – Discussed certain aggregate CRR Dry Run results at CRR Stakeholder Meeting to review and obtain initial feedback on issues related to CRRs; and March 7, 2007 – Board of Governors Meeting – Review of CRR Dry Run Results.

Run and may potentially develop into specific rule changes that should improve the established structure for CRR allocation and auction.

- Source Nominations at Trading Hubs
- Source Verification Rules and Historical Reference Year
- Set-aside of Import Capacity on each Inter-tie for CRR Auctions
- Frequency of conducting Monthly Allocation and Auction Process.

Certain issues currently under consideration were not identified through the CRR Dry Run process and results, but still require resolution. The CAISO has included the following issues in its plans to resolve all remaining CRR rules related issues over the next several months:

- Modeling of Transmission Outages in the CRR Network Model
- Use of Common Forecasts for Monthly CRR Eligibility and Monthly RA Showings
- CRR Transfers to Reflect Load Migration Between LSEs
- Methodology for Determining CRRs for Merchant Transmission Upgrades
- CRR Credit Requirements
- Provisions for Renewal of Expiring Long-Term CRRs and Transition of Expiring Existing Transmission Contracts (ETCs) to CRRs

The CAISO anticipates it will file with FERC any request for any tariff rule changes related with the source nominations at Trading Hubs, source verification rules and historical reference year, set-aside of import capacity on each Inter-tie for CRR Auction, and the methodology for determining CRRs for Merchant Transmission Upgrades on May 2. These rule changes will be required to be in effect in time for the CAISO to conduct its first annual CRR Allocation and Auction. Subsequently, the CAISO anticipates it will make an additional filing on August 3 to include any remaining CRR-related rule changes that have to be in effect before MRTU start-up but need not be resolved before conducting the first annual CRR Allocation and Auction.

IV. REQUEST OF CONFIDENTIAL TREATMENT OF ATTACHMENT B

Attachment B to this filing contains the results of the CRR Dry Run in terms of MW allocated and auctioned as well as the financial implications of such results for individual participants. The CAISO considers the information in Attachment B to be "trade secrets and commercial or financial information obtained from a person [that is] privileged and confidential." *See* 18 C.F.R. § 388.107 (d). Such material contains information regarding the participants' expected usage of the system and requested allocations which the CAISO believes to be commercially sensitive. Pursuant to Section 388.112 of the Commission's regulations, the CAISO respectfully requests that the Commission treat such documents as commercial or financial information obtained as confidential and pursuant to Section 388.107(d) of the Commission's regulations and

exempt from public disclosure. Attachment B, is labeled "Contains Privileged Information Submitted Pursuant to 18 C.F.R. § 388.112 (2006) – Do Not Release."

V. SERVICE

This filing (excluding Attachment B) has been served on all parties on the Secretary's official service list for Docket Nos. ER06-615 and ER07-475.

VII. COMMUNICATIONS

Communications regarding this filing should be addressed to the following individual whose name should also be placed on the official service list established by the Secretary with respect to this submittal:

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VII. CONTENTS OF FILING

Attached to this transmittal letter are the following supporting documents:

Attachment A	-	California ISO Congestion Revenue Rights Dry Run Report, March 30, 2007
Attachment B	-	Appendix 4 – Confidential CRR Dry Run Results by Entity

VIII. CONCLUSION

For all the reasons stated herein, the CAISO respectfully requests that this filing be accepted in fulfillment of the Commission's requirement in paragraph 741 of the September 21 Order.

Respectfully submitted,

Anna McKenna

Anna A. McKenna
Counsel for the
California Independent System Operator
Corporation

Attachment A

California ISO
Your Link to Power

California Independent
System Operator Corporation

Report to the Federal Energy Regulatory Commission

Congestion Revenue Rights Dry Run Report

March 30, 2007

Table of Contents

1 Executive Summary

Between July 2006 and January 2007 the CAISO conducted the Congestion Revenue Rights Dry Run ("CRR Dry Run"), a process through which the CAISO and market participants performed, on a non-binding market simulation basis, the complete sequence of activities for the allocation and auction of one-year Seasonal and Monthly Congestion Revenue Rights ("CRRs") as specified in the CAISO's February 9, 2006 MRTU Tariff.[1]

The objectives of the CRR Dry Run were to:

- Provide an opportunity for the CAISO and the participants to step through the filed CRR allocation and auction steps and procedures in a "practice mode" well in advance of the actual allocation and auction;
- Provide illustrative results to demonstrate the potential for the filed rules and procedures to allocate Seasonal and Monthly CRRs to load serving entities ("LSEs") that reasonably cover dry run estimates of their exposure to congestion charges under MRTU; and
- Identify any potential problems with the filed rules and procedures that may require modifications to the filed tariff provisions, which the CAISO would then discuss with stakeholders and, depending on the outcome of these discussions, ultimately submit any proposed changes to FERC in a post-CRR Dry Run filing.

The CAISO believes that the CRR Dry Run successfully achieved the above objectives, due in large part to the substantial commitment of time and effort on the part of the participants. This CRR Dry Run Report describes the CRR Dry Run process in detail and presents the results, focusing mainly on the first two objectives. Regarding the third objective, the CAISO is now engaged in a stakeholder process to develop certain targeted changes to the filed CRR rules and procedures, and will fully discuss these matters when it files the proposed changes (now planned for early May, 2007).

The CRR Dry Run Report is divided into a public report, which has two major sections, plus a confidential appendix. The public report does not provide any information on the results for any individually identified CRR Dry Run participant. Rather, it presents aggregate results, averaged across all participants, and describes individual results in a manner that does not allow the individual participants to be identified. The confidential appendix identifies and provides results for all participants and will be submitted to FERC on a confidential basis. In filing this CRR Dry Run Report with the Federal Energy Regulatory Commission ("FERC" or "Commission"), the CAISO has requested that Appendix 3 of the CRR Dry Run Report be treated as confidential pursuant to the Section 388.112 of the Commission's rules. The CAISO is also providing each CRR Dry Run participant the opportunity to meet with CAISO staff to discuss its individual CRR Dry Run results.

[1] On January 29, 2007 the CAISO filed its proposal for Long Term Congestion Revenue Rights in compliance with FERC's Orders No. 681 and 681-A. If approved this proposal would add some steps and processes for the allocation of Long Term CRRs that could not have been included in the CRR Dry Run for obvious timing reasons.

The first part of the public report describes the CRR Dry Run process in some detail and presents the CRR Dry Run allocation and auction results in terms of quantities of CRRs allocated and auctioned, as well as the CRR auction prices for the Seasonal and Monthly auction processes. For the allocation part of the CRR Dry Run, although the non-binding aspect of the CRR Dry Run was emphasized, the CAISO encouraged LSEs to nominate CRRs that reflect the CRRs they might expect to nominate into the actual production process, so that the CRR Dry Run could provide them with useful information upon which to develop their actual nominations. Of course, the CAISO does not know and cannot comment on how each LSE chose to approach the CRR Dry Run in this respect. We can say, however, that LSEs generally nominated close to the full quantity of CRRs for which they were eligible, and the CRR Dry Run demonstrated the extent to which their nominations cleared the allocation process and were awarded.

For the auction portion of the CRR Dry Run, it is impossible to say how well CRR Dry Run auction participation represented what can be expected in the actual production auctions. Nevertheless the CRR Dry Run auctions provided a useful and successful test of the auction procedures, data exchanges and software.

The second part of the public CRR Dry Run Report describes the financial analysis of the CRR Dry Run allocation results, in which the value of each LSE's portfolio of allocated CRRs was estimated based on price data from the CAISO's Locational Marginal Pricing (LMP) studies, and was compared to estimates of the LSE's congestion charges under MRTU. This comparison, which is performed using two different approaches to estimating LSE congestion charges under MRTU, illustrates the potential for each LSE's portfolio of allocated CRRs to generate revenues comparable to its LMP-based congestion charges.

For the CRR Dry Run allocation of one-year Seasonal CRRs, the CAISO conducted simultaneous but separate nomination and award processes for each combination of four seasons (*i.e.*, calendar quarters) and two time-of-use periods (on-peak and off-peak hours), thus covering an entire calendar year in exactly the same manner as will be done in production. For the allocation of Monthly CRRs, the CAISO conducted the process for two test months – April and August to reflect the peak and off-peak periods of the typical annual electricity consumption cycles – and two time-of-use periods per month. The LMP data for the financial analysis actually covered 30 months, however, so the Report's comparison of the revenue streams associated with each LSE's allocated CRR portfolio against its simulated LSE congestion charges benefited from the additional diversity of CAISO system conditions over this longer time period.

By way of a high-level summary, the results and analysis discussed in this CRR Dry Run Report support the following observations:

- On average a large percentage of nominated CRRs cleared the three-tier process for allocating one-year Seasonal CRRs. Among the eight combinations of Season and Time-of-Use, the aggregate percentage of nominations that actually cleared ranged from 75 percent to 95 percent (see Table 3).
- Among the four combinations of Month and Time-of-Use (for the two CRR Dry Run months) the aggregate percentage of nominations that cleared ranged from 81 percent to 91 percent (see Table 5).

- Financial analysis of the one-year Seasonal CRR allocations demonstrates that LSEs on average received revenues from their allocated Seasonal CRRs (which are limited in quantity to 75 percent of each LSE's CRR eligibility) that exceeded 75 percent of their estimated congestion charges (see Figures 6 and 7).
- Financial analysis of the combined Seasonal and Monthly CRR allocations for the two CRR Dry Run months demonstrated that LSEs on average received revenues from their total allocated CRRs that exceeded their estimated congestion charges in eight of the ten Month and Time-of-Use combinations for which LMP data was available (see Figure 9).
- Comparison of the total payments to allocated CRRs versus the estimated congestion revenues to be collected by the CAISO in the MRTU markets indicates that the CRRs allocated under the filed rules were revenue adequate in virtually all cases (see Figures 4, 5 and 8 in Section 6 of this CRR Dry Run Report.

In addition the CRR Dry Run provided an effective opportunity for the CAISO and the participants to become familiar with the procedures and mechanics of the CRR allocation and auction processes, road test the data exchange systems, assess the needs of each party to acquire new tools and train staff to perform these processes in production mode, and identify areas where some rule changes or procedure modifications may improve either the processes or the results. As noted earlier, the last area is currently under discussion with stakeholders and will be the subject of a FERC filing by the CAISO in early May.

2 Background on the CRR Dry Run

As part of the Market Redesign and Technology Upgrade ("MRTU"), the CAISO will be administering an LMP-based wholesale energy markets and will be making financial transmission rights, *i.e.*, CRRs, available to Market Participants through annual and monthly CRR allocation and auction processes. The implementation of CRRs is a key component of MRTU providing market participants with the ability to manage the their exposure to congestion costs related to the cost of using the grid as reflected in the congestion component of LMPs.

The CRR Dry Run was basically a market simulation and analysis of the results to test CAISO and market participant readiness based on the CRR Rules and processes as proposed in the MRTU Tariff as filed on February 9, 2006, with the Commission in Docket ER06-615 and as further detailed in the CRR Business Practice Manual. The time and effort devoted to this test provides a good test of readiness for the CAISO and market participants who will be engaged in CRR allocation and the CRR auction markets.

The CRRDry Run Report examines and reports on the outcome of the CRR market simulation both in terms of the actual megawatts allocated as CRRs and in terms of the financial implications of such allocations.

2.1 Reference Materials

For additional information related to topics discussed in this report please refer to the following documents which are posted on the CAISO website:

- CAISO MRTU Tariff, as filed on February 9, 2006, and further amended from time-to-time
  http://www.caiso.com/1798/1798ea1b23080.html
- CRR Dry Run Guidebook
  http://www.caiso.com/17f4/17f4e73724eb0.pdf
- CRR Business Practice Manual
  http://www.caiso.com/1b6b/1b6bf0b6614c0.doc

All capitalized terms used in this document, unless otherwise specified herein, are defined as provided in Appendix A of the CAISO MRTU Tariff.

2.2 CRRs and the Dry Run Process

2.2.1 Attributes of CRRs

CRRs, as proposed under MRTU, are financial instruments that Market Participants may use to provide a hedge against LMP-based congestion charges incurred in the Day-Ahead Market. The sinks and sources for CRRs may be a single network node or set of nodes. The CAISO will make available CRRs that are either Point-to-Point (PTP) CRRs or Multi-Point (MPT) CRRs.

A Point-to-Point CRR Obligation is made up of a single CRR Source and CRR Sink pair and entitles the holder to a CRR Payment when Congestion is in the direction of the CRR Source to CRR Sink direction and imposes on its holder a CRR Charge when the Congestion is in the opposite direction. A Point-to-Point CRR option entitles its holder to a CRR Payment when Congestion is in the direction of the CRR Source to CRR Sink specification.

A Multi-Point CRR is a CRR Obligation specified according to one or more CRR Sources and multiple CRR Sinks, provided that the CRR Source identifies more than one point and the sum of the source MWs is equal to the sum of the sink MWs.

Both CRRs will be offered as peak and off-peak products. Payments to CRR holders are to be funded by the collected by the CAISO in settling the Integrated Forward Market ("IFM"), which is part of the Day-Ahead Market, and by the CRR Auction revenues paid by Market Participants that obtain CRRs through the CRR Auction. In accordance with the CAISO's January 29, 2007 compliance filing for FERC Order Nos. 681 and 682, each CRR will be fully funded throughout its term, so that any periodic shortfall in congestion revenues would be covered through a balancing account plus an uplift charge to metered internal load and real-time interchange export schedules.

Under the currently proposed rules, all CRRs will be made available as CRR Obligations, with one exception for Merchant CRRs which can be chosen to be awarded as CRR Options.

Like traditional firm transmission rights, the award of financial transmission rights such as CRRs is limited by the transfer capability of the transmission system. The reason for this link between the award of CRRs and the transfer capability of the transmission system is that payments to CRR Holders are funded by the congestion rents collected by the CAISO when employing LMP.

2.2.2 Purpose of the CRR Dry Run

The purpose of the CRR Dry Run was to ensure that the CAISO and its participants are ready to successfully conduct the CRR Allocation and CRR Auction processes in accordance with Section 36 of the CAISO MRTU Tariff, as filed with FERC on February 9, 2006.

In addition to providing a testing environment for the CRR software and rules for the CAISO, the CRR Dry Run objectives were to help Market Participants:

- **Understand the CRR process**

  The new CRR allocation and auction process is a significant departure from the way the CAISO currently allocates Firm Transmission Rights ("FTRs") and conducts its FTR auction. The CRR Dry Run gave Market Participants an opportunity to become familiar with the new process prior to the CRR system going into production.

- **Facilitate Data Exchange**

  The CRR Dry Run provided Market Participants the opportunity to test/verify that they could collect, submit, and retrieve the necessary data to participate in the allocation and auction process.

- **Evaluate the necessity for new tools, staffing requirements and workload**

  The CRR Dry Run allowed Market Participants to assess the need for new software tools, and to assess the workload and staffing requirements necessary to participate in the upcoming live CRR Allocations and auctions.

- **Gain experience**

  The CRR Dry Run gave participants meaningful experience to formulate strategies for nominating and bidding for CRRs.

- **Gain familiarity with the new Market User Interface ("MUI") and Secondary Registration System ("SRS")**

  Throughout the CRR Dry Run, Market Participants used the MUI and SRS to:

  - Submit load forecasts, CRR nominations and bids
  - Retrieve public and private allocation and auction results
  - View private and public messages
  - Trade CRR ownership with the bulletin board features of the SRS

- **Review the rules for the allocation and auction process**

  The CRR Dry Run allowed opportunities for stakeholders and CAISO staff to assess and make recommendations for improving the tariff rules and BPM processes by which CRRs are released.

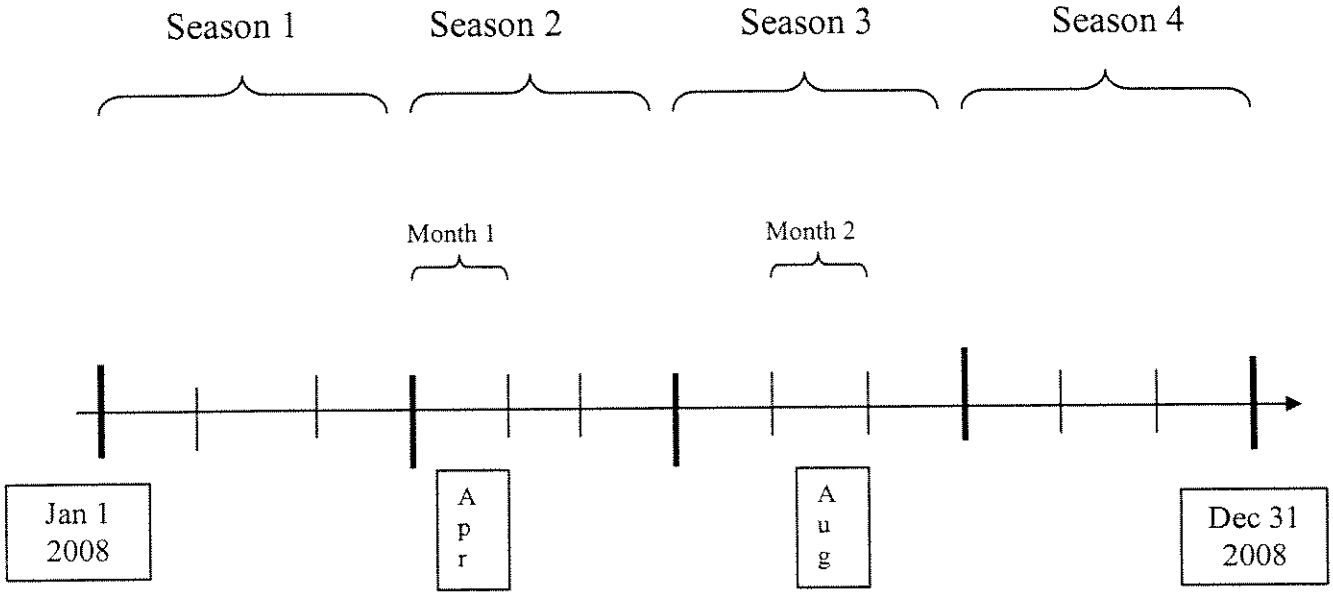
2.2.3 CRR Dry Run Process

The market simulation of the CRR Dry Run was carried out pursuant to the allocation and auction processes detailed in the CAISO Tariff that was filed with the FERC on February 9, 2006 and the more detailed information as noted in the CRR BPM. As with the previous studies performed by the CAISO the data provided by CRR Dry Run participants was treated to be confidential and not financially binding.

The CAISO, with stakeholder input, selected the year 2008 as the term for the CRR Dry Run and conducted an annual allocation and auction simulation which included all four seasons - winter, spring, summer and fall and two time-of-use (TOU) periods, on and off-peak. For the CRR Dry Run, rather than conducting twelve monthly allocations and auctions, the CAISO (with stakeholder input) chose to conduct only two monthly processes. The months of April 2008 and August 2008 were selected as good representative months for periods with either high hydroelectricity production or high demand.

The illustration in Figure 1 shows the annual and monthly terms that were used for the CRR Dry Run. The full annual term, with the four seasons and two time-of-use periods, was used for the annual allocation and auction processes. The monthly allocation and auction processes were simulated for April and August, each with two TOU periods.

Figure 1: Annual and Monthly Terms Used in CRR Dry Run



2.2.3.2 The Annual Allocation and Auction

The CRR Dry Run annual allocation process was open to all eligible LSEs. Eighteen LSEs participated in the annual allocation.

The allocation process consisted of three tiers in accordance with the filed rules. For the CRR Dry Run each LSE submitted its historical load data through the CRR system web based MUI. This load data was used to calculate the load metric (the starting point for calculating how many CRRs could be requested) for each LSE by season, load aggregate point ("LAP") and time of use period.

The load metric for each LSE was reduced by the LSE's right to serve load by way of Transmission Ownership Rights ("TORs"), Converted Rights ("CVRs") and Existing Transmission Rights ("ETCs"). The result was then multiplied 75 percent, in accordance with Section 36.8.2.1 of the filed CAISO MRTU Tariff, to produce each entity's Seasonal Eligible Quantity ("SEQ").

In Tier 1, LSEs could nominate CRRs up to 50 percent of its SEQ. The nominations were submitted through the MUI and validated by the CRR system for permissible source/sink locations and MW values. The source/sink verification process is discussed further in section 3.1.10 of this document.

Once LSE nominations were validated, these nominations were included in Tier 1 with the other validated LSE's CRR nominations and subjected to a simultaneous feasibility test ("SFT"[2]). Cleared CRRs were then provided back to the LSEs via the MUI.

In Tier 2, each LSE could nominate up to 75 percent of its SEQ less any CRRs that it was awarded in Tier 1. For Tier 3, LSEs could nominate up to 100 percent of their SEQ less any CRRs that cleared in Tier 1 or in Tier 2. In accordance with the CAISO MRTU Tariff, in Tier 3 the CRR Source location and MW verification was relaxed so that LSEs could nominate CRRs from any allowable source. However, the CRR Sink location and MWs were validated and enforced in all tiers of the allocation.

For Tier 3, the allowable sink location was expanded to include not only the default LAP locations but also the sub LAPs (see Table 1 for the list of sub LAPs). If an LSE decided to nominate a CRR from a sub LAP instead of the default LAP it was limited to using the sub LAPs contained within the LAP for which it was verified to serve load.

The CRR Dry Run annual auction was open to all eligible Market Participants. Seventeen Market Participants participated in the annual auction, including ten of the LSEs that participated in the annual allocation.

For annual auction, Market Participants were able to use any Aggregate Pricing Node (APNode)[3] as a source or sink in the auction process.

As directed in CAISO MRTU Tariff § 36.8.4.1, prior to the annual allocation capacity was set-aside on each of the Scheduling Points (interties) to be used for the annual auction. The process

[2] The process that the CAISO conducts to ensure that allocated and auction CRRs do not exceed relevant transmission system constraints.
[3] An APNode is a Load Aggregation Point, Trading Hub or any group of Pricing Nodes as defined by the CAISO.

for determining the set-aside value at each Scheduling Point starts with the total capacity at each Scheduling Point that was available in the Full Network Model ("FNM"). From this beginning value the CAISO subtracted the verified amounts at those Scheduling Points submitted to the CAISO by the LSEs as well as the capacity taken up on the Scheduling Points associated with Transmission Ownership Rights ("TORs"), Existing Transmission Contracts ("ETCs") and Converted Rights ("CVR") nominations. The CAISO then set aside fifty percent of this leftover capacity for the annual auction.[4]

Once the bidding window was opened, Market Participants were able to submit bids into the CRR auctions via the MUI. Each Market Participant's CRR auction bid price was verified not to exceed its posted collateral.[5] Once the bidding window closed, the CAISO ran a SFT and optimization to clear the CRR annual auction. The results were returned to the Market Participants via the MUI.

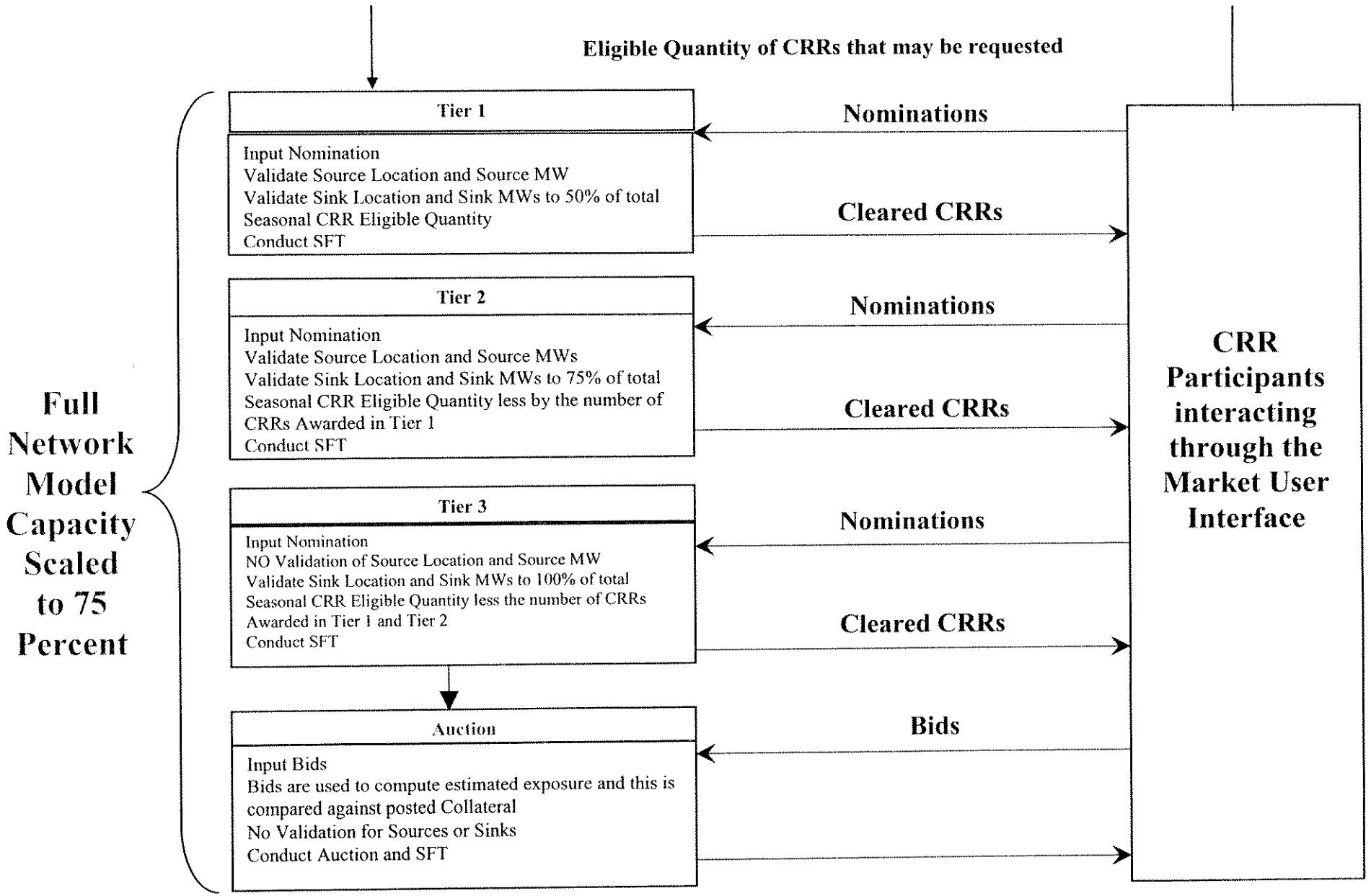
The details of the SFT, including the optimization formulation, are described in the CRR Business Practice Manual. For the CRR Dry Run the CAISO used the base case constraints without running contingency analysis. CAISO determined that the base case constraints, which are derived using contingency analysis and operating procedures, are consistent with the expected modeling of constraints in the Day Ahead Market when MRTU goes operational.

Figure 2 illustrates the annual allocation and auction process:

[4] In the actual CRR production process the CAISO will allow LSEs to nominate pro-rata shares of the other 50 percent of each Scheduling Point that was not set aside for the auction, in proportion to their Seasonal CRR eligible quantities. This step was not included in the CRR Dry Run.

[5] The CAISO did not enforce approved credit limitations for the CRR Dry Run. Instead, each Market Participant indicated to the CAISO the dollar amount they wanted as posted collateral prior to the CRR Dry Run.

Figure 2: General Annual Process for a Season / Time of Use Period – Year 1



2.2.4 The Monthly Allocation and Auction

Similar to the annual allocation, the monthly allocation was also open to all eligible LSEs. The major differences between the annual and monthly allocation processes were that the monthly allocation consisted of two tiers rather than three tiers, and the load metric was based on forecasted load rather than historical load.

In Tier 1 of the monthly allocation process, the LSEs were able to nominate up to 50 percent of their Monthly Eligible Quantity and for Tier 2 they could nominate up to 100 percent of their Monthly Eligible Quantity less any CRRs that they were allocated in Tier 1. The nominations submitted in Tier 1 were validated against both the CRR Source and CRR Sink location and MW value.[6] In Tier 2, which is similar to the annual Tier 3 validation, the CRR Source Location and MW validation was relaxed. However, the CRR Sink location and MWs were validated during both tiers with the Tier 2 CRR Sink locations expanded to allow not only the Default LAP locations but also the sub LAPs (see Table 1 for the list of sub LAPs).

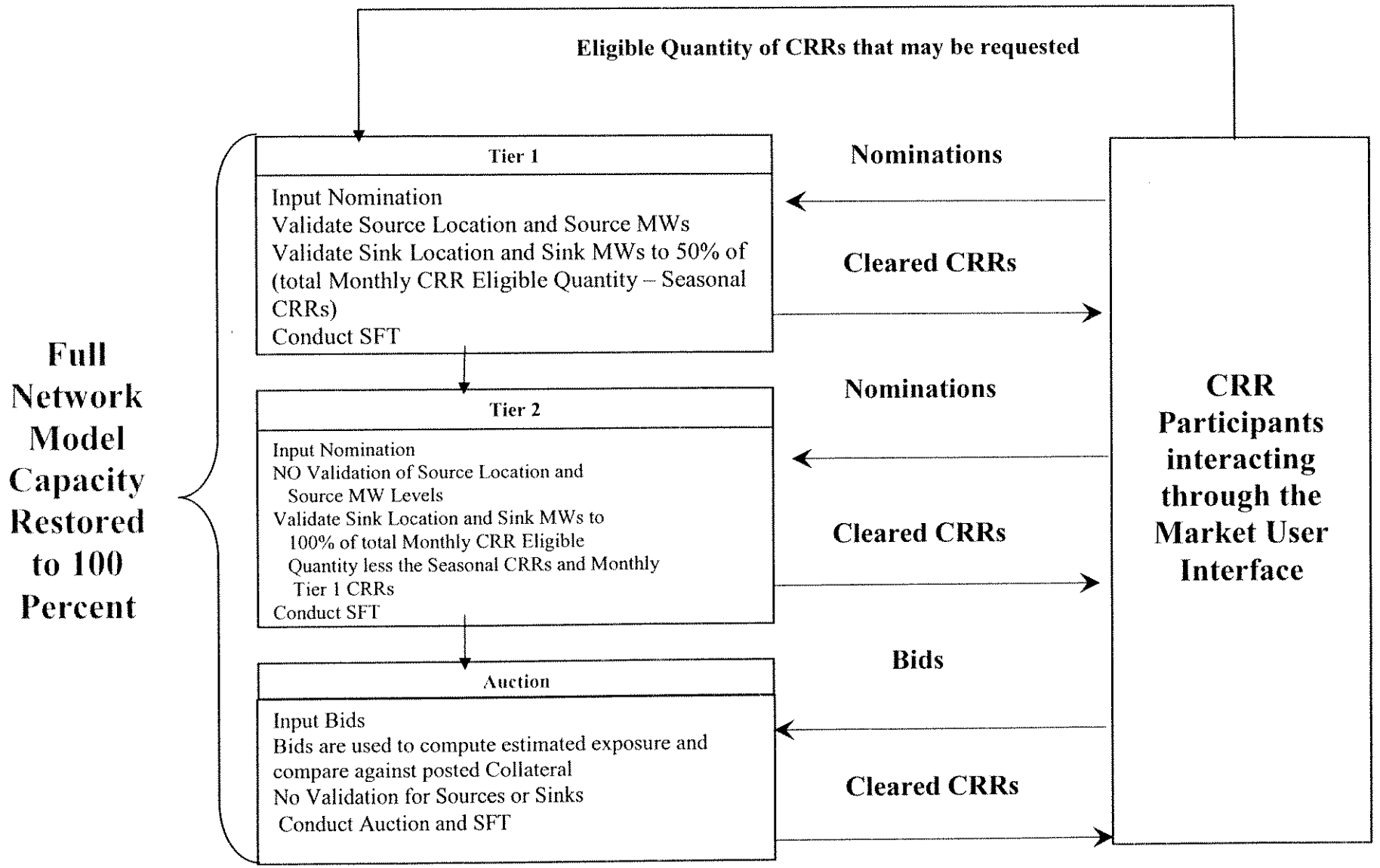
If an LSE decided to use a sub LAP in Tier 2 instead of the Default LAP it was limited to using the sub LAPs contained within the LAP for which it was validated to serve load.

The monthly auction had an identical process to the annual auction, except that the term of the CRRs is for one month. As with the annual auction, the CAISO did not enforce an approved credit limit; instead, Market Participants indicated to the CAISO the amount of collateral they wished to have for the monthly auction.

Figure 3 below illustrates the monthly allocation and auction process.

[6] Section 3.1.10 of this document provides more details on source and sink validation.

Figure 3: General Monthly Process for a Month / Time of Use Period – Year 1



3 CRR Dry Run Parameters

3.1 DC Network Model

3.1.1 Full Network Model

The DC FNM used in the CRR Dry Run is consistent with the CAISO 2007 Local Capacity Requirements model (*i.e.*, 2007 summer peak-load planning model). The model provides a good representation of the model the CAISO will use going into production. It consisted of 3930 buses and 5191 branches (transmission lines and transformers). For more details on the process for developing the FNM, refer to the Business Practice Manual for Managing Full Network Model, which can be located at:
http://www.caiso.com/1840/1840b27422f60.html

For purposes of the CRR Dry Run the FNM includes all transmission within the CAISO Control Area and the Sacramento Municipal Utility District ("SMUD") and Western Area Power Administration ("WAPA") (including the California Oregon Transmission Project, "COTP") transmission. The CAISO has also included in the FNM transmission from the southern cities that was turned over to the CAISO but is outside of the CAISO Control Area. The CAISO cut off the transmission at the external connections to the adjacent control areas.

3.1.2 Operating Constraints (Monitored Facilities)

One of the critical data inputs needed to conduct the CRR allocations and auctions for the CRR Dry Run is the operating (or transmission) constraints.

The CAISO enforced constraints in each CRR SFT for both the allocation and auction processes. The CAISO categorized these constraints into two groups: single line normal thermal constraints and generalized group constraints ("GGC"). Operating Constraints that were used for the CRR Dry Run include thermal line and transformer limits[7] and 103 Interfaces, consisting of 43 variable branch group constraints to reflect existing Branch Groups within the CAISO footprint represented as generalized group limits (*e.g.*, PACI_BG) and 60 fixed branch group constraints (*e.g.*, SCIT). A total of approximately 3,700 monitored facilities (branches, interfaces and nomograms) were included in each of the annual and monthly allocation tiers and annual and monthly auctions.

3.1.2.3 Single Line Normal Thermal Constraints

The CAISO enforced these limits on all transmission lines that are part of the CAISO Controlled Grid and whose "from" and "to" bus voltage rating is 60 kV or higher. Thermal limits on branches 60 kV and above (lines and transformers) include normal and emergency thermal limits. These limits generally do not vary by time of use (*e.g.*, on-peak and off-peak) but do vary by season (summer and winter). Consequently, the CRR team used a summer and winter constraint set.

[7] All 60 kV lines and above were monitored for violations.

A single line normal thermal constraint represents the maximum rated current (amperage) that can flow through a line on a continuous time basis. The normal limit is on a continuous time limit whereas the emergency thermal limit is the current limit that a transmission line can sustain for a shorter period, such as 20 to 30 minutes.

There were limits for the summer period (April through October) and for the winter period (November through March). The winter limit is generally higher than the summer limit due to the generally colder ambient temperatures surrounding the transmission line (dissipates more of the thermal heat from the transmission line). For purposes of the CRR Dry Run, the CAISO defined season 1 (Jan-Mar) as winter and the remaining three seasons as summer. The CAISO realized that season 4 (Oct-Dec) only had one summer month but it was decided that a conservative approach (*i.e.*, using the summer limits, which are generally lower) would be used for the seasonal allocation and auction. The result of using a seasonal limit is therefore that the summer limits are used for a period that includes the months of November and December.

The operating constraint limits were adjusted by taking into consideration the absence of reactive power and loss modeling. The CRR team worked with CAISO operating engineers to determine the appropriate adjustment to the operating constraint limits that were used for the full network model. For the annual allocation and auction there was a 3% adjustment made for the absence of reactive power and a 3% adjustment make for the absence of losses. For the monthly allocation and auction, adjustments were made based on kV levels to reflect the absence of both reactive power and losses.

In summary, the limits for the normal thermal constraints were derived as follows:

- The start limit is the actual normal thermal limit. This limit is specified in MVA.
- The CAISO then reduces this limit by 3% to account for the reactive power modeling that is absent in the DC FNM.
- The CAISO then reduced the limit by a specified amount to account for the absence of loss modeling the DC FNM. The CAISO used a flat rate of 3% in the annual allocation and auction process. By the time of the monthly allocation and auction process, the CAISO calculated more accurate percentage factors associated with the transmission losses. These new factors were applied in the monthly process. These new factors were determined for transmission line kV levels. These factors are:
    - 500 kV: 1.0%
    - 230 kV: 1.3%
    - 115 kV: 1.7%
    - 70 kV and below: 2.0%

(Note that the transmission lines that are part of the interconnections with other control areas are not enforced as single thermal limits. These lines are part of GGCs.)

3.1.2.4 Generalized Group Constraints

A generalized group constraint is comprised of one or more transmission lines. Associated with each transmission line is a weighting factor (0 <= factor <= 1). In determining the flow on the GGC, each weight is applied to the flow (as calculated via the SFT) on the corresponding transmission line and this product is summed over all transmission lines within the GGC.

The limit for each GGC is generally not determined from the normal operating thermal limits of the transmission lines that comprise the GGC. Rather, these limits are based on: (i) emergency thermal limits; (ii) MW limits that prevent voltage stability/collapse problems; or (iii) MW limits that prevent transient stability problems. In day-to-day operations, many of the GGC limits vary by hour, whereas other GGC limits may stay constant over a period of time (may vary by season and may change due to certain network configuration).

In each SFT, the CAISO enforced 103 GGCs. With some exceptions, the 103 GGCs come directly from CAISO operating procedures and definitions of the Branch Group interfaces currently utilized in the CAISO inter-zonal model.[8]

The limits for the GGCs were derived as follows:

- For those GGC limits that were constant, the correct limit was taken from the corresponding CAISO operating procedure taking into consideration the season.
- For those GGC limits that vary by hour, the CAISO staff developed historical limit duration curves and chose appropriate limits based on this historical data.
- The CAISO modeled TORs, ETCs and CVRs as CRRs in the SFTs. For those TOR and ETC associated with Scheduling Points (*i.e.*, interconnections with other control areas) if the CAISO does not fully model the full rights with the CRR MW, the remaining amount of rights will be removed by reducing the limit of the associated GGC.
- The GGC limits for the import direction of Branch Groups (the GGCs that represent the interconnections to adjacent control areas) can also be reduced, prior to running the annual allocation process, to account for capacity that is set-aside for the annual auction. In calculating the set-aside amount the result can be zero up to 50% of the limit on a particular Branch Group. This set-aside reduction is also done prior to the monthly allocation process.
- To account for transmission losses that are not modeled in the DC FNM, the GGC limit was reduced by 3%.

In the case of the Southern California Import Transmission (SCIT) limit, the CRR Dry Run was unable to account for hourly variation in this constraint, and the SFT used a value close to the seasonal maximum. SCIT is typically limited to less than its maximum because it is affected by the amount of inertia of committed generation in southern California, and

[8] The SFT for the CRR Dry Run did not enforce the Humboldt area import limits because there were no CRR nominations sourced from within the Humboldt area. With no CRR nominations sourced within the Humboldt area, the enforced Humboldt area constraint will become binding due to the large portion of the PG&E default LAP that sinks within that Humboldt area (i.e. there is no source to create counterflow.) RMR generation was not nominated, which could be used to relieve this constraint.

because there are many factors that cause further derates, and thus it is a frequent reason for out-of-sequence dispatch for congestion management, especially in winter months when generation commitment is limited. A complete determination of the actual SCIT limit for the CAISO would further involve determination of Los Angeles Department of Water and Power's ("LADWP") usage of part of the available SCIT capacity for service to LADWP's load that is not met by its generation within southern California.

The CAISO did not perform contingency analysis. The purpose of many of the GGCs is to take the place of an actual contingency. The limit of the GGC will be set in such a way that if the flow in the base system (the configuration of the system at which time the contingency has not been applied) is within the limit of the GGC, the flows on certain transmission lines in the same area as the contingent transmission line will remain within their respective emergency limits.

3.1.3 Binding Constraints

Appendix 2 lists the binding constraints (monitored facilities and interfaces) encountered during the annual allocation, annual auction, monthly allocation and monthly auction of the CRR Dry Run.

3.1.4 Outages

For the purpose of the annual CRR allocation and auction, it was assumed that all transmission facilities were in service. For the two monthly allocations and auctions (April and August) that are part of the CRR Dry Run, the CAISO reviewed the data that was available and determined that outages could not properly be predicted with the data available. Thus, in order to account for monthly outages, the CAISO derated the monitored facilities by a global percentage based on kV levels.

To derive the final derate values for the monthly allocation and auction the CAISO fine-tuned the loss values used in the annual process to more accurately reflect losses by kV level. The net effect of the adjustment to the losses percentage plus the derate for monthly outages ended was to reduce the capacity of the 500 kV lines by 4% and the 230 kV lines by 1%.

3.1.5 Modeling of Existing Rights and Contracts

Existing rights were taken into consideration for the CRR Annual and Monthly Allocations. In order to account for TORs which are not subject to congestion charges,[9] the TOR capacity was removed from the system by modeling it as fixed point to point CRR Options.[10]

Existing Transmission Contracts are also not subject to congestion charges[11] and where modeled as point-to-point CRR Obligations, where the sink was modeled at the actual ETC load location or Custom LAP rather than as part of a Default LAP.

[9] According to the CAISO Tariff filed with FERC on February 9, 2006.
[10] In order to exclude couterflow, PTP CRR Options were used to model TORs as opposed to PTP CRR obligations which would not exclude counterflow.
[11] Under MRTU, ETCs will not be subject to congestion charges.

Those entities that currently hold CVRs, which include the City of Anaheim, the City of Azusa, the City of Banning, the City of Pasadena, the City of Riverside and the City of Vernon, are not subject to congestion charges in the Integrated Forward Market. These CVRs were modeled as point-to-point CRR Obligations.

3.1.6 Sources and Sinks

Market Participants who participated in the CRR Dry Run were able to choose the following sources and sinks for the annual and monthly allocation process, subject to verification requirements, where applicable.

Sources	Sinks
Generator Locations Trading Hub (NP15-EZGTH, ZP26-EZGTH, SP15-EZGTH) Scheduling Points (i.e., interties)	Default Load Aggregation Points (LAPs) (PGE_DFLAP, SCE_DFLAP, SDGE_DFLAP)(Used by Load Serving Entities and also MSSs that choose the gross settlement option) Sub-LAPs(Used by LSEs only in Tier 3 of the annual allocation process and Tier 2 of the monthly allocation process) Metered Subsystem (MSS) LAPs (Used only by MSSs that choose the net settlement option) Participating Loads Some ETC sink locations

For the annual and monthly auction, Market Participants were permitted to use any permissible APNode as a source or sink.

3.1.7 Distribution Factors

3.1.7.5 Default Load Aggregation Points

There were three standard Default LAPs, one for each of the service territories of Pacific Gas & Electric (PG&E), Southern California Edison (SCE) and San Diego Gas & Electric (SDG&E). The load distribution factors ("LDFs") or allocation factors for the Default LAPs (*i.e.*, PGE_DFLAP, SCE_DFLAP and SDGE_DFLAP) were used to allocate the CRR Sink MWs to the underlying network nodes. For the CRR Dry Run, the CAISO created sets of LDFs by season and time of use period (*i.e.*, on-peak and off-peak).

3.1.7.6 Sub Load Aggregation Points

The sub Load Aggregation Points (sub LAPs) were available in tier 3 of the annual allocation, tier 2 of the monthly allocation and the auction markets. These sub LAPs used LDFs that are based on LDFs from the Default LAPs.

The following Table 1 provides a mapping from each of the three default LAPs to their corresponding sub LAPs.

Table 1
LAP to SUBLAP Mapping

LAP	SUBLAP
PGE_DFLAP	PGF1
	PGCC
	PGVA
	PGSN
	PGSI
	PGST
	PGSF
	PGSA
	PGEB
	PGSB
	PGFG
	PGHB
	PGLP
	PGNB
	PGNC
	PGNV
	PGP2
SCE_DFLAP	SCEN
	SCES
	SCHD
	SCLD
	SCEC
SDGE_DFLAP	SDG1

3.1.8 Metered Subsystem Load Aggregation Points

Consistent with the CAISO MRTU Tariff filed on February 9, 2006, Metered Subsystems ("MSS") could choose to be settled "net", which entitled them to sink in a Custom LAP created by the CAISO, or "gross" which entitled the MSS entity to use the Default LAP. For the CRR Dry Run, all MSS entities chose gross settlement.

3.1.9 Trading Hubs

In accordance with Section 27.3 of the filed CAISO MRTU Tariff, the CAISO included Trading Hubs in the new market design to facilitate bilateral energy transactions. Trading Hubs are defined as all generation resources within existing internal congestion zones (NP15, ZP26 and SP15). These Trading Hubs will only be used in settlement of Inter-SC Trades in the Integrated Forward Market; Market Participants may not use them when scheduling energy. These Trading Hubs were used as CRR Sources during the CRR allocation process and as either a CRR Source or a CRR Sink in the auction process.

Each Trading Hub is comprised of all Generating Units within that zone. The allocation factor for each PNode[12] within a Trading Hub was based upon the ratio of the total output of energy at a PNode divided by the total generation output in that existing zone, for the corresponding season and time-of-use period.[13]

3.1.10 Source/Sink Verification Process

As stated in the "Congestion Revenue Rights Dry Run Guidebook" (http://www.caiso.com/17df/17dfe1439840.pdf) participants were required to verify the sources and sinks they were going to use in the CRR Dry Run allocation process. CRR Source verification was enforced in tiers 1 and 2 of the annual allocation and tier 1 of the monthly allocation. The CRR Sink location was verified throughout all tiers of the allocation.

The MW upper bound limit for each source was determined by the following methodology:

- Generating Units – Participants had to demonstrate they had a right to use a specific Generating Unit up to a specific MW value. The maximum aggregate MW request from all participants using a particular unit was limited to the unit's PMax value as reflected in the CAISO Master File.
- Trading Hubs – Participants had to demonstrate that they had contracts that sourced at the particular Trading Hub. The maximum MW value requested was limited to the average hourly quantity of energy contracted for delivery at that hub.
- Scheduling Points – Participants had to demonstrate ownership of external generation resources, energy contracts and contracts demonstrating an ability to move energy from the external resource to the Scheduling Point up to a maximum MW value.

CRR Sink locations for the allocation were determined in three ways. For those LSEs and MSSs choosing gross settlement, the sink locations were limited to the Default LAPs (PGE_DFLAP, SCE_DFLAP and SDGE_DFLAP). Each participant had to demonstrate that

[12] A PNode is a single network Node or subset of network Nodes where a physical injection or withdrawal is modeled and for which a Locational Market Pricing is calculated and used for financial settlements.
[13] The Trading Hubs weights (for CRR Dry Run purposes) were based on the simulated output of generators from the LMP Studies. For further explanation on the Trading Hub calculation methodology, please refer to LMP Study 3C (report on September 2004 conditions) located at:
http://www.caiso.com/1814/1814abd048fb0.pdf

they serve load in the LAP or LAPs that they used as sinks. A specific MSS LAP was created for those MSSs choosing net settlement.[14] Participants serving load external to the CAISO Control Area could only elect Scheduling Points that could be verified by historical scheduling information.

The annual allocation MW upper bound limit for each eligible CRR Sink was derived from the historical load submitted by each of the participants. The monthly MW upper bound limit was derived from the forecasted load submitted by each participant. This load data was submitted by each Market Participant via the Market User Interface.

3.1.11 Merchant Transmission

For purposes of the CRR Dry Run Merchant transmission was not considered. There is a Merchant Transmission upgrade in the Blythe area that has been operational for a few years but the exact process for determining the allocation of CRRs to Merchant Transmission owners is under development, and thus was not ready for testing during the CRR Dry Run process.

4 CRR Dry Run Results – Capacity MW Amounts

The CRR Dry Run process concluded on January 26, 2007. The CAISO has reviewed individual results with entities that participated and obtained feedback on the process.

Eighteen LSEs participated in the annual and monthly allocations. A total of seventeen participants participated in the annual auction, including ten of the LSEs that participated in the allocation. Twelve participants participated in the monthly auction of which ten participated previously in the annual auction. Unless stated otherwise, aggregate results include both Point-to-Point and Multi-Point CRRs.

[14] None of the participants chose net settlement for the CRR Dry Run.

4.1 Annual and Monthly Allocation

Table 2 below summarizes the total number of MWs nominated and allocated for each of the financial CRR types offered to LSEs in the annual allocation broken down by season, tier and time of use.

Table 2
Total Number of MWs Nominated and Allocated by CRR Type

CRR Type	Season	Tier	Time of Use	Nominated	Allocated	% Cleared
Point-to-Point	Season 1	1	OFF-PEAK	9,529	9,529	100.0%
			ON-PEAK	10,536	10,536	100.0%
		2	OFF-PEAK	4,927	4,849	98.4%
			ON-PEAK	5,318	4,733	89.0%
		3	OFF-PEAK	4,588	3,935	85.8%
			ON-PEAK	5,730	3,410	59.5%
	Season 2	1	OFF-PEAK	10,321	10,317	100.0%
			ON-PEAK	12,587	11,640	92.5%
		2	OFF-PEAK	5,254	4,906	93.4%
			ON-PEAK	6,166	3,681	59.7%
		3	OFF-PEAK	5,317	2,180	41.0%
			ON-PEAK	8,044	4,108	51.1%
	Season 3	1	OFF-PEAK	13,759	13,733	99.8%
			ON-PEAK	15,362	15,329	99.8%
		2	OFF-PEAK	6,379	3,598	56.4%
			ON-PEAK	6,641	3,672	55.3%
		3	OFF-PEAK	8,908	2,666	29.9%
			ON-PEAK	10,467	5,136	49.1%
	Season 4	1	OFF-PEAK	10,489	10,488	100.0%
			ON-PEAK	12,159	12,155	100.0%
		2	OFF-PEAK	5,425	3,850	71.0%
			ON-PEAK	5,873	4,727	80.5%
		3	OFF-PEAK	5,123	2,485	48.5%
			ON-PEAK	5,298	3,051	57.6%
Multi-Point	Season 1	1	OFF-PEAK	487	487	100.0%
			ON-PEAK	550	550	100.0%
		2	OFF-PEAK	307	307	100.0%
			ON-PEAK	369	369	100.0%
		3	OFF-PEAK	1,160	681	58.7%
			ON-PEAK	1,813	1,055	58.2%
	Season 2	1	OFF-PEAK	485	485	100.0%
			ON-PEAK	785	785	100.0%
		2	OFF-PEAK	281	212	75.5%
			ON-PEAK	1,070	669	62.6%
		3	OFF-PEAK	1,098	582	53.0%
			ON-PEAK	2,292	1,450	63.3%
	Season 3	1	OFF-PEAK	712	712	100.0%
			ON-PEAK	1,169	1,151	98.4%

CRR Type	Season	Tier	Time of Use	Nominated	Allocated	% Cleared
		2	OFF-PEAK	395	389	98.7%
			ON-PEAK	392	354	90.3%
		3	OFF-PEAK	1,528	636	41.6%
			ON-PEAK	2,471	1,429	57.8%
	Season 4	1	OFF-PEAK	441	441	100.0%
			ON-PEAK	575	575	100.0%
		2	OFF-PEAK	209	202	96.8%
			ON-PEAK	286	285	99.7%
		3	OFF-PEAK	2,004	1,477	73.7%
			ON-PEAK	2,384	1,800	75.5%

4.1.1 Annual Allocation Data

A metric for assessing the extent to which LSE requests were covered by the CRR annual allocation was developed by taking the total number of CRRs allocated in each of the three tiers and comparing it to the total number of CRRs eventually requested:

- Total number of CRRs allocated is equal to the number of CRRs allocated in Tier 1 (T1a) plus the number of CRRs allocated in Tier 2 (T2a) plus the number of CRRs allocated in Tier 3 (T3a).
- Total number of CRRs eventually requested is equal to the number of CRRs allocated in T1a plus the number of CRRs allocated in T2a plus the number of CRRs nominated in Tier 3 (T3n).

Table 3 below uses the above metric and summarizes the extent of requested coverage for each Season and Time of Use for the annual allocation.

Table 3
Annual CRR Allocation
Number of MW Allocated / Adjusted Number of MWs Nominated*

Season	Time of Use	MW Annual Adjusted Nomination (T1a+T2a+T3n)	MW Annual Allocation (T1a+T2a+T3a)	Percentage Cleared
Season 1	Off-Peak	20,919	19,787	94.6%
	On-Peak	23,731	20,652	87.0%
Season 2	Off-Peak	22,335	18,682	83.6%
	On-Peak	27,111	22,333	82.4%
Season 3	Off-Peak	28,868	21,734	75.3%
	On-Peak	33,443	27,070	80.9%
Season 4	Off-Peak	22,109	18,944	85.7%
	On-Peak	25,425	22,593	88.9%

*CVR, ETC and TOR are not represented

4.1.2 Annual Allocation by Default LAP

Table 4 below summarizes for each of the default LAPs the total number of MWs allocated and nominated by each type of source (Generator, Trading Hub, and Scheduling Point), broken down by season, tier and time of use.

Table 4
Annual CRR Allocation
Total MWs Nominated and Allocated by Default LAP

Default Lap	Season	Tier	Time of Use	Generation		Trading Hub		Scheduling Point	
				Nominated*	Allocated*	Nominated*	Allocated*	Nominated*	Allocated*
PGE_DFLAP	Season 1	1	Off-Peak	3,747	3,747	432	432	364	364
			On-Peak	4,243	4,243	487	487	398	398
		2	Off-Peak	1,888	1,863	180	180	86	86
			On-Peak	2,162	1,786	245	225	56	56
		3	Off-Peak	1,963	1,861	64	0	212	210
			On-Peak	2,588	1,614	37	0	239	204
	Season 2	1	Off-Peak	3,452	3,449	452	452	499	499
			On-Peak	4,837	3,892	573	573	489	486
		2	Off-Peak	1,964	1,866	50	50	56	56
			On-Peak	1,241	1,102	1,732	5	3	3
		3	Off-Peak	1,985	1,247	101	0	230	82
			On-Peak	3,934	3,206	92	0	266	106
	Season 3	1	Off-Peak	5,263	5,237	402	402	571	571
			On-Peak	5,780	5,747	577	577	514	514
		2	Off-Peak	1,064	1,017	1,865	36	88	88
			On-Peak	1,202	1,164	2,160	6	12	12
		3	Off-Peak	4,623	994	123	0	258	20
			On-Peak	4,615	3,302	97	0	282	196
	Season 4	1	Off-Peak	4,248	4,247	367	367	373	373
Default Lap	Season	Tier	Time of Use	Generation		Trading Hub		Scheduling Point	
				Nominated*	Allocated*	Nominated*	Allocated*	Nominated*	Allocated*
			On-Peak	4,592	4,588	517	517	379	379
		2	Off-Peak	1,304	1,303	994	12	65	65

			On-Peak	1,632	1,631	960	8	81	81
		3	Off-Peak	2,162	1,166	96	0	194	62
			On-Peak	2,365	2,190	81	0	265	225
SCE_DFLAP	Season 1	1	Off-Peak	1,963	1,963	438	438	1,423	1,423
			On-Peak	1,924	1,924	543	543	1,648	1,648
		2	Off-Peak	1,305	1,305	131	131	300	300
			On-Peak	1,721	1,533	155	155	405	404
		3	Off-Peak	1,329	1,204	97	97	380	210
			On-Peak	1,752	1,121	134	0	411	140
	Season 2	1	Off-Peak	2,419	2,419	488	488	1,929	1,929
			On-Peak	2,927	2,927	639	639	1,883	1,883
		2	Off-Peak	1,843	1,829	74	27	284	284
			On-Peak	2,217	2,163	201	0	249	249
		3	Off-Peak	1,829	481	176	0	453	190
			On-Peak	1,857	486	173	0	794	42
	Season 3	1	Off-Peak	3,110	3,110	543	543	2,446	2,446
			On-Peak	3,648	3,648	720	720	2,543	2,543
		2	Off-Peak	2,422	2,071	84	84	64	64
			On-Peak	2,311	1,984	307	0	3	1
		3	Off-Peak	1,971	824	246	0	615	51
			On-Peak	2,714	1,069	365	0	1,476	181
	Season 4	1	Off-Peak	1,818	1,818	449	449	2,012	2,012
			On-Peak	2,466	2,466	557	557	2,301	2,301
		2	Off-Peak	1,735	1,735	150	101	148	148
			On-Peak	2,153	5,060	229	229	239	139
		3	Off-Peak	1,578	825	138	0	362	44
			On-Peak	1,258	319	205	0	506	109

Default Lap	Season	Tier	Time of Use	Generation		Trading Hub		Scheduling Point	
				Nominated*	Allocated*	Nominated*	Allocated*	Nominated*	Allocated*
SDGE_DFLAP	Season 1	1	Off-Peak	722	722	217	217	106	106
			On-Peak	722	722	348	348	106	106
		2	Off-Peak	270	270	212	212		
			On-Peak	88	88	487	487		
		3	Off-Peak	13	13	167	74	363	266
			On-Peak	118	118	205	50	248	163
	Season 2	1	Off-Peak	682	682	171	171	106	106
			On-Peak	702	702	309	309	106	106
		2	Off-Peak	207	207	231	231		
			On-Peak	87	87	436	71		
		3	Off-Peak	11	11	210	0	324	169
			On-Peak	29	29	580	79	319	160
	Season 3	1	Off-Peak	818	818	384	384	106	106
			On-Peak	790	790	568	568	106	106
		2	Off-Peak	224	223	15	15	1	1
			On-Peak	379	379	268	126	1	1
		3	Off-Peak	520	520	114	0	437	258
			On-Peak	125	125	428	50	366	215
	Season 4	1	Off-Peak	722	722	276	276	106	106
			On-Peak	790	790	335	335	106	106
		2	Off-Peak	319	319	167	167	1	1
			On-Peak	117	117	462	462		
		3	Off-Peak	281	281	52	0	261	107
			On-Peak	14	14	218	40	385	153

*CVR, ETC and TOR are not represented

4.1.3 Monthly Allocation Data

The results of the two monthly allocations are listed below. The results are presented to reflect what an LSE would have been allocated in addition to the annual allocation.

Table 5 summarizes the ratio of total MWs allocated in the annual, Season 2 and 3, and monthly, April and August, allocations over the total MWs allocated in the each of the Seasons and tier 1 of the corresponding monthly plus the number of MWs nominated in tier 2 of the corresponding monthly.

Table 5

Annual & Monthly CRR Allocation
Season 2 and Season 3
MW Allocated / Adjusted number of MW Nominated[15]

All Tiers

Season	Time of Use	Annual & Monthly MW Nomination Adjusted	Annual & Monthly MW Allocation	Percentage Cleared
Season 2 & April	Off-Peak	27,115	24.753	91.3%
	On-Peak	31,177	28,149	90.3%
Season 3 & August	Off-Peak	36,433	29,389	80.7%
	On-Peak	42,801	36,243	84.7%

*CVR, ETC and TOR are not represented

As with the annual auction, the metric used for determining to what extent LSE requests were covered by the CRRs monthly allocation was to take the total number of CRRs allocated in each of the two tiers and compare it to the total number of CRRs eventually requested.

- Total number of CRRs allocated is equal to the number of CRRs allocated in Tier 1 (T1a) plus the number of CRRs allocated in Tier 2 (T2a).
- Total number of CRRs eventually requested is equal to the number of CRRs allocated in T1a plus the number of CRRs nominated in Tier 2 (T2n).

[15] The results in Table 5 exclude those LSEs that did not participate in the Monthly Allocations.

Table 6 below uses the above metric and summarizes the extent of coverage for each Month and Time of Use for the monthly allocation.

Table 6
Monthly CRR Allocation

Number of MW Allocated / Adjusted Number of MWs Nominated

Month	Time of Use	MW Monthly Nomination Adjusted (T1a+T2n)	MW Monthly Allocation (T1a+T2a)	Percentage Cleared
April	Off-Peak	8,509	6,147	72.2%
	On-Peak	8,943	5,915	66.1%
August	Off-Peak	14,367	7,724	53.8%
	On-Peak	15,832	9,274	58.6%

4.1.4 Annual and Monthly Auctions

After the conclusion of the annual allocation, CAISO ran the Annual CRR Auction, which was open to all market participants. Seventeen participants were involved in the annual auction.

Table 7 below summarizes the results of the auction by Season and Time of Use.

Table 7
Annual Auction Results by Season and Time of Use

Season	Time Of Use	MWs Bid	MW Awarded	Percent Cleared
Season 1	Off-Peak	13,780	3,206	23.3%
	On-Peak	21,978	4,801	21.8%
Season 2	Off-Peak	16,266	4,509	27.7%
	On-Peak	23,403	3,595	15.4%
Season 3	Off-Peak	18,238	6,461	35.4%
	On-Peak	24,709	4,498	18.2%
Season 4	Off-Peak	15,940	4,155	26.1%
	On-Peak	19,408	4,076	21.0%

It should be noted that all bids in the CRR Dry Run auction are not financially binding. Since any APNode can be used for the auction, the magnitude of the awarded MWs may be misleading since flow and counterflow can effectively cancel each other out and be fully awarded.

Table 8 below shows the net revenue brought in by the annual auction. The total revenues are split into positive and negative value to show the effect that counterflow bids had during the auction.

Table 8
Aggregated Annual Auction Results by Season and Time of Use

Season	Time of Use	Annual Bid MW	Annual Award MW	Positive Revenue ($)	Negative Revenue ($)	Net Revenue ($)
Season1	Off-Peak	13,780	3,206	1,669,065	-1,048,231	620,834
	On-Peak	21,978	4,801	3,936,113	-1,972,790	1,963,322
Season2	Off-Peak	16,266	4,509	4,198,489	-1,053,506	3,144,983
	On-Peak	23,403	3,595	3,802,467	-1,717,534	2,084,933
Season3	Off-Peak	18,238	6,461	4,703,708	-1,225,260	3,478,448
	On-Peak	24,709	4,498	12,898,711	-6,976,472	5,922,240
Season4	Off-Peak	15,940	4,155	3,592,672	-1,943,625	1,649,047
	On-Peak	19,408	4,076	6,326,092	-3,743,153	2,582,939
	Total	**153,722**	**35,301**	**41,127,317**	**-19,680,571**	**21,446,746**

Two monthly auctions were performed after each of the monthly allocations (April & August); Table 9 below summarizes the results of both auctions by Month and Time of Use.

Table 9
Monthly Auction Results by Time of Use

Month	Time Of Use	MWs Bid	MWs Awarded	Percent Cleared
April	Off-Peak	7,346	2,005	27.3%
	On-Peak	16,893	5,136	30.4%
August	Off-Peak	19,873	1,172	5.9%
	On-Peak	18,283	105	0.6%

Table 10 below shows the net revenue brought in by the monthly auctions. The total revenues were split into positive and negative. The negative does show the effect that counterflow bids had during the auctions.

Table 10
Aggregated Monthly Auction Results

Month	Time of Use	Monthly Bid MW	Monthly Award MW	Positive Revenue ($)	Negative Revenue ($)	Net Revenue ($)
April	Off-Peak	7,346	2,005	582,726	-123	582,603
	On-Peak	16,893	5,136	12,239,304	-3,148,154	9,091,150
August	Off-Peak	19,873	1,172	13,477,214	-13,176,122	301,091
	On-Peak	18,283	105	1,357,492	0	1,357,492
	Total	**62,395**	**8,418**	**27,656,736**	**-16,324,399**	**11,332,336**

4.1.5 Import Capacity at the Interties Available for Auction

The CAISO's filed CAISO MRTU Tariff provides a mechanism whereby import capacity at each of the interties between the CAISO Controlled Grid and the Adjacent Control Areas is reserved or set-aside prior to the running of the Annual and Monthly CRR allocation processes, so that it may be added back to the network model for the running of the Annual and Monthly CRR auctions. The CRR Dry Run performed this procedure in order to illustrate the effectiveness of the filed provisions to enable parties who may not have been eligible for CRR allocation, as well as parties who were eligible for CRR allocation but wish to obtain additional import CRRs, to obtain import CRRs in the auctions.

For each intertie the CAISO calculated a residual MW quantity of import capacity defined as the difference between the total available import capacity after accounting for TORs, ETCs and CVRs, minus the total amount of import capacity taken up by LSE verified sources for the CRR allocation. Then 50 percent of this quantity would be set-aside for the auctions, while the other 50 percent would be made available for eligible LSEs in the allocation. To be consistent with the amounts of grid capacity available in the Annual and Monthly CRR processes, respectively, 75 percent of the set-aside was made available in the Annual CRR Auctions and the additional 25 percent was made available in the Monthly CRR Auctions.

To give an example, if the total import capacity of a particular intertie is 500 MW after accounting for TORs, ETCs and CVRs, and the eligible LSEs have verified 300 MW of import sources at that intertie, then the residual would be 200 MW and the set-aside would be 100 MW. Based on the 75/25 allocation of grid capacity to the annual and monthly CRR processes, respectively, the CAISO would make 300 MW of import capacity (= (500MW – 100MW) * 0.75) available for eligible LSEs in the annual allocation, 375 MW for the annual auction, 475 MW (= 500MW – 0.25*100MW) for the monthly allocation (assuming no reduction due to modeling of line outages and derates), and the full 500 MW for the monthly auction.

In practice these set-aside quantities turned out to be less than the amounts of import capacity actually available in the auctions, because LSEs typically did not utilize the full amounts available to them in the allocations. **Tables A3-1 and A3-2** in Appendix 3 report both the set-aside and the actual available import capacity quantities for each intertie and each combination of season and Time-of-Use in the Annual CRR Auction, and each combination of Month and Time-of-Use in the Monthly CRR Auctions. These tables also indicate the MW quantities of import and export bids submitted in the CRR auctions and the MW quantities of these bids that cleared. As part of the stakeholder discussions currently in progress the CAISO and the participants are considering whether any modifications to the filed provisions for the set-aside are warranted.

5 CRR Dry Run: Financial Analysis

Sections 5 and 6 discuss the financial analysis of the CRR Dry Run allocation results, which estimates the extent to which the CRRs allocated to eligible load serving entities cover their estimated congestion costs under MRTU based on the simulated LMPs generated in the CAISO's LMP studies.

The financial analysis provides insights on the coverage of LSEs' congestion costs by comparing the estimated revenues that would accrue to the LSEs based on the CRRs allocated to them in the CRR Dry Run to the estimates of the congestion charges for each of the LSEs in meeting their demand under the MRTU market structure. The financial analysis uses LMPs generated in LMP Studies 3A and 3C[16] to estimate both the CRR revenues and the congestion charges.

5.1 Methodology for Financial Analysis

The financial analysis requires the computation of both the estimated congestion charges LSEs will pay under MRTU and the expected CRR revenue streams they will receive from their allocated holdings of CRRs. The estimation of LSE congestion charges for this financial analysis also requires an estimate of how each LSE will use the CAISO transmission system to serve its load, that is, the specific resource locations from which it will obtain energy to serve its load, as the basis for calculating estimated congestion charges.

Because the CAISO has no information on exactly how LSEs will use the system going forward, the CAISO uses two separate methodologies to estimate the congestion charges participants will be exposed to under the estimated LMPs. One method assumes that the megawatt CRR allocations themselves reflect the sources of generation that would be used by an LSE to serve its load. This approach was taken in the CAISO's earlier study, CRR Study 2 which was completed in August 2005, but that approach was enhanced somewhat for the CRR Dry Run and is therefore referred to as the "enhanced CRR Study 2 method."[17] In contrast, the second methodology makes use of historical market schedules to determine the generation sources that would be used by LSEs to serve their load (*i.e.*, "historical schedule method").[18]

As explained further below, these two methodologies differ substantially in their assumptions, but are useful as they provide two data points for evaluating an LSE's exposure to congestion costs based on differing assumptions on their potential use of the system. Both methods use the prices computed in the CAISO's LMP Studies[19] to perform the financial calculations. Because the objective is to simulate congestion charges to be incurred under a future market system, any method of estimating the expected congestion charges for individual LSEs under MRTU must rely on assumptions about how LSEs acquire generation to meet their load.

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[16] LMP studies are published at http://www.caiso.com/docs/2004/01/29/2004012910361428106.html.
[17] CRR Study 2 Evaluation of Alternative CRR Allocation Rules, 08/24/2004 http://www.caiso.com/docs/2005/08/24/2005082417481216533.pdf.
[18] Today's CAISO markets have a "balanced schedule" requirement which ensures that all load scheduled in the Day Ahead and Hour Ahead markets is balanced by specific supply sources, either generation , imports or Inter-SC Trades.
[19] All analysis is therefore subject to the same assumptions and caveats presented in the LMP studies.

5.1.1 Enhanced CRR Study 2 Method

CRR Study 2 used a CRR based congestion charge calculation entailing a number of assumptions about how LSEs meet their load. This method assumes that each LSE owns generation or has energy contracts at each allocated CRR source equal to the amount of the CRR. The fact that the CRRs have been subject to a simultaneous feasibility test upon allocation helps ensure that the balanced schedules resulting from this method would be feasible. Furthermore this generation is dispatched each hour to meet the LSE's real time ("RT") load in an economic sequence going from the lowest LMP at source to the highest.

In each hour the LSE pays the difference between the sink and source congestion component of the LMP times the amount of power transferred. The use of the LMP-based economic sequence arbitrarily assumes that LSEs meet their load from the lowest price buses, which are not necessarily the lowest cost generation or the generation actually used to meet the load. In particular, utilizing supply sources in economic sequence from lowest to highest LMP tends to over-estimate the amount of congestion rent paid by the LSEs, though only when the load is less than the quantity of CRRs. If the load exceeds the quantity of CRRs then it is assumed that the extra load not covered by the CRRs must be met locally. CRR Study 2 therefore priced this extra load at the LAP price where the load is located, effectively shielding it from congestion charges[20].

As stated above the CRR Study 2 method was enhanced for the CRR Dry Run. One enhancement made to the original CRR Study 2 method is how load that exceeds the quantity of allocated CRRs is handled. In CRR Study 2, load exceeding the quantity of CRRs was priced at the LAP price where the load was located, which coincided with the definition of Trading Hubs that the CAISO contemplated at that time. This was changed for the CRR Dry Run analysis to use a system-wide hub price, that is, an overall absolute value injection- and withdrawal-weighted-average system congestion price. Using such a system wide average congestion price ensures that the congestion cost associated with the excess load is not neglected as it was in CRR Study 2, and should give a more realistic picture, as it is likely that there is more congestion when load is high, so that the extra load could represent a significant portion of the congestion charges for that time period.

Another enhancement to the original CRR Study 2 method is to remove load that was served by ETCs, because ETCs are given a perfect hedge under MRTU, and thus they will not be subject to congestion charges.

Additionally it is important to note that only CRRs that were allocated in the annual process were used to determine sources of generation. Since LSEs were limited in the annual allocation to 75 percent of their full CRR eligibility, this would over-estimate the amount of load that is served at the system-wide average price.

Finally, because this method focuses narrowly on the congestion rent incurred to meet load, it ignores other transactions that may have caused the LSE to incur congestion costs such as exports or Inter-SC trades to other Scheduling Coordinators. When we discuss the historical schedule method in the next section we will see that that method cannot easily exclude these transactions, and this will account for some of the differences between the two methods. (Of

[20] It is shielded from congestion charges because the sink and source are the same and there is no price difference.

course, if an LSE received energy through an Inter-SC Trade to meet its load and has CRRs sourced at the Trading Hub, it is considered in the present analysis).

5.1.2 Historical Schedule Method

A second method to associate congestion rents with specific LSEs involves the use of actual historical schedules. In order to more closely match system conditions to the LMPs from the LMP study, final hour-ahead ("HA") schedules are used in the calculation of congestion rents. Calculations of congestion rents to be collected by the CAISO are done on a Scheduling Coordinator ("SC") basis, as the SCs are responsible for scheduling with the CAISO and for all settlements associated with the schedules. System results are examined, but can be obtained simply by summing the individual SCs' results.

SCs that schedule load are assumed to be LSEs, or to represent specific LSEs. HA schedules are required to be balanced in the current market design; therefore there is no need to make assumptions about the resource mix used to meet a particular load at a particular time. Although CRR payments will be settled under MRTU using day-ahead (DA) LMPs, the final HA schedules are used here because they should reflect actual RT load more accurately than DA schedules, and the quantities of allocated CRRs each LSE is eligible to nominate are based on their actual load.

In order to perform the calculations, HA schedules for the four different schedule types – generation, load, Inter-SC Trades, and imports/exports – are compiled for the time periods of LMP studies 3A and 3C. These schedules are combined with the existing transmission contracts (ETCs) that were in use at the time to determine the share of each schedule that was covered under contractual rights and therefore would not be subject to congestion charges under MRTU. The congestion components of the appropriate LMPs are then applied to the schedules on an hourly basis and adjusted for ETC coverage to determine the amount of congestion rent that is paid to the CAISO. This calculation can be done fairly simply for each of the schedule types as:

Congestion Rent = (MWh Transferred – MWh ETC Coverage) * Congestion Price

It is important to understand that each of the schedule types is a transaction at a particular grid location and therefore is only a portion of an SC's entire balanced schedule. The "Congestion Rent" is the amount collected by the CAISO on an individual transaction. "MWh Transferred" refers to the hour ahead scheduled transfer of energy by an SC corresponding to a grid location. "MWh ETC Coverage" is the quantity of an existing transmission contract the SC holds for that grid location. "Congestion Price" is the marginal congestion component of the LMP at that location.

These calculations are done over all schedules for each SC, with some schedules paying to the SC and others paying to the CAISO. The net amount over all the schedules is the SC's congestion rent. It should be also noted that ETCs generally cover from point to point and do not necessarily extend from source to sink of a transaction. In this analysis, if part of the path of a transaction is covered by an ETC the entire transaction associated with that ETC is excluded from congestion rent. This may have the tendency to report congestion rent to be lower than it actually is.

5.1.3 CRR Payments

Once the congestion charges collected from each LSE by the CAISO are estimated, the next step is to compare these amounts to the payments each LSE is expected to receive from its allocated CRRs. The primary focus of the CRR payments for this study is based on the annual and monthly allocations discussed in the CRR Dry Run Allocation and Auction Results section of this report.

In any particular hour the total congestion rent collected by the CAISO could exceed or fall short of the total amount owed to CRR Holders. This largely depends on the awarded CRRs and the system conditions that are present during each settlement hour. Over time, however, it is expected that the rents collected will be approximately equal to the amount due to CRR Holders. In order to calculate the amount to be paid on each CRR under MRTU it is simply a matter to calculate over all hours of a CRR's term the congestion price difference between sink and source based on LMPs calculated in the day-ahead IFM, and then multiply by the amount of the MW on the CRR, to arrive at the payment. Since IFM prices do not yet exist, the results from the LMP studies are used in their place. This also ensures consistency between congestion rent calculations, also calculated using LMP studies, and the estimated CRR revenue.

5.1.4 Other Issues

The CAISO did not attempt to remove the load covered by CVRs and TORs from the congestion rent calculations for either method. This is primarily due to the difficulty in mapping the historic contracts to the grid usage. It is assumed that their impact will be relatively small, and that the failure to account for them will only slightly overestimate the congestion rents owed by a particular LSE. LSEs should also know the impacts of their CVRs and TORs, and would then be able to judge how well their congestion costs are covered with all transmission rights included. The payments accruing to CVRs and TORs that are modeled as CRRs by the CAISO are calculated in the overall CRR payment calculations; however these payments are not included in the individual LSE results.

One issue that is consistent in both methodologies is the inability to distinguish between LSEs and SCs. Smaller LSEs, in particular, make use of other entities to do their scheduling for them. As a result an SC can schedule for multiple LSEs. Additionally the LSE-SC relationships change over time and it is not always apparent on which LSE's behalf a particular SC is acting.

Since all of the results depend on the LMP Studies they are subject to the same limitations identified in the LMP studies.[21] All results should be viewed as illustrative of possible outcomes. Though they cover a diverse 30-month time period, they are not intended to represent the full range of possible outcomes, nor are they intended to be predictive of future performance under MRTU.

6 Results of Financial Analysis

[21] Please refer to the LMP Study 3C description of methodology, http://www.caiso.com/14cd/14cd6d735cf60.pdf.

The CRR allocations resulting from the CRR Dry Run allocation process were used to do the financial analyses. The LMPs produced in LMP Studies 3A & 3C were used with the CRR allocations to determine each LSE's congestion rent and CRR revenue.

The time period considered covers 30 months, from November 2002 through April 2005. During this time period there are five months for which there are CRRs from monthly allocations.[22]

The results for individual LSEs are provided within the confidential attachment to this report. The following aggregated results, in turn, address two separate questions:

1. Do the results indicate that the overall collection of congestion rents by the CAISO will be sufficient to cover CRR settlements, *i.e.*, that there is system revenue adequacy for CRR settlements?
2. Do the results indicate that, in general, CRR allocations will be sufficient to enable LSEs to offset congestion costs that will be introduced by MRTU?

Addressing these two questions involves looking at different aggregations of LSEs. First, assessing overall system revenue adequacy must account for all CRR payments and congestion charges, including positive and negative settlement amounts for SCs that are not LSEs, and even when there were data issues for specific LSEs. Second, assessing financial coverage for LSEs as a group requires aggregation of only those LSEs for which the CAISO could account for CRR payments and congestion charges on a comparable basis, even though this involves excluding LSEs for which CRR holdings and historical schedules could not be matched adequately. In the following sections we consider these two questions, looking first at the one-year Seasonal CRRs allocated in the annual allocation process, and then at the total of one-year Seasonal and Monthly CRRs for the April and August CRR Dry Run months.

6.1 System Revenue Adequacy – Seasonal CRRs

As a way to estimate overall system revenue adequacy, Figure 4 shows a comparison of the aggregate revenue distributed to participants based on the allocated one-year Seasonal CRRs and aggregate the congestion rents calculated from the two methods. The congestion rents have been scaled down to 75 percent to reflect the fact that under the filed CRR allocation rules the allocation of Seasonal CRRs is limited to 75 percent of each LSE's total eligible quantity. It can be seen from this figure that for most CRR terms (*i.e.*, combinations of Season and Time-of-Use) the two estimates of congestion rents tend to bracket the CRR payout.

[22] Monthly CRR allocations for two months, April and August, were performed during the dry run, and there are three Aprils and two Augusts in the LMP study time period

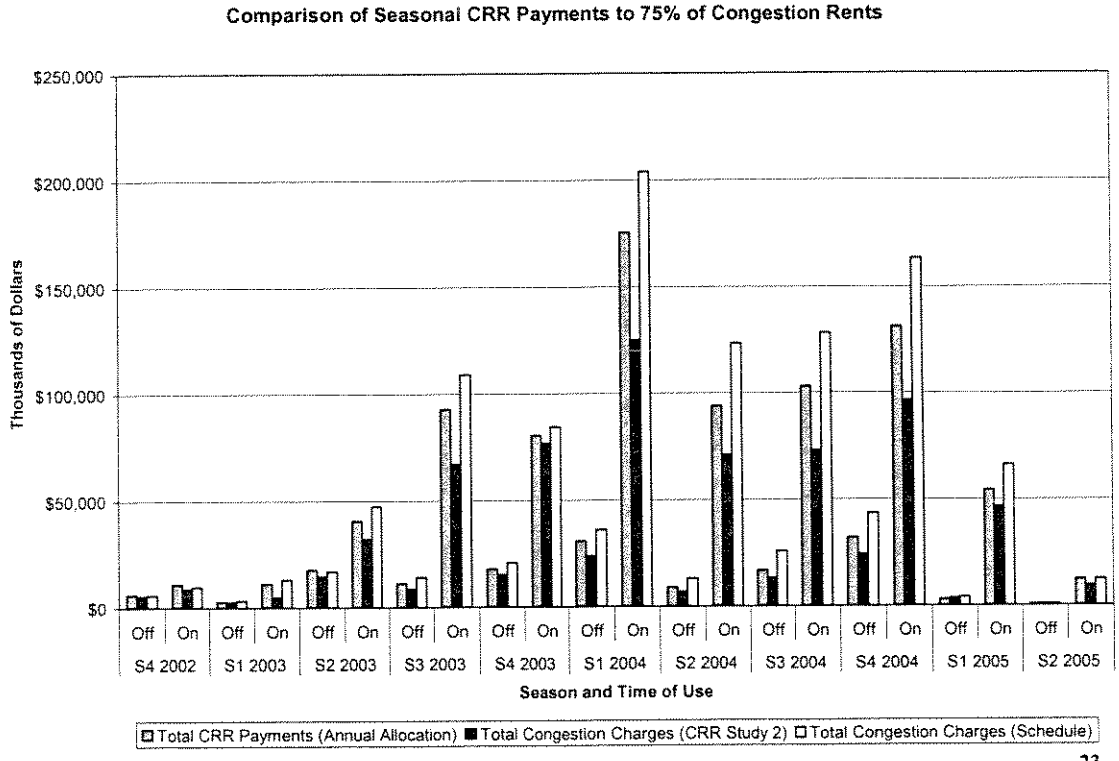

Figure 4: Comparison of Payments to Seasonal CRRs and 75% of Congestion Rents[23]

Figure 5 below shows the overall "congestion coverage ratio" for the allocated one-year Seasonal CRRs calculated for the two different methods of calculating congestion rents. The congestion coverage ratio is defined as the ratio of CRR payments to congestion rents or charges. Because the CRR payments reflect only the one-year Seasonal CRRs allocated in the annual allocation process, the estimated congestion charges are scaled to 75 percent to provide the appropriate comparison.

The chart shows the ratio of aggregate revenue distributed to participants based on CRRs allocated in the annual process to the sum over the SCs' individual congestion rents, adjusted to 75 percent of total. The chart shows that using the CRR Study 2 method of simulating congestion rents, LSEs in aggregate obtain significant additional CRR revenues beyond the coverage of their congestion exposure, which seems to suggest that collected congestion rents would be insufficient to fully pay allocated CRRs. This is not a correct interpretation, however, because the measure of congestion rents in this method includes only the congestion associated with serving load and neglects other congestion rents (for example, those associated with delivery of energy to trading hubs under inter-SC trades, and exports). Therefore this measure is useful as an indicator of the adequacy of CRRs to cover the congestion exposure of LSEs, but not so useful as a measure of system revenue adequacy.

A better way to think about system revenue adequacy is to use the second method for estimating congestion rents. The congestion rent total from the historical schedule method represents the entire system congestion including all market participants, not just those eligible for CRRs. This

[23] Season 4, 2002, and Season 2, 2005 are incomplete seasons; Season 4, 2002 is a two month period, while Season 2, 2005 is a one month period.

graphic is therefore not a good indicator of LSEs' congestion coverage represented by CRRs allocated to LSEs because it uses a measure of congestion charges that is too large. Rather, this comparison is most relevant for assessing revenue adequacy showing that for all periods the congestion rent collected is sufficient to cover all revenue returned on CRRs. This indicates that the CAISO did not allocate too many CRRs.

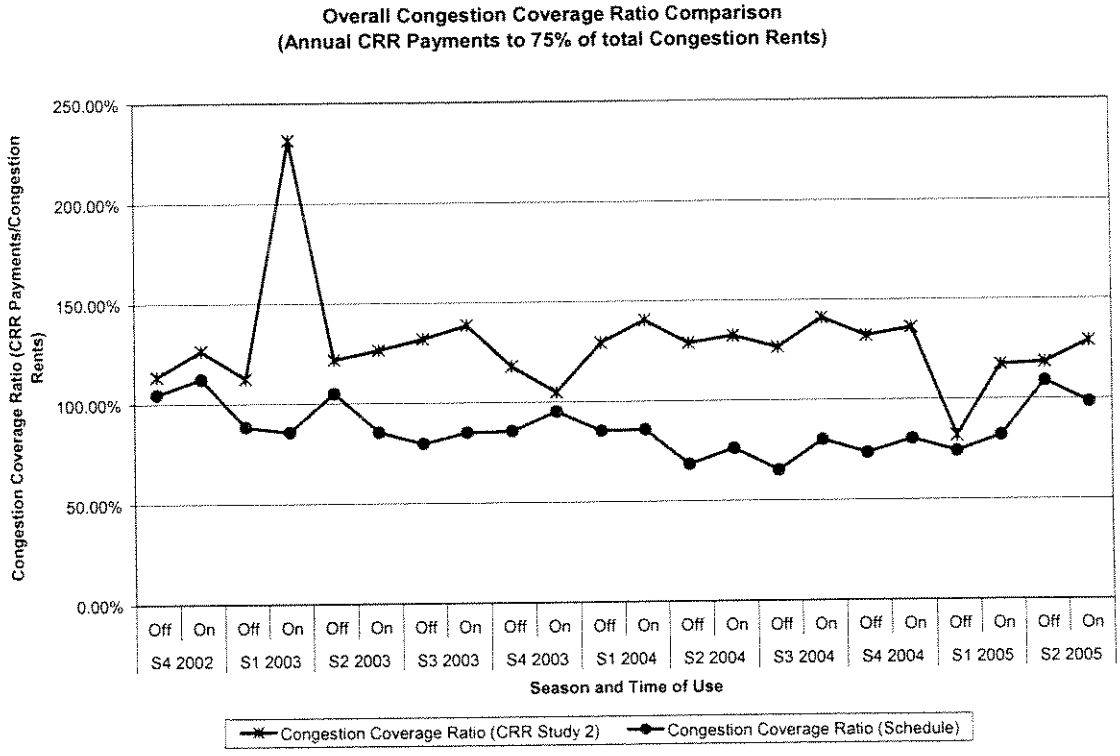

Figure 5: Congestion Coverage Ratio Comparison

6.2 Coverage of LSEs' Congestion Costs – Seasonal CRRs

The total congestion rents collected versus the amount of revenue distributed based on the allocated CRRs, as described in the previous section, provides an indication of the degree of revenue adequacy. It does not however provide an indication of the amount of the rent paid by LSEs with allocated CRRs which is returned to them with their allocated CRR portfolio. Considering the CRR revenue collected by the subset of LSEs who hold allocated CRRs compared to 75 percent of their congestion rent one can see that in almost all cases the CRRs are returning more revenue than is collected, as shown in Figure 6 below.

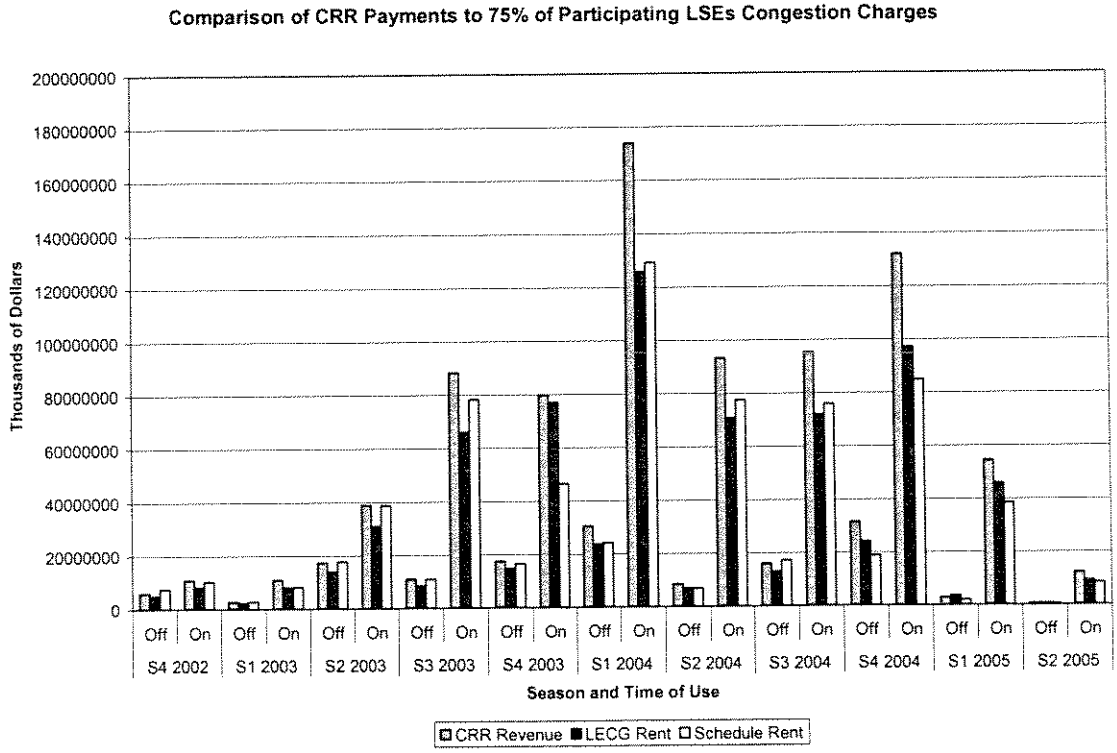

Figure 6: Comparison of CRR payments to 75% of participating LSEs congestion rent

An alternative way to look at the degree to which LSE congestion costs are covered by CRR payments is to do a load weighted average of the individual LSE congestion coverage ratios; this tends to prevent outliers, which generally have small load, from skewing the total results greatly. Moreover, the weighted average indicates that the congestion rents paid by load are generally being returned to the payee by their CRR holdings, which is not revealed when we look at aggregate CRR payments versus aggregate congestion charges.

Figure 7 below shows the load weighted average congestion coverage ratio for the two methods of calculating congestion rents for the LSEs participating in the allocation process. The chart shows that in most of the time frames considered the CRRs are returning revenues in excess of the congestion rent collected.[24] The right-hand points on the chart indicate the total results for the entire analysis period, which clearly shows CRR revenues in excess of LSE congestion charges.

[24] The one negative ratio on the chart (Season 4, 2004 off-peak) indicates that LSE's congestion charges and CRR revenues were in the same direction rather than tending to offset each other. This period was characterized by very low loads and frequent reversals in the normally expected direction of congestion.

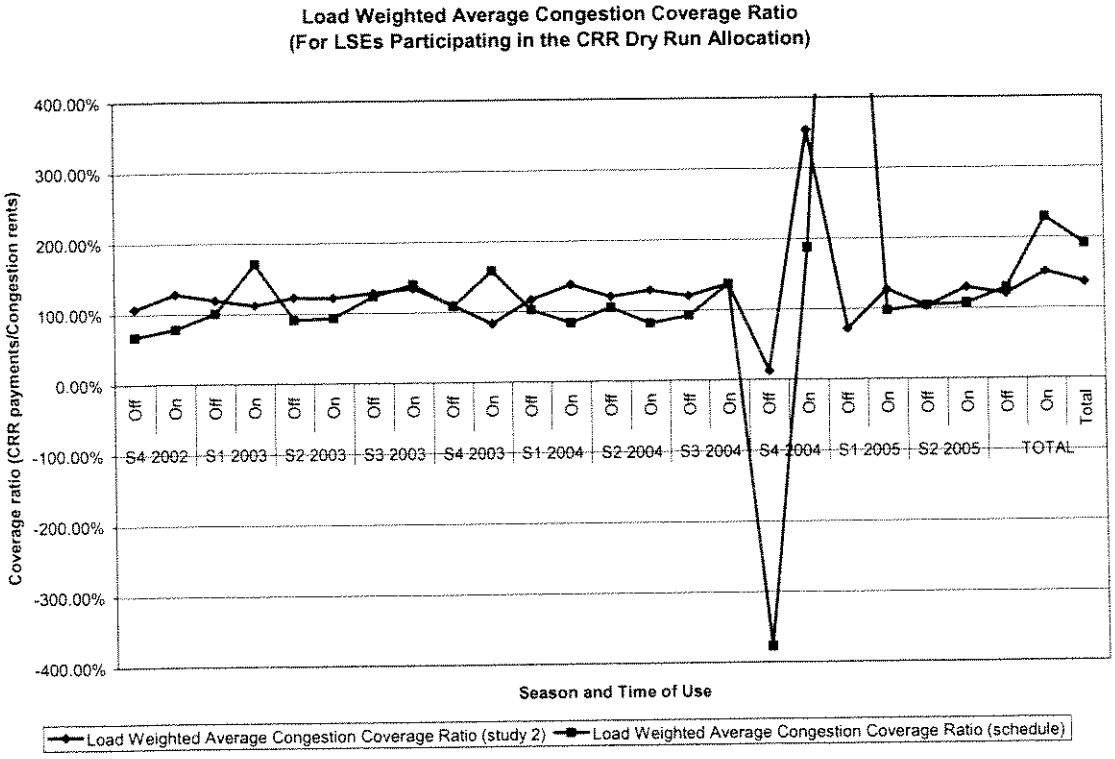

Figure 7: Load weighted average hedge for LSEs participating in CRR dry run allocation

6.3 System Revenue Adequacy – Seasonal and Monthly CRRs

The filed CRR allocation rules, which were followed in the CRR Dry Run, allow LSEs to nominate up to 100 percent of their Adjusted Load Metric in the combined annual and monthly allocation processes, and to utilize the full capacity of the transmission system for clearing CRRs (after adjustment for the inter-tie set-aside, capacity for CAISO modeled ETCs, TORs and CVRs, and expected outages). Therefore, it is appropriate for this part of the financial analysis to compare CRR revenues against 100 percent of the estimated congestion charges, rather than 75 percent as we did in the financial analysis of the one-year Seasonal CRR allocations.

Considering the five months in which there are LMP prices for the monthly results, Figure 8 below, shows that the total system congestion is adequate to cover all of the allocated CRRs.

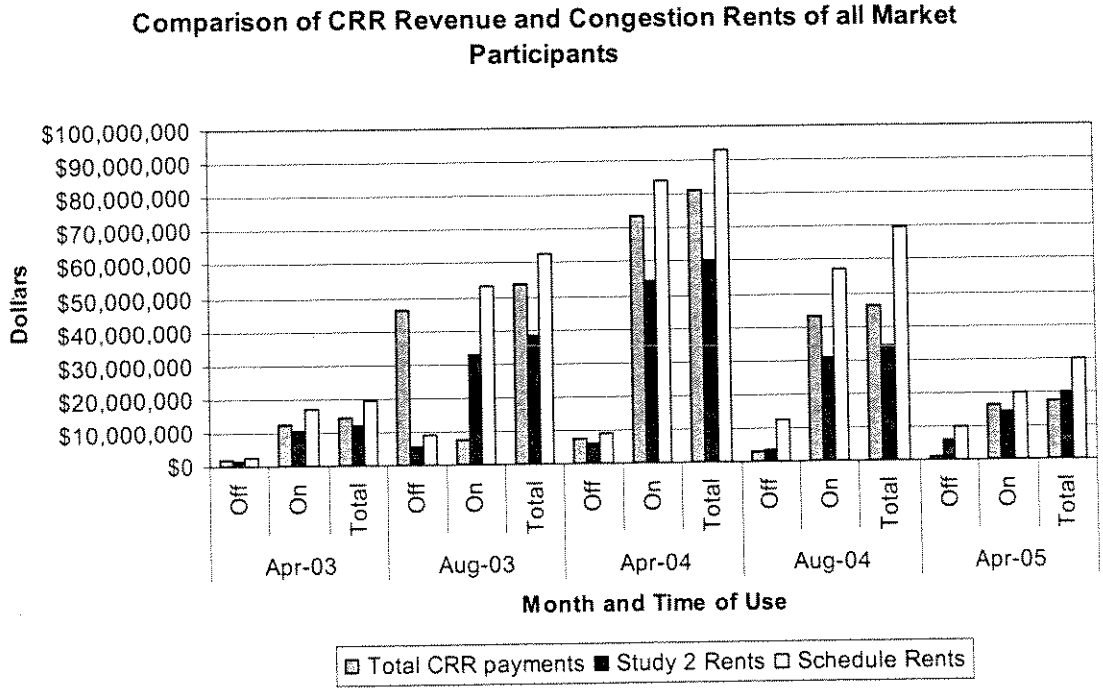

Figure 8: Comparison of total annual and monthly CRR revenue to total system congestion rents by month and time of use periods

6.4 Coverage of LSEs' Congestion Costs – Seasonal and Monthly CRRs

Looking at the same subset of LSEs participating in the annual and monthly allocation processes and looking at their overall coverage we can see that in general their congestion was reasonably covered through their allocated amounts.

Figure 9 below shows the total CRR revenue paid on allocated CRRs compared to the sum of congestion rents of the participating LSEs, as calculated by the two methods. The amount returned on CRRs was greater than the amount collected, except in two periods.

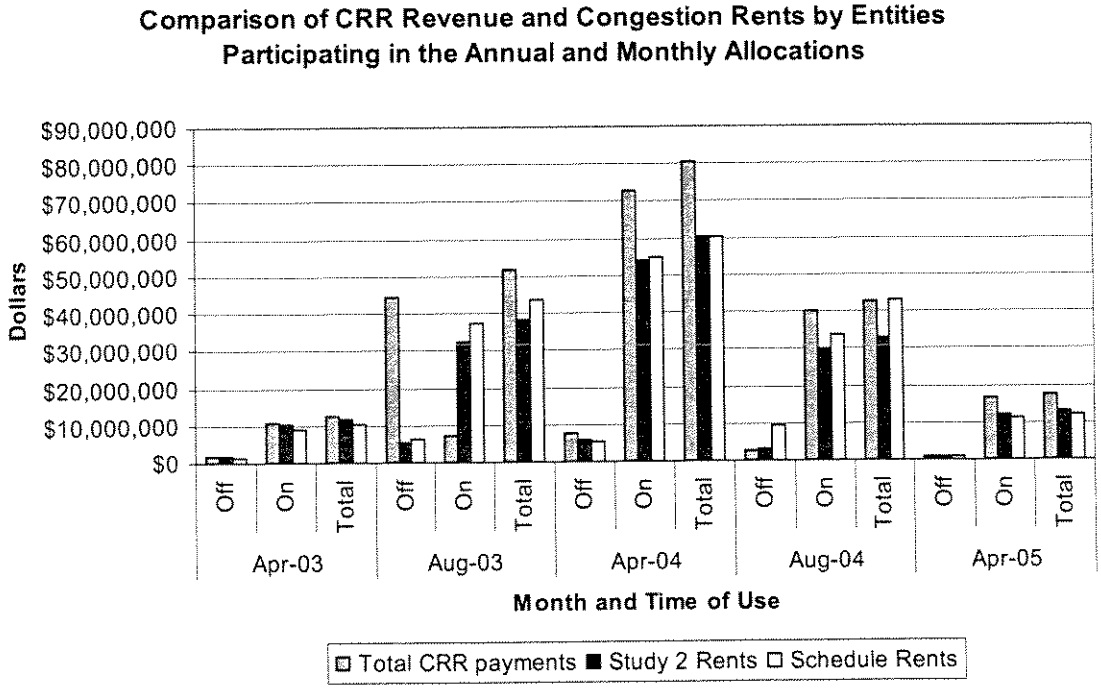

Figure 9: Comparison of annual and monthly CRR revenue to allocation participant congestion rents by month and time of use periods

Figure 10 below shows the aggregate congestion coverage ratio comparison for the subset of participating LSEs. The graph shows that for the total month for each of the five months the congestion coverage ratio was greater than 100 percent, so that LSEs in aggregate are getting their congestion charges returned.

Figure 11 below shows the load-weighted average congestion coverage ratio for the annual and monthly CRRs. It is has a very similar shape to the aggregate congestion coverage ratio, and LSEs are generally being returned the full amount of their congestion charges, as calculated by either method.

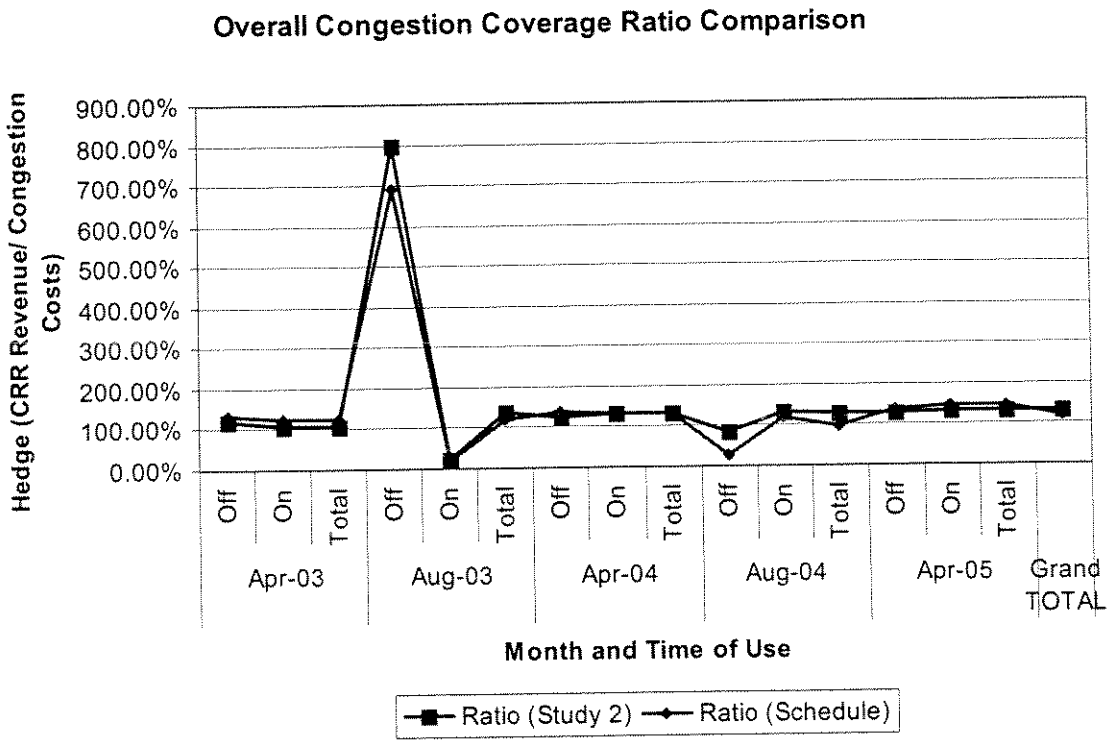

Figure 10: Overall Congestion Coverage Ratio of annual plus monthly CRR revenue to Congestion costs using the two methods

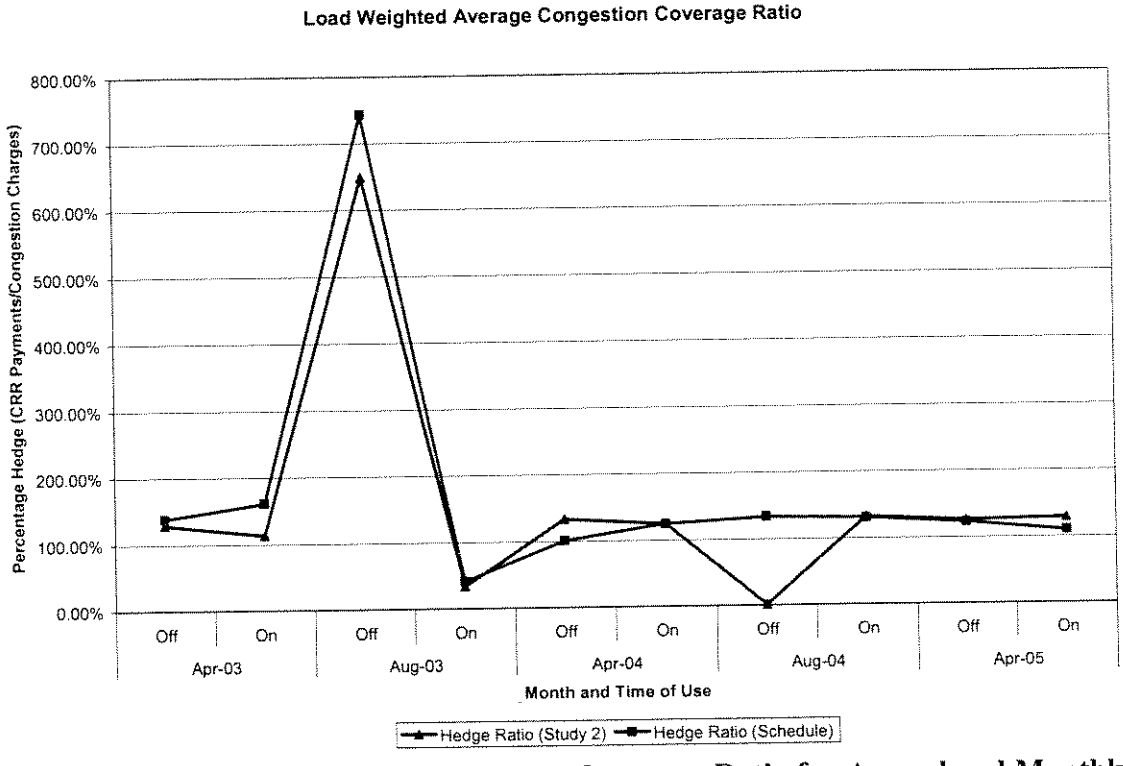

Figure 11: Load weighted average Congestion Coverage Ratio for Annual and Monthly Allocated CRRs

6.5 Individual LSE Results

Of primary concern in this report is how the payments to each LSE's portfolio of allocated CRRs compares to the LSE's simulated congestion costs. Table 11 below shows the individual LSE congestion coverage ratio by taking each LSE's CRR revenue based on its allocated one-year Seasonal CRRs divided by 75 percent of its congestion charges for each of the two methods. The table covers all 30 months of the analysis. Note that the table assumes that the same set of Seasonal CRRs is held by the LSE over a much longer time period, during which there is significant variability in congestion patterns. Under the CRR Study 2 method, where CRRs are assumed to closely match actual schedules, the congestion coverage ratios are generally close to 100 percent. This illustrates the fundamental principle that when CRR holdings match LSE scheduling patterns they provide an effective hedge against congestion volatility because the payment to the CRRs offsets the charges due to congestion.

Table 11: Individual LSE's overall congestion coverage ratio from the two methods over the LMP study time period

LSE	75% Congestion Charge Ratio (Study 2)	75% Congestion Charge Ratio (Schedule)
LSE A1	100.24%	39.10%
LSE A2	106.49%	106.97%
LSE A3	100.33%	96.46%
LSE A4[25]	30.38%	7.81%
LSE A5	183.65%	153.13%
LSE A6	99.25%	140.41%
LSE A7	110.34%	113.27%
LSE A8	98.32%	73.21%
LSE A9	14.25%	75.74%
LSE A10[24]	93.26%	22.10%
LSE A11	99.91%	117.07%
LSE A12	89.02%	84.53%
LSE A13	81.53%	139.48%
LSE A14	86.11%	52.88%

6.6 Conclusions of Financial Analysis

Overall this financial analysis indicates that CRRs allocated in accordance with the filed MRTU tariff are capable of functioning as intended. The allocated CRRs are returning a large share of the congestion rent that is collected by the CAISO, and the CAISO is collecting sufficient congestion revenues to fully pay allocated CRRs. Moreover, the analysis shows that the allocated CRRs are covering LSEs congestion costs.

[25] These LSEs have substantial transmission rights other than CRRs, and is expected to be adequately covered from those holdings.

The two methods for simulating LSE congestion costs in some cases produce very different results; this is likely due to variations in LSE scheduling, and how closely the allocated CRRs represent the typical schedule of the LSE over the time period. For LSEs with consistent scheduling and an allocated CRR portfolio representing that schedule there is good agreement between the two methods of calculating congestion rent, and there is sufficient coverage of congestion charges through the allocated CRRs.

Appendix 1: Example of Congestion Charge Calculations used in this Financial Analysis

The following shows an example of the individual congestion costs are calculated. This example is adapted from a historical example of a southern California LSE.

The calculations are performed on an hourly basis. The LSE's hour-ahead schedule and real time load are shown in Table A1-1. This information will be used in both methods, along with some additional information specific to each method.

The schedule shows that there is 100MW of HA load and 110MW of RT load.

Table A1-1: Example schedule data for use in congestion charge calculation examples

HA Sinks	Location	MW 'Usage	ETC Coverage (MW)	Subject to Congestion (MW)
HA Load	SCE LAP/Load Point	100	40	60
Trade	SP15 Hub	1	0	1
HA Sources				
Import	PVERDE_5_DEVERS	60	30	30
Import	SYLMAR_2_NOB	15	10	5
Trade	SP15 Hub	26		26
RT load				
Load	SCE LAP/Load Point	110	40	70

Sample Calculation of Congestion Charges using the "Schedule" Methodology

This methodology relies on the HA schedule information presented above, as well as the LMP prices produced in the studies. As can be seen above the HA schedule is balanced, additionally after removing the ETC coverage from the schedule it remains balanced. The next step is to collect the prices for this time period and for these grid locations and associate them with the schedule. As noted earlier, the prices used are the marginal congestion component of the LMP from the LMP studies.

Table A1-2 below shows the HA schedule with the associated congestion prices. The congestion rent column is found by multiplying each transactions MW that will be subject to congestion times the congestion LMP at that location. The total rent over sinks and sources is calculated by simply summing over all of the transactions. The total congestion cost faced by this LSE is then the difference between the congestion cost for the sinks and congestion costs for the sources. In this example the LSE would face $120 in congestion charges for this schedule.

Table A1-2: Schedule method congestion cost calculation example

	Location	MW 'Usage	ETC Coverage (MW)	Subject to Congestion (MW)	Congestion LMP ($/MWh)	Congestion Rent ($)
Sinks						
HA Load	SCE LAP/Load Point	100	40	60	2	120
Trade	SP15 Hub	1		1	1	1
Total cost						121
Sources						
Import	PVERDE_5_DEVERS	60	30	30	-1	-30
Import	SYLMAR_2_NOB	15	10	5	1	5
Trade	SP15 Hub	26		26	1	26
Total credit						1
Total congestion cost						
HA						120

Sample Calculation of Congestion Costs using the "Enhanced CRR Study 2" methodology

This methodology relies on LSEs' real time load and ETC coverage from the Table A1-1, as well as their allocated CRR holdings, Table A1-3. The ETC coverage is subtracted from the real time load, similar to what is done for the other method. This leaves 70MW of load subject to congestion which must be balanced.

This LSE holds two CRRs valid for this time of use period totaling 50MW. This means that there is an additional 20MW which is not covered by CRRs, and is purchased at an overall system congestion price.

Table A1-4 below shows the calculations performed to calculate the congestion costs. The CRRs are arranged by the least expensive source congestion price. The LSE pays the difference between the sink and source LMP times the quantity of MW they use on that CRR path. The remaining 20MW that is not covered by CRRs is bought from the system and is subject to the difference between the sink LMP and the system congestion price times the number of MW.

Using this methodology the LSE would be subject to $130 in congestion charges for this hour.

Table A1-3: CRR holdings for example LSE

CRR ID	Source Location	Sink Location	Quantity (MW)
A	PVERDE_5_DEVERS	SCE LAP	30
B	SP15 Hub	SCE LAP	20

TableA1-4: Example of CRR study 2 congestion cost calculation

Balance covered by CRRs				
CRR ID	Sink LMP ($/MWh)	Source LMP ($/MWh)	CRR MW	Congestion Rent ($)
A	2	-1	30	90
B	2	1	20	20
TOTAL			50	110
Balance not covered by CRRs				
	Sink LMP ($/MW)	System Congestion Price ($/MW)	Residual MW (Congestion MW - CRR MW)	
	2	1	20	20
Total Congestion Cost				
CRR study 2 Method				130

Appendix 2: List of Binding Constraints

Binding Constraints in the Annual/Seasonal and Monthly Allocation

Below are all of the constraints that were observed in the annual and monthly allocation process.

This data includes the type of constraint: line (LINE), transformer (XFMR) or interface (INTR). The interface ID refers to the numeric reference for a defined generalized group constraint that is defined in the interface definition file made available under a Non Disclosure Agreement. If there is no interface ID listed then the constraint is a line or transformer.

Also noted below is the season or month in which the constraint was binding and the associated time-of-use (TOU), tier and term (either annual or monthly). The flow limits have been removed.

Table A2-1: List of Binding Constraints [CRR Allocation]

Type	Interface ID	Constraint Name	Season / Month	TOU	Tier
LINE	N/A	34112EXCHEQUR115_34116LE GRAND115_1	S2	OFF	1
LINE	N/A	30280POE 230_30330RIO OSO 230_1	S2	ON	1
LINE	N/A	31474FRBSTNTP115_31476OWID 115_1	S2	ON	1
LINE	N/A	33540TESLA 115_33576USWP-PAT115_1	S2	ON	1
LINE	N/A	33912SPRNG GJ115_33914MI-WUK 115_1	S2	ON	1
LINE	N/A	34112EXCHEQUR115_34116LE GRAND115_1	S2	ON	1
XFMR	N/A	30345MIDLFORK230_30346MDDLFK M230_1	S2	ON	1
INTR	28	PALOVRDE _BG	S2	ON	1
INTR	42	WSTLYLSBN_BG	S2	ON	1
INTR	48	Drum - Rio Oso Limit 1 (outflow)	S2	ON	1
LINE	N/A	30280POE 230_30330RIO OSO 230_1	S3	OFF	1
LINE	N/A	34112EXCHEQUR115_34116LE GRAND115_1	S3	OFF	1
XFMR	N/A	30345MIDLFORK230_30346MDDLFK M230_1	S3	OFF	1
INTR	48	Drum - Rio Oso Limit 1 (outflow)	S3	OFF	1
LINE	N/A	24418LANCSTR 66_24436GOLDTOWN66_1	S3	ON	1
LINE	N/A	30280POE 230_30330RIO OSO 230_1	S3	ON	1
LINE	N/A	33912SPRNG GJ115_33914MI-WUK 115_1	S3	ON	1
LINE	N/A	34112EXCHEQUR115_34116LE GRAND115_1	S3	ON	1
LINE	N/A	35204ZONDWD 60_35208USWP-FRK60_1	S3	ON	1
XFMR	N/A	30345MIDLFORK230_30346MDDLFK M230_1	S3	ON	1
INTR	48	Drum - Rio Oso Limit 1 (outflow)	S3	ON	1
XFMR	N/A	30345MIDLFORK230_30346MDDLFK M230_1	S4	OFF	1
XFMR	N/A	30345MIDLFORK230_30346MDDLFK M230_1	S4	ON	1
LINE	N/A	31636BURNEY 60_31638BURNEYQF60_1	S1	OFF	2
LINE	N/A	32328YBA CTYJ60_32332PEASE 60_1	S1	OFF	2
INTR	42	WSTLYLSBN_BG	S1	OFF	2
INTR	48	Drum - Rio Oso Limit 1 (outflow)	S1	OFF	2
INTR	49	Drum - Rio Oso Limit 2 (outflow)	S1	OFF	2
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S1	ON	2
LINE	N/A	31636BURNEY 60_31638BURNEYQF60_1	S1	ON	2

Type	Interface ID	Constraint Name	Season / Month	TOU	Tier
INTR	41	WSLYTESLA_BG	S1	ON	2
INTR	49	Drum - Rio Oso Limit 2 (outflow)	S1	ON	2
INTR	87	South of Magunden	S1	ON	2
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	S2	OFF	2
LINE	N/A	30280POE 230_30330RIO OSO 230_1	S2	OFF	2
LINE	N/A	30300TBL MT D230_30325PALERMO 230_1	S2	OFF	2
LINE	N/A	30500BELLOTA 230_38208COTTLE B230_1	S2	OFF	2
LINE	N/A	33511AVENATP2115_33514MANTECA 115_1	S2	OFF	2
INTR	48	Drum - Rio Oso Limit 1 (outflow)	S2	OFF	2
INTR	49	Drum - Rio Oso Limit 2 (outflow)	S2	OFF	2
INTR	87	South of Magunden	S2	OFF	2
LINE	N/A	24087MAGUNDEN230_24101OMAR 230_1	S2	ON	2
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	S2	ON	2
LINE	N/A	30280POE 230_30330RIO OSO 230_1	S2	ON	2
LINE	N/A	30300TBL MT D230_30325PALERMO 230_1	S2	ON	2
LINE	N/A	31636BURNEY 60_31638BURNEYQF60_1	S2	ON	2
LINE	N/A	33511AVENATP2115_33514MANTECA 115_1	S2	ON	2
LINE	N/A	33912SPRNG GJ115_33914MI-WUK 115_1	S2	ON	2
INTR	42	WSTLYLSBN_BG	S2	ON	2
INTR	49	Drum - Rio Oso Limit 2 (outflow)	S2	ON	2
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S3	OFF	2
LINE	N/A	24087MAGUNDEN230_24115PASTORIA230_2	S3	OFF	2
LINE	N/A	30280POE 230_30330RIO OSO 230_1	S3	OFF	2
LINE	N/A	30500BELLOTA 230_38208COTTLE B230_1	S3	OFF	2
LINE	N/A	31636BURNEY 60_31638BURNEYQF60_1	S3	OFF	2
LINE	N/A	33912SPRNG GJ115_33914MI-WUK 115_1	S3	OFF	2
INTR	49	Drum - Rio Oso Limit 2 (outflow)	S3	OFF	2
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S3	ON	2
LINE	N/A	24087MAGUNDEN230_24115PASTORIA230_2	S3	ON	2
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	S3	ON	2
LINE	N/A	30280POE 230_30330RIO OSO 230_1	S3	ON	2
LINE	N/A	31636BURNEY 60_31638BURNEYQF60_1	S3	ON	2
LINE	N/A	33912SPRNG GJ115_33914MI-WUK 115_1	S3	ON	2
INTR	49	Drum - Rio Oso Limit 2 (outflow)	S3	ON	2
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S4	OFF	2
LINE	N/A	30280POE 230_30330RIO OSO 230_1	S4	OFF	2
LINE	N/A	31636BURNEY 60_31638BURNEYQF60_1	S4	OFF	2
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S4	ON	2
LINE	N/A	30280POE 230_30330RIO OSO 230_1	S4	ON	2
LINE	N/A	31636BURNEY 60_31638BURNEYQF60_1	S4	ON	2
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S1	OFF	3
LINE	N/A	24087MAGUNDEN230_24101OMAR 230_1	S1	OFF	3
LINE	N/A	24087MAGUNDEN230_24115PASTORIA230_2	S1	OFF	3
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	S1	OFF	3
LINE	N/A	30280POE 230_30330RIO OSO 230_1	S1	OFF	3
LINE	N/A	33912SPRNG GJ115_33914MI-WUK 115_1	S1	OFF	3
XFMR	N/A	30345MIDLFORK230_30346MDDLFK M230_1	S1	OFF	3

Type	Interface ID	Constraint Name	Season / Month	TOU	Tier
XFMR	N/A	30760COBURN 230_36075COBURN 60_1	S1	OFF	3
INTR	10	IID-SDGE _BG	S1	OFF	3
INTR	28	PALOVRDE _BG	S1	OFF	3
INTR	48	Drum - Rio Oso Limit 1 (outflow)	S1	OFF	3
INTR	87	South of Magunden	S1	OFF	3
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S1	ON	3
LINE	N/A	24087MAGUNDEN230_24115PASTORIA230_2	S1	ON	3
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	S1	ON	3
LINE	N/A	31104CARLOTTA60_31105RIODLLTP60_1	S1	ON	3
LINE	N/A	32328YBA CTYJ60_32332PEASE 60_1	S1	ON	3
LINE	N/A	33912SPRNG GJ115_33914MI-WUK 115_1	S1	ON	3
XFMR	N/A	30302TBL MTX1230_30066TB MT 1M500_1	S1	ON	3
XFMR	N/A	30345MIDLFORK230_30346MDDLFK M230_1	S1	ON	3
XFMR	N/A	30760COBURN 230_36075COBURN 60_1	S1	ON	3
INTR	10	IID-SDGE _BG	S1	ON	3
INTR	27	PACI _BG	S1	ON	3
INTR	28	PALOVRDE _BG	S1	ON	3
INTR	41	WSLYTESLA_BG	S1	ON	3
INTR	49	Drum - Rio Oso Limit 2 (outflow)	S1	ON	3
INTR	76	Ravenswood to San Mateo	S1	ON	3
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S2	OFF	3
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	S2	OFF	3
LINE	N/A	30280POE 230_30330RIO OSO 230_1	S2	OFF	3
LINE	N/A	30300TBL MT D230_30325PALERMO 230_1	S2	OFF	3
LINE	N/A	30515WARNERVL230_38208COTTLE B230_1	S2	OFF	3
LINE	N/A	32328YBA CTYJ60_32332PEASE 60_1	S2	OFF	3
LINE	N/A	33511AVENATP2115_33514MANTECA 115_1	S2	OFF	3
LINE	N/A	33912SPRNG GJ115_33914MI-WUK 115_1	S2	OFF	3
LINE	N/A	34112EXCHEQUR115_34116LE GRAND115_1	S2	OFF	3
LINE	N/A	34358KERCKHF2115_34360WWARD JT115_1	S2	OFF	3
LINE	N/A	34454RIVERROC70_34464COPPRMNE70_1	S2	OFF	3
LINE	N/A	34774MIDWAY 115_34804BELRIDGE115_1	S2	OFF	3
LINE	N/A	36083TEXCO J260_36084OILFLDS 60_1	S2	OFF	3
XFMR	N/A	30345MIDLFORK230_30346MDDLFK M230_1	S2	OFF	3
XFMR	N/A	30760COBURN 230_36075COBURN 60_1	S2	OFF	3
INTR	10	IID-SDGE _BG	S2	OFF	3
INTR	17	MEAD _BG	S2	OFF	3
INTR	27	PACI _BG	S2	OFF	3
INTR	28	PALOVRDE _BG	S2	OFF	3
INTR	48	Drum - Rio Oso Limit 1 (outflow)	S2	OFF	3
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S2	ON	3
LINE	N/A	24087MAGUNDEN230_24115PASTORIA230_2	S2	ON	3
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	S2	ON	3
LINE	N/A	30250CARIBOU 230_30261BELDENTP230_1	S2	ON	3
LINE	N/A	31474FRBSTNTP115_31476OWID 115_1	S2	ON	3
LINE	N/A	31692DE SABLA60_31696CNTRVLLE60_1	S2	ON	3
LINE	N/A	32314SMRTSVLE60_32341BEALE1J160_2	S2	ON	3

Type	Interface ID	Constraint Name	Season / Month	TOU	Tier
LINE	N/A	32328YBA CTYJ60_32332PEASE 60_1	S2	ON	3
LINE	N/A	33511AVENATP2115_33514MANTECA 115_1	S2	ON	3
LINE	N/A	33912SPRNG GJ115_33914MI-WUK 115_1	S2	ON	3
LINE	N/A	34112EXCHEQUR115_34116LE GRAND115_1	S2	ON	3
LINE	N/A	34358KERCKHF2115_34360WWARD JT115_1	S2	ON	3
XFMR	N/A	30345MIDLFORK230_30346MDDLFK M230_1	S2	ON	3
XFMR	N/A	33584TIGR CRK115_30486TIGR CKM230_1	S2	ON	3
INTR	10	IID-SDGE _BG	S2	ON	3
INTR	27	PACI _BG	S2	ON	3
INTR	36	SUTTRNP15_BG	S2	ON	3
INTR	41	WSLYTESLA_BG	S2	ON	3
INTR	49	Drum - Rio Oso Limit 2 (outflow)	S2	ON	3
INTR	76	Ravenswood to San Mateo	S2	ON	3
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S3	OFF	3
LINE	N/A	24087MAGUNDEN230_24115PASTORIA230_2	S3	OFF	3
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	S3	OFF	3
LINE	N/A	30300TBL MT D230_30325PALERMO 230_1	S3	OFF	3
LINE	N/A	32328YBA CTYJ60_32332PEASE 60_1	S3	OFF	3
LINE	N/A	33511AVENATP2115_33514MANTECA 115_1	S3	OFF	3
LINE	N/A	33912SPRNG GJ115_33914MI-WUK 115_1	S3	OFF	3
LINE	N/A	34112EXCHEQUR115_34116LE GRAND115_1	S3	OFF	3
LINE	N/A	34358KERCKHF2115_34360WWARD JT115_1	S3	OFF	3
LINE	N/A	34774MIDWAY 115_34804BELRIDGE115_1	S3	OFF	3
LINE	N/A	36083TEXCO J260_36084OILFLDS 60_1	S3	OFF	3
XFMR	N/A	30345MIDLFORK230_30346MDDLFK M230_1	S3	OFF	3
XFMR	N/A	30760COBURN 230_36075COBURN 60_1	S3	OFF	3
XFMR	N/A	33584TIGR CRK115_30486TIGR CKM230_1	S3	OFF	3
INTR	10	IID-SDGE _BG	S3	OFF	3
INTR	28	PALOVRDE _BG	S3	OFF	3
INTR	49	Drum - Rio Oso Limit 2 (outflow)	S3	OFF	3
INTR	61	Miguel Import	S3	OFF	3
INTR	66	North Geysers Import	S3	OFF	3
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S3	ON	3
LINE	N/A	24087MAGUNDEN230_24115PASTORIA230_2	S3	ON	3
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	S3	ON	3
LINE	N/A	31219ERFT5_25115_31220EGLE RCK115_1	S3	ON	3
LINE	N/A	32224CHCGO PK115_32232HIGGINS 115_1	S3	ON	3
LINE	N/A	34112EXCHEQUR115_34116LE GRAND115_1	S3	ON	3
XFMR	N/A	30345MIDLFORK230_30346MDDLFK M230_1	S3	ON	3
INTR	28	PALOVRDE _BG	S3	ON	3
INTR	3	CASCADE _BG	S3	ON	3
INTR	36	SUTTRNP15_BG	S3	ON	3
INTR	41	WSLYTESLA_BG	S3	ON	3
INTR	46	Colgate 60 kV	S3	ON	3
INTR	61	Miguel Import	S3	ON	3
INTR	76	Ravenswood to San Mateo	S3	ON	3
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S4	OFF	3

Type	Interface ID		Constraint Name	Season / Month	TOU	Tier
LINE	N/A		24087MAGUNDEN230_24101OMAR 230_1	S4	OFF	3
LINE	N/A		30280POE 230_30330RIO OSO 230_1	S4	OFF	3
LINE	N/A		30300TBL MT D230_30325PALERMO 230_1	S4	OFF	3
LINE	N/A		30515WARNERVL230_38208COTTLE B230_1	S4	OFF	3
LINE	N/A		31474FRBSTNTP115_31476OWID 115_1	S4	OFF	3
LINE	N/A		32328YBA CTYJ60_32332PEASE 60_1	S4	OFF	3
LINE	N/A		33511AVENATP2115_33514MANTECA 115_1	S4	OFF	3
LINE	N/A		33912SPRNG GJ115_33914MI-WUK 115_1	S4	OFF	3
LINE	N/A		34774MIDWAY 115_34804BELRIDGE115_1	S4	OFF	3
LINE	N/A		36083TEXCO J260_36084OILFLDS 60_1	S4	OFF	3
XFMR	N/A		30760COBURN 230_36075COBURN 60_1	S4	OFF	3
INTR		10	IID-SDGE _BG	S4	OFF	3
INTR		48	Drum - Rio Oso Limit 1 (outflow)	S4	OFF	3
LINE	N/A		24086LUGO 500_85928EL-LU 2 500_1	S4	ON	3
LINE	N/A		24235RECTOR 230_24303BIG CRK3230_1	S4	ON	3
LINE	N/A		30280POE 230_30330RIO OSO 230_1	S4	ON	3
LINE	N/A		31474FRBSTNTP115_31476OWID 115_1	S4	ON	3
LINE	N/A		32224CHCGO PK115_32232HIGGINS 115_1	S4	ON	3
LINE	N/A		32328YBA CTYJ60_32332PEASE 60_1	S4	ON	3
LINE	N/A		33511AVENATP2115_33514MANTECA 115_1	S4	ON	3
LINE	N/A		33912SPRNG GJ115_33914MI-WUK 115_1	S4	ON	3
LINE	N/A		34774MIDWAY 115_34804BELRIDGE115_1	S4	ON	3
LINE	N/A		36083TEXCO J260_36084OILFLDS 60_1	S4	ON	3
XFMR	N/A		30345MIDLFORK230_30346MDDLFK M230_1	S4	ON	3
INTR		27	PACI _BG	S4	ON	3
INTR		28	PALOVRDE _BG	S4	ON	3
INTR		41	WSLYTESLA_BG	S4	ON	3
INTR		61	Miguel Import	S4	ON	3
LINE	N/A		24087MAGUNDEN230_24101OMAR 230_1	April	OFF	1
LINE	N/A		24086LUGO 500_85928EL-LU 2 500_1	April	OFF	2
LINE	N/A		24087MAGUNDEN230_24101OMAR 230_1	April	OFF	2
LINE	N/A		24235RECTOR 230_24303BIG CRK3230_1	April	OFF	2
LINE	N/A		30870PINE FLT230_30875MC CALL 230_1	April	OFF	2
LINE	N/A		34112EXCHEQUR115_34116LE GRAND115_1	April	OFF	2
INTR		10	IID-SDGE _BG	April	OFF	2
INTR		27	PACI _BG	April	OFF	2
INTR		28	PALOVRDE _BG	April	OFF	2
INTR		41	WSLYTESLA_BG	April	OFF	2
LINE	N/A		30860BALCH3TP230_30875MC CALL 230_1	April	ON	1
LINE	N/A		24086LUGO 500_85928EL-LU 2 500_1	April	ON	2
LINE	N/A		24235RECTOR 230_24303BIG CRK3230_1	April	ON	2
LINE	N/A		30860BALCH3TP230_30875MC CALL 230_1	April	ON	2
INTR		66	North Geysers Import	April	ON	1
INTR		10	IID-SDGE _BG	April	ON	2
INTR		27	PACI _BG	April	ON	2
INTR		28	PALOVRDE _BG	April	ON	2
INTR		41	WSLYTESLA_BG	April	ON	2

Type	Interface ID	Constraint Name	Season / Month	TOU	Tier
INTR	49	Drum - Rio Oso Limit 2 (outflow)	April	ON	2
INTR	80	SDGE Import	April	ON	2
INTR	9	IID-SCE _BG	April	ON	2
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	August	OFF	1
LINE	N/A	24087MAGUNDEN230_24101OMAR 230_1	August	OFF	1
LINE	N/A	24418LANCSTR 66_24436GOLDTOWN66_1	August	OFF	1
LINE	N/A	34425KCOGNJCT115_34427GRDNGLS2115_1	August	OFF	1
LINE	N/A	34454RIVERROC70_34464COPPRMNE70_1	August	OFF	1
LINE	N/A	34487SNGRJCT 70_34488SANGER 70_1	August	OFF	1
LINE	N/A	34570COLNGA 270_34572TORNADO 70_1	August	OFF	1
LINE	N/A	34774MIDWAY 115_34804BELRIDGE115_1	August	OFF	1
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	August	OFF	2
LINE	N/A	24087MAGUNDEN230_24101OMAR 230_1	August	OFF	2
LINE	N/A	24087MAGUNDEN230_24115PASTORIA230_2	August	OFF	2
LINE	N/A	24418LANCSTR 66_24436GOLDTOWN66_1	August	OFF	2
LINE	N/A	34425KCOGNJCT115_34427GRDNGLS2115_1	August	OFF	2
LINE	N/A	34570COLNGA 270_34572TORNADO 70_1	August	OFF	2
LINE	N/A	34774MIDWAY 115_34804BELRIDGE115_1	August	OFF	2
LINE	N/A	85942TA-VA 1 500_85943TA-VA 2 500_1	August	OFF	2
INTR	10	IID-SDGE _BG	August	OFF	2
INTR	27	PACI _BG	August	OFF	2
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	August	ON	1
LINE	N/A	24087MAGUNDEN230_24115PASTORIA230_2	August	ON	1
LINE	N/A	24418LANCSTR 66_24436GOLDTOWN66_1	August	ON	1
LINE	N/A	34112EXCHEQUR115_34116LE GRAND115_1	August	ON	1
LINE	N/A	34425KCOGNJCT115_34427GRDNGLS2115_1	August	ON	1
LINE	N/A	34464COPPRMNE70_34478TVY VLLY70_1	August	ON	1
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	August	ON	2
LINE	N/A	24087MAGUNDEN230_24115PASTORIA230_2	August	ON	2
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	August	ON	2
LINE	N/A	24418LANCSTR 66_24436GOLDTOWN66_1	August	ON	2
LINE	N/A	32208GLEAF TP115_32214RIO OSO 115_1	August	ON	2
LINE	N/A	34425KCOGNJCT115_34427GRDNGLS2115_1	August	ON	2
LINE	N/A	34464COPPRMNE70_34478TVY VLLY70_1	August	ON	2
LINE	N/A	35210VASCJCT.60_35220LPOSTAS 60_1	August	ON	2
LINE	N/A	85942TA-VA 1 500_85943TA-VA 2 500_1	August	ON	2
INTR	61	Miguel Import	August	ON	1
INTR	65	Moss Landing to Metcalf	August	ON	1
INTR	41	WSLYTESLA_BG	August	ON	2
INTR	46	Colgate 60 kV	August	ON	2
INTR	61	Miguel Import	August	ON	2
INTR	65	Moss Landing to Metcalf	August	ON	2
INTR	76	Ravenswood to San Mateo	August	ON	2

Binding Constraints in the Annual/Seasonal and Monthly Auction

Below are all of the constraints that were observed in the annual and monthly auction process.

This data includes the type of constraint: line (LINE), transformer (XFMR) or interface (INTR). The interface ID refers to the numeric reference for a defined generalized group constraint that is in the interface definition file made available under a Non Disclosure Agreement. If there is no interface ID listed then the constraint is a line or transformer.

Also noted below is the season or month in which the constraint was binding and the associated time-of-use (TOU), tier and term (either annual or monthly). The flow limits have been removed.

Table A2-2: List of Binding Constraints [CRR Auction]

Type	Interface ID	Constraint Name	Season / Month	TOU	Tier
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S1	OFF	AUC
LINE	N/A	24418LANCSTR 66_24436GOLDTOWN66_1	S1	OFF	AUC
LINE	N/A	24804DEVERS 230_24806MIRAGE 230_1	S1	OFF	AUC
LINE	N/A	31104CARLOTTA60_31105RIODLLTP60_1	S1	OFF	AUC
XFMR	N/A	30345MIDLFORK230_30346MDDLFK M230_1	S1	OFF	AUC
INTR	17	MEAD _BG	S1	OFF	AUC
INTR	48	Drum _Rio Oso Limit 1 (outflow)	S1	OFF	AUC
INTR	61	Miguel Import	S1	OFF	AUC
INTR	76	Ravenswood to San Mateo	S1	OFF	AUC
INTR	96	Panoche-Kearney & Gates-Gregg	S1	OFF	AUC
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S1	ON	AUC
LINE	N/A	24087MAGUNDEN230_24115PASTORIA230_2	S1	ON	AUC
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	S1	ON	AUC
LINE	N/A	31104CARLOTTA60_31105RIODLLTP60_1	S1	ON	AUC
INTR	27	PACI _BG	S1	ON	AUC
INTR	49	Drum _Rio Oso Limit 2 (outflow)	S1	ON	AUC
INTR	61	Miguel Import	S1	ON	AUC
INTR	76	Ravenswood to San Mateo	S1	ON	AUC
INTR	80	SDGE Import	S1	ON	AUC
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S2	OFF	AUC
LINE	N/A	24804DEVERS 230_24806MIRAGE 230_1	S2	OFF	AUC
LINE	N/A	31086EUREKA 60_31090HMBLT BY60_1	S2	OFF	AUC
LINE	N/A	34570COLNGA 270_34572TORNADO 70_1	S2	OFF	AUC
LINE	N/A	34774MIDWAY 115_34804BELRIDGE115_1	S2	OFF	AUC
INTR	17	MEAD _BG	S2	OFF	AUC
INTR	27	PACI _BG	S2	OFF	AUC
INTR	28	PALOVRDE _BG	S2	OFF	AUC
INTR	47	Contra Costa 230kV Import	S2	OFF	AUC
INTR	48	Drum _Rio Oso Limit 1 (outflow)	S2	OFF	AUC
INTR	76	Ravenswood to San Mateo	S2	OFF	AUC
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S2	ON	AUC
LINE	N/A	24804DEVERS 230_24806MIRAGE 230_1	S2	ON	AUC
LINE	N/A	24806MIRAGE 230_25406J.HINDS 230_1	S2	ON	AUC
LINE	N/A	31086EUREKA 60_31090HMBLT BY60_1	S2	ON	AUC

Type	Interface ID	Constraint Name	Season / Month	TOU	Tier
LINE	N/A	32224CHCGO PK115_32232HIGGINS 115_1	S2	ON	AUC
LINE	N/A	32314SMRTSVLE60_32341BEALE1J160_2	S2	ON	AUC
LINE	N/A	33511AVENATP2115_33514MANTECA 115_1	S2	ON	AUC
INTR	24	NOB _BG	S2	ON	AUC
INTR	27	PACI _BG	S2	ON	AUC
INTR	28	PALOVRDE _BG	S2	ON	AUC
INTR	76	Ravenswood to San Mateo	S2	ON	AUC
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S3	OFF	AUC
LINE	N/A	24087MAGUNDEN230_24101OMAR 230_1	S3	OFF	AUC
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	S3	OFF	AUC
LINE	N/A	24806MIRAGE 230_25406J.HINDS 230_1	S3	OFF	AUC
LINE	N/A	32224CHCGO PK115_32232HIGGINS 115_1	S3	OFF	AUC
LINE	N/A	34774MIDWAY 115_34804BELRIDGE115_1	S3	OFF	AUC
INTR	17	MEAD _BG	S3	OFF	AUC
INTR	25	OAKDALSUB_BG	S3	OFF	AUC
INTR	27	PACI _BG	S3	OFF	AUC
INTR	61	Miguel Import	S3	OFF	AUC
INTR	76	Ravenswood to San Mateo	S3	OFF	AUC
INTR	96	Panoche-Kearney & Gates-Gregg	S3	OFF	AUC
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S3	ON	AUC
LINE	N/A	24418LANCSTR 66_24436GOLDTOWN66_1	S3	ON	AUC
LINE	N/A	24804DEVERS 230_24806MIRAGE 230_1	S3	ON	AUC
LINE	N/A	32224CHCGO PK115_32232HIGGINS 115_1	S3	ON	AUC
LINE	N/A	32314SMRTSVLE60_32341BEALE1J160_2	S3	ON	AUC
LINE	N/A	85942TA-VA 1 500_85943TA-VA 2 500_1	S3	ON	AUC
INTR	12	LAUGHLIN _BG	S3	ON	AUC
INTR	37	TRACYCOTP_BG	S3	ON	AUC
INTR	46	Colgate 60 kV	S3	ON	AUC
INTR	61	Miguel Import	S3	ON	AUC
INTR	63	MiraLoma Bank	S3	ON	AUC
INTR	76	Ravenswood to San Mateo	S3	ON	AUC
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S4	OFF	AUC
LINE	N/A	24804DEVERS 230_24806MIRAGE 230_1	S4	OFF	AUC
LINE	N/A	34774MIDWAY 115_34804BELRIDGE115_1	S4	OFF	AUC
INTR	17	MEAD _BG	S4	OFF	AUC
INTR	27	PACI _BG	S4	OFF	AUC
INTR	47	Contra Costa 230kV Import	S4	OFF	AUC
INTR	48	Drum _Rio Oso Limit 1 (outflow)	S4	OFF	AUC
INTR	61	Miguel Import	S4	OFF	AUC
INTR	66	North Geysers Import	S4	OFF	AUC
INTR	75	Ravenswood Cutplane	S4	OFF	AUC
INTR	76	Ravenswood to San Mateo	S4	OFF	AUC
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	S4	ON	AUC
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	S4	ON	AUC
LINE	N/A	32224CHCGO PK115_32232HIGGINS 115_1	S4	ON	AUC
LINE	N/A	34774MIDWAY 115_34804BELRIDGE115_1	S4	ON	AUC

Type	Interface ID	Constraint Name	Season / Month	TOU	Tier
XFMR	N/A	30345MIDLFORK230_30346MDDLFK M230_1	S4	ON	AUC
INTR	27	PACI _BG	S4	ON	AUC
INTR	61	Miguel Import	S4	ON	AUC
INTR	76	Ravenswood to San Mateo	S4	ON	AUC
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	April	OFF	AUC
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	April	OFF	AUC
LINE	N/A	32314SMRTSVLE60_32341BEALE1J160_2	April	OFF	AUC
INTR	28	PALOVRDE _BG	April	OFF	AUC
INTR	76	Ravenswood to San Mateo	April	OFF	AUC
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	April	ON	AUC
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	April	ON	AUC
LINE	N/A	30205BLACK 230_30209PIT5JT2 230_1	April	ON	AUC
LINE	N/A	32224CHCGO PK115_32232HIGGINS 115_1	April	ON	AUC
LINE	N/A	32314SMRTSVLE60_32341BEALE1J160_2	April	ON	AUC
LINE	N/A	34774MIDWAY 115_34804BELRIDGE115_1	April	ON	AUC
XFMR	N/A	34540HENRITTA70_30881HENRIETA230_2	April	ON	AUC
INTR	10	IID-SDGE _BG	April	ON	AUC
INTR	24	NOB _BG	April	ON	AUC
INTR	27	PACI _BG	April	ON	AUC
INTR	28	PALOVRDE _BG	April	ON	AUC
INTR	41	WSLYTESLA_BG	April	ON	AUC
INTR	60	Metcalf to Morgan Hill	April	ON	AUC
INTR	61	Miguel Import	April	ON	AUC
INTR	80	SDGE Import	April	ON	AUC
INTR	84	Sobrante _Grizzly - Claremont	April	ON	AUC
LINE	N/A	24086LUGO 500_85928EL-LU 2 500_1	August	OFF	AUC
LINE	N/A	24087MAGUNDEN230_24101OMAR 230_1	August	OFF	AUC
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	August	OFF	AUC
LINE	N/A	24418LANCSTR 66_24436GOLDTOWN66_1	August	OFF	AUC
LINE	N/A	34774MIDWAY 115_34804BELRIDGE115_1	August	OFF	AUC
INTR	61	Miguel Import	August	OFF	AUC
INTR	76	Ravenswood to San Mateo	August	OFF	AUC
LINE	N/A	24087MAGUNDEN230_24115PASTORIA230_2	August	ON	AUC
LINE	N/A	24235RECTOR 230_24303BIG CRK3230_1	August	ON	AUC
LINE	N/A	34464COPPRMNE70_34478TVY VLLY70_1	August	ON	AUC
LINE	N/A	85942TA-VA 1 500_85943TA-VA 2 500_1	August	ON	AUC
INTR	46	Colgate 60 kV	August	ON	AUC
INTR	61	Miguel Import	August	ON	AUC
INTR	76	Ravenswood to San Mateo	August	ON	AUC

Appendix 3: Intertie Set-Aside and Auction Results

Table A3-1: Intertie Set-aside and Auction Results – Annual Process
(See text section 4.1.5 for explanation of table values.)

Interface ID	Branch Group Name	Season	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
1	ADLANTOSP_BG	S1	OFF	373.5	466.5	0	0	0	0
1	ADLANTOSP_BG	S1	ON	373.5	431.0	0	0	0	0
1	ADLANTOSP_BG	S2	OFF	376.9	446.9	0	0	0	0
1	ADLANTOSP_BG	S2	ON	373.5	431.0	0	0	0	0
1	ADLANTOSP_BG	S3	OFF	376.9	446.9	0	0	0	0
1	ADLANTOSP_BG	S3	ON	376.9	437.8	0	0	0	0
1	ADLANTOSP_BG	S4	OFF	376.9	446.9	0	0	0	0
1	ADLANTOSP_BG	S4	ON	376.9	437.8	0	0	0	0
2	BLYTHE _BG	S1	OFF	31.5	63.0	0	0	0	0
2	BLYTHE _BG	S1	ON	32.6	65.3	0	0	0	0
2	BLYTHE _BG	S2	OFF	32.6	65.3	0	0	0	0
2	BLYTHE _BG	S2	ON	32.6	65.3	0	0	0	0
2	BLYTHE _BG	S3	OFF	32.6	65.3	0	0	0	0
2	BLYTHE _BG	S3	ON	32.6	65.3	0	0	0	0
2	BLYTHE _BG	S4	OFF	32.6	65.3	0	0	0	0
2	BLYTHE _BG	S4	ON	32.6	65.3	0	0	0	0
3	CASCADE _BG	S1	OFF	36.4	72.8	0	0	0	0
3	CASCADE _BG	S1	ON	36.4	52.8	0	0	0	0
3	CASCADE _BG	S2	OFF	29.3	58.5	0	0	0	0
3	CASCADE _BG	S2	ON	29.3	58.5	0	0	0	0
3	CASCADE _BG	S3	OFF	29.3	38.5	0	0	0	0
3	CASCADE _BG	S3	ON	29.3	29.3	0	0	0	0
3	CASCADE _BG	S4	OFF	29.3	58.5	0	0	0	0
3	CASCADE _BG	S4	ON	29.3	31.5	0	0	0	0
4	CFE _BG	S1	OFF	291.0	582.0	75	0	0	0
4	CFE _BG	S1	ON	291.0	582.0	0	0	0	0

Interface ID	Branch Group Name	Season	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
4	CFE _BG	S2	OFF	291.0	582.0	75	75	0	0
4	CFE _BG	S2	ON	291.0	582.0	0	0	0	0
4	CFE _BG	S3	OFF	291.0	582.0	75	0	0	0
4	CFE _BG	S3	ON	291.0	482.0	50	0	0	0
4	CFE _BG	S4	OFF	291.0	582.0	75	75	0	0
4	CFE _BG	S4	ON	291.0	582.0	0	0	0	0
5	CTNWDRDMT_BG	S1	OFF	134.6	363.0	0	0	0	0
5	CTNWDRDMT_BG	S1	ON	134.6	348.8	0	0	0	0
5	CTNWDRDMT_BG	S2	OFF	134.6	357.3	0	0	0	0
5	CTNWDRDMT_BG	S2	ON	134.6	319.7	0	0	0	0
5	CTNWDRDMT_BG	S3	OFF	116.3	288.3	0	0	0	0
5	CTNWDRDMT_BG	S3	ON	116.3	319.6	0	0	0	0
5	CTNWDRDMT_BG	S4	OFF	116.3	283.0	0	0	0	0
5	CTNWDRDMT_BG	S4	ON	116.3	326.8	0	0	0	0
6	CTNWDWAPA_BG	S1	OFF	538.1	1,118.9	0	0	0	0
6	CTNWDWAPA_BG	S1	ON	520.1	1,138.7	0	0	0	0
6	CTNWDWAPA_BG	S2	OFF	534.4	1,079.2	0	0	0	0
6	CTNWDWAPA_BG	S2	ON	515.3	1,052.2	0	0	0	0
6	CTNWDWAPA_BG	S3	OFF	526.1	1,070.3	48	21	0	0
6	CTNWDWAPA_BG	S3	ON	503.3	1,021.9	0	0	0	0
6	CTNWDWAPA_BG	S4	OFF	530.6	1,026.5	0	0	0	0
6	CTNWDWAPA_BG	S4	ON	509.6	1,115.7	0	0	0	0
7	ELDORADO_BG	S1	OFF	132.1	264.8	367.5	141.7	900	166.5
7	ELDORADO_BG	S1	ON	131.8	264.8	267.5	0	0	0
7	ELDORADO_BG	S2	OFF	132.1	146.3	366.7	86.5	900	72
7	ELDORADO_BG	S2	ON	131.9	234.8	373.5	44.7	0	0
7	ELDORADO_BG	S3	OFF	276.3	553.5	738.5	79.1	900	112.3
7	ELDORADO_BG	S3	ON	276.0	553.5	641	31.8	0	0
7	ELDORADO_BG	S4	OFF	64.8	137.1	687.5	157.5	900	154.7
7	ELDORADO_BG	S4	ON	64.5	230.5	476.2	0	0	0
8	GONDIPPDC_BG	S1	OFF	6.4	9.4	0	0	0	0
8	GONDIPPDC_BG	S1	ON	6.4	8.7	0	0	0	0

Interface ID	Branch Group Name	Season	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
8	GONDIPPDC_BG	S2	OFF	4.9	5.7	0	0	0	0
8	GONDIPPDC_BG	S2	ON	4.9	5.7	0	0	0	0
8	GONDIPPDC_BG	S3	OFF	4.9	5.7	0	0	0	0
8	GONDIPPDC_BG	S3	ON	4.9	5.7	0	0	0	0
8	GONDIPPDC_BG	S4	OFF	6.4	8.7	0	0	0	0
8	GONDIPPDC_BG	S4	ON	6.4	8.7	0	0	0	0
9	IID-SCE_BG	S1	OFF	10.4	111.7	98	31.6	0	0
9	IID-SCE_BG	S1	ON	10.4	111.7	98	22.8	0	0
9	IID-SCE_BG	S2	OFF	0.0	149.1	98	36.3	0	0
9	IID-SCE_BG	S2	ON	0.0	133.4	83	59.6	0	0
9	IID-SCE_BG	S3	OFF	0.0	133.4	83	2.9	0	0
9	IID-SCE_BG	S3	ON	0.0	133.4	83	31.2	0	0
9	IID-SCE_BG	S4	OFF	10.4	111.7	98	44.5	0	0
9	IID-SCE_BG	S4	ON	10.4	100.1	86	39.8	0	0
10	IID-SDGE_BG	S1	OFF	20.6	20.6	0	0	0	0
10	IID-SDGE_BG	S1	ON	20.6	20.6	10	10	0	0
10	IID-SDGE_BG	S2	OFF	20.6	20.6	0	0	0	0
10	IID-SDGE_BG	S2	ON	20.6	20.6	10	10	0	0
10	IID-SDGE_BG	S3	OFF	20.6	20.6	20	0	0	0
10	IID-SDGE_BG	S3	ON	20.6	41.2	60	10	0	0
10	IID-SDGE_BG	S4	OFF	20.6	20.6	20	20	0	0
10	IID-SDGE_BG	S4	ON	20.6	41.2	60	10	0	0
11	IPPDCADLN_BG	S1	OFF	235.5	299.6	0	0	0	0
11	IPPDCADLN_BG	S1	ON	235.5	288.6	0	0	0	0
11	IPPDCADLN_BG	S2	OFF	235.5	288.6	0	0	0	0
11	IPPDCADLN_BG	S2	ON	235.5	288.6	0	0	0	0
11	IPPDCADLN_BG	S3	OFF	235.5	288.6	0	0	0	0
11	IPPDCADLN_BG	S3	ON	235.5	288.6	0	0	0	0
11	IPPDCADLN_BG	S4	OFF	235.5	288.6	0	0	0	0
11	IPPDCADLN_BG	S4	ON	235.5	288.6	0	0	0	0
12	LAUGHLIN_BG	S1	OFF	0.0	0.1	75	0	0	0
12	LAUGHLIN_BG	S1	ON	0.0	0.1	75	0	0	0

Interface ID	Branch Group Name	Season	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
12	LAUGHLIN_BG	S2	OFF	0.0	0.1	75	0	0	0
12	LAUGHLIN_BG	S2	ON	0.0	0.1	75	0	0	0
12	LAUGHLIN_BG	S3	OFF	0.0	0.1	75	0	0	0
12	LAUGHLIN_BG	S3	ON	0.0	0.1	75	0	0	0
12	LAUGHLIN_BG	S4	OFF	0.0	0.1	75	0	0	0
12	LAUGHLIN_BG	S4	ON	0.0	0.1	75	0	0	0
13	LLNLTESLA_BG	S1	OFF	93.0	177.6	0	0	0	0
13	LLNLTESLA_BG	S1	ON	93.0	182.2	0	0	0	0
13	LLNLTESLA_BG	S2	OFF	59.6	106.3	0	0	0	0
13	LLNLTESLA_BG	S2	ON	59.6	118.0	0	0	0	0
13	LLNLTESLA_BG	S3	OFF	54.0	107.3	0	0	0	0
13	LLNLTESLA_BG	S3	ON	54.0	89.8	0	0	0	0
13	LLNLTESLA_BG	S4	OFF	54.0	100.6	0	0	0	0
13	LLNLTESLA_BG	S4	ON	54.0	102.9	0	0	0	0
15	MCCLMKTPC_BG	S1	OFF	249.4	498.8	0	0	0	0
15	MCCLMKTPC_BG	S1	ON	249.4	498.8	0	0	0	0
15	MCCLMKTPC_BG	S2	OFF	249.4	498.8	0	0	0	0
15	MCCLMKTPC_BG	S2	ON	249.4	498.8	0	0	0	0
15	MCCLMKTPC_BG	S3	OFF	249.4	498.8	0	0	0	0
15	MCCLMKTPC_BG	S3	ON	249.4	498.8	0	0	0	0
15	MCCLMKTPC_BG	S4	OFF	249.4	498.8	0	0	0	0
15	MCCLMKTPC_BG	S4	ON	249.4	498.8	0	0	0	0
16	MCCULLGH_BG	S1	OFF	826.5	1,653.0	0	0	0	0
16	MCCULLGH_BG	S1	ON	826.5	1,653.0	0	0	0	0
16	MCCULLGH_BG	S2	OFF	826.5	1,653.0	0	0	0	0
16	MCCULLGH_BG	S2	ON	826.5	1,653.0	0	0	0	0
16	MCCULLGH_BG	S3	OFF	826.5	1,653.0	0	0	0	0
16	MCCULLGH_BG	S3	ON	826.5	1,653.0	0	0	0	0
16	MCCULLGH_BG	S4	OFF	826.5	1,653.0	0	0	0	0
16	MCCULLGH_BG	S4	ON	826.5	1,653.0	0	0	0	0
17	MEAD_BG	S1	OFF	12.6	76.6	302.1	76.5	900	0
17	MEAD_BG	S1	ON	10.2	21.7	257.1	0	0	0

Interface ID	Branch Group Name	Season	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
17	MEAD _BG	S2	OFF	11.6	11.6	783.2	74	900	62.4
17	MEAD _BG	S2	ON	10.2	22.4	377.2	0	0	0
17	MEAD _BG	S3	OFF	12.3	24.5	439.5	121	900	96.4
17	MEAD _BG	S3	ON	10.9	21.7	451.5	11.9	0	0
17	MEAD _BG	S4	OFF	12.3	24.5	389.5	169.8	900	145.3
17	MEAD _BG	S4	ON	10.2	20.2	394.5	0	0	0
18	MEADMKTPC_BG	S1	OFF	162.0	274.9	0	0	0	0
18	MEADMKTPC_BG	S1	ON	162.0	265.5	0	0	0	0
18	MEADMKTPC_BG	S2	OFF	162.0	268.6	0	0	0	0
18	MEADMKTPC_BG	S2	ON	162.0	265.5	0	0	0	0
18	MEADMKTPC_BG	S3	OFF	162.0	268.6	0	0	0	0
18	MEADMKTPC_BG	S3	ON	162.0	265.5	0	0	0	0
18	MEADMKTPC_BG	S4	OFF	162.0	268.6	0	0	0	0
18	MEADMKTPC_BG	S4	ON	162.0	265.5	0	0	0	0
19	MEADTMEAD_BG	S1	OFF	66.4	132.8	0	0	0	0
19	MEADTMEAD_BG	S1	ON	66.4	132.8	0	0	0	0
19	MEADTMEAD_BG	S2	OFF	66.4	132.8	0	0	0	0
19	MEADTMEAD_BG	S2	ON	66.4	132.8	0	0	0	0
19	MEADTMEAD_BG	S3	OFF	66.4	132.8	0	0	0	0
19	MEADTMEAD_BG	S3	ON	66.4	132.8	0	0	0	0
19	MEADTMEAD_BG	S4	OFF	66.4	132.8	0	0	0	0
19	MEADTMEAD_BG	S4	ON	66.4	132.8	0	0	0	0
20	MERCHANT _BG	S1	OFF	199.8	367.7	0	0	0	0
20	MERCHANT _BG	S1	ON	164.8	329.7	0	0	0	0
20	MERCHANT _BG	S2	OFF	194.8	349.7	0	0	0	0
20	MERCHANT _BG	S2	ON	174.8	323.9	0	0	0	0
20	MERCHANT _BG	S3	OFF	174.8	349.7	0	0	0	0
20	MERCHANT _BG	S3	ON	139.9	279.8	0	0	0	0
20	MERCHANT _BG	S4	OFF	174.8	349.7	0	0	0	0
20	MERCHANT _BG	S4	ON	139.9	279.8	0	0	0	0
21	MKTPCADLN_BG	S1	OFF	153.8	198.4	0	0	0	0
21	MKTPCADLN_BG	S1	ON	153.8	173.9	0	0	0	0

Interface ID	Branch Group Name	Season	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
21	MKTPCADLN_BG	S2	OFF	153.8	183.0	0	0	0	0
21	MKTPCADLN_BG	S2	ON	153.8	173.9	0	0	0	0
21	MKTPCADLN_BG	S3	OFF	153.8	183.0	0	0	0	0
21	MKTPCADLN_BG	S3	ON	153.8	173.9	0	0	0	0
21	MKTPCADLN_BG	S4	OFF	153.8	183.0	0	0	0	0
21	MKTPCADLN_BG	S4	ON	153.8	173.9	0	0	0	0
22	MONAIPPDC_BG	S1	OFF	196.1	275.6	0	0	0	0
22	MONAIPPDC_BG	S1	ON	196.1	268.4	0	0	0	0
22	MONAIPPDC_BG	S2	OFF	166.5	209.1	0	0	0	0
22	MONAIPPDC_BG	S2	ON	166.5	209.1	0	0	0	0
22	MONAIPPDC_BG	S3	OFF	166.5	209.1	0	0	0	0
22	MONAIPPDC_BG	S3	ON	166.5	209.1	0	0	0	0
22	MONAIPPDC_BG	S4	OFF	196.1	268.4	0	0	0	0
22	MONAIPPDC_BG	S4	ON	196.1	268.4	0	0	0	0
23	N.GILABK4_BG	S1	OFF	60.0	120.1	0	0	0	0
23	N.GILABK4_BG	S1	ON	60.0	120.1	0	0	0	0
23	N.GILABK4_BG	S2	OFF	60.0	120.1	0	0	0	0
23	N.GILABK4_BG	S2	ON	60.0	120.1	0	0	0	0
23	N.GILABK4_BG	S3	OFF	60.0	119.9	0	0	0	0
23	N.GILABK4_BG	S3	ON	60.0	119.9	0	0	0	0
23	N.GILABK4_BG	S4	OFF	60.0	119.9	0	0	0	0
23	N.GILABK4_BG	S4	ON	60.0	120.1	0	0	0	0
24	NOB _BG	S1	OFF	710.5	1,419.2	1400	0	0	0
24	NOB _BG	S1	ON	467.5	940.1	1031	622.8	0	0
24	NOB _BG	S2	OFF	553.0	1,107.0	2061	961	0	0
24	NOB _BG	S2	ON	523.1	1,037.9	2404	1038	0	0
24	NOB _BG	S3	OFF	570.6	1,106.0	2060	960	0	0
24	NOB _BG	S3	ON	509.6	853.4	2100	750	0	0
24	NOB _BG	S4	OFF	203.7	414.8	811	411	0	0
24	NOB _BG	S4	ON	196.0	338.7	721	321	0	0
25	OAKDALSUB_BG	S1	OFF	41.1	92.1	0	0	0	0
25	OAKDALSUB_BG	S1	ON	41.1	77.8	0	0	0	0

Interface ID	Branch Group Name	Season	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
25	OAKDALSUB_BG	S2	OFF	4.0	18.6	0	0	0	0
25	OAKDALSUB_BG	S2	ON	0.0	4.7	0	0	0	0
25	OAKDALSUB_BG	S3	OFF	4.0	19.3	0	0	0	0
25	OAKDALSUB_BG	S3	ON	4.0	8.5	0	0	0	0
25	OAKDALSUB_BG	S4	OFF	41.1	91.5	0	0	0	0
25	OAKDALSUB_BG	S4	ON	41.1	78.3	0	0	0	0
27	PACI _BG	S1	OFF	634.5	951.4	467	467	0	0
27	PACI _BG	S1	ON	440.3	548.6	1308	653	2000	104.3
27	PACI _BG	S2	OFF	364.1	417.9	873	417.9	0	0
27	PACI _BG	S2	ON	267.4	287.7	1854	508.2	1200	220.4
27	PACI _BG	S3	OFF	553.1	1,040.0	2167	1039.9	0	0
27	PACI _BG	S3	ON	553.1	553.6	2428	704.6	1200	263.5
27	PACI _BG	S4	OFF	529.1	990.8	1936	990.7	0	0
27	PACI _BG	S4	ON	541.9	541.9	1361	598.3	1000	56.2
28	PALOVRDE_BG	S1	OFF	329.8	330.6	1422.1	146.6	0	0
28	PALOVRDE_BG	S1	ON	217.3	218.1	2251.7	71.1	1100	42.8
28	PALOVRDE_BG	S2	OFF	53.1	53.8	1359.2	53.9	0	0
28	PALOVRDE_BG	S2	ON	187.3	307.1	2052	307	1000	0
28	PALOVRDE_BG	S3	OFF	236.1	236.8	1327	0	0	0
28	PALOVRDE_BG	S3	ON	118.0	118.7	2108.3	106.1	1100	113
28	PALOVRDE_BG	S4	OFF	254.8	377.6	1296.9	138.5	0	0
28	PALOVRDE_BG	S4	ON	91.0	91.8	499.7	50	1000	0
29	PARKER _BG	S1	OFF	23.6	92.3	0	0	0	0
29	PARKER _BG	S1	ON	23.6	92.3	0	0	0	0
29	PARKER _BG	S2	OFF	23.6	47.8	0	0	0	0
29	PARKER _BG	S2	ON	23.6	92.3	0	0	0	0
29	PARKER _BG	S3	OFF	23.6	48.3	0	0	0	0
29	PARKER _BG	S3	ON	23.6	92.3	0	0	0	0
29	PARKER _BG	S4	OFF	23.6	92.3	45	0	0	0
29	PARKER _BG	S4	ON	23.6	92.3	45	0	0	0
32	RNCHLAKE_BG	S1	OFF	636.8	1,607.9	0	0	0	0
32	RNCHLAKE_BG	S1	ON	636.8	1,835.8	0	0	100	100

Interface ID	Branch Group Name	Season	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
32	RNCHLAKE_BG	S2	OFF	370.1	1,151.2	0	0	0	0
32	RNCHLAKE_BG	S2	ON	370.1	1,156.7	0	0	100	99.2
32	RNCHLAKE_BG	S3	OFF	370.1	1,127.1	0	0	0	0
32	RNCHLAKE_BG	S3	ON	370.1	1,177.6	30	27.9	100	77.2
32	RNCHLAKE_BG	S4	OFF	377.3	984.2	0	0	0	0
32	RNCHLAKE_BG	S4	ON	377.3	1,249.0	0	0	100	50
33	SILVERPK_BG	S1	OFF	1.1	12.0	0	0	0	0
33	SILVERPK_BG	S1	ON	1.1	12.0	10	0	0	0
33	SILVERPK_BG	S2	OFF	1.1	12.0	0	0	0	0
33	SILVERPK_BG	S2	ON	1.1	12.0	10	0	0	0
33	SILVERPK_BG	S3	OFF	1.1	12.0	0	0	0	0
33	SILVERPK_BG	S3	ON	1.1	12.0	10	0	0	0
33	SILVERPK_BG	S4	OFF	1.1	12.0	0	0	0	0
33	SILVERPK_BG	S4	ON	1.1	12.0	10	0	0	0
34	STNDFDSTN_BG	S1	OFF	146.6	302.4	0	0	0	0
34	STNDFDSTN_BG	S1	ON	146.6	324.3	0	0	0	0
34	STNDFDSTN_BG	S2	OFF	99.4	212.2	0	0	0	0
34	STNDFDSTN_BG	S2	ON	99.4	213.9	0	0	0	0
34	STNDFDSTN_BG	S3	OFF	99.4	214.2	0	0	0	0
34	STNDFDSTN_BG	S3	ON	99.4	200.9	0	0	0	0
34	STNDFDSTN_BG	S4	OFF	146.6	318.4	0	0	0	0
34	STNDFDSTN_BG	S4	ON	146.6	324.2	0	0	0	0
35	SUMMIT_BG	S1	OFF	25.5	51.0	75	9.9	0	0
35	SUMMIT_BG	S1	ON	25.5	51.0	75	6.6	0	0
35	SUMMIT_BG	S2	OFF	25.5	51.0	75	14.3	0	0
35	SUMMIT_BG	S2	ON	25.5	51.0	75	1.7	0	0
35	SUMMIT_BG	S3	OFF	25.5	51.0	75	12.2	0	0
35	SUMMIT_BG	S3	ON	25.5	51.0	75	0	0	0
35	SUMMIT_BG	S4	OFF	25.5	51.0	75	9.8	0	0
35	SUMMIT_BG	S4	ON	25.5	51.0	75	4.7	0	0
37	TRACYCOTP_BG	S1	OFF	0.0	69.3	0	0	0	0
37	TRACYCOTP_BG	S1	ON	0.0	69.8	0	0	0	0

Interface ID	Branch Group Name	Season	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
37	TRACYCOTP_BG	S2	OFF	0.0	40.0	0	0	0	0
37	TRACYCOTP_BG	S2	ON	0.0	67.5	0	0	0	0
37	TRACYCOTP_BG	S3	OFF	0.0	0.0	0	0	0	0
37	TRACYCOTP_BG	S3	ON	0.0	89.8	0	0	105	102.9
37	TRACYCOTP_BG	S4	OFF	0.0	56.8	0	0	0	0
37	TRACYCOTP_BG	S4	ON	0.0	46.0	0	0	0	0
38	TRACYPGAE_BG	S1	OFF	1185.4	2,982.1	0	0	0	0
38	TRACYPGAE_BG	S1	ON	1178.1	3,341.6	0	0	0	0
38	TRACYPGAE_BG	S2	OFF	1210.7	3,145.8	0	0	0	0
38	TRACYPGAE_BG	S2	ON	1236.2	3,220.4	0	0	0	0
38	TRACYPGAE_BG	S3	OFF	1239.9	2,947.2	0	0	0	0
38	TRACYPGAE_BG	S3	ON	1228.9	3,424.7	75	75	0	0
38	TRACYPGAE_BG	S4	OFF	1254.8	2,913.0	17	10	0	0
38	TRACYPGAE_BG	S4	ON	1251.0	3,296.2	0	0	0	0
40	VICTVL_BG	S1	OFF	634.9	1,396.8	184	184	0	0
40	VICTVL_BG	S1	ON	634.9	1,478.5	200	200	800	0
40	VICTVL_BG	S2	OFF	634.9	1,461.0	150	150	0	0
40	VICTVL_BG	S2	ON	634.9	1,388.5	200	200	800	0
40	VICTVL_BG	S3	OFF	634.9	1,399.3	150	150	0	0
40	VICTVL_BG	S3	ON	634.9	1,324.0	200	50	800	0
40	VICTVL_BG	S4	OFF	634.9	1,514.4	150	150	0	0
40	VICTVL_BG	S4	ON	634.9	1,410.8	200	160.5	800	0
41	WSLYTESLA_BG	S1	OFF	0.0	173.3	0	55.9	0	0
41	WSLYTESLA_BG	S1	ON	0.0	76.5	0	0	0	0
41	WSLYTESLA_BG	S2	OFF	0.0	125.6	0	33.4	0	0
41	WSLYTESLA_BG	S2	ON	0.0	76.5	0	0	0	0
41	WSLYTESLA_BG	S3	OFF	0.0	165.5	0	34.6	0	0
41	WSLYTESLA_BG	S3	ON	0.0	76.5	0	0	0	0
41	WSLYTESLA_BG	S4	OFF	0.0	170.2	0	3.8	0	0
41	WSLYTESLA_BG	S4	ON	0.0	76.5	0	0	0	0
42	WSTLYLSBN_BG	S1	OFF	0.0	77.6	0	0	0	0
42	WSTLYLSBN_BG	S1	ON	0.0	271.5	0	0	0	0

Interface ID	Branch Group Name	Season	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
42	WSTLYLSBN_BG	S2	OFF	0.0	162.4	0	0	0	0
42	WSTLYLSBN_BG	S2	ON	0.0	254.4	0	0	0	0
42	WSTLYLSBN_BG	S3	OFF	0.0	92.6	0	0	0	0
42	WSTLYLSBN_BG	S3	ON	0.0	226.8	0	0	0	0
42	WSTLYLSBN_BG	S4	OFF	0.0	74.2	0	0	0	0
42	WSTLYLSBN_BG	S4	ON	0.0	260.9	0	0	0	0
43	WSTWGMEAD_BG	S1	OFF	21.2	42.4	0	0	0	0
43	WSTWGMEAD_BG	S1	ON	16.5	33.0	0	0	0	0
43	WSTWGMEAD_BG	S2	OFF	18.1	36.1	0	0	0	0
43	WSTWGMEAD_BG	S2	ON	16.5	33.0	0	0	0	0
43	WSTWGMEAD_BG	S3	OFF	18.1	36.1	0	0	0	0
43	WSTWGMEAD_BG	S3	ON	16.5	33.0	0	0	0	0
43	WSTWGMEAD_BG	S4	OFF	18.1	36.1	0	0	0	0
43	WSTWGMEAD_BG	S4	ON	16.5	33.0	0	0	0	0
103	SYLMAR-AC_BG	S1	OFF	92.0	1,279.8	0	0	0	0
103	SYLMAR-AC_BG	S1	ON	92.0	1,285.5	0	0	0	0
103	SYLMAR-AC_BG	S2	OFF	92.0	1,238.6	0	0	0	0
103	SYLMAR-AC_BG	S2	ON	92.0	1,232.6	0	0	0	0
103	SYLMAR-AC_BG	S3	OFF	92.0	1,157.9	0	0	0	0
103	SYLMAR-AC_BG	S3	ON	92.0	1,160.0	0	0	0	0
103	SYLMAR-AC_BG	S4	OFF	92.0	1,254.8	0	0	0	0
103	SYLMAR-AC_BG	S4	ON	92.0	1,348.8	0	0	0	0

Table A3-2: Intertie Set-aside and Auction Results – Monthly Process
(See text section 4.1.5 for explanation of table values.)

Interface ID	Branch Group Name	Month	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
1	ADLANTOSP_BG	April	OFF	247.8	496.9	0	0	0	0
1	ADLANTOSP_BG	April	ON	266.7	533.4	0	0	0	0
1	ADLANTOSP_BG	August	OFF	247.8	496.9	0	0	0	0
1	ADLANTOSP_BG	August	ON	316.7	633.4	0	0	0	0
2	BLYTHE _BG	April	OFF	43.5	87.0	0	0	0	0
2	BLYTHE _BG	April	ON	43.5	87.0	13	0	0	0
2	BLYTHE _BG	August	OFF	43.5	87.0	1125	0	0	0
2	BLYTHE _BG	August	ON	43.5	87.0	40	0	0	0
3	CASCADE _BG	April	OFF	39.0	78.0	0	0	0	0
3	CASCADE _BG	April	ON	39.0	78.0	80	77	0	0
3	CASCADE _BG	August	OFF	29.0	58.0	40	0	0	0
3	CASCADE _BG	August	ON	24.4	48.8	80	0	0	0
4	CFE _BG	April	OFF	350.5	701.0	80	0	0	0
4	CFE _BG	April	ON	388.0	776.0	370	86.9	0	0
4	CFE _BG	August	OFF	388.0	776.0	180	0	0	0
4	CFE _BG	August	ON	338.0	676.0	370	0	0	0
5	CTNWDRDMT_BG	April	OFF	179.5	487.8	0	0	0	0
5	CTNWDRDMT_BG	April	ON	179.5	415.2	0	0	0	0
5	CTNWDRDMT_BG	August	OFF	155.0	433.3	0	0	0	0
5	CTNWDRDMT_BG	August	ON	155.0	438.1	0	0	0	0
6	CTNWDWAPA_BG	April	OFF	727.8	1,446.0	0	0	0	0
6	CTNWDWAPA_BG	April	ON	715.1	1,457.6	0	0	0	0
6	CTNWDWAPA_BG	August	OFF	702.7	1,410.9	0	0	0	0
6	CTNWDWAPA_BG	August	ON	654.5	1,428.5	0	0	0	0
7	ELDORADO_BG	April	OFF	110.0	232.0	440	5.7	0	0
7	ELDORADO_BG	April	ON	139.3	277.3	440	0	0	0
7	ELDORADO_BG	August	OFF	385.6	948.1	619	0	0	0
7	ELDORADO_BG	August	ON	353.1	898.7	616.5	0.7	0	0

Interface ID	Branch Group Name	Season	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
8	GONDIPPDC_BG	April	OFF	3.8	8.9	0	0	0	0
8	GONDIPPDC_BG	April	ON	3.8	7.5	0	0	0	0
8	GONDIPPDC_BG	August	OFF	3.8	8.9	0	0	0	0
8	GONDIPPDC_BG	August	ON	3.8	7.5	0	0	0	0
9	IID-SCE_BG	April	OFF	20.8	230.3	20	1.9	0	0
9	IID-SCE_BG	April	ON	9.1	109.1	5	0	0	0
9	IID-SCE_BG	August	OFF	37.5	178.0	5	5	0	0
9	IID-SCE_BG	August	ON	23.3	155.4	0	0	0	0
10	IID-SDGE_BG	April	OFF	17.2	17.2	0	0	0	0
10	IID-SDGE_BG	April	ON	12.2	12.2	65	12.1	0	0
10	IID-SDGE_BG	August	OFF	17.2	17.2	290	0	0	0
10	IID-SDGE_BG	August	ON	22.5	45.0	65	0	0	0
11	IPPDCADLN_BG	April	OFF	142.4	286.1	0	0	0	0
11	IPPDCADLN_BG	April	ON	192.4	384.7	0	0	0	0
11	IPPDCADLN_BG	August	OFF	142.4	286.1	0	0	0	0
11	IPPDCADLN_BG	August	ON	192.4	384.7	0	0	0	0
12	LAUGHLIN_BG	April	OFF	0.0	0.1	0	0	0	0
12	LAUGHLIN_BG	April	ON	0.0	0.1	150	0	0	0
12	LAUGHLIN_BG	August	OFF	0.0	0.1	100	0	0	0
12	LAUGHLIN_BG	August	ON	0.0	0.1	1350	0	0	0
13	LLNLTESLA_BG	April	OFF	66.5	126.6	0	0	0	0
13	LLNLTESLA_BG	April	ON	78.9	151.9	0	0	0	0
13	LLNLTESLA_BG	August	OFF	59.4	140.2	0	0	0	0
13	LLNLTESLA_BG	August	ON	61.4	146.5	0	0	0	0
15	MCCLMKTPC_BG	April	OFF	332.5	665.0	0	0	0	0
15	MCCLMKTPC_BG	April	ON	332.5	665.0	0	0	0	0
15	MCCLMKTPC_BG	August	OFF	332.5	665.0	0	0	0	0
15	MCCLMKTPC_BG	August	ON	332.5	665.0	0	0	0	0
16	MCCULLGH_BG	April	OFF	1,102.0	2,204.0	250	13.4	0	0
16	MCCULLGH_BG	April	ON	1,102.0	2,204.0	350	9.8	0	0
16	MCCULLGH_BG	August	OFF	1,102.0	2,204.0	330	0	0	0
16	MCCULLGH_BG	August	ON	1,102.0	2,204.0	350	0	0	0

Interface ID	Branch Group Name	Season	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
17	MEAD _BG	April	OFF	3.0	26.8	105.5	14.5	0	0
17	MEAD _BG	April	ON	13.4	92.6	226.2	0	0	0
17	MEAD _BG	August	OFF	4.0	84.2	876.3	37.7	0	0
17	MEAD _BG	August	ON	8.5	48.2	180	0	0	0
18	MEADMKTPC_BG	April	OFF	179.0	358.0	0	0	0	0
18	MEADMKTPC_BG	April	ON	177.0	353.9	0	0	0	0
18	MEADMKTPC_BG	August	OFF	179.0	358.0	0	0	0	0
18	MEADMKTPC_BG	August	ON	177.0	353.9	0	0	0	0
19	MEADTMEAD_BG	April	OFF	88.5	177.0	0	0	0	0
19	MEADTMEAD_BG	April	ON	88.5	177.0	0	0	0	0
19	MEADTMEAD_BG	August	OFF	88.5	177.0	0	0	0	0
19	MEADTMEAD_BG	August	ON	88.5	177.0	0	0	0	0
20	MERCHANT _BG	April	OFF	239.8	479.5	0	0	0	0
20	MERCHANT _BG	April	ON	220.2	440.4	0	0	0	0
20	MERCHANT _BG	August	OFF	233.1	506.2	0	0	0	0
20	MERCHANT _BG	August	ON	186.5	436.3	0	0	0	0
21	MKTPCADLN_BG	April	OFF	121.9	243.8	0	0	0	0
21	MKTPCADLN_BG	April	ON	90.9	181.7	0	0	0	0
21	MKTPCADLN_BG	August	OFF	121.9	243.8	0	0	0	0
21	MKTPCADLN_BG	August	ON	140.9	281.7	0	0	0	0
22	MONAIPPDC_BG	April	OFF	89.4	178.8	0	0	0	0
22	MONAIPPDC_BG	April	ON	139.4	278.8	0	0	0	0
22	MONAIPPDC_BG	August	OFF	89.4	178.8	0	0	0	0
22	MONAIPPDC_BG	August	ON	139.4	278.8	0	0	0	0
23	N.GILABK4_BG	April	OFF	80.0	160.0	0	0	0	0
23	N.GILABK4_BG	April	ON	80.0	160.0	0	0	0	0
23	N.GILABK4_BG	August	OFF	19.0	38.0	0	0	0	0
23	N.GILABK4_BG	August	ON	19.0	51.6	0	0	0	0
24	NOB _BG	April	OFF	254.8	507.9	50	0	0	0
24	NOB _BG	April	ON	27.4	46.0	692.4	45.9	0	0
24	NOB _BG	August	OFF	406.6	815.3	120	61.2	0	0
24	NOB _BG	August	ON	292.6	540.7	546	3.9	0	0

Interface ID	Branch Group Name	Season	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
25	OAKDALSUB_BG	April	OFF	0.0	15.9	0	0	0	0
25	OAKDALSUB_BG	April	ON	0.0	12.7	0	0	0	0
25	OAKDALSUB_BG	August	OFF	0.0	9.6	0	0	0	0
25	OAKDALSUB_BG	August	ON	0.0	11.3	0	0	0	0
27	PACI _BG	April	OFF	94.5	180.5	0	0	0	0
27	PACI _BG	April	ON	78.9	129.7	1250	78.9	0	0
27	PACI _BG	August	OFF	153.8	260.2	55	0	0	0
27	PACI _BG	August	ON	247.0	379.6	750	0	0	0
28	PALOVRDE_BG	April	OFF	216.0	216.0	416	216	0	0
28	PALOVRDE_BG	April	ON	23.6	23.6	1394.1	23.5	0	0
28	PALOVRDE_BG	August	OFF	191.3	205.0	2975	50.7	0	0
28	PALOVRDE_BG	August	ON	97.2	235.5	1668.1	0.9	0	0
29	PARKER _BG	April	OFF	9.3	53.5	0	0	0	0
29	PARKER _BG	April	ON	31.5	123.0	0	0	0	0
29	PARKER _BG	August	OFF	31.5	63.0	0	0	0	0
29	PARKER _BG	August	ON	31.5	63.0	0	0	0	0
32	RNCHLAKE_BG	April	OFF	493.5	1,423.4	0	0	0	0
32	RNCHLAKE_BG	April	ON	493.5	1,546.9	0	0	0	0
32	RNCHLAKE_BG	August	OFF	486.4	1,455.8	0	0	0	0
32	RNCHLAKE_BG	August	ON	503.0	1,625.6	0	0	0	0
33	SILVERPK_BG	April	OFF	1.5	16.0	0	0	0	0
33	SILVERPK_BG	April	ON	1.5	16.0	17	14.6	0	0
33	SILVERPK_BG	August	OFF	1.5	16.0	50	0	0	0
33	SILVERPK_BG	August	ON	1.5	16.0	17	0	0	0
34	STNDFDSTN_BG	April	OFF	137.7	276.3	0	0	0	0
34	STNDFDSTN_BG	April	ON	142.0	290.1	0	0	0	0
34	STNDFDSTN_BG	August	OFF	135.6	267.5	0	0	0	0
34	STNDFDSTN_BG	August	ON	134.1	266.1	0	0	0	0
35	SUMMIT _BG	April	OFF	26.9	53.7	0	0	0	0
35	SUMMIT _BG	April	ON	33.2	66.3	70	1.1	0	0
35	SUMMIT _BG	August	OFF	27.9	55.8	17	0	0	0
35	SUMMIT _BG	August	ON	34.0	68.0	70	3.4	0	0

Interface ID	Branch Group Name	Season	TOU	Set-aside Quantity	Actual Capacity Available	Import Bids Submitted	Import Bids Cleared	Export Bids Submitted	Export Bids Cleared
37	TRACYCOTP_BG	April	OFF	0.0	69.5	0	0	0	0
37	TRACYCOTP_BG	April	ON	0.0	105.7	0	0	0	0
37	TRACYCOTP_BG	August	OFF	0.0	0.0	0	0	0	0
37	TRACYCOTP_BG	August	ON	0.0	228.4	0	0	0	0
38	TRACYPGAE_BG	April	OFF	1,964.7	4,343.1	830	797.3	0	0
38	TRACYPGAE_BG	April	ON	1,883.9	4,382.2	595	250	0	0
38	TRACYPGAE_BG	August	OFF	1,995.9	4,073.3	950	500	0	0
38	TRACYPGAE_BG	August	ON	1,882.7	4,491.6	490	91.1	0	0
40	VICTVL_BG	April	OFF	768.9	1,803.9	9.6	0	0	0
40	VICTVL_BG	April	ON	746.4	1,658.6	9.4	0	0	0
40	VICTVL_BG	August	OFF	771.3	1,679.4	9.6	9.3	0	0
40	VICTVL_BG	August	ON	821.6	1,686.1	49.1	0	0	0
41	WSLYTESLA_BG	April	OFF	0.0	102.0	0	0	0	0
41	WSLYTESLA_BG	April	ON	0.0	102.0	0	130.6	0	0
41	WSLYTESLA_BG	August	OFF	0.0	129.7	0	302.3	0	0
41	WSLYTESLA_BG	August	ON	0.0	102.0	0	0	0	0
42	WSTLYLSBN_BG	April	OFF	71.0	275.8	0	0	0	0
42	WSTLYLSBN_BG	April	ON	71.0	341.3	0	0	0	0
42	WSTLYLSBN_BG	August	OFF	71.0	208.3	0	0	0	0
42	WSTLYLSBN_BG	August	ON	71.0	284.8	0	0	0	0
43	WSTWGMEAD_BG	April	OFF	24.0	48.0	0	0	0	0
43	WSTWGMEAD_BG	April	ON	22.0	43.9	0	0	0	0
43	WSTWGMEAD_BG	August	OFF	24.0	48.0	0	0	0	0
43	WSTWGMEAD_BG	August	ON	22.0	43.9	0	0	0	0
103	SYLMAR-AC_BG	April	OFF	149.2	1,659.6	0	0	0	0
103	SYLMAR-AC_BG	April	ON	168.9	1,619.0	0	0	0	0
103	SYLMAR-AC_BG	August	OFF	168.9	1,562.7	5	5	0	0
103	SYLMAR-AC_BG	August	ON	198.6	1,581.6	62	0	0	0

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ATTACHMENT B

APPENDIX 3 – CONFIDENTIAL MARKET PARTICIPANT CRR DRY RUN RESULTS

**PUBLIC VERSION:

PRIVILEGED AND CONFIDENTIAL

INFORMATION HAS BEEN REMOVED

PURSUANT TO 18 C.F.R. § 388.112**