UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation	**)** **)**	**Docket No. ER06-___-000**

PREPARED DIRECT TESTIMONY OF SCOTT M. HARVEY AND SUSAN L. POPE

February 8, 2006

Table of Contents

Page

February 8, 2006

EXECUTIVE SUMMARY

This testimony provides a background explanation of the nature of financial transmission rights such as CRRs, describes the details of the CAISO's proposal for the definition, allocation and auction of CRRs, explains the reason for many elements of the CRR definition, allocation and auction design, and explains the key CAISO and stakeholder concerns that affected the design choices in the CRR proposal.

CRRs will be source-to-sink financial rights, essentially identical to FTRs in PJM and TCCs in New York. CRRs will be purely financial; they will not convey any scheduling priority in the day-ahead market or in real-time operations and the CRR holder will be paid regardless of whether it schedules a transaction matching its CRR in the day-ahead market and regardless of the pattern of its real-time generation and loads. CRRs will be allocated and auctioned as obligations. As in New York and the MISO, the payment to the CRR holder will be the difference between the congestion component of the LMP price in the day-ahead market at the CRR sink and at the CRR source.

The CAISO is proposing to allocate CRRs annually and monthly, and also to hold an auction after each allocation process. Separate allocations and auctions will be performed for the on-peak and off-peak periods. The CAISO proposes to make 75% of seasonal transmission system capacity available to support seasonal CRRs that will be allocated and auctioned in an

annual process, and to make the remaining capacity (approximately 25%, less any reduction due to outages modeled in the monthly allocation process) available to support CRRs allocated and auctioned on a monthly basis. CRRs that are allocated and auctioned must pass a simultaneous feasibility test.

The proposed CRR allocation rules have elements drawn from the eastern ISOs, with some adaptations for the context in California. The crux of the allocation process is an initial annual allocation based upon historical grid usage and entitlements, followed by a priority allocation in subsequent years in which LSEs may request to renew percentage of their previously awarded annual CRRs. The priority allocation allows the renewal of CRRs as a way to support long-term energy contracts. The CRR auction design will be essentially identical to that employed by the eastern ISOs.

CRRs serve two important functions in the CAISO LMP market design. First, they support forward contracting by permitting LSEs to acquire CRRs hedging congestion charges on forward power contracts. Second, they support an equitable allocation of the benefits of the transmission system, so that the economic value of the transmission system flows back to the transmission customers that have a continuing obligation to pay the embedded costs of the transmission system. The design and allocation of the CRRs is intended to accomplish these purposes without giving rise to inefficient incentives either in responding to dispatch instructions in the very short-term, scheduling imports in the intermediate term, or entering into forward power contracts in the long term. In addition, the allocation rules have been designed to avoid undermining retail competition and to ensure that CRRs are allocated to LSEs in a manner such

that retail competition will cause the value of CRRs to be passed through to the retail access consumer. Most of the contentious CRR related issues: lack of validation of CRRs sources after year 1 based on generation ownership or contracts; priority nominations of CRRs after year 1; and release of priority CRR nominations with load shifts are contentious precisely because the CAISO could not accommodate the desires of some stakeholders without undermining one of these fundamental objectives.

An important and difficult trade off in the CRR allocation proposal is between allocative equity and administrative cost. By allocative equity we have in mind several considerations. One consideration is avoiding material and predictable changes in the entitlement to use the transmission system without paying congestion to meet a distribution company's load, relative to the pre-MRTU or pre-CAISO entitlement. A second consideration is avoiding allocation rules that have the potential to produce materially different outcomes for similarly situated LSEs. Features of the CAISO CRR allocation mechanism that serve to promote allocative equity include allowing LSEs to specify their CRR source nominations in each allocation; CRR source nomination validation based on historical contracts and generation ownership in the first annual allocation; and use of multiple, sequential nomination tiers. However, the need to run an allocation process based on LSE nominations on a continuing basis will directly and indirectly impose significant administrative costs on the CAISO. In addition, there is a direct trade off between increases in the number of tiers and the CAISO's cost to implement the allocation process.

Although the CAISO has retained the feature of LAP pricing for very broadly defined load zones for some LSEs, it has addressed the critical market design problems relating to LAPs

that were present in the original MRTU LAP formulation through a variety of changes, including the introduction of nodal or subzonal pricing for some loads and LSEs.

I. INTRODUCTION

A. Experience

Q. PLEASE STATE YOUR NAMES AND BUSINESS ADDRESS.

A. Scott M. Harvey and Susan L. Pope. Dr. Harvey and Dr. Pope's business address is Suite 300, 350 Massachusetts Avenue, Cambridge MA 02139.

Q. DR. HARVEY, WHAT IS YOUR OCCUPATION?

A. I am a director with LECG, LLC an economic and management consulting company.

Q. DR. POPE, WHAT IS YOUR OCCUPATION?

A. I am a principal with LECG, LLC an economic and management consulting company.

Q. DR. POPE, PLEASE DESCRIBE YOUR QUALIFICATIONS.

A. I have been working on the economic and public policy analysis of electricity market restructuring for over ten years. Starting in 1994 I was a consultant to the New York member systems concerning all aspects of the development of the market design and regulatory filings to restructure the New York Power Pool into the New York

Independent System Operator, including the design of the NYISO's bid-based electricity markets, two-settlement system, and system of financial transmission rights. I participated in the testing of the NYISO's electricity markets and, after the start of the NYISO, contributed to several efforts to improve their markets, including a study of possible approaches to coordinating the day-ahead forward markets in the Northeast, and the design of a pre-scheduling system.

In the mid-1990s I was also involved in the development of market-based energy and transmission pricing systems for PJM, leading to their implementation of LMP. In the late 1990s, I was involved in the NEPOOL stakeholder process that developed ISO-New England's LMP-based multi-settlement system, and also led a number of stakeholder meetings on electricity market design in the Northwest (RTO West).

Since about 2001, my work has centered on the development and refinement of systems for allocating, auctioning and settling financial transmission rights. During the period 2001 to 2003, I worked intensely for the MISO in their stakeholder process to design the market rules for converting existing entitlements to transmission usage into financial transmission rights, and all other aspects of their FTR markets. My participation in the MISO process was very similar to the work that I have done to support the CAISO stakeholder process in developing their CRR market design, in that I assisted the MISO and market participants in evaluating and comparing the equity and efficiency consequences of alternative FTR allocation rules. Starting in 2003, I also assisted the SeTrans Sponsors with similar issues, helping them to develop rules for allocating financial transmission rights and awarding incremental financial transmission rights to

parties that "participant fund" expansions to the transmission system. During this period, I also consulted to the NYISO, leading stakeholder processes to develop TCC-related incentives for improved transmission outage performance and to develop market rules for awarding incremental TCCs to parties funding transmission expansions. This work for the NYISO led to substantial progress in discussion and understanding of how to implement the simultaneous feasibility test for CRR options. My CV is attached as Appendix 2.

Q. DR. HARVEY, PLEASE DESCRIBE YOUR QUALIFICATIONS

A. During the period from 1994 to 1999, I was actively involved as a consultant to the New York Power Pool and the PJM Supporting Companies in the restructuring of the New York and PJM power pools and assisted with the development and implementation in those control areas of open access markets based on LMP pricing, financial transmission rights, and day-ahead financial markets with security-constrained unit commitment. Prior to the startup of the NYISO, I was extensively involved in testing elements of the NYISO day-ahead market and real-time pricing software. I have continued to be a consultant to the NYISO since its startup, providing consulting assistance on issues relating to coordinating external transactions; demand response; TCC auctions; transmission outage performance incentives; locational reserve pricing; installed capacity markets; market power mitigation; transmission expansion and virtual (convergence) bidding.

Subsequently, during the period from 1998 to 2000, I was actively involved, as a consultant to a group of New England market participants (initially Westbrook Power), and later ISO-New England ("ISO-NE") in the reform of the New England power markets and the development of a two-settlement market design based on LMP pricing, financial transmission rights and a day-ahead financial market with security-constrained unit commitment. More recently, during the period 2001to 2004 I was a consultant to the Mid West ISO, supporting the development of the Midwest ISO's Stage 2 congestion management system based on LMP pricing, financial transmission rights and a day-ahead financial market with security-constrained unit commitment

Since 1997, I have been involved in a variety of efforts to diagnose and address the causes of the problems that have affected the power markets coordinated by the California ISO. Since August 2004, I have been a consultant to the California ISO, assisting with the implementation of the MRTU market design.

I previously spent ten years in antitrust enforcement at the Federal Trade Commission, where I specialized in the antitrust and regulatory issues in the oil and gas industries. My CV is attached as Appendix 1.

B. Description of Work Performed

Q. PLEASE DESCRIBE THE WORK THAT YOU HAVE BEEN PERFORMING FOR THE CALIFORNIA ISO IN DEVELOPING THE CRR DESIGN CONTAINED IN THEIR CURRENT FILINGS.

A. There have been three aspects to our involvement in the development of the CAISO's CRR proposal. First, we provided an initial set of comments discussing issues relating to the original MD02 CRR proposal in Section 8 of a report on the MRTU market design that we prepared at the request of the CAISO about a year ago.[1] Second, beginning in May 2005, we assisted the CAISO with the stakeholder process tasked with developing the details of the definition, allocation and auction of CRRs. We assisted the CAISO with the preparation of educational and discussion materials for stakeholder meetings, and led discussions and answered questions at the meetings. One or both of us attended all stakeholder meetings concerning CRRs. Third, we prepared the CRR Study 2 Report,[2] and a subsequent addendum,[3] that analyzed the results of the CAISO's trial allocation process for CRRs. Throughout the second and third phases we listened to stakeholder views regarding the design of the CRR allocation and auction process, read stakeholder comments, and assisted the CAISO in determining how best to respond to stakeholder issues.

---

1 Scott M. Harvey, William W. Hogan, and Susan L. Pope, "Comments on the California ISO MRTU LMP Market Design," February 23, 2005 (hereafter "February 2005 MRTU Report").

2 Scott M. Harvey and Susan L. Pope, "CRR Study 2 Evaluation of Alternative CRR Allocation Rules," August 24, 2005 (hereafter "CRR Study 2").

3 Scott M. Harvey and Susan L, Pope, "CRR Study 2 Addendum," September 30, 2005 (hereafter "Study 2 Addendum").

C. Purpose of Testimony

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of our testimony is to provide a background explanation of the nature of financial transmission rights such as CRRs, to describe the details of the CAISO's proposal for the definition, allocation and auction of CRRs, to explain the reason for many elements of the CRR definition, allocation and auction design, and to explain the key CAISO and stakeholder concerns that affected the design of the proposal.

Q. PLEASE DESCRIBE HOW YOUR TESTIMONY IS ORGANIZED.

A. There are two initial sections to our testimony. Section I describes our qualifications and experience, the work that we have performed for the CAISO and the purpose of our testimony. Section II provides background information on CRRs, explaining how CRRs are defined and how the quantity of CRRs that can be allocated or auctioned is constrained by the capacity of a transmission system. In Section II we also explain the difference between CRR obligations and options, and the purpose that CRRs serve within an energy market structure based on LMP. It is not essential to read Section II prior to Section III, but Section II provides an initial conceptual explanation of many issues that are discussed further later in the testimony.

In Section III, we describe and discuss the CAISO's proposal for the design, allocation and auction of CRRs. Sub-sections address how CRRs will be allocated in the context of retail access and participant-funded transmission expansion. Most of the

topics that we discuss in Section III can be found in Section 36, Section 11 (settlements), or Section 24 (transmission expansion) of the tariff that this testimony accompanies.

Section III.A begins with a description of how the CAISO is proposing to define CRRs. In the following discussion we address topics such as the degree to which CRRs are expected to provide a congestion hedge for LSEs and why CRRs do not provide a hedge against transmission losses. In a separate section, we also explain how the CAISO's proposed definition of CRRs addresses issues that we raised in a separate report that we wrote (along with William W. Hogan) on the MRTU in February of 2005. The first sub-section explains how the CAISO has addressed issues concerning the implementation of LAP settlements and pricing, and the second sub-section addresses issues that the LAPs potentially raise for the allocation of CRRs. Our analyses of trial CRR allocations performed by the CAISO in CRR Study 2 indicate that CRR allocations will not necessarily be materially impacted by the use of LAP sinks. However, this finding may not be valid for actual LSE nominations and actual LMP prices, so the CAISO has designed an allocation proposal to include CRRs sinking at sub-LAPS as well as LAPS.

Section III.B contains a detailed description and discussion of how the CAISO is proposing to allocate CRRs to LSEs. Section III.B.1 addresses: the sources and sinks that will be allowed for LSE CRR requests, how tiers will be used in the CRR allocation process, the requirement for validation of CRR sources in the first tiers of the annual and monthly allocations for the first year, how the right to nominate CRRs from inter-tie sources will be pro-rated among the LSEs, the reservation of inter-tie capacity for the

CRR auction, the priority nomination process that will be used to provide LSEs with the opportunity to renew some of their CRRs in the annual allocation processes starting in year 2, and how external LSEs may participate in the CRR allocation. Section III.B.1 concludes with a description of how the CAISO is planning to implement the simultaneous feasibility test for CRRs.

In Section III.B.2 we explain many of the choices that the CAISO made in its proposed CRR allocation process from the standpoint of five economic goals. The objective of allocative efficiency underlies the decision to validate CRR sources only in the first year based on historical data, while the goal of facilitating long-term contracts and hedging motivated the introduction of a priority nomination process for renewing CRRs in subsequent years. A detailed discussion of the priority nomination process can be found in Section III.B.2.b. A third section explains why equity is also a goal and how the proposed allocation process attempts to achieve an equitable CRR allocation. Other parts of this section explain design choices that the CAISO made to strike a balance between the interests of different groups of stakeholders and to avoid unintentionally inequitable allocation outcomes. The final sub-section of III.B.2 discusses the goal of simplicity, the need to control the administrative cost of the CRR allocation process, and how choices made in the design of the allocation process balanced this interest against other economic goals.

Section III.C explains in detail how the CRR allocation will be adjusted annually, monthly, and between annual allocations to take into account the migration of retail load.

Allocation rules have been designed to attempt to fairly adjust both the CRRs and the rights to nominate CRRs of LSEs that lose and gain load.

The rules for the CRR auctions are explained in Section III.D. These are, by and large, very similar to those used in the eastern ISOs. Section III.E. briefly explains that CRRs will also be allocated to parties that fund transmission system expansions. Finally, in Section IV, we offer some brief conclusions.

II. CRR BACKGROUND

A. Definition of CRRs

Q. WHAT IS A CRR AS THAT TERM IS USED IN THE CAISO MRTU PROPOSAL?

A. In LMP markets such as those coordinated by PJM, NYISO, ISO-NE and MISO, and in the LMP market under development by the CAISO, traditional firm transmission rights have been largely replaced by source-to-sink financial transmission rights called CRRs.[4] The ownership of CRRs serves to hedge market participants that have long-term load serving obligations and resource commitments against changes in the level of LMP-based

[4] The concept of financial transmission rights was originally developed by William Hogan and it was first implemented in PJM on April 1, 1998. Source-to-sink financial transmission rights are referred to as FTRs in PJM, New England and the Midwest, TCCs in NYISO, and were referred to as CRRs in the FERC NOPR for a standard market design. In developing its LMP market design the CAISO uses the term CRRs to distinguish the new LMP-based financial instruments from the "Firm Transmission Rights" or "FTRs" that exist within the current zonal market design in California. Most of these regions had provisions for "grandfathering" some traditional third-party transmission rights in the transition to CRRs

congestion charges that they incur in scheduling energy from these resources to meet their load in the day-ahead market.

The owner of a CRR obligation pays or is paid the hourly cost of congestion ($/MWh) between specified locations on the transmission system in every hour of the period to which the CRR applies.[5] Specifically, a CRR from location A to location B entitles the holder to be paid the difference between the congestion component of the day-ahead LMP price at B and the congestion component of the day-ahead LMP price at A.[6] Since the formula used to determine payments to CRR holders is identical to the formula used to calculate congestion charges, if a market participant schedules injections and withdrawals of power in the day-ahead market at the source and sink of its CRR in the megawatt amount of its CRR, the payment and charge will net to zero and the market participant will incur no net congestion charges for its transmission usage (the CRR holder would pay Congestion Component$_b$ – Congestion Component$_a$ in congestion charges for transmission use, injecting power at A and withdrawing it at B, and receive Congestion Component$_b$ – Congestion Component$_a$ for its CRRs). A CRR is therefore financially equivalent to a firm transmission right for transactions scheduled in the day-ahead market because the holder is able to inject power at A and withdraw power at B

---

5 CRRs may be defined as "options" or "obligations," but have generally been implemented as obligations. Unless specifically stated to the contrary, the term CRR will be used to mean a CRR obligation in this testimony. CRR options will be discussed in a later section.

6 CAISO LMP prices will reflect differences in both congestion and losses so CRRs will be settled based on the difference in the congestion components of the LMP prices. In LMP pricing systems that do not include the cost of losses the difference in the congestion components of the LMP prices is equal to the difference in prices so CRRs can be settled in such systems based on the difference in LMP prices between the source and sink.

without paying for congestion. CRR ownership provides the financial equivalent of firm point-to-point transmission service if the transmission usage the CRR holder schedules in the day-ahead market matches its financial rights.

Q. ARE CRRS USED IN OTHER ELECTRICITY MARKETS?

A. Yes. Financial transmission rights with properties essentially identical to those proposed for CRRs in the CAISO market design have been in use in PJM since April 1, 1998 (FTRs), in New York since November 19, 1999 (TCCs), in New England since March 1, 2003 (FTRs), and in the MISO since April 1, 2005 (FTRs).

B. CRR Quantity, Transfer Capability and Revenue Adequacy

Q. HOW MANY CRRS CAN BE AWARDED?

A. Like traditional firm transmission rights, the award of financial transmission rights such as CRRs is intended to be limited by the transfer capability of the transmission system. The number of CRRs awarded is limited by a simultaneous feasibility test to ensure that the awarded CRRs do not exceed 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 must be funded. These payments are intended to be funded by the congestion charges collected by the CAISO in settling

the day-ahead market, not by uplift charges paid by market participants or from CRR auction revenues.

Q. HOW DO CONGESTION CHARGES FUND CRR PAYMENTS?

A. When there is congestion under an LMP pricing system, there will be differences between locational prices across the grid, reflecting congestion charges, that will cause the ISO to collect congestion rents.[7] This must be the case under an LMP pricing system because the existence of congestion necessarily implies that some generator will be paid a lower price for its power than the price at which that power will be sold to load located within a constrained region. It is these congestion rents that fund payments to CRR holders. The congestion rents collected by an ISO, in the form of congestion charges, will be limited, however, by the physical transfer capability of the transmission system. For this reason, the physical transfer capability of the transmission system also limits the CRR payments that can be funded from these congestion rents.

Q. HOW DO ISOS DETERMINE WHETHER THE CRRS THEY ISSUE CAN BE FUNDED FROM THE CONGESTION CHARGES COLLECTED FOR THE USE OF TRANSMISSION SYSTEM?

[7] Congestion rents are produced by the difference between the prices paid to generators and paid by loads. The total congestion rents in an hour are calculated by multiplying the net injections at each location on the CAISO grid by the congestion component of the LMP price at that location.

A. The determination that a set of CRRs can be funded with reasonable assurance from the congestion rents the ISO collects is called CRR revenue adequacy. The property of revenue adequacy for a set of CRRs means that the congestion rents an ISO collects in charges for congestion under LMP pricing will be sufficient for the ISO to fund payments to CRR holders, *regardless of the actual usage of the grid*.

Revenue adequacy is an important issue for CRR systems and is governed by several revenue adequacy theorems. The most basic of these revenue adequacy theorems is William Hogan's 1992 proof that a set of CRR obligations[8] is revenue adequate if the market is cleared and prices determined in a least-cost, contingency-constrained dispatch, and the set of injections and withdrawals corresponding to the CRRs is simultaneously feasible in a contingency constrained dispatch of the same grid that is used to clear the market.[9] An important point is that this proof does not require the CRRs to match the energy schedules in the market. *Any* simultaneously feasible set of net injections and loads can describe a set of revenue-adequate CRRs, and that set of CRRs will remain revenue-adequate for that grid (transmission facilities and contingency set) *even if actual energy schedules on the grid differ from the set of injections and loads matching the CRRs*. The significance and usefulness of the revenue adequacy theorem is that a set of CRRs satisfying the simultaneous feasibility criteria will be revenue adequate not only

[8] CRR obligations entitle the holder to payments if the difference in congestion components between the CRR sink and source is positive, but require payments if the difference is negative.

[9] See William W. Hogan, "Contract Networks for Electric Power Transmission," *Journal of Regulatory Economics*, Vol. 4 #3, September 1992, pp. 211-242.

when grid use (injections and withdrawals) matches CRR sources and sinks but even when grid use is entirely different from the sources and sinks of the awarded CRRs, as long as the transmission grid that was the basis for the simultaneous feasibility test remains fully available in the dispatch used for CRR settlements.

The award of financial transmission rights such as CRRs in either an auction or allocation process is therefore intended to be limited by a simultaneous feasibility condition to reasonably ensure that the congestion charges collected by the ISO in the day-ahead market are sufficient to fund payments to CRR holders. The simultaneous feasibility condition for CRR obligations is that the awarded CRRs must be simultaneously feasible in a contingency constrained dispatch of the transmission system used to schedule the market. In this test, each CRR is modeled as an injection at the CRR source and a withdrawal at the CRR sink of the appropriate number of megawatts. If the simultaneous feasibility condition is satisfied, then the revenue adequacy theorem assures that if the same transmission grid is available in the market as the grid that was used to test the feasibility of the awarded CRRs, and the market is cleared at least cost based on LMP prices, then the congestion rents collected in settling the market will be sufficient to fully fund the required payments to CRR holders, even if schedules are completely different from the CRRs held by market participants.

Q. WILL THE CONGESTION RENTS COLLECTED BY THE CAISO IN THE DAY-AHEAD MARKET ALWAYS BE SUFFICIENT TO FULLY FUND PAYMENTS TO CRR HOLDERS?

A. No. The CAISO will settle CRRs based on prices in the day-ahead market and the congestion rents collected by the CAISO in the day-ahead market will not necessarily be sufficient to fully fund payments to CRR holders if the grid model used to test simultaneous feasibility is different from the grid model used to settle the CRRs in the day-ahead market. LMP-based congestion rent collections may be insufficient to fully fund the required payments to CRR holders if elements of the transmission grid that were modeled as in service in the simultaneous feasibility test for CRRs are modeled as out of service in the market in which the CRRs are settled, as a result of either maintenance or forced outages.[10] In essence, the payments due to CRR holders are hedged by the transfer capacity of the transmission system, and if the transfer capability of the transmission system is reduced, the hedge provided by the transmission system is no longer necessarily sufficient to cover these payments. Conversely, if transmission lines modeled as out of service in the simultaneous feasibility test in the CRR allocation or

[10] Revenue inadequacy may also occur due to other changes in grid availability in the day-ahead market, relative to that modeled in the simultaneous feasibility test for CRRs. These include differences in unscheduled grid use (loop flow), phase angle regulator settings, and transmission limits. There may also be revenue inadequacy if the prices used to settle CRRs are not the result of a least-cost dispatch.

auction process are available in the market in which CRRs are settled, then there is a potential for the collection of a congestion rent surplus in settling the market.[11]

All LMP-based markets must account in one manner or another for the possibility of congestion rent short-falls (or surpluses) arising from transmission outages and returns to service, and different markets have adopted different procedures.[12]

C. CRR Options and Obligations

Q. DESCRIBE THE DIFFERENCES BETWEEN, AND THE POSSIBLE PURPOSES FOR, CRR "OBLIGATIONS" AND CRR "OPTIONS."

A. William Hogan's original revenue adequacy theorem applied to CRRs defined as obligations, which is one of the two types of CRRs.[13] A CRR obligation entitles the

[11] It is also possible in some circumstances for the return to service of a line modeled as out of service in the preceding auction or allocation to give rise to a congestion rent shortfall but this is an unusual circumstance.

[12] In the NYISO, the applicable tariff provides that TCCs will be fully funded; that is, the TCC holder always pays or is paid the full difference between the congestion components of the LMP prices at the point of receipt and delivery. If the congestion rent collections in the day-ahead market are not sufficient to fund these payments to TCC holders, the New York transmission owners make up the congestion rent short-fall and recover these payments in their transmission access charges, which recover the embedded costs of the transmission system. Similarly, any congestion rent surplus in the day-ahead market is credited against the access charge. Since TCC auction revenues are also credited against the access charge, the increase in TCC auction prices attributable to full funding flows into the same account as the payments that make possible the full funding.

In PJM and the Midwest ISO, the applicable tariff provides that payments to FTR holders will be prorated if congestion rent collections are insufficient to fully fund payments to FTR holders. Shortfalls in congestion rent collections during hours in which payments to FTR holders are prorated are made up with surpluses collected in other hours of the month or other months of the year to the extent possible.

[13] Financial rights in PJM and New York were initially defined solely as source-to-sink obligations. This choice was motivated in part by the ease of applying the simultaneous feasibility test to obligations using existing software algorithms. The simultaneous feasibility test for obligations is a contingency-constrained dispatch, a familiar industry problem that many vendors had software to solve.

holder to a payment when the difference in congestion components between the sink and the source of the CRR is positive, but requires a payment by the holder if the difference is negative. A CRR obligation can provide a perfect congestion hedge even in the circumstance in which the CRR obligation entails a payment by the CRR holder, because the transaction hedged by that CRR would receive an offsetting congestion payment for providing counterflow so the net congestion charge would still be zero. Under LMP, a transmission schedule from a high priced location to a low priced location is paid for providing counterflow rather than being charged for congestion. The potential for a CRR to entail payments rather than the receipt of revenues means that CRR obligations can be risky, however, if the CRR is held for speculation rather than to hedge a transaction.

An important feature of CRR obligations is that they are transitive. Thus, any CRR obligation from A to B can be partitioned into two CRRs sinking and sourcing at a common third location. For example, an A to B CRR obligation could be partitioned into two CRRs, one from A to the Hub and the second from the Hub to B, which would receive the same total payments as the A-B CRR, since $(CC_{HUB} - CC_A) + (CC_B - CC_{HUB}) = CC_B - CC_A$.[14] Furthermore, any CRR from A to C can be reconfigured into an A to B CRR by purchasing a C to B CRR, since $(CC_C - CC_A) + (CC_B - CC_C) = CC_B - CC_A$.

It is also possible to define CRRs as options. CRRs defined as options entitle the holder to the difference in congestion components between the CRR source and sink if

[14] CC_A is the congestion component of the price at A.

the difference is positive, but do not require payment when it is negative.[15] The principal difficulty in implementing a system including CRR options has been the complexity of implementing a revenue adequacy test for CRR options. A set of CRR options is revenue adequate if the set of injections and withdrawals corresponding to the CRR options is simultaneously feasible in a contingency constrained dispatch for all possible exercise levels and combinations of exercise levels for every CRR defined as an option.[16] This means that all possible combinations of the CRR options must be simultaneously feasible. To test this would entail running a powerflow test for every possible combination of the awarded CRR options. While this test cannot be literally applied for the award of a significant number of options, software developers have developed approximations that appear to be workable and in 2003 PJM began running auctions in which FTR options as well as obligations have been sold.

---

[15] The transitivity property noted above does not extend to CRRs defined as options. The maximum of ($CC_{HUB} - CC_A$, 0) plus the maximum of ($CC_B - CC_{HUB}$, 0) is not necessarily equal to the maximum of ($CC_B - CC_A$, 0). For example, suppose CC_B = \$30, CC_A = \$20, CC_{HUB} = \$18, then Max ($CC_B - CC_A$, 0) = \$10; Max ($CC_{HUB} - CC_A$, 0) = \$0; and Max ($CC_B - CC_{HUB}$, 0) = \$12.

[16] Scott M. Harvey, William W. Hogan, and Susan L. Pope, "Transmission Capacity Reservations and Transmission Congestion Contracts" (hereafter Harvey-Hogan-Pope 1996) June 6, 1996 (revised March 8, 1997), pp. 41-44. William Hogan, "Financial Transmission Right Formulations," March 31, 2000.

D. Purpose of CRRs

Q. IS IT FEASIBLE TO MANAGE CONGESTION USING LMP PRICING WITHOUT IMPLEMENTING A SYSTEM OF FINANCIAL RIGHTS SUCH AS CRRS?

A. Yes. Neither day-ahead nor real-time congestion management requires implementation of a system of financial transmission rights. It is possible to manage congestion simply using LMP pricing in the day-ahead market and real-time dispatch. New Zealand implemented such a pricing system in 1996 and that pricing system has been successful in managing congestion from a reliability standpoint, without implementing a system of financial transmission rights.

Q. IF LMP-BASED CONGESTION MANAGEMENT CAN BE IMPLEMENTED WITHOUT CRRS, WHAT IS THE PURPOSE OF INCLUDING CRRS IN AN LMP PRICING SYSTEM?

A. CRRs serve three functions in LMP markets. First, they provide a mechanism for an ISO to dispose of the congestion rents collected through LMP congestion pricing. The second and most important purpose of financial rights such as CRRs is to facilitate long-term contracting by load-serving entities ("LSEs") and generators. CRRs accomplish this by permitting market participants to hedge the LMP-based congestion charges associated with long-term power contracts. Third, CRRs can be used to support an equitable transmission cost and benefit allocation by preserving existing entitlements to use of the

transmission system following the transition to LMP pricing, ensuring that the market participants that have a continuing obligation to pay the embedded cost of the transmission system receive the economic value of the transmission system. Importantly, CRRs are designed to achieve these purposes without creating incentives for market participants to withdraw from the ISO's economic dispatch, without undermining reliability or the effectiveness of the ISOs day-ahead and real-time congestion management system and without undermining open access to the transmission system.

1. Distribute Congestion Rents

Q. PLEASE EXPLAIN HOW CRRS PROVIDE A MECHANISM FOR DISTRIBUTING THE CONGESTION RENTS COLLECTED BY THE ISO.?

A. Under LMP pricing, all energy is purchased by loads at the market clearing price at the withdrawal location and all energy is sold by suppliers at the market clearing price at the point of injection. At times when there is transmission congestion, LMP pricing will cause the payments by load to exceed payments to generators. Because an ISO is not entitled to keep this difference, the congestion rents need to be returned in some manner to market participants.

Q. IS IT ESSENTIAL TO HAVE CRRS TO DISTRIBUTE THE CONGESTION RENTS COLLECTED BY THE ISO?

A. No. The funding of CRRs is one method for ISOs to dispose of these congestion rents. There are, however, many ways other than the funding of CRRs through which congestion rents could be returned to market participants. For example, as suggested by members of the Market Surveillance Committee, the congestion rents collected by the CAISO could be returned to transmission customers on a prorata basis based on their real-time transmission usage in the same manner that the CAISO proposes to credit the loss residual to transmission customers.

2. Support Long-Term Power Contracts

Q. PLEASE EXPLAIN WHY CRRS ARE NEEDED TO SUPPORT LONG-TERM POWER CONTRACTS BY LSES AND GENERATORS.

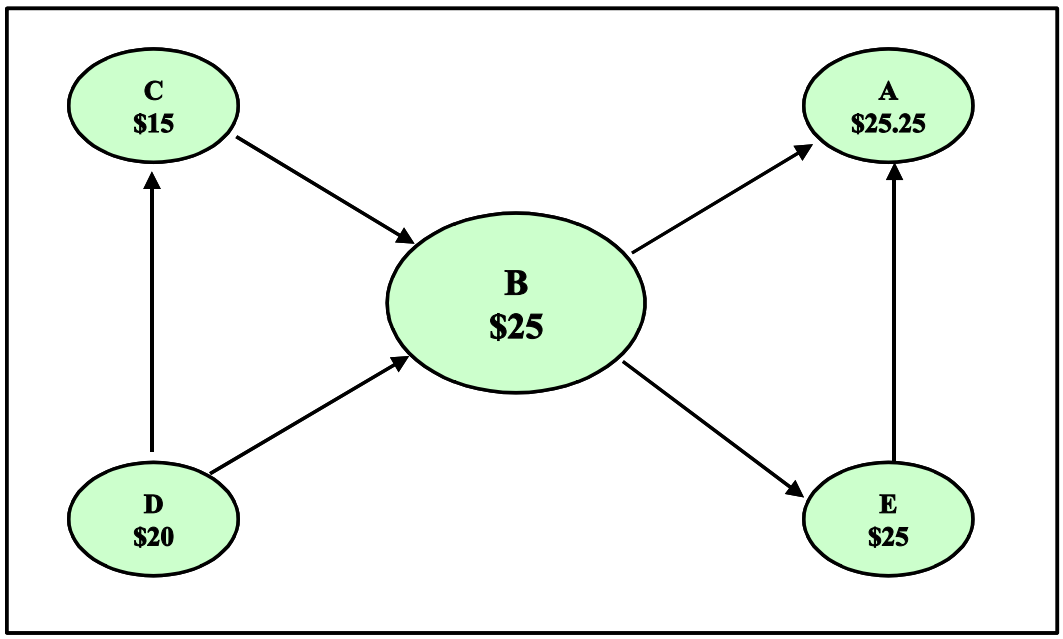
A. The second purpose served by CRRs, to provide a mechanism for market participants to hedge the congestion charges associated with long-term power contracts, is particularly important because it cannot readily be achieved through other means. LMP pricing provides a market mechanism for allocating the short-term use of the transmission grid but it does not by itself provide a framework for market participants to enter into long-term price hedging forward contracts. Congestion charges can be volatile under LMP in both the short- and long-run, and actual redispatch costs are not known under LMP until generators provide their offers for redispatch and transmission schedules are determined. This uncertainty of future congestion charges under a market-based congestion pricing system creates a potential demand for congestion hedges to enable entities entering into long-term contracts or load serving obligations to lock in the congestion costs associated

with their long-term contracts. Absent some form of effective long-term congestion hedge, the risks arising from changes in congestion patterns would deter LSEs from entering into long-term contracts.

Q. PLEASE EXPLAIN WHY THE RISK OF CHANGES IN CONGESTION PATTERNS WOULD DETER LONG-TERM CONTRACTING IF LONG-TERM CONGESTION HEDGES WERE NOT AVAILABLE OR WERE EXTREMELY EXPENSIVE?

A. If an LSE contracting to buy power under a long-term fixed-price contract at the location of a generator that is geographically remote from the LSE's load could not hedge the risk of changes in congestion patterns, the delivered cost of power under such a long-term contract could rise with changes in congestion, making long-term power purchases more risky than simply purchasing power in the spot market. This potential can be illustrated with a simple example. Consider the transmission system portrayed in Figure 1 with expected average prices at locations A, B, C, D and E, as shown. It can be seen that while there is significant congestion between locations C or D and B, there is only sporadic congestion between generation at B and load at A.

Figure 1
Expected Average Prices

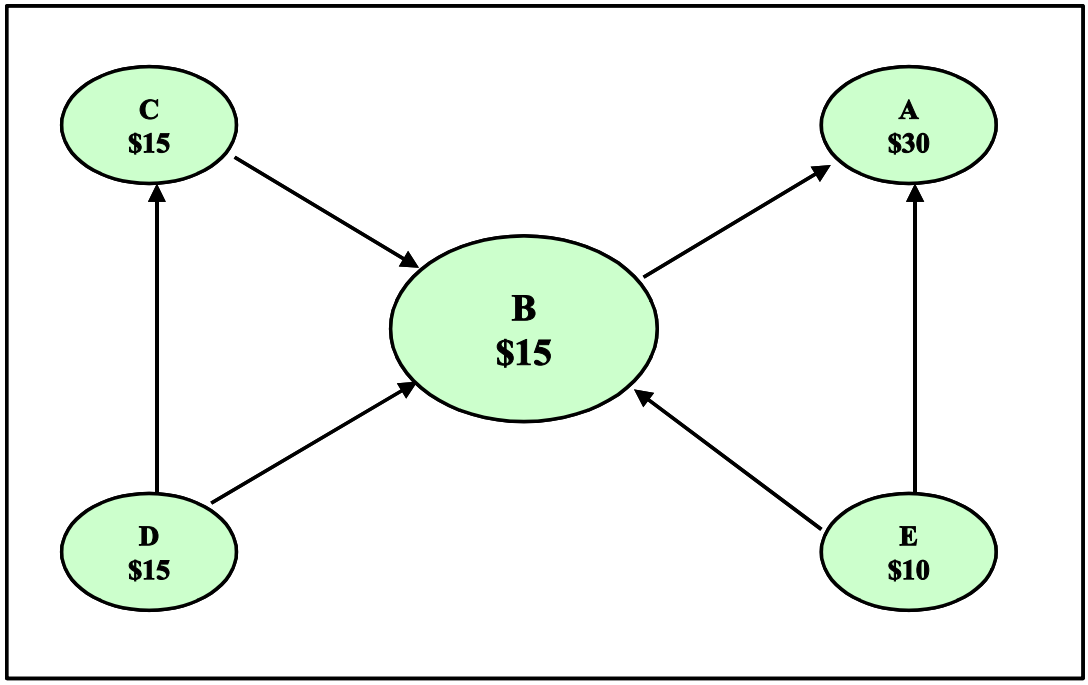


Suppose that an LSE at A entered into a long-term contract to buy power from a generator at B at $24.75, i.e., at a slight discount from the expected average spot price at B. If congestion between B and A averaged $.25 as expected, the total delivered cost of the power would be $25, less than the expected spot price at A. If the cost of power at A and B both rose to $30, such a long-term contract would protect the LSE's load against the increase over the duration of the contract. So, in this example, if there is no unexpected change in congestion, the LSE can hedge itself against a spot price increase with a long-term contract unhedged by CRRs.

Suppose, however, that after the LSE entered into the long-term contract to buy power at B, a large wind power project were developed at location E, creating congestion between both E and A and B and A, and resulting in the average spot prices portrayed in

Figure 2. The LSE would now need to pay congestion charges from B to A of $15/MWh, so the total delivered cost of power under its long-term fixed-price contract would be $39.75/MWh. This would be well above the spot price at A, despite a contract price that is below the spot price at A.

Figure 2
Actual Average Spot Prices



The LSE serving load at A could avoid these congestion risks by contracting to buy power on a delivered basis at A, but that would merely shift the congestion risk to the seller, and the cost of the seller's inability to hedge the congestion risk between B and A would be reflected in the contract price.

Financial transmission rights such as CRRs were developed to address these limitations of a pure spot pricing system for energy and transmission. CRRs enable

market participants to obtain long-term congestion price certainty for the delivery of power from specific generation sources or contractual delivery points to their load, similar to that obtained with traditional firm transmission rights. For instance, in this example, if the LSE had CRRs from B to A matching its long-term energy contract, its price for delivered power would be locked in at $24.75/MWh, plus the fixed (known) cost of the CRRs. By enabling market participants to "lock-in" a price for congestion, CRRs support long-term bilateral contracts in the energy market.[17]

Q. COULD CONGESTION HEDGING FOR LONG-TERM POWER CONTRACTS BE SUPPORTED BY RETURNING THE CONGESTION RENTS COLLECTED BY THE ISO TO LSES ON THE BASIS OF A LOAD RATIO SHARE?

A. No. The variations over time in the congestion charges associated with purchasing power at a specific source to meet a particular load could be quite different than variations in the overall level of congestion rent collections. Returning a pro rata share of the overall congestion rents to an LSE might therefore only slightly reduce an LSE's exposure to changes in congestion patterns and charges arising from a long-term power contract with a generator at a specific location.

[17] Since financial rights such as CRRs are a risk management mechanism, their existence provides no short-term welfare benefits in models in which there is no risk aversion; see Paul L. Joskow and Jean Tirole, "Transmission Rights and Market Power on Electric Power Networks," *Rand Journal of Economics*, Vol. 31, #3, Autumn 2000 (hereafter Joskow-Tirole 2000). Similarly, financial rights provide no long-term welfare benefits in models in which the transmission grid is fixed or investments are funded through a regulatory process, as there is no need to define efficient property rights in order to incent transmission expansion.

Q. CAN THIS POTENTIAL VARIATION IN CONGESTION CHARGES BETWEEN DIFFERENT LOCATIONS BE OBSERVED IN THE CONGESTION CHARGES OF OTHER EXISTING ISOS?

A. Yes. Figure 3 shows the monthly TCC payments for TCCs sourcing at either Niagara (western New York) or Indian Point 3 (outside New York City but East of the Central East transmission constraint) and sinking in Zones G (East of Central East), J (New York City) or K (Long Island) over the period January 2002 through September 2005.[18] It is apparent that the TCC payments between these different sources and sinks rarely move in parallel and at times even move in opposite directions.

[18] The comparison is not extended back to the beginning of NYISO operations because summers prior to 2002 are not comparable to later summers due to the introduction of load pocket modeling in the NYISO day-ahead market for summer 2002.

Figure 3
NYISO TCC Payouts by Month
January 2002 - September 2005

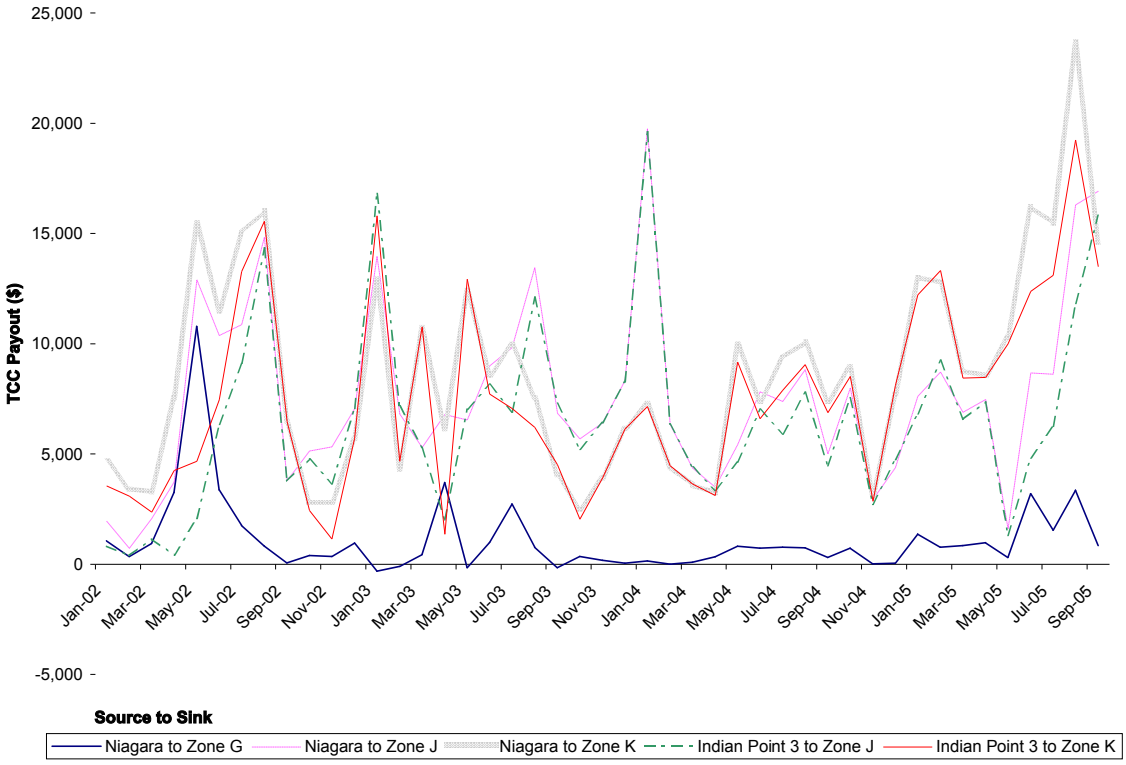


Table 4 shows the correlation coefficients for the monthly payments to a similar set of TCCs over the same period. The payments to a Niagara to Zone G TCC have been inversely correlated to the payments to a Indian Point 3 to Zone J TCC, and have very limited correlation to the payments to a Niagara to Zone J or Indian Point 3 to Zone K TCC.

Table 4
NYISO TCC Payments by Month
Correlation January 2002 - September 2005

NYISO TCC Payout Correlation Matrix	Niagara to Zone C	Niagara to Zone G	Niagara to Zone J	Niagara to Zone K	Indian Point 3 to Zone C	Indian Point 3 to Zone J	Indian Point 3 to Zone K
Niagara to Zone C -- West	1.00	-0.23	0.06	-0.02	0.47	0.24	0.15
Niagara to Zone G -- East		1.00	0.27	0.45	-0.93	-0.20	0.03
Niagara to Zone J -- New York City			1.00	0.63	-0.22	0.88	0.57
Niagara to Zone K -- Long Island				1.00	-0.38	0.43	0.90
Indian Point 3 to Zone C					1.00	0.27	0.06
Indian Point 3 to Zone J						1.00	0.59
Indian Point 3 to Zone K							1.00

Similarly, Figure 5 shows the pattern of the monthly PJM target payments to FTRs sourced at Keystone or Peachbottom and sinking at the PP&L, PECO, or PSEG load zone over the period June 2000 through September 2005.[19] It is apparent that there is even more variation in the payment to these PJM FTRs than observed above in the NYISO data.

[19] PJM introduced its day-ahead market in June 2000; prior to that month FTRs were valued at real-time prices.

Figure 5
PJM FTR Target Payouts by Month
June 2000 - September 2005

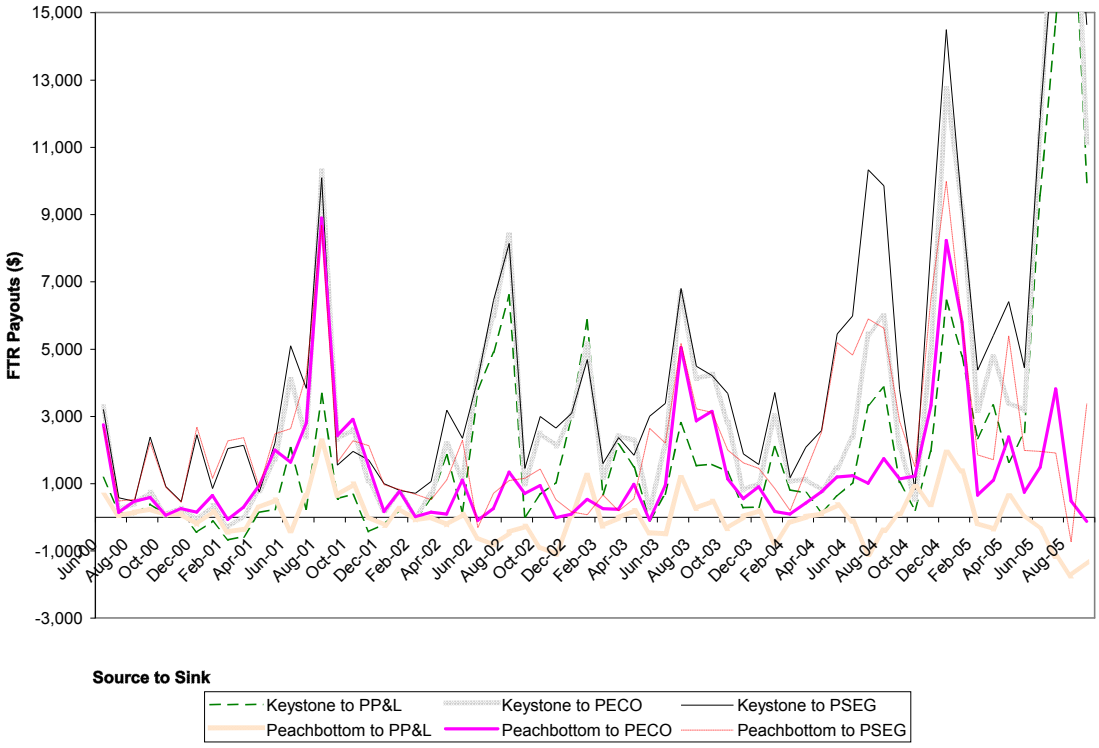


Table 6 shows the correlation coefficients for the monthly payments to the FTRs portrayed in Figure 5 as well as to FTRs sourced at the Western Hub and FTRs sinking in the Pepco Zone. These data reinforce the conclusion from Figure 5 that congestion charges in PJM very often move in quite different directions for generation and load at different locations.

Table 6
PJM FTR Target Payouts by Month
Correlation June 2000 –September 2005

PJM TCC Payout Correlation Matrix	Western Hub to PP&L	Western Hub to PECO	Western Hub to PSEG	Western Hub to PEPCO	Keystone to PP&L	Keystone to PECO	Keystone to PSEG	Keystone to PEPCO	Peach-bottom to PP&L	Peach-bottom to PECO	Peach-bottom to PSEG	Peach-bottom to PEPCO
Western Hub to PP&L	1.00	0.88	0.73	0.71	0.82	0.85	0.81	0.68	0.01	0.45	0.27	0.31
Western Hub to PECO		1.00	0.87	0.58	0.70	0.86	0.83	0.56	0.22	0.78	0.58	0.30
Western Hub to PSEG			1.00	0.51	0.55	0.71	0.83	0.45	0.13	0.68	0.81	0.27
Western Hub to PEPCO				1.00	0.93	0.86	0.86	0.98	-0.41	0.10	0.04	0.84
Keystone to PP&L					1.00	0.96	0.90	0.96	-0.30	0.22	0.04	0.68
Keystone to PECO						1.00	0.95	0.89	-0.13	0.48	0.28	0.63
Keystone to PSEG							1.00	0.86	-0.17	0.45	0.44	0.63
Keystone to PEPCO								1.00	-0.43	0.08	-0.02	0.83
Peachbottom to PP&L									1.00	0.68	0.50	-0.24
Peachbottom to PECO										1.00	0.78	0.08
Peachbottom to PSEG											1.00	0.06
Peachbottom to PEPCO												1.00

If the congestion charges for the various source-sink pairs were highly correlated, then assigning LSEs a share of the overall congestion rent collections might provide the LSEs a reasonable hedge for future congestion charges regardless of the generation sources used to meet the LSE's load or the location of the LSE's load. This has not been the case in New York or PJM, however. Instead, congestion charges in those regions have moved quite differently for financial transmission rights between different sources and sinks. As a result, paying LSEs a share of the overall congestion rent collections would not provide a very good congestion hedge for the future congestion charges of LSEs with an obligation to serve load at particular locations or with long-term entitlements (through ownership or contract) to take power at particular locations.

Q. IF THE CAISO IMPLEMENTED LMP PRICING BUT DID NOT ALLOCATE OR AUCTION CRRS, COULDN'T LSES HEDGE FUTURE CONGESTION CHARGES ASSOCIATED WITH LONG-TERM CONTRACTS BY ACQUIRING CONGESTION INSURANCE FROM FINANCIAL FIRMS?

A. Absent a CAISO coordinated allocation or auction of CRRs, it is likely that some form of congestion hedges would be offered for sale in this market by entities other than the CAISO. It is not likely, however, that the market for congestion hedges would be as liquid, or that the cost of the hedges (i.e., the premium over expected day-ahead congestion values) would be comparable to the cost of CRRs in a CAISO-coordinated auction.

A key feature of the financial rights awarded by an ISO is that so long as the rights awarded satisfy the simultaneous feasibility test, the ISO's payment obligations will be hedged by the congestion rents it will collect on the transmission system. An ISO therefore does not need to estimate future congestion patterns, future energy prices, or the future level of industrial production and electricity demand in order to determine the price at which it will offer CRRs for sale. If gas prices rise from $2.25/mmBtu to $12.50/mmBtu and the payments to CRR holders rise correspondingly, an ISO allocating CRRs to LSEs or selling CRRs in an auction will not incur shortfalls in its CRR account

due to changes in congestion patterns or levels, because its congestion rent collections will increase in parallel with the CRR payments.[20]

This would not be the case for a financial institution selling congestion hedges backed by its stockholders' equity. Such a firm would be exposed to increased liabilities when congestion charges rose, but would not be hedged with an offsetting entitlement to congestion rents. Such a firm would therefore need to limit its risk exposure, because volatile movements in energy markets could impose large losses on its shareholders. Moreover, while financial hedges analogous to CRRs could potentially be obtained in conventional insurance markets, insurance markets are generally not used to hedge against sustained long-term changes in market conditions such as those that would produce long-term changes in congestion levels. Entities would not be willing to bear this kind of unhedged risk unless they were paid a premium over the expected payout, which would raise the overall cost to LSEs of entering into forward contracts for power.

Q. COULDN'T CONGESTION INSURANCE BE OFFERED BY THE SAME KIND OF ENTITIES THAT TAKE POSITIONS IN OTHER FORWARD MARKETS?

A. Yes. But limiting the supply of congestion hedges to those offered by entities willing to bear unhedged congestion risk would likely raise the cost of congestion hedges. While it is common for hedge funds and other risk-taking entities to take positions in forward

[20] This remains true as long as the CRR awards satisfy the relevant revenue adequacy theorems and simultaneous feasibility test.

markets for other commodities, such as natural gas, foreign exchange, heating oil, or agricultural commodities, most financial positions in these markets are taken by market participants with offsetting physical positions, so the financial position reduces risk rather than creating risk. Thus, refiners sell heating oil forward while heating oil consumers buy heating oil forward. Natural gas producers sell natural gas forward while gas distribution companies and industrial customers buy gas forward. Exporters in country A receiving payments for exports to country B in the currency of country B can sell that foreign exchange forward to exporters in country B. Finally, agricultural producers can lock in the price of their output by selling it forward, while food processors can lock in the cost of their inputs by purchasing agricultural products forward.

Futures or options contracts that match physical and financial positions in this manner do not require the same risk premium as unhedged contracts because they can be risk reducing rather than risk increasing for the parties. If a refiner buys crude oil and then sells its heating oil output in the forward market, the forward sale will lock in the refiner's margin and reduce its exposure to movements in energy prices that drive down the price of heating oil. Similarly, the heating oil distributor that sets a seasonal price for its heating oil customers and simultaneously buys heating oil in the forward market reduces its risk through those heating oil futures purchases. Alternatively, a terminal operator could buy #2 oil in the current spot market, take delivery of the #2 oil and then sell the #2 oil in the forward market to lock in its margin on storage. Because these transactions are risk reducing for the refiner, distributor and the terminal operator, none would require a risk premium in order to enter into the futures market transactions.

Conversely, suppose the entity selling the heating oil in the forward market had no physical position in the market and would be obligated to buy heating oil in the spot market to cover any such forward sales. Such an entity might be willing to sell some heating oil forward if it thought the current forward price exceeded the likely future spot price but it would incur risk in doing so and the larger the unhedged position it had to take on, the larger the expected margin it would require. This is the situation that a risk-taking entity would be in if it took a position in the forward market by selling congestion insurance, but had no offsetting physical position in the energy market.

Q. ARE THERE ANY DATA ON THE LEVEL OF PARTICIPATION IN FORWARD AND FUTURES MARKETS BY MARKET PARTICIPANTS WITH VERSUS WITHOUT POSITIONS IN THE PHYSICAL MARKET?

A. Yes. Table 7 (appended) reproduces the open position data posted by the Commodity Futures Trading Commission (CFTC) on a recent day, breaking down the open positions between commercial and non-commercial traders, where the commercial traders are "engaged in business activities hedged by the use of the futures or options markets."[21] Table 7 shows that in most of the oil, gas, electricity and foreign exchange markets shown, 40% or more of both the reported short and long positions are held by commercial

[21] CFTC Backgrounder Number 4-91, July 2004.

traders. The proportion of natural gas basis swap positions held by commercial traders is generally over 70%.

The participation of non-commercial traders in forward markets can be a useful source of additional liquidity at the margin, but if the entities with offsetting physical positions were not permitted to participate in forward markets, the price spreads for consumers would be higher. For example, if refiners were not permitted to sell heating oil forward in NYMEX markets and consumers could only buy hedges from financial firms that would be fully exposed to the offsetting price risk, the cost of heating oil hedges to heating oil consumers would undoubtedly increase. Table 7 shows that only 13.9% of the reported short-positions in #2 Heating Oil NYMEX factors were held by non-commercial traders.

Q. HOW DOES THE ROLE OF COMMERCIAL AND NON-COMMERCIAL TRADERS IN FORWARD MARKETS RELATE TO THE ROLE OF AN ISO IN ALLOCATING OR AUCTIONING CRRS?

A. If an ISO awards CRRs in a manner that satisfies the relevant revenue adequacy theorems and simultaneous feasibility tests, then the ISO is analogous to a commercial trader whose physical position offsets its financial position. An ISO's physical position is its entitlement to collect the congestion rents in the day-ahead market and the application of the revenue adequacy theorem in awarding CRRs will ensure that these congestion rents will offset the forward financial obligation to pay CRR holders.

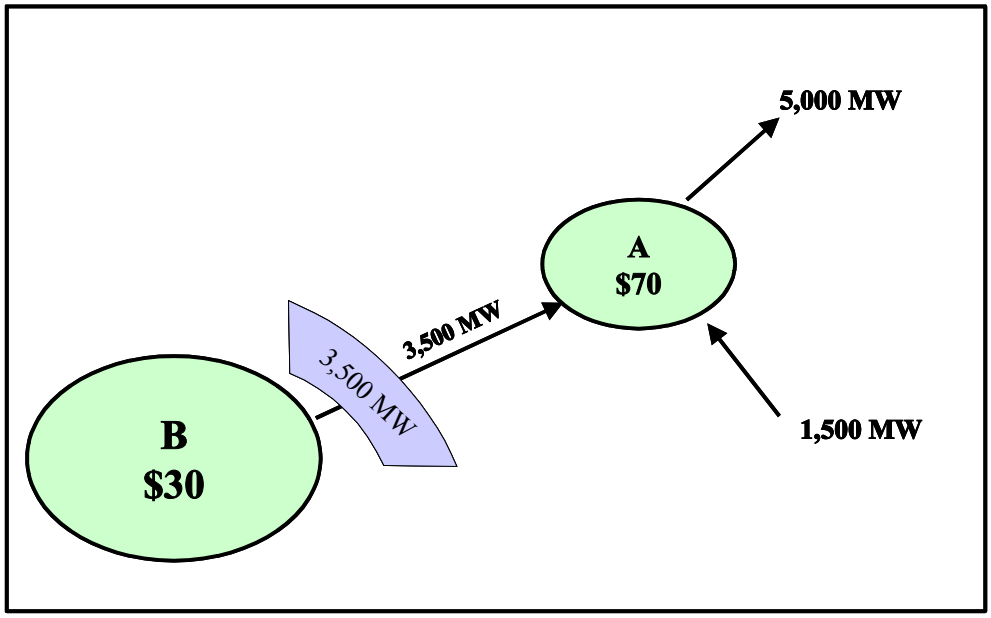
If an ISO were to collect the congestion rents that offset the congestion charges paid by LSEs but were not to make these congestion rents available to support the allocation or auction of CRRs, it should be anticipated that the consequence would be that the market price of congestion hedges for consumers would likely be significantly higher.

Q. WOULDN'T GENERATORS WITHIN A CONSTRAINED REGION HAVE AN OFFSETTING PHYSICAL POSITION THAT COULD SUPPORT THE SALE OF CONGESTION HEDGES TO LSES WITHOUT REQUIRING A SUBSTANTIAL RISK PREMIUM?

A. Yes. But the congestion hedges offered by generators would be supported by their physical positions only to the extent that load within the constrained region (i.e., at the CRR sink) could be met with this generation. The generators would be a high cost source of hedges for the portion of load that would be met with the transfer capability of the potentially constrained transmission system, since either the generator or load would need to bear the cost of changes in congestion.

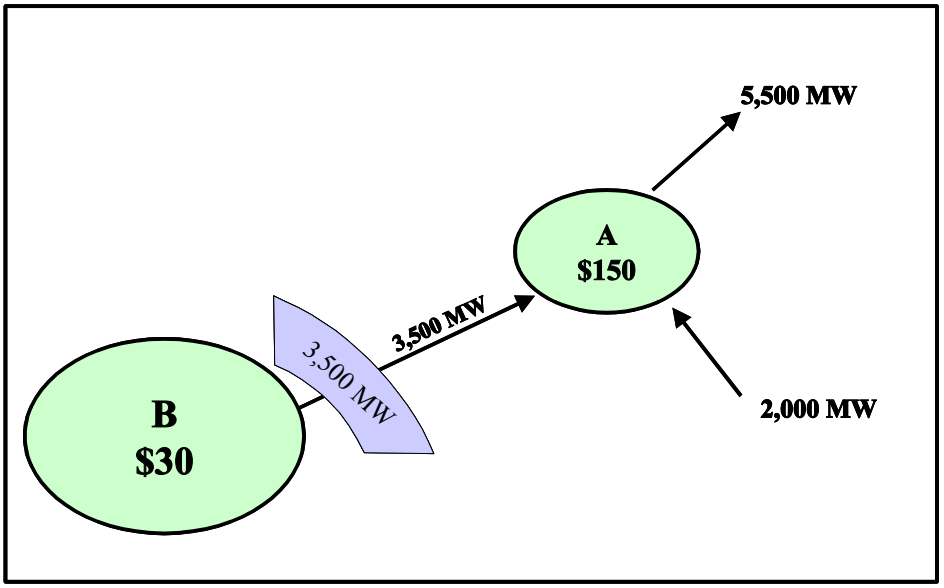
This situation is illustrated by the example portrayed in Figures 8 and 9. Figure 8 portrays the expected pattern of congestion with 1,500 MW of load at A met with local generation and 3,500 MW met with imports from region B.

Figure 8
Expected Prices and Loads



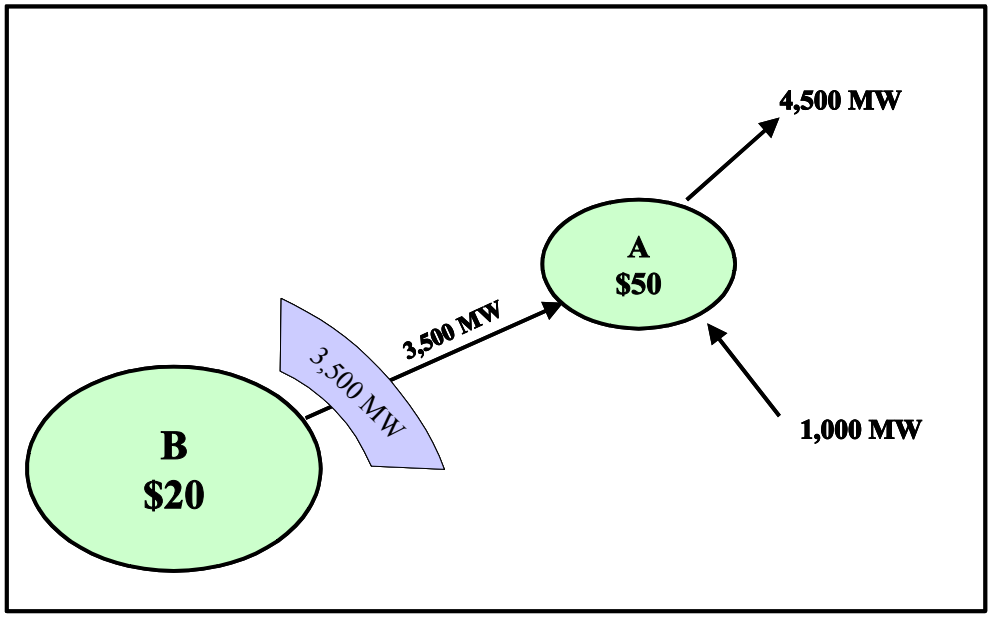
Suppose that there is a potential for a hotter than normal summer that would raise load at A to 5,500 MW. This would require the operation of 500 MW of high cost generation at A and raise the spot price at A to $150 as shown in Figure 9.

Figure 9
High Load and Prices



Conversely, suppose that there is also a risk that the summer will be cooler than normal, with load of only 4,500 MW at A. In this case, spot prices would fall to $50 at A and $20 at B, as shown in Figure 10.

Figure 10
Low Load and Prices



In this example, there would be 1,500 MW of generation at A that would find it potentially attractive to sell power forward at a price of $70 or enter into call contracts at a price of $70. Since this price would exceed what a generator would receive during a cool summer, such a forward sale would be risk-reducing for the generator. There would not be sufficient economic generation at A to hedge the 3,500 MW of load met with imports, however, for that would require that a total of 5,000 MW of generation at A be available at a price of $70/MWh.

While there is more than 1,500 MW of generation at A, the cost of this generation exceeds $70. This generation could not provide a physical hedge for forward power sales at a price reflecting the expected future spot price but only at price in excess of the expected future spot price. The existence of this high cost generation would reduce the

risk premium required to support the sale of additional forward congestion hedges at A because the high cost generation would provide a physical hedge that would cap the potential exposure to higher than expected congestion costs for importing this power from B. However, the amount of this high cost generation could be far less than the amount required to support hedges for all of the transfer capability from B to A. Overall, such generators would be a high-cost source of congestion hedges for the load that could only be met using the transfer capability of the transmission system to deliver low-cost power.

Q. EVEN IF THE ISO DID NOT USE THE CONGESTION RENTS IT COLLECTS TO SUPPORT THE AWARD OF CONGESTION HEDGES, WOULDN'T THESE CONGESTION RENTS BE INDIRECTLY AVAILABLE TO THE MARKET TO SUPPORT CONGESTION HEDGES AS LONG AS THE ISO ULTIMATELY RETURNS THESE RENTS TO LSES IN SOME MANNER?

A. This is true for the market as a whole, but not for individual LSEs. If an ISO returns the congestion rents to individual LSEs through a formula that is unrelated to the hedging needs of the individual LSEs, the congestion rents will be returned, but no entity will be able to use these congestion rents to hedge congestion charges on their particular forward power contracts. The LSEs receiving the congestion rents could collectively agree to pool the congestion rents they receive and use those pooled congestion rents to support

payments to an agreed-upon allocation of CRRs, but that is essentially what the CAISO proposal does.

Q. WHAT ARE YOUR CONCLUSIONS REGARDING THE ROLE OF CRRS IN SUPPORTING LONG-TERM CONTRACTS?

A. CRRs of the general type proposed by the CAISO are important to supporting long-term contracting. Simply assigning a fixed share of total congestion rents to an LSE will not effectively hedge the LSE against future variations in the congestion to that LSE's load. Limiting LSE congestion hedging options to financial hedges offered by generators and non-commercial traders (i.e., excluding CRRs supported by the congestion rents collected by the CAISO) would very likely raise the cost of acquiring these hedges.

3. Support Equitable Allocation of Benefits of Transmission System

Q. WHAT IS THE THIRD PURPOSE OF CRRS?

A. A third purpose served by CRRs is to support an equitable allocation of the benefits provided by the transmission system. LMP pricing by itself does not provide any direct financial benefits to those transmission customers that have prior entitlements to use of the transmission system without paying congestion because they have an ongoing responsibility to pay the embedded costs of the transmission system. As explained above, however, LMP pricing causes the system operator to collect congestion rents when the transmission system is constrained. CRRs provide a mechanism for assigning

this economic value of the transmission system (the congestion rents or entitlement to use the transmission system without paying congestion) to the customers currently having an entitlement to use the transmission system without paying congestion because of their ongoing responsibility to pay the embedded costs of the transmission system.[22] Because CRRs scheduled in the day-ahead market are the financial equivalent of firm transmission rights, the allocation of CRRs to firm transmission customers provides a transition mechanism that preserves the economic value of customers' existing entitlements to use of the transmission system.

Mitigation of cost shifting through the allocation of CRRs does not directly provide welfare benefits, but the practical reality is that transmission customers will not willingly participate in a transmission access and pricing system under which they continue to pay the embedded costs of past transmission investments but the benefits of these investments (the congestion rents) are shared with other market participants. Conversely, if both embedded costs and benefits were shared, then transmission customers of low-cost systems would be unwilling to participate in sharing the higher costs of others. Thus, in practice, an important advantage of allocating CRRs to reflect current entitlements to usage of the transmission grid without paying for congestion is

[22] This allocation of economic value can be direct – through the allocation of CRRs – or indirect – through the allocation of auction revenue rights.

that it permits ”Pareto optimal” changes in transmission usage, such as those resulting from the implementation of an LMP pricing system, without undue cost shifting.[23]

Q. AREN'T THERE OTHER WAYS TO ACHIEVE THESE PURPOSES WITH AN LMP PRICING SYSTEM WITHOUT IMPLEMENTING A SYSTEM OF FINANCIAL RIGHTS?

A. Yes, but a system of financial transmission rights defined in the manner of CRRs accomplishes the three purposes discussed above, disposing of the congestion rents collected by the CAISO, supporting long-term contracting, and facilitating an equitable distribution of the economic value of the transmission system to those having an ongoing responsibility to pay the costs of the transmission system, without conflicting with open access or the incentive of generators to respond to dispatch instructions and LMP prices. This would not be the case for a LMP pricing system that did not include CRRs, such as a system based on conventional firm transmission service.

CRRs differ from traditional firm transmission rights in two respects that define the meaning of a “financial” right and enable the rights to support open access in combination with security-constrained least-cost dispatch of the transmission system. The first difference relative to traditional firm transmission rights is that market participants do not have to hold CRRs from a generation resource to their load in order to

[23] An allocation of resources is “Pareto optimal” if there is no possible reallocation of resources that would increase the utility of one or more individuals and not make at least one individual worse off.

schedule use of the transmission system to deliver power from that resource to meet their load. Second, market participants holding CRRs are paid the market value of their CRRs even if their transmission usage does not match their CRR holdings. Because the payment of transmission congestion rents to CRR holders is independent of their transmission use, CRRs are financial instruments.

The financial structure of CRRs is central to their operation in a LMP system. It is because transmission customers do not have to hold a CRR in order to utilize the transmission system under LMP pricing that the system operator is able to redispatch all generation in real time based on offer prices to meet load at least cost (i.e., to coordinate a competitive market) while maintaining reliable operation. This would be impossible if a generator had to acquire a firm transmission right before being redispatched. Separation of the system of financial transmission rights from the physical dispatch also means that an entity holding CRRs cannot withhold use of the transmission system by failing to schedule transactions to use its entitlement, as would be possible with physical rights.[24]

In addition, because CRRs are financial, they avoid use-it-or-lose-it incentives associated with firm transmission rights. If a generator held a firm transmission right from A to B that had no value unless it was used (i.e., the generator injected power to match its transmission right), the generator's incentive to respond to dispatch instructions and spot pricing would be undermined by its incentive to realize the value of its

[24] An entity holding CRRs could financially benefit from withholding generation to raise the value of its CRRs, but it cannot withhold use of the transmission system.

transmission right. Absent ownership of any form of transmission rights, a generator with incremental costs that exceed the LMP price at its location would have an incentive to respond to dispatch instructions and the LMP price by reducing output and buying power to cover any forward sales whenever the LMP price at its location was lower than its incremental generating costs. Such behavior would be consistent with both least-cost dispatch and reliable grid operation, and is essential to achieving the efficiency and reliability benefits of implementing LMP pricing and least-cost dispatch.

If a generator held a firm transmission right from A to B, however, it would forgo the value of the right if it did not generate power at A to match its input right. Thus, the effective price facing the generator would be the price at B, the sink of its firm transmission right, rather than the LMP price at its location. The generator therefore would have a financial incentive not to respond to dispatch instructions to reduce output as long as the LMP price at the sink of its physical right exceeded its incremental costs. Thus, the generator, in responding to the financial incentives provided by the transmission rights, would operate uneconomically and, by being unwilling to respond to dispatch instructions, potentially undermine the ISO's ability to maintain reliability.

Financial transmission rights such as CRRs are consistent with coordination of transmission grid use by multiple entities (i.e., open access) because CRR owners receive the economic value of their transmission rights regardless of how their generation is dispatched. If the generator in the example had a CRR from A to B, it would be paid the value of its CRR even if it did not generate power, so its output decision would be

affected only by the spot price at its location compared to its incremental generating costs, not by its ownership of CRRs.

III. CAISO PROPOSAL

Q. PLEASE PROVIDE A BRIEF OVERVIEW OF THE CAISO'S PROPOSED CRR DESIGN.

A. The CAISO's proposed market rules regarding CRRs have related elements: the definition and design of the CRR financial instrument, the CRR allocation process, the treatment of CRRs for load shifting between competitive retailers and the CRR auction process.

A. Design of CRRs

1. Description

Q. PLEASE DESCRIBE THE DESIGN AND DEFINITION OF THE CRRS PROPOSED BY THE CAISO.

A. CRRs will be source-to-sink financial rights, essentially identical to FTRs in PJM and TCCs in New York. The CRR source may be a generator node, an inter-tie point, a trading hub or a load aggregation point. The CRR sink may be a generator node, an inter-tie point, a trading hub or a load aggregation point. CRRs will be purely financial, they will not convey any scheduling priority in the day-ahead market or in real-time operations and the CRR holder will be paid regardless of whether it schedules a

transaction matching its CRR in the day-ahead market and regardless of the pattern of its real-time generation and loads.[25] CRR options may be awarded to parties that fund transmission expansions.

Q. WILL THE AWARDED CRRS SATISFY A SIMULTANEOUS FEASIBILITY TEST?

A. Yes. The CRRs awarded in the annual allocation will satisfy a simultaneous feasibility test in combination with reservations for existing transmission rights and transmission ownership rights. The CRRs awarded in the annual auction will satisfy a simultaneous feasibility test in combination with the CRRs awarded in the annual allocation and the reservations for existing transmission rights and transmission ownership rights. The CRRs awarded in the monthly allocation will satisfy a simultaneous feasibility test in combination with the CRRs awarded in the annual allocation and auction, and the reservations for existing transmission rights and transmission ownership rights. The CRRs awarded in the monthly auction will satisfy a simultaneous feasibility test in combination with the CRRs awarded in the annual and monthly allocations, CRRs awarded in the annual auction, and with reservations for existing transmission rights and transmission ownership rights.[26]

---

[25] MRTU Tariff, Sections 36.2-36.22, 36.8.4, 36.9.4 and 36.13.5.

[26] The tariff has special rules in the event a transmission outage modeled in a monthly allocation or auction makes the CRRs awarded in the annual allocation or auction infeasible.

Q. WILL CRRS BE DEFINED AS OBLIGATIONS OR OPTIONS?

A. CRRs allocated to LSEs and sold through the CRR auction will only be defined as in obligations. As explained previously, this means that the CRR payment could be positive or negative.[27] CRR options may be awarded to parties that fund transmission expansions.

Q. HOW WILL THE PAYMENT RECEIVED BY THE CRR HOLDER BE DEFINED?

A. The target payment to the CRR holder will be the difference between the congestion component of the LMP price in the day-ahead market at the CRR sink and at the CRR source. In the case of CRRs sourced or sinking at trading hubs, the congestion component will be the weighted average of the congestion components at the individual nodes comprising the trading hub, based on the weights used to define the trading hub. In the case of CRRs sourced or sinking at a LAP, the congestion component will be the weighted average of the congestion components of the individual nodes comprising the LAP, based on the weights used to define the LAP in the day-ahead market.[28]

---

[27] MRTU Tariff, Sections 11.2.4.2.2 and 36.2.1.

[28] MRTU Tariff, Section 11.2.4.2. We understand that the CAISO intends to ultimately calculate LAP prices for CRR settlements using the same weights used to define the LAP in the simultaneous feasibility test, providing greater assurance of revenue adequacy. This is consistent with the way FTRs sinking at load zones are settled in PJM. We understand, however, that software limitations will not permit CRRs to be valued in the day-ahead market using LAP weights from the simultaneous feasibility test in release 1. The proposed settlement methodology for release 1 is workable and is consistent with the way CRRs sinking at load zones have been settled in NYISO. There is, however, a potential for revenue inadequacy as a result of this difference between

Q. WHAT DO YOU MEAN BY THE REFERENCE TO A TARGET PAYMENT?

A. The target payment to the CRR holder or payment by the CRR holder is the amount that will be paid to (or charged to) the CRR holder if the total congestion rents collected by the CAISO in the day-ahead market for the relevant hour are greater than or equal to the total net target payments to all CRR holders for that hour. If the congestion rents collected by the CAISO in the day-ahead market for the relevant hour are not sufficient to fully cover the target payments for that hour,[29] then the payments to (and charges to) the CRR holders will be proportionately prorated below the target payment until the total settlements with CRR holders just exhaust the total congestion rent collections in the hour. This proration will be applied to both the target payments to CRR holders for positively valued CRRs and the target charges to CRR holders for negatively valued CRRs.[30]

If congestion rent collections exceed the target payout for some hours of the month but are less than the target payment for other hours of the month, the surpluses

---

the load weights used in the various CRR simultaneous feasibility tests and in determining LAP prices in the day-ahead market. In implementing the release 1 methodology, it will be important to limit the potential for substantial congestion rent shortfalls arising from the potential infeasibility of CRRs sinking at LAPS defined based on day-ahead market load weights. To do this, the CAISO should use load weights in the CRR simultaneous feasibility test that are centered on the load weights that will be used in the day-ahead market when the system has high congestion costs to the LAP. This task is likely to be complicated by the broad extent of the LAPs, which can lead to multiple potential constrained subregions.

[29] This could happen, for example, if transmission outages modeled in the day-ahead market render the outstanding CRRs infeasible on the grid used to schedule the day-ahead market.

[30] MRTU Tariff, Sections 11.2.4; 11.2.4.4.

will be used to proportionately make up shortfalls during that month. Any monthly surpluses will remain in the CRR balancing account until the end of the year at which point they will be used to make up remaining shortfalls in CRR payments. True-ups will apply symmetrically to positively and negatively valued CRRs, so that settlement of a positive balancing account will lead to an *increased* charge to negatively valued CRRs that were originally prorated below their target payment. Any remaining excess at the end of the year will be distributed to the participating transmission owners in proportion to their transmission revenue requirement to reduce future access charges.[31]

Q. PLEASE DESCRIBE THE SETTLEMENT ASPECTS OF CRRS (E.G., THE TIMING OF CONGESTION PAYMENTS AND RECEIPTS).

A. Market participants will in general be credited with CRR settlements on the same monthly invoice on which congestion charges are assessed, so the cash impact of congestion charges will be limited to the difference between congestion charges and CRR revenues during the month.

Q. PLEASE DESCRIBE THE TERMS OF THE CRRS THAT WILL BE AWARDED BY THE CAISO.

[31] MRTU Tariff, Sections 11.2.4.4; 11.2.4.4.2

A. For the MRTU, the CAISO has proposed to offer CRRs of two term lengths, seasonal and monthly, with distinct CRRs issued for the on-peak and off-peak periods. CRRs with a seasonal term will be allocated and auctioned in the annual process while CRRs with a monthly term will be allocated and auctioned monthly.[32]

Q. HOW WILL THE SEASONS BE DEFINED FOR PURPOSES OF ALLOCATING AND AUCTIONING SEASONAL CRRS THROUGH THE ANNUAL PROCESS?

A. The CAISO is proposing to use the WECC's definition of seasons.[33] At present, the WECC defines three seasons – Summer (June 1 to October 31); Winter (November 1 to March 31); and Spring (April 1 to May 31).[34]

Q. HOW DO THE CAISO'S PROPOSED CRR TERM LENGTHS COMPARE TO THE TERM OF CRRS ALLOCATED BY OTHER ISOS?

A. PJM allocates auction revenue rights ("ARRs") annually and holds FTR auctions annually and monthly. PJM's annual FTR allocation and auction is for on-peak and off-peak instruments with a one-year duration. Its monthly FTR allocation and auction is the same as that proposed in the MRTU, for on-peak and off-peak CRRs with a one-month duration. In the NYISO, there was a one-time allocation of Existing Transmission

---

32 MRTU Tariff, Sections 36.3.3, 36.8.1 and 36.13.1.

33 MRTU Tariff, Section 36.3.2 Term.

34 Operating Transfer Capability Policy Committee Handbook. http://www.wecc.biz/documents/library/OTC/OTCPC_HANDBOOK_09-23-05.pdf

Capacity for Native Load ("ETCNL"), which are auction revenue rights. Transmission customers were also allowed to convert existing firm transmission to TCCs. The NYISO holds TCC auctions bi-annually and reconfiguration auctions monthly. In the bi-annual auctions, it has sold TCCs with terms ranging from 5 years to 6 months, with the most common auctions being for 6 month and 1 year TCCs.

Q. HOW MANY CRRS WILL BE ALLOCATED ANNUALLY VERSUS MONTHLY?

A. Under the MRTU market design, the CAISO proposes to release a fixed percentage of the transmission capacity as seasonal CRRs for a particular operating year, after accounting for the impact of ETCs and TORs on the available capacity of the grid. The CAISO proposes to make 75% of seasonal transmission system capacity available to support seasonal CRRs that are allocated in the annual allocation process, and to make the remaining capacity (approximately 25%, less any reduction due to outages modeled in the monthly allocation process) to support CRRs allocated on a monthly basis. These are the same percentages that were used in CRR Study 2.[35]

Q. WHAT ENTITIES WILL BE ABLE TO HOLD CRRS?

[35] MRTU Tariff, Sections 36.4, 36.8.2.1, and 36.8.2.2.

A. CRRs will be allocated to LSEs. CRRs can be purchased either in a bilateral transaction or in a CAISO auction by any CAISO market participant that is able to satisfy the appropriate credit requirements.[36]

Q. WHY MUST ENTITIES SATISFY CAISO CREDIT REQUIREMENTS TO HOLD CRRS?

A. Because CRRs are defined as obligations, some CRRs may, in effect, be counterflow and the holder will be obligated to make a payment, rather than receive a payment, based on the prices in the day-ahead market. The willingness of market participants to hold such counterflow CRRs makes the award of additional positively valued CRRs feasible in the simultaneous feasibility test. The CRRs awarded by the CAISO will only be revenue adequate, however, if the holders of negatively valued CRRs make the payments to which they are obligated. It is therefore necessary to apply credit standards to CRR holders. This is particularly important in the case of entities that buy counterflow CRRs in the auction at negative prices, and then must make payments based on prices in the day-ahead market.

[36] MRTU Tariff, Sections 36.5.-36.7.1 and 36.13-36.13.3.

2. Discussion of Design Choices

Q. WHAT QUALITIES OR PROPERTIES OF THE CAISO CRR DESIGN ARE SIMILAR TO THOSE CURRENTLY IN USE IN OTHER RTOs?

A. All of the basic elements of the CAISO CRR financial instrument design are the same as FTRs in PJM and TCCs in NYISO.

Q. WHAT ARE THE PROPERTIES OF THE CRR INSTRUMENT IN COMPARISON TO THE CURRENT FTR INSTRUMENT USED IN THE CAISO MARKET?

A. There are several differences. First, CRRs will be defined between more locations on the grid and will provide a hedge against all congestion charges. The current CAISO FTRs only hedge the holder against congestion charges across the ties or between the active zones. Second, the award of CRRs will be subject to a simultaneous feasibility test based on the full network model. The ability to apply the simultaneous feasibility test to a well-defined set of point-to-point financial rights will allow the CAISO to award a set of rights that more fully utilizes the transmission system. Third, CRRs will be defined as obligations while the CAISO's FTRs were defined as options. Fourth, CRRs will not provide the holder with any scheduling priority, while the current FTRs provide the holder with scheduling priority in the day-ahead market if there is inter-zonal congestion over the path of and in the direction of the FTR. Fifth, FTR payments were subject to reduction based on shortfalls in the congestion rent collections assigned to a specific

inter-zonal boundary, while CRR payments will be subject to proration in the event of shortfalls in the overall CAISO congestion rent collections.

Q. HOW EFFECTIVE A HEDGE WILL A CRR BE FOR LSES AGAINST CONGESTION COSTS?

A. The hedge provided against congestion costs by CRRs in the CAISO market design will be similar to the hedge provided by firm transmission rights. To the extent that there is sufficient transfer capability to meet LSE load with low-cost generation located elsewhere, LSEs will not incur congestion costs for transactions scheduled day-ahead that are matched by CRRs. CRRs do not hedge LSEs against the costs of meeting load with local generation if there is, in fact, insufficient transmission capability to meet load without dispatching this higher-cost local generation. However, firm transmission rights have the same limitation as a congestion hedge. Firm rights that are in excess of the transfer capability of the transmission system cannot be used to hedge LSE congestion costs through delivery of low-cost power into a constrained region, because the power will not all be deliverable if the awarded firm rights exceed transfer capability.

Q. WILL THE CRR DESIGN PROPOSED BY THE CAISO PROVIDE ALL LSES WITH INSULATION FROM ALL CONGESTION COSTS IN EVERY HOUR OF THE YEAR?

A. No. The ability of LSEs to hedge congestion costs with CRRs under the CAISO's proposed design is limited by the transfer capability of the grid. So LSEs in aggregate will not be able to obtain CRRs that hedge all of their load against congestion charges. As explained above, the amount of load within constrained regions that can be met with low cost generation located outside the constrained area is limited by the ability of the transmission system to support imports. If congestion exists, not all load can be met with low cost generation located outside the constrained region, i.e., some high cost generation located within the constrained region must be dispatched at the margin to meet load. In these congested situations, the load in the congested region will pay a high LMP price because of the need at the margin to dispatch high-cost local generation; this price includes congestion costs. Neither CRRs nor traditional firm transmission rights can hedge LSEs against the congestion costs implicitly paid when it is necessary to dispatch high-cost local generation.

Q. COULD THE CAISO CRR DESIGN PROVIDE FOR FULL CRR PROTECTION FOR ALL OF THE LOAD OF LSES AND, IF SO, WOULD IT BE DESIRABLE TO DO SO?

A. If the CAISO did not define CRRs such that the awarded CRRs satisfied a simultaneous feasibility test, it could award CRRs sufficient to cover the entire load of all LSEs. If the awarded CRRs did not satisfy the simultaneous feasibility test, however, they would not actually fully insulate LSEs against congestion costs because the congestion rents

collected by the CAISO would not be sufficient to fully fund payments to all of the awarded CRRs at times when the transmission system is congested.[37] The CAISO would therefore have to collect the funds required to fully fund payments to CRR holders from LSEs through some other charge, so the LSEs would still be exposed to variations in congestion costs in their payment of this other charge.

Q. COULD THE CAISO UPLIFT THE COSTS OF FULL CRR PROTECTION TO ALL LSES?

A. Yes. But the LSEs would then not be fully hedged against congestion charges; they would simply pay the congestion charges through this uplift charge that funds the infeasible CRRs.

Q. IS THE QUANTITY OF CONGESTION HEDGES PROVIDED BY THE PROPOSED CRRS SIMILAR TO THAT PROVIDED BY CRRS OR FTRS ELSEWHERE?

A. Yes. Under the CAISO's CRR proposal, the quantity of CRRs allocated and auctioned will be limited only by the transfer capability of the grid. This is the same constraint on the quantity of available FTRs and TCCs that exists in the markets coordinated by PJM and New York. As in PJM and New York, CAISO market participants will also be able

[37] Revenue inadequacy must exist in this situation as the existence of congestion implies that load must be met in part with high-cost local generation.

to hedge against variations in future congestion charges through contracts with generators located within constrained regions. This will be necessary to the extent that some load must be met with generation located within the constrained region and will be an important change relative to the current system. LMP implementation will eliminate the disincentive for LSEs to contract with higher-cost generation located within constrained regions that exists under the current zonal pricing system.[38]

Q. DOES THE CRR DESIGN PROVIDE LSES A HEDGE AGAINST VOLATILITY IN THE COST OF TRANSMISSION LOSSES?

A. No. CRRs will only hedge the congestion component of CAISO transmission charges. If LSEs wish to hedge themselves against increases in the price of power that would correspondingly raise loss charges, they could do so by entering into forward energy contracts covering their estimated loads plus transmission losses.

Q. COULDN'T HIGHER OR LOWER LOAD LEVELS RAISE OR LOWER LINE LOADINGS, THUS RAISING OR LOWERING MARGINAL LOSSES AND LSE COSTS?

A. Yes, but this will be a relatively minor source of variation in the cost of meeting load.

[38] Since intra-zonal congestion costs are currently recovered in uplift, there is currently no incentive for LSEs to enter into forward contracts with generation within constrained regions.

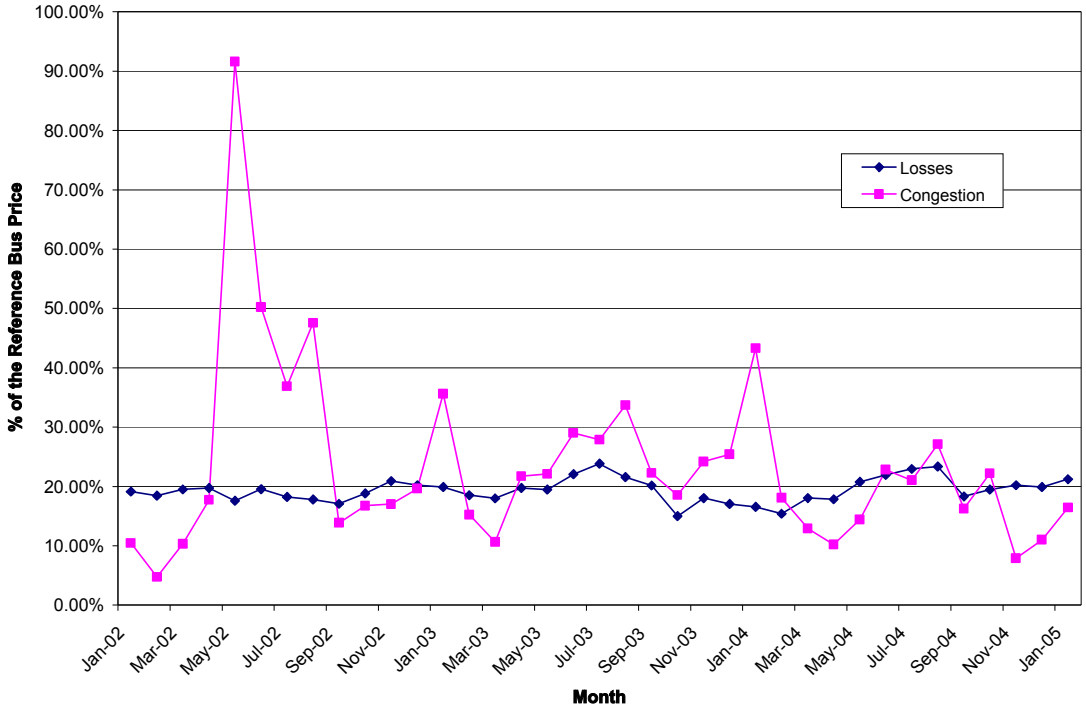
Q. DO CRRS IN OTHER REGIONS PROVIDE A HEDGE AGAINST VOLATILITY IN THE COST OF TRANSMISSION LOSSES?

A. No.

Q. DO DATA FROM OTHER REGIONS CONFIRM THE RELATIVELY LOW VOLATILITY OF THE COST OF TRANSMISSION LOSSES?

A. Yes. Figure 11 portrays the loss and congestion charges to deliver power from Niagara to New York City (Zone J) over the period January 2002 through January 2005 (pre-SMD) as a fraction of the price at the reference bus. It can be seen that the average monthly cost of losses is much more stable than the average monthly congestion charge.

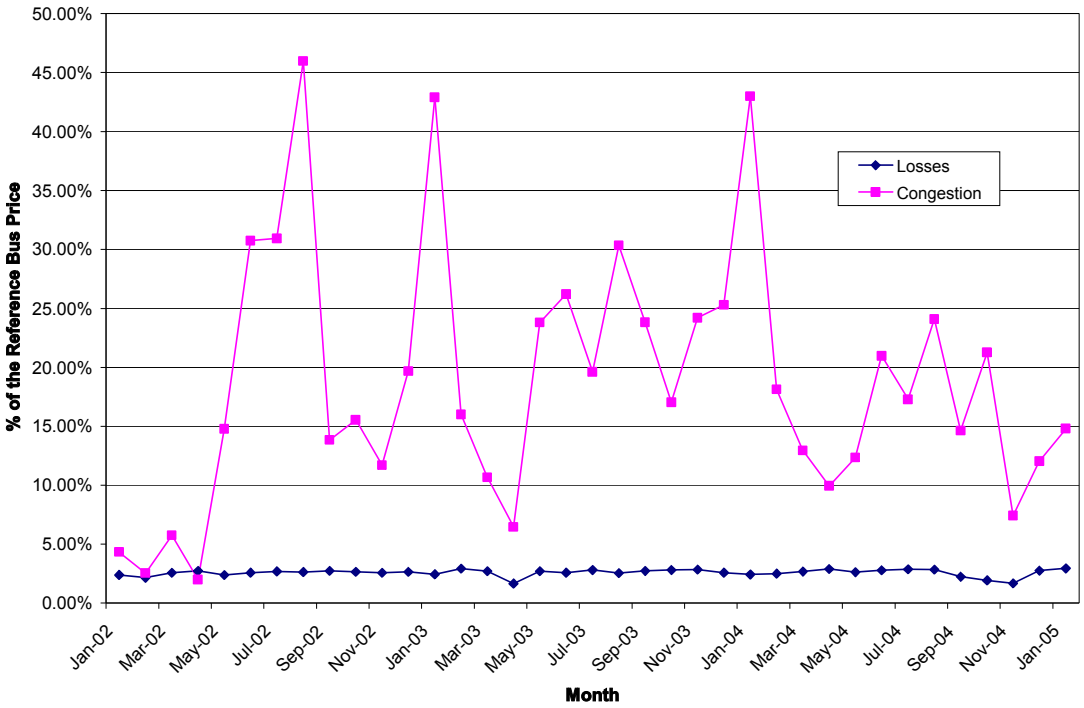
Figure 11
Niagara-NYC Losses and Congestion
As a Percentage of the Reference Bus Price
January 2002-January 2005



Sources: Generator and Zonal Day-Ahead Price files at www.nyiso.com.
Notes: Percentages are calculated from average hourly values for losses, congestion, and the reference bus price.

Figure 12 portrays the average monthly loss and congestion charge between Indian Point 2 and Zone J over the same period and again shows that the congestion charges are much more volatile than the loss charges.

Figure 12
IP2-NYC Losses and Congestion
As a Percentage of the Reference Bus Price
January 2002-January 2005



Sources: Generator and Zonal Day-Ahead Price files at www.nyiso.com.
Notes: Percentages are calculated from average hourly values for losses, congestion, and the reference bus price.

Q. WHAT IS THE REASON FOR AWARDING CRR OBLIGATIONS IN THE CAISO MARKET DESIGN?

A. The award of obligations rather than options is expected to permit the award of a larger number of CRRs in both megawatt and dollar terms than would be the case if LSEs were awarded CRRs defined as options. The reason for this expectation is that CRRs defined as obligations can provide counterflow that relieves otherwise binding constraints in the simultaneous feasibility test, while CRRs defined as options do not provide counterflow

in the simultaneous feasibility test. Because the counterflow provided by CRRs defined as obligations can cause constraints to not bind in the simultaneous feasibility test that would be binding if CRRs were defined as options, there is a potential for more CRRs defined as obligations to be awarded, allowing an allocation of CRRs that more fully utilizes the transmission system in both the allocation and auction processes.

3. Issues Raised in MRTU Report

a) LAP Issues

Q. HAS THE CAISO ADDRESSED THE PROBLEMS WITH RELYING ON BROAD LAPS FOR LOAD PRICING AND CRR ALLOCATION THAT WERE IDENTIFIED IN THE FEBRUARY 23, 2005 REPORT AUTHORED BY WILLIAM HOGAN, SCOTT HARVEY AND SUSAN POPE?

A. Yes. Although the CAISO has retained the feature of LAP pricing for very broadly defined load zones for some LSEs, it has addressed the critical market design problems relating to LAPs that were present in the original LAP formulation through a variety of changes, including the introduction of nodal or subzonal pricing for some loads or LSEs.

The February 23, 2005 MRTU Report identified a number of potential problems with the proposed LAP pricing, some were critical problems that needed to be addressed, while others were areas of concern that needed to be monitored as the market design evolved. First, the proposal to clear LAP bids at a nodal level and then to reaggregate the cleared nodal schedules into infeasible LAP schedules has been addressed by

implementing a zonal clearing of LAP bids.[39] This was the most important problem relating to LAP pricing identified in the February 23, 2005 report.

A second area of concern relating to LAP pricing was the treatment of vertically integrated loads, particularly metered subsystems.[40] The original MRTU rules could have given rise to a variety of inefficient incentives because of the potential for there to be different prices for load and generation at the same physical location. These concerns have been addressed by the new market rules that effectively establish subzonal pricing for vertically integrated LSEs that choose net settlement for their transactions with the CAISO.[41]

A third area of concern relating to LAP pricing was the treatment of price responsive load. Under the original formulation, non-participating demand response would buy power at the LAP in the day-ahead market and sell back demand response at the nodal price in the day-ahead market. As discussed in the MRTU Report, this formulation potentially provided a windfall to loads within constrained areas that actually provided little or no demand response, while providing zero or negative payments to demand response resources located outside the most constrained regions.[42] These

---

[39] February 2005 MRTU Report, pp. 14-20. California Independent Operator Corporation, "Further Amendments to the California Independent System Operator Corporation's Annual Comprehensive Market Design Proposal," May 13, 2005, pp. 18-20. 112 FERC ¶ 61, 013, July 1, 2005, # 22-24, 34. MRTU Tariff, Sections 27.4.1-27.4.1.3.2.

[40] February 2005 MRTU Report, pp. 22-23; 97-98.

[41] MRTU Tariff,. Sections 11.2.3.2.1-11.2.3.2.2.

[42] February 2005 MRTU Report, pp. 23-24, 62-63.

potential problems have been addressed by proposals that would implement nodal pricing for demand response resources, such as the state water project pumps.[43]

Q. DID THE MRTU REPORT IDENTIFY ANY OTHER POTENTIAL DIFFICULTIES WITH THE SETTLEMENT OF LOAD PURCHASES AT AGGREGATE LAP ZONES?

A. Yes. Another potential concern with the LAP pricing system is the potential for arbitrage of predictable shifts in the nodal load weights used to determine LAP prices between the day-ahead market and real-time. As explained in the MRTU Report, this is not a critical problem that necessarily requires changes to the market design; rather its impact needs to be considered in the course of the software implementation.[44]

It is also anticipated that the broad LAPs will somewhat complicate forward hedging by LSEs as well as complicating development by LSEs of appropriate price capped load bids in the day-ahead market, but the LSEs that would be impacted by these limitations generally oppose further unbundling of the LAP price.

---

[43] MRTU Policy Issues White Paper, Section 5.7, p. 49. MRTU Tariff, November 2, 2005. Section 27.4.1.1. Exceptions to LAP Settlement. Appendix A.

[44] February 2005 MRTU Report, p. 21.

b) LAP Issues Relating to CRRs

Q. DID THE FEBRUARY 2005 MRTU REPORT IDENTIFY ANY LAP ISSUES RELATING TO CRRS?

A. Yes. A fourth area of concern relating to LAP pricing concerned the potential for constraints within the LAP to significantly limit the number of CRRs that could be awarded to sink at the LAP as a whole, which could unnecessarily limit the ability of LSEs to obtain hedges against congestion charges through CRRs.[45]

Q. WHAT HAS BEEN DONE TO ADDRESS THE CONCERN THAT CONSTRAINTS WITHIN A LAP MIGHT SIGNIFICANTLY LIMIT THE NUMBER OF CRRS THAT CAN BE AWARDED TO SINK AT THE LAP AS A WHOLE?

A. This is one of the issues that were empirically examined in CRR Study 2. CRR Study 2 assessed the empirical impact of defining CRRs to sink at the LAP versus defining them to sink at disaggregated sub-LAPs. The assessment applied several alternative CRR proration and award rules to market participant CRR nominations.[46] The case referred to as Sensitivity 5 in CRR Study 2 enforced the simultaneous feasibility test at the LAP level, so all CRRs awarded were defined to sink at the LAP. The case referred to as Sensitivity 7 enforced the simultaneous feasibility test at the sub-LAP level, awarding

[45] February 2005 MRTU Report, pp. 94-97.

[46] As discussed below, the MRTU tariff provides for a combination of these alternatives.

CRRs that would not be feasible to the entire LAP but that were feasible to a subset of the regions comprising the LAPs.[47] CRR Study 2 found that application of the simultaneous feasibility test to CRR awards at the LAP level, rather than at the sub-LAP level, had relatively little impact on the level of proration of CRR awards in the scenario in which most CRR nominations were modeled as obligations (except for converted rights and TORs), reducing the average MW proration ratio from 87.45% to 81.49% (see Table 47R of the study) and reduced the proration ratio on a dollar value basis from 90.70% to 86.74% (Table 46).[48]

An important caveat for these findings is that the dollar magnitude of the difference in CRR awards under the two approaches to CRR definition is sensitive to the prices used to value the CRR awards. A different set of simulated prices might result in a higher or lower estimate of the impact of applying the simultaneous feasibility test at the LAP level rather than the sub-LAP level.

Q. DO YOU HAVE ANY OTHER CONCERNS ABOUT REACHING FIRM CONCLUSIONS ABOUT THE IMPACT OF BROADLY DEFINED LAPS OR CONGESTION HEDGING BASED ON THE RESULTS OF CRR STUDY 2?

[47] For the purpose of CRR Study 2 the SCE LAP was decomposed into five sub-LAPs and the PG&E LAP was decomposed into 17 sub-LAPs. The San Diego LAP was not decomposed into sub-LAPs for the purpose of CRR Study 2.

[48] CRR Study 2, pp. 90-93; CRR Study Addendum, p. 9.

A. Yes. It is also important to recognize that the rules that were used to define sub-LAP nominations for the Sensitivity 7 analysis in CRR Study 2 probably resulted in a different set of CRR awards than would actually result from a process in which LSEs nominated CRRs with foreknowledge that the awarded CRRs would be settled at sub-LAP prices. CRR Study 2 sub-LAP nominations were created from CRR nominations LSEs had made from their designated sources to the LAP. For the purpose of the sub-LAP CRR sensitivity model, the CAISO unbundled the LAP CRR nominations into proportional CRR nominations to each of the sub-LAPs composing the LAP.

This methodology gives rise to the potential for the simulated CRR allocation in CRR Study 2 to award CRRs to sub-LAPs that are negatively valued counterflow CRRs that would not have been requested by LSEs in an actual CRR allocation process. This suggests that the actual difference between the allocation results for LAP versus sub-LAP sinks might be smaller on a MW basis than suggested by the CRR Study 2 results (because LSEs might not even request some of the CRRs awarded to sub-LAPs in Sensitivity 7 of the CRR Study 2) and larger on a dollar valued basis than suggested by the CRR Study 2 results (because the dollar value of the CRRs awarded to sub-LAPs would rise in an actual CRR allocation due to the elimination of negatively valued CRR awards that would not be nominated by LSEs in the real-world).

The possibility that the value of the sub-LAP CRRs that would be awarded in an actual allocation process was understated by the CRR Study 2 sensitivity methodology was examined in an additional sensitivity run (reported in Tables 41 and 57 of the CRR Study 2 report), which excluded all negatively valued sub-LAP CRR nominations from

the simultaneous feasibility test. Tables 41 and 57 of the CRR Study 2 report show that the percentage of congestion rents paid out to CRR holders (Table 41) and the average CRR value per MW is markedly higher under this sensitivity case than under the case in which the simultaneous feasibility test was applied at the LAP level. This is consistent with the hypothesis that the impact of the alternative allocation rules is understated by a comparison of the LAP (Sensitivity 5) and sub-LAP (Sensitivity 7) models without taking into account the possible impact on the Sensitivity 7 results of including negatively valued sub-LAP CRRs that would not be nominated. On the other hand, Sensitivity 8 excludes all negatively valued sub-LAP CRRs, not merely those that were not feasible to the LAP,[49] so differences between the Sensitivity 7 and 8 results may not actually indicate a difference between the outcome under models in which feasibility is enforced at the LAP versus sub-LAP levels. Instead, the differences could arise from negatively valued CRRs that were omitted in Sensitivity 8 causing the CRRs to be negatively valued.[50]

Another complication is that the interpretation of the study data for the purpose of understanding the potential impact of broadly-defined LAPs on the quantity and value of CRRs awarded in the proposed CAISO CRR allocation process is affected, in potentially

[49] The value- and megawatt-based proration ratios show smaller differences between Sensitivity 5 and 8 but it needs to be kept in mind that the exclusion of negatively valued CRR nominations and awards impacts both the numerator and the denominator of these statistics.

[50] In addition, this comparison is sensitive to the prices used for the CRR valuation. If these prices do not provide an accurate measure of expected future congestion patterns, this assessment could be far off the mark. For example, in the LMP Study 3b simulation of LMP prices for on peak August, both the East Bay and San Francisco sub-LAPs had prices that averaged lower than the PG&E LAP price. See CRR Study 2, Table 30, p. 69.

complex ways, by the proration rule used to enforce the simultaneous feasibility of the CRR awards in CRR Study 2. As discussed at length in CRR Study 2, the objective function for the proration of CRRs in CRR Study 2 attempted to maximize the megawatts of CRRs awarded. The proration of CRRs in Sensitivity 7, in which the simultaneous feasibility test was applied at the sub-LAP level, did not include any mechanism to favor the award of CRRs that were feasible to the entire LAP. In fact, the Sensitivity 7 allocation rule awarded CRRs sinking at a subset of the sub-LAPs making up the LAP, even when a different set of CRRs could have been awarded to the LAP as a whole without violating the simultaneous feasibility test.[51] The difference between the CRR awards when the simultaneous feasibility test is applied at the LAP or sub-LAP level might be smaller than observed in CRR Study 2 if the proration process used to determine awards in the sub-LAP model (Sensitivity 7) were structured so as to favor awards to the LAP as a whole.[52]

Another factor complicating the use of CRR Study 2 to reach definitive conclusions about the impact of the use of large LAPs on the level of CRR awards is that there are indications that some of the Sensitivity 5 (LAP model) awards are very sensitive to the fact that counterflow CRR nominations were submitted that caused particular constraints not to bind in the Sensitivity 5 simultaneous feasibility test. If the LSEs chose

[51] See CRR Study 2, pp 72-74, 115.

[52] The currently proposed CAISO mechanism for awarding CRRs sinking at sub-LAPs effectively accomplishes this by restricting nominations of CRRs sinking at sub-LAPs to Tier 3. This could perhaps also be implemented through a rule that gave higher weights to the award of CRRs sinking at the LAP.

not to submit these CRR nominations in the actual CRR nomination process, the comparison between Sensitivities 5 and 7 could turn out differently.

Overall, while the CAISO CRR studies may be very valuable for LSEs in developing their understanding of the CRR allocation process, one should be cautious in drawing conclusions regarding likely allocation outcomes based on the study results. Precisely because LSEs are developing their understanding of the CRR allocation process, the choices LSEs made in these studies may not reflect the nominations LSEs will make in the actual CRR nomination process. Thus, while the CRR Study 2 results do not show a material impact on the quantity or value of CRR awards from restricting LSE CRR awards to CRRs sinking at the LAPs, these results may not provide a reliable forecast of the outcome of an actual CRR nomination and award process.

Q. HOW DO THE CAISO'S PROPOSED CRR ALLOCATION RULES ADDRESS THE UNCERTAINTY THAT REMAINS CONCERNING THE IMPACT ON THE QUANTITY AND VALUE OF CRR AWARDS OF REQUIRING CRRS ALLOCATED TO LSES TO SINK AT THE LAPS?

A. The current CAISO filing accommodates this uncertainty through the multi-step process that has been proposed for CRR allocation. In each monthly or annual allocation, the CRRs are allocated gradually in several steps, called "tiers." The tiered allocation serves several purposes. One of these is that CRR nominations will be restricted to CRRs sinking at the LAPs in all but the last tier of any allocation process. Thus, in the annual

allocation LSE nominations of CRRs must sink at the aggregate LAPs in Tiers 1 and 2, but LSEs will be allowed to nominate CRRs sinking at sub-LAPs in Tier 3. If allowing nominations to the sub-LAPs in the last tier has an immaterial impact on the number and value of CRRs that can be awarded because most of the CRRs that LSEs wish to acquire and that can be awarded are defined to the LAP, then there will be few awards of CRRs defined to the sub-LAP in the last tier. On the other hand, if it turns out that a material number of CRRs defined to the sub-LAP are nominated by market participants in the last tier and can be awarded in addition to CRRs sinking at the LAP, then this additional flexibility in obtaining congestion hedges will be available to LSEs under the CAISO CRR allocation proposal.

Q. IF THE CRR STUDY 2 DATA SHOWED THE POSSIBILITY FOR A GREATER ALLOCATION OF CRRS IF NOMINATIONS COULD HAVE SINKS THAT WERE MORE GRANULAR THAN LAPS, WHY DID THE CAISO ULTIMATELY DECIDE TO LIMIT CRR NOMINATIONS AND AWARDS IN TIERS 1 AND 2 TO CRRS SINKING AT LAPS?

A. Since most LSEs will be purchasing power in the day-ahead market at the LAP price, they will be best able to hedge the congestion charges associated with these purchases with CRRs sinking at the LAP as well. Restricting the Tier 1 and 2 CRR allocations to CRRs sinking at the LAP, in effect, maximizes the allocation of CRRs sinking at the LAPs.

The CAISO proposal also provides for the allocation of CRRs sinking at sub-LAPS in Tier 3, to the extent that they are requested by an LSE and satisfy the simultaneous feasibility test.[53] Sub-LAP CRRs can provide a partial hedge for load settled at the LAP, so to the extent that they are requested and can be awarded, they will be made available after the award of CRRs sinking at the LAP.

Q. WHY ARE CRRS SINKING AT THE SUB-LAPS AVAILABLE FOR ALLOCATION ONLY IN TIER 3?

A. Including CRRs sinking at both the LAP and at sub-LAPS in the same simultaneous feasibility test can result in proration patterns that award fewer CRRs sinking at the LAP than would actually be feasible. This was apparent in the base case CRR allocation in CRR Study 2. The intent of allowing the award of CRRs sinking at sub-LAPS, however, is not to award such partial congestion hedges instead of complete hedges but to allow the award of CRRs providing partial hedges in addition to those feasible to the LAP as a whole. This goal could be achieved by developing weighting factors for the objective function that would favor the award of CRRs to the LAP as a whole over CRRs sinking only in particular sub-LAPs, but the CAISO has not developed or tested such an approach. The MRTU tariff therefore achieves this purpose by restricting the award of

[53] MRTU Tariff. Section 36.8.3.1.c. Annual CRR Allocation for CRR Year One. Tier 3. Section 36.8.3.2.b. Monthly Allocation for CRR Year One. Tier 2. Section 36.8.3.5.c. Annual CRR Allocation Beyond CRR Year One. Section 36.8.3.6.b. Monthly Allocation Beyond CRR Year One.

CRRs sinking at sub-LAPS to Tier 3, at which point it is anticipated that most CRRs that LSEs wish to hold and that are feasible to the LAP will have been awarded.

Q. IS IT LIKELY THAT ANY SUB-LAP AWARDS WILL BE MADE IN TIER 3?

A. Tier 3 in the CAISO's proposed initial annual CRR process would cover, at a minimum, the last 25% of LSE load, corresponding to priority 4 in CRR Study 2. Table 13 shows that on average only 61% of the nominated CRRs were awarded in priority 4 of Sensitivity Case 5 of Scenario 1, in which the feasibility test was applied at the LAP level.

Table 13
Scenario I[1] Proration Ratio Metric by Priority
Awarded MW/Nominated MW

	Priority 1	Priority 2	Priority 3	Priority 4
Base Case – Annual Allocation				
Average – All LSEs & LAPs	97.90%	93.86%	81.24%	74.85%
Low LSE	95.87%	77.22%	13.89%	0.00%
High LSE	100.00%	100.00%	100.00%	97.13%
Sensitivity Case 5 - Annual Allocation[2]				
Average – All LSEs & LAPs	97.89%	92.61%	71.40%	60.82%
Low LSE	95.84%	72.63%	7.35%	0.00%
High LSE	100.00%	100.00%	100.00%	91.91%

[1] CVR and Transmission Ownership Rights are options, all LAP nominations.
[2] Simultaneous feasibility test applied at LAP level.

Similarly, Table 14 shows that only 58% of the nominated priority 4 CRRs could be awarded in Sensitivity Case 5 of Scenario 4, which included CRRs sourced at the trading hubs and only awarded CRRs feasible to the entire LAP.

Table 14
Scenario IV[1] Proration Ratio Metric by Priority
Awarded MW/Nominated MW

	Priority 1	Priority 2	Priority 3	Priority 4
Base Case – Annual Allocation				
Average – All LSEs & LAPs	98.38%	94.40%	76.39%	64.51%
Low LSE	97.05%	80.12%	0.00%	0.00%
High LSE	100.00%	100.00%	98.58%	98.26%
Sensitivity Case 5 - Annual Allocation[2]				
Average – All LSEs & LAPs	98.38%	93.58%	69.22%	58.31%
Low LSE	97.03%	80.12%	0.00%	0.00%
High LSE	100.00%	100.00%	100.00%	98.26%

[1] CVR and Transmission Ownership Rights are options, including trading hub nominations and LAP nominations.
[2] Simultaneous feasibility test applied at LAP level.

These data from CRR Study 2 suggest that allowing LSEs to nominate CRRs sinking at sub-LAPs in Tier 3 will likely allow LSEs to acquire CRRs sinking at sub-LAPs in a tier in which most CRR nominations sinking at the LAPs would be prorated.

Q. WHAT IS THE VALUE OF CRRS SINKING AT SUB-LAPS IN HEDGING CONGESTION CHARGES FOR LSES PURCHASING POWER AT THE LAP PRICE?

A. While holding a CRR sinking at a sub-LAP would not fully hedge an LSE against all congestion charges on power purchased at the LAP price, it would fully hedge the LSE against the contribution of congestion charges on load in that sub-LAP to the overall

congestion charges paid by the LSE calculated at the LAP price.[54] The LSE could obtain a complete hedge by entering into generation contracts with suppliers in the other sub-LAPs or purchasing CRRs sinking at the other sub-LAPs in the auction.

The potential for improved hedging through the allocation of CRRs defined to sub-LAPS is illustrated with a simple example in Appendix 4. Allocating CRRs sinking at sub-LAPs will not change the total amount of congestion rents collected by the CAISO but will simply return these congestion rents to LSEs in a manner that better hedges them against variations in congestion charges.

Q. DOES LIMITING THE CRR SINKS TO THE LAP LEVEL FOR ALLOCATED CRRS LOWER THE POSSIBILITY OF REVENUE INADEQUACY?

A. Not in practice. The payout ratios calculated for CRR Study 2 only include the payment to CRRs awarded in the simulated allocation; they do not account for the impact of CRRs that might be purchased in an auction. If the allocated CRRs were limited to those sinking at the LAP and this restriction were, in practice, to result in a material amount of unallocated capacity on valuable transmission constraints, this would probably not result in extra congestion rents being available, unallocated, to make up shortfalls due to outages. Instead, this would likely result in the purchase of point-to-point CRRs across these constraints in the auction, using up the unallocated congestion rents. It is therefore

[54] The LAP price is the load weighted sum of the sub-LAP prices. Holding a CRR to a sub-LAP therefore hedges an LSE against this sub-LAP's contribution to the overall LAP congestion charge.

unclear how much impact there would ultimately be on revenue adequacy from restricting the allocated CRRs to those sinking at the LAP.

Q. WILL THE CRRS ALLOCATED BY THE CAISO IN THE ALLOCATION PROCESS SATISFY A SIMULTANEOUS FEASIBILITY TEST?

A. Yes. This reflects an important change to the CAISO's original CRR allocation methodology. This change was discussed with market participants over the first nine months or so of 2005 and examined in CRR Study 2. The method for applying the simultaneous feasibility test that was planned at the time the MRTU report was prepared, would likely have led to the award of infeasible CRRs.

As discussed in the February 2005 MRTU Report, the earlier version of the CAISO CRR allocation proposal would have applied the simultaneous feasibility test to CRRs sinking in sub-LAPs, but would have changed the definition of the CRRs to the LAP level for purposes of award and settlement. The CAISO planned to award CRRs that were feasible to any sub-lap as CRRs defined to sink at the LAP that included the relevant sub-LAP.[55] This process for applying the simultaneous feasibility test could have resulted in the award of many CRRs that were actually infeasible if the feasibility test were applied with LAP sinks. This potential was confirmed in CRR Study 2,

[55] February 2005 MRTU Report, pp. 95-97.

although the financial impact of this infeasibility was not dramatic in the context of the CRR Study 2 awards and LMP Study 3b prices.[56]

Q. HAS THE CONCERN YOU EXPRESSED IN THE MRTU REPORT REGARDING THE AWARD OF INFEASIBLE CRRS BEEN SATISFACTORILY ADDRESSED?

A. Yes. The issue was discussed at length with CAISO market participants in the stakeholder process on CRR allocation and the CAISO has revised the process it proposes to use for the simultaneous feasibility test. The simultaneous feasibility test will be applied at the LAP level to any CRRs that will be settled based on the LAP prices and will only be applied at the sub-LAP level to CRRs that will be settled at the sub-LAP prices (i.e., sub-LAP CRRs awarded in Tier 3 of the annual allocation process or CRRs awarded to MSS entities electing net settlements).[57]

B. CRR Allocation Process

1. Description

Q. PLEASE DESCRIBE THE PROPOSED PROCESS FOR AWARDING CRRS.

[56] CRR Study 2, pp. 20-21, 63-79.

[57] See, MRTU Tariff. Section 36.4.2. Simultaneous Feasibility. Section 36.8.4.Eligible Sources and Sinks.

A. Under the MRTU, existing transmission contracts (ETCs) pre-dating the formation of the CAISO will be honored by providing transmission service without charging for congestion, as discussed in the Testimony of Lorenzo Kristov. Taking ETCs and other transmission ownership rights (TORs) into account, the CAISO will allocate additional CRRs in annual and monthly processes to the CAISO LSEs on behalf of the CAISO load that they serve (and to LSEs serving external loads that qualify). Finally, the CAISO will also hold auctions of CRRs following each annual and monthly allocation process.

a) Rules for CRR Allocation Requests

Q. WHAT WILL DETERMINE THE ELIGIBILITY OF LSES SERVING CAISO LOAD TO RECEIVE AN ALLOCATION OF CRRS?

A. Under the MRTU, CRR obligations will be allocated to all LSEs on behalf of the load they serve within the CAISO control area that is not already hedged by an ETC or converted right. This load has a continuing responsibility to pay the embedded costs of the transmission grid that are not recovered through other charges. LSEs will receive the CRRs on behalf of the CAISO loads that they serve. The allocation of CRRs to LSEs will be based on the historic level of load, the geographic distribution of load, and the hedging choices of the LSE.

Q. WHAT QUANTITY OF CRRS IN TOTAL MAY EACH LSE REQUEST?

A. The total megawatt quantity of CRRs that an LSE may request to be allocated for load in a specific LAP will be calculated from the seasonal or monthly on-peak or off-peak load duration curve of the eligible LSE.[58] The number, which is called the CRR Load Metric, will be calculated separately for each LSE for each LAP in which it serves load, and for each seasonal or monthly time-of-use period (on-peak or off-peak). The CRR Load Metric is the level of load that is exceeded only 0.5% of the time for the relevant seasonal or monthly time-of-use period. Historical load data from the prior year will be used for the load metric for the annual allocations, and forecast load will be used for the monthly allocations. The data used for the annual allocations will be adjusted to incorporate all load migration that has occurred up to the time of the annual allocation.

The quantity of CRRs that an LSE is eligible to request for a LAP for a seasonal time-of-use period will be calculated by subtracting the quantity of the LSE's load served by ETC, converted ETC and TOR from the seasonal time-of-use Load Metric and multiplying by .75. Similarly, the quantity of CRRs that an LSE is eligible to request for a LAP for a monthly time-of-use period is calculated by subtracting the quantity of the LSE's load served by ETC, converted ETC , TOR and the quantity of seasonal CRRs already allocated to the LSE for that month from the monthly time-of-use CRR Load Metric. LSEs may nominate a quantity of CRRs that is less than the upper bound

[58] MRTU Tariff. Section 36.8.2 Quantity of Load Eligible for CRRs. Section 36.8.2.1 Seasonal CRR Eligible Quantity. Section 36.8.2.2 Monthly CRR Eligible Quantity.

calculated for them for the relevant LAP, season or month, and time of use. The CRR nomination cap for pumped storage load sinks will be based on an average water year.

Q. WHY IS THE QUANTITY OF CRRS THAT AN LSE IS ELIGIBLE TO NOMINATE IN THE ANNUAL ALLOCATION LIMITED TO 75% OF THE OVERALL NOMINATION CAP?

A. This ratio is applied to be consistent with the CAISO proposal to allocate and auction CRRs supported by 75% of transmission capacity in the annual process and award CRRs supported by the remaining transmission capacity in the monthly process. The limit on the quantity of CRRs that an LSE is eligible to nominate in the annual process is set at 75% of the overall nomination cap, so that the LSE CRR requests are not grossly infeasible when represented on a model that includes only 75% of the transmission grid capacity. This approach tends to ensure that all LSEs are awarded a substantial proportion of their annual nominations.

Q. WHY IS THE QUANTITY OF CRRS MADE AVAILABLE THROUGH THE ANNUAL ALLOCATION PROCESS LIMITED TO THOSE SUPPORTED BY 75% OF THE TRANSFER CAPABILITY OF THE TRANSMISSION SYSTEM?

A. By only allocating 75% of the transfer capability of the transmission system in the annual allocation, the CAISO will potentially be able to take account of known maintenance outages in the monthly CRR allocation and avoid some congestion rent shortfalls.

Q. WILL CRR ELIGIBILITY BE REDUCED DUE TO THE OWNERSHIP OF LOCAL GENERATION?

A. The CAISO has proposed that there would be no reduction in the quantity of CRRs allocated to an LSE due to the LSE's ownership of local generation.[59] In particular, a metered sub-system will be eligible for a CRR allocation in the same manner as other LSEs serving internal load, unless the metered sub-system has elected net settlement. Except in this instance, an LSE's load-based cap on its CRR nominations would not be net of local generation, although the LSE would be free to request a lower level of CRRs. This treatment of local generation is significant and a consequence of the aggregation level of the LAP pricing zones. When aggregate load zones covering large electrical areas are used for load pricing, the proposed rules allow an LSE to request CRRs from generation located electrically close to its load in order to hedge itself against congestion charges between the generation node and the LAP, arising from the LAP pricing system. It would not be appropriate under the proposed LAP pricing system to reduce the CRRs allocated to an LSE based on its local generation, since an LSE with generation at the same location as its load could need CRRs from its generation to its load in order to be hedged for changes in congestion charges.[60]

---

[59] MRTU Tariff. Section 36.8.2. "Quantity of Load Eligible for CRRs. Section 36.8.2.1 Seasonal CRR Eligible Quantity.

[60] This possibility was discussed in the February 2005 MRTU Report, pp. 22-23, 97-98, 101, 106, and 119. These incentives may have been reflected in the nomination choices made by LSEs in CRR Study 2.

If a metered sub-system has elected net settlement, its CRR eligibility will be reduced by the MW value of its internal generation, based on its expected use of the CAISO-controlled grid.[61]

Q. WHAT INFORMATION MUST LSES PROVIDE WHEN THEY REQUEST CRRS IN THE ALLOCATION PROCESS?

A. Entities eligible for a CRR allocation in either the annual allocation or a monthly allocation will submit their CRR requests to the CAISO by specifying source, sink (which is generally the LAP), MW quantity and time of use. In the annual allocation, entities may request different CRRs for each season and time-of-use period, but are not required to do so.

Q. WHAT ARE THE ELIGIBLE SOURCES AND SINKS FOR LSE CRR REQUESTS?

A. The CAISO proposes that the source locations for CRRs allocated to LSEs may, as a general matter, be generator PNodes, trading hubs or scheduling points which means that they may be a single generator node, a CAISO-defined trading hub or and inter-tie point.[62] In the case of LSEs with ETC rights that do not sink at the location of the LSE's

[61] MRTU Tariff. Section 36.10. CRR Allocation to Metered Subsystems.

[62] MRTU Tariff. Section 36.8.4 Eligible Sources and Sinks. CAISO Tariff Appendix A. Pricing Node (PNode).

load, the LSE may also nominate CRRs sourced at the sink of the ETC right.[63] As discussed below, the sources for CRRs requested by each LSE in Tiers 1 and 2 of the first-year allocation process will be restricted to the LSE's validated energy source locations and a pro-rata share of residual inter-tie capacity.[64]

LAPs will generally be defined as the sink for CRRs allocated to LSEs, but not for the CRRs used to reserve capacity for loads served by ETCs or for CRRs allocated to pumped storage load, or metered sub-systems electing net settlement. CRRs allocated to LSEs in all but the last tier of the annual or monthly allocation must have a sink location corresponding to one of three standard LAPs: PG&E, SCE and SDG&E. Sub-LAP nominations will be accepted in the final tier, both annually and monthly. In addition, MSS entities that elect net settlement will settle their imbalances at the MSS price and may designate CRRs sinking at the MSS LAP.[65]

In addition to CRR nominations with a single pre-determined source specified by the requestor the CAISO also plans to permit LSEs to use Multi-Point CRR nominations (MPT CRRs).[66] A MPT-CRR nomination will specify a set of injection nodes or

---

63 MRTU Tariff. Section 36.8.3.4. Source Verification.

64 MRTU Tariff. Section 36.8.3.4. Source Verification.

65 MRTU Tariff. Sections 36.8.4 and 11.2.3.2-11.2.3.2.2.

66 These were previously referred to as Network Service CRRs. The name has been changed to avoid confusion with the usual usage of the term network service. The CAISO will be the first ISO to use a process like MPT-CRRs to allocate financial transmission rights. MRTU Tariff. November 2, 2005. Section 36.2.4. Multi-Point CRRs. "A Multi-Point CRR is a CRR specified according to one or more CRR Sources and one or more CRR Sinks and a flow from the CRR Source(s) to the CRR Sink(s), provided that at least the CRR Sink or the CRR Source identifies more than one point. The sum of the MW injections at the CRR Sources must equal the sum of the MW withdrawals at the CRR Sinks." For the allocation process, MPT-CRRs have been discussed primarily as having multiple sources and a single sink, as described in the text.

interties, rather than a single location, and will assign nodal quantity bids or priorities to indicate its preferred distribution of CRR sources over these nodes, as well as acceptable adjustments in case the allocation of CRRs from preferred sources is not feasible to the designated sink. The CRR allocation procedures will award CRRs from the preferred CRR sources, if possible, or else will optimize the award of CRRs from other sources based on the indicated preferences of the LSE. Once a CRR is awarded for a MPT-CRR nomination, the distribution factors for the injection nodes will be fixed. MPT-CRR nomination awards subsequently may be unbundled into single injection node CRRs, consistent with the distribution factors defining the MPT-CRR.[67]

Q. WHAT IS THE PURPOSE OF MULTI-POINT CRR NOMINATIONS?

A. The nomination of MPT-CRRs is a way for LSEs to reduce the likelihood that they are awarded few, if any, of the CRRs they nominate as a result of the proration process.

Q. WHAT WILL BE THE PROCESS FOR LSES TO SUBMIT THEIR CRR NOMINATIONS? WILL ALL REQUESTS BE GIVEN TO THE ISO AT ONE TIME?

[67] MRT-CRRs were not included in CRR Study 2 because the software enhancements required to model them had not been completed.

A. Both the annual and monthly allocation processes will be conducted in tiers, and LSEs will submit separate CRR requests for each tier. All LSEs will provide their requests for a tier at the same time.

b) CRR Allocation Tiers

Q. HOW WILL THE CRR ALLOCATION TIERS WORK FOR THE FIRST ANNUAL ALLOCATION PROCESS?

A. The first annual allocation will consist of three tiers for each season and time of use period (on-peak or off-peak), so that each LSE will submit twenty-four sets of CRR nominations into each annual allocation process for each LAP in which it serves load. In each tier, each LSE will be allowed to nominate up to a certain percentage of the total CRRs that it is eligible to request for a particular LAP/season/time of use period. In Tier 1, each LSE may nominate a megawatt quantity of CRRs for each LAP that is up to 50% of its eligible quantity for the season/time of use period. In Tier 2, each LSE may nominate a quantity of CRRs up to 75% of its eligible quantity, less the quantity of CRRs that it was awarded in the Tier 1 allocation for that season/time of use period. In the last tier, Tier 3, the cap on each LSE's CRR nomination is the difference between the full quantity (100%) of CRRs which it is eligible to receive to that LAP, minus the CRRs that it was awarded in Tiers 1 and 2.

Q. WHAT HAPPENS AFTER EACH LSE SUBMITS ITS ANNUAL NOMINATIONS FOR TIER 1?

A. The ISO will perform a simultaneous feasibility test for the LSE Tier 1 requests as a whole and determine the set of CRRs that can be awarded. The CAISO will then inform each LSE of the CRRs that it was awarded in the Tier 1 allocation; these CRR awards will be final. The LSEs will then have some time to consider the nominations that they would like to make for Tier 2, taking into account the CRRs that were awarded in Tier 1, and other information that the CAISO may make available concerning the Tier 1 simultaneous feasibility test.

Q. WHAT HAPPENS AFTER EACH LSE SUBMITS ITS ANNUAL NOMINATIONS FOR TIERS 2 AND 3?

A. The CAISO will take the same steps as after Tier 1, except that in running the simultaneous feasibility test for Tier 2, it will create fixed reservations for the CRRs that were awarded in Tier 1. Similarly, in running the simultaneous feasibility test for Tier 3, both the Tier 1 and Tier 2 CRR awards will be reserved.

c) Rules for First Annual Allocation

Q. ARE THERE ANY DIFFERENCES BETWEEN THE CRR ALLOCATION PROCESS THAT WILL BE USED FOR THE FIRST YEAR OF THE CRR

ANNUAL ALLOCATION AND THE PROCESS THAT WILL BE USED FOR SUBSEQUENT YEARS?

A. Yes. The allocation process in the first year has a number of unique features that distinguish it from the end-state process that will be used starting in the second year. The most unique feature of the first year is that LSEs may nominate in Tiers 1 and 2 only CRRs sourced at two kinds of sources: validated sources and inter-tie locations.

Q. PLEASE DESCRIBE HOW LSES WOULD SUBMIT CRR NOMINATIONS FROM VALIDATED SOURCES.

A. Validation means that an LSE would demonstrate that the source for its CRR request is either (1) a generating unit that it either owned or had under contract during the historical period to provide energy for a contract term of at least one month or (2) a trading hub at which it had a contract for energy to serve its load during the historical period for a contract term of at least one month. The LSE must demonstrate that during the relevant period it could schedule energy from the source to serve its load. Valid sources include generating units located outside of the ISO control area that were owned or under contract to an LSE and for which the LSE had firm transmission to the CAISO border. For CRRs sourced outside the CAISO control area, the LSE would nominate import

CRRs sourced at the inter-tie for the energy import. Source validation will be based on data for the historical period September 1, 2004 through August 31, 2005.[68]

If the validated energy source is a generating unit, the CRR quantity that may be requested from the source will be restricted to 75% of the unit's Pmax in Tiers 1 and 2 of the first annual allocation. If the validated source is a trading hub, the CRR quantity that may be requested from the source will be restricted to 75% of the contract quantity in Tiers 1 and 2.

Q. PLEASE DESCRIBE HOW LSES WOULD NOMINATE CRRS SOURCED AT THE INTERTIES IN TIERS 1 AN 2 OF THE FIRST ANNUAL CRR ALLOCATION.

A. In addition to nominating CRRs from validated sources in Tiers 1 and 2 of the first annual allocation, LSEs will also be permitted to nominate import CRRs for up to their pro-rata share of residual inter-tie capacity (i.e., capacity at a Scheduling Point). The residual capacity for each inter-tie that can be nominated in Tiers 1 and 2 of the first annual allocation will be calculated by taking the full inter-tie capacity, multiplying by 75%, subtracting the inter-tie capacity associated with validated energy ownership or contracts, and multiplying by 50%. This megawatt quantity will then be divided among all LSEs based on load-ratio shares calculated from each LSE's seasonal eligible CRR

[68] MRTU Tariff. Section 36.8.3.4. Source Verification.

quantity. Each LSE may nominate CRRs from the inter-tie sources in Tiers 1 and 2 of the first annual CRR allocation without verification, up to their individual caps. The other 50% of the residual inter-tie capacity will be reserved in Tiers 1, 2 and 3 to make it available in the annual CRR auction.

Q. WHY ARE LSES ALLOCATED TIER 1 AND TIER 2 NOMINATION RIGHTS FOR ONLY 50% OF RESIDUAL INTER-TIE CAPACITY?

A. This process was adopted so that some CRRs sourced at the inter-ties would be available in the CRR auction. 50% of the residual inter-tie capacity will be reserved in Tiers 1, 2 and 3, so that capacity sourced at the inter-ties will remain available for participants in the ISO-coordinated CRR auction.

Q. WILL INTER-TIE CAPACITY ALSO BE RESERVED IN THE MONTHLY ALLOCATION PROCESS FOR THE FIRST YEAR?

A. Yes. For each month of the first year, source verification will be required for Tier 1 of the monthly allocation. After the verification, the ISO will calculate the capacity that remains available at each inter-tie point, accounting for sources that have been verified for monthly nomination at the inter-ties and the capacity at the inter-ties consumed by the annual CRR allocation and auction results for the month. Half (50%) of the residual capacity will be divided among the LSEs in proportion to their monthly eligible quantities; LSEs may nominate monthly CRRs sourced at the inter-ties up to these caps.

The other 50% of the residual inter-tie capacity will be reserved in both Tiers 1 and 2 of the monthly allocation, and will be available in the monthly auction.

Q. WHAT HAPPENS IF THE QUANTITY OF VALIDATED SOURCES AND INTER-TIE NOMINATION RIGHTS FOR AN LSE EXCEEDS 50% OF ITS LOAD THAT IS ELIGIBLE FOR THE ANNUAL ALLOCATION?

A. The LSE would be required to choose among the CRRs that it is eligible to nominate so as to stay within its 50% cap for Tier 1. It could then nominate additional CRRs up to the higher caps in Tiers 2 and 3.

Q. HOW WILL TIER 3 OF THE INITIAL ANNUAL ALLOCATION DIFFER FROM TIERS 1 AND 2?

A. More flexibility will be permitted in the CRRs that LSEs may nominate in Tier 3. First, there will be no source validation in Tier 3 in the initial allocation; LSEs may nominate CRRs from any source, including the inter-ties. In addition, LSEs may nominate CRRs in Tier 3 that sink at sub-LAPs within the LAP in which they serve load, as well as nominating CRRs that sink at the LAP in which they serve load.

Sub-LAP nominations are permitted in Tier 3 to enable LSEs to obtain partial hedges for load in their LAP, if they wish. Because sub-LAP CRRs may only be nominated in Tier 3, they are evaluated after consideration of all nominations made to the LAP in Tiers 1 and 2 and, presumably, would be nominated in instances in which LSEs anticipate that the award of CRRs to the LAP will not be feasible. The sub-LAP

definition will be used only for evaluating the simultaneous feasibility of the sub-LAP CRRs, and for settlement of the sub-LAP CRRs. The sub-LAPs will not be used for pricing energy purchases, except in the case of LSEs that elect net balancing for a metered subsystem.

d) Rules for Annual Allocations after Year 1

Q. YOU SAID THAT THERE WERE SEVERAL DIFFERENCES BETWEEN THE CRR ALLOCATION PROCESS THAT WILL BE USED FOR THE FIRST YEAR OF THE CRR ANNUAL ALLOCATION AND THE PROCESS THAT WILL BE USED FOR SUBSEQUENT YEARS. WHAT WILL BE DIFFERENT STARTING IN THE SECOND YEAR?

A. After the first year, Tier 1 of the annual allocation will be used to allocate only priority CRRs. In the second and subsequent annual allocations, LSEs may nominate in Tier 1 only the same CRRs for each LAP, season and time-of-use period that they were allocated in the annual allocation for the same LAP, season, and time-of-use period for the immediately previous year.

This priority renewal of CRRs will be subject to several restrictions. First, the quantity of priority CRRs that can be nominated from a given source cannot exceed the quantity of CRRs that the LSE was allocated from that source in the prior annual allocation for the same LAP, season, and time-of-use period. The quantity of each CRR that an LSE may nominate in Tier 1 will be reduced, if appropriate, in proportion to the

LSE's net loss of load from load migration relative to the prior year. CRR quantities eligible for priority nomination will not be affected by secondary market purchases or sales of CRRs. CRRs purchased in the annual CRR auction are not eligible for priority nomination in Tier 1.

Second, there will be a restriction on the overall quantity of priority CRRs that a LSE may nominate. In the second annual allocation (the first year beyond year 1), the megawatt quantity of priority CRRs that a LSE may nominate in Tier 1 will be limited to the lesser of: 1) 33% of its eligible CRR quantity for that season and time of use and 2) the total quantity of CRRs that the LSE received in the previous annual CRR allocation for that season and time of use reduced for any net loss of load. In the third annual allocation, and for all annual allocations after that, the megawatt quantity of priority CRRs that an LSE may nominate will be limited to the lesser of: 1) 66% of its eligible CRR quantity for that season and time of use and 2) the total quantity of CRRs that the LSE received in the previous annual CRR allocation for that season and time of use reduced for any net loss of load.

A third restriction is that priority nominations in Tier 1 will only be permitted for CRRs that have a LAP sink (i.e., LSEs may not nominate CRRs sinking at sub-LAPs that they were allocated in Tier 3 of the prior annual allocation). As in the initial annual allocation, CRRs sinking at sub-LAPS may only be nominated in Tier 3, except in the case of MSS entities electing net balancing.

Q. CAN A LSE BE SURE THAT IT WILL BE ALLOCATED THE CRRS THAT IT NOMINATES WITH PRIORITY INTO TIER 1 OF THE SECOND OR SUBSEQUENT ANNUAL ALLOCATIONS?

A. No. The CAISO will run a simultaneous feasibility test for the Tier 1 priority nominations. There is no guarantee that all of these nominations will be awarded as CRRs in Tier 1, although there is a high likelihood that they will be feasible since they were feasible in the prior allocation. It is possible, however, that the decision of other LSEs not to nominate CRRs that they were awarded in the prior annual allocation could render other CRRs awarded in the prior allocation infeasible. If an LSE is not awarded a CRR that it nominates in Tier 1, it may nominate the CRR in the following tiers of the allocation process.

Q. HOW WILL THE TIER 2 ALLOCATION BE CONDUCTED AFTER THE FIRST ANNUAL ALLOCATION?

A. The Tier 2 allocation also will be conducted differently in the second and subsequent annual allocations than in the first allocation. In Tier 2, there will be no priority CRR nominations as in Tier 1 of year 2, and after year 1 there will be no validation. LSEs may nominate CRRs from any permitted source: generator node, load zone, trading hub or inter-tie. Each LSE may nominate CRRs in Tier 2 up to 50% of the quantity of CRRs for which it is eligible, less the quantity of CRRs that it was allocated in Tier 1 for a given LAP, season and time of use. In addition, each LSE may nominate CRRs for up to 50%

of the net load it has gained through load migration in the relevant period. This provision, which applies only after the first annual allocation, gives priority in Tier 2 to LSEs requesting CRRs to hedge load gained through load migration.

Q. HOW WILL THE TIER 3 CRR ALLOCATION BE CONDUCTED AFTER THE FIRST ANNUAL ALLOCATION?

A. Tier 3 will be the same for the second and subsequent annual allocations as in the first year. In Tier 3, LSEs may request CRRs from any permitted source to either a LAP or sub-LAP sink. Each LSE may request CRRs for up to 100% of its eligible quantity for a given LAP, season and time of use, after taking into account the CRRs that it has already been allocated in Tiers 1 and 2. This quantity includes load growth and any net shift in retail load.

Q. AFTER YEAR 1, WILL THE CAISO CONTINUE TO RESERVE 50% OF THE RESIDUAL INTER-TIE CAPACITY FOR SALE IN THE CAISO-COORDINATED CRR AUCTION?

A. Yes. In the second and subsequent annual allocations, the ISO will reserve 50% of the residual inter-tie capacity in Tier 3 of the annual allocation, so that it will be available as a source in the annual auction. The residual will be calculated by subtracting from the

capacity available at the scheduling point the inter-tie capacity used by CRRs awarded in Tiers 1 and 2 of that allocation.[69] Inter-tie capacity will not be reserved in Tiers 1 and 2.

e) Rules for Monthly Allocations

Q. PLEASE EXPLAIN THE MONTHLY ALLOCATION PROCESS FOR CRRS. HOW WILL THE TIERS WORK FOR THE MONTHLY PROCESS?

A. One-hundred percent of the monthly available grid capacity will be allocated in the monthly allocation, taking into account the CRRs previously allocated during the annual allocation. The monthly allocation will consist of two tiers for each time of use period (on-peak or off-peak), so that each LSE will submit four sets of CRR nominations into each monthly allocation process for each LAP in which it has load. In each tier, each LSE will be allowed to nominate up to a certain percentage of the total CRRs that it is eligible to request for a particular LAP/month/time-of-use period. In Tier 1, each LSE may request a megawatt quantity of CRRs that is up to 50% of its eligible quantity for the LAP/month/time-of-use period. In Tier 2, each LSE may nominate a quantity of CRRs up to 100% of its eligible quantity, less the quantity of CRRs that it received in the Tier 1 allocation for that LAP/month/time-of-use period.

[69] MRTU Tariff. Section 36.8.4.1. Import CRRs.

Q. WHAT HAPPENS AFTER EACH LSE SUBMITS ITS MONTHLY NOMINATIONS FOR TIER 1?

A. The ISO will take the same steps to evaluate LSE CRR nominations as in the annual process. It will perform a simultaneous feasibility test for the LSE Tier 1 requests as a whole, using a network model that contains all transmission capacity that is available for the monthly allocation (i.e., all transmission capacity, taking into account outages and derates). The ISO will then communicate to each LSE the CRRs that it received in the monthly Tier 1 allocation; these CRR awards are final. The LSEs will then have some time to consider the nominations that they would like to make for Tier 2, taking into account the CRRs that they received in Tier 1, and other information that the ISO may make available concerning the Tier 1 simultaneous feasibility test.

Q. WHAT SOURCES AND SINKS MAY LSES REQUEST IN THE FIRST YEAR OF THE MONTHLY CRR ALLOCATION PROCESSES?

A. During year 1, nominations into Tier 1 of each monthly allocation must be from validated sources or for an LSE's share of the residual monthly inter-tie capacity as described above. Sinks for CRR requests must be LAPs in Tier 1, but may be LAPs or sub-LAPs that are within the requesting LSE's LAP in Tier 2.[70]

[70] MRTU Tariff. Section 36.8.3.4. Source Verification.

Q. DOES THE MONTHLY CRR ALLOCATION PROCESS DIFFER FOR YEAR 1 OF THE CRR ALLOCATION VERSUS SUBSEQUENT YEARS?

A. Yes. There will be no validation in Tier 1 after Year 1, and no reservation of inter-tie capacity in Tier 1. Starting in year 2, 50% of the residual inter-tie capacity will be reserved in Tier 2, after accounting for the inter-tie capacity used by the CRRs allocated in Tier 1 and by the CRRs awarded in the annual allocation and auction valid for that month. There will be no priority nomination of CRRs in the monthly CRR allocation process for any year[JF1].[71]

Q. CAN LSES SERVING LOADS EXTERNAL TO THE CAISO ACQUIRE CRRS IN THE ALLOCATION PROCESS WITHOUT PARTICIPATING IN THE CRR AUCTION?

A. Yes. The CAISO has defined a firm transmission service product that will entitle LSEs serving external loads to nominate CRRs in the annual CRR allocation process, so long as they make a showing of legitimate need for the CRRs they nominate and prepay the appropriate wheeling access charge for the CRRs they nominate.[72] External LSEs that prepay for transmission service will incur the same continuing obligation to pay the embedded costs of the CAISO grid as CAISO LSEs and will be able to nominate CRRs in the annual and monthly allocation process. Their nominations will be considered in

[71] MRTU Tariff. Section 36.8.3.6. Monthly Allocation Beyond CRR Year One.

[72] MRTU Tariff. Section 36.9. CRR Allocation to LSEs Serving External Load. Also see Sections 36.9.1-36.9.5

the tiered allocation processes simultaneously with CRR nominations from the internal LSEs. The external LSE will receive the nominated CRRs if they clear the relevant simultaneous feasibility test. The prepaid access charge will be refunded for any CRRs that are not cleared.[73] External LSEs may not nominate CRRs to serve external load that is served through an ETC, converted ETC or TOR.

Q. HOW WILL THE CAISO ASSESS A "LEGITIMATE NEED" IN DETERMINING ELIGIBILITY OF EXTERNAL LOAD SERVING ENTITIES FOR CRR ALLOCATIONS?

A. The determination of a legitimate need will be based on whether the LSE owns or has a long-term power purchase contract with generation internal to the CAISO's control area for the time period covered by its CRR request.[74]

f) Simultaneous Feasibility Test

Q. PLEASE DESCRIBE THE TRANSMISSION MODEL THAT THE SIMULTANEOUS FEASIBILITY TEST WILL USE TO EVALUATE THE CRR REQUESTS THAT LSES MAKE ON BEHALF OF INTERNAL LOAD.

[73] MRTU Tariff. Section 36.9.2. Prepayment of Wheeling Access Charges.

[74] MRTU Tariff, Section 36.9.1. Showing of Legitimate Need.

A. For the simultaneous feasibility test, the CAISO will use its most up-to-date DC network model, which is based on the full network AC model used in the Day-Ahead market. The annual transmission model generally will assume that all lines are in service, but will take into consideration long-term scheduled transmission outages, OTC adjusted for any long-term derates, and TOR. The monthly transmission models will be adjusted for planned outages and derates during the month, OTC adjusted for derates occurring during the month and TOR. As indicated previously, the annual model will include only 75% of the transmission capacity of each facility. A new transmission facility will be included in the monthly and annual allocation models once it is energized. The CAISO will use seasonal load distribution factors for on-peak and off-peak periods to assign load to nodes within the LAPs for purposes of the simultaneous feasibility test.

Q. WHY DOES THE FULL NETWORK MODEL USED IN THE ANNUAL ALLOCATION OPERATE UNDER AN "ALL LINES IN SERVICE" ASSUMPTION INSTEAD OF ACCOUNTING FOR KNOWN OUTAGES?

A. Many outages would not be known sufficiently far in advance to be reflected in the seasonal CRR allocation. In addition, the duration of most maintenance outages would be for only a portion of the period covered by a seasonal CRR, so modeling the outages in a seasonal allocation would unduly reduce the availability of CRRs. Since the CAISO anticipates that most outages would not reduce transfer capability by more than 25%, their impact can be taken into account in the transmission model used for the allocation

of monthly CRRs without giving rise to infeasibility in the award of CRRs on a seasonal basis.

Q. PLEASE DESCRIBE HOW EXISTING FINANCIAL OR PHYSICAL TRANSMISSION RIGHTS WILL BE TAKEN INTO ACCOUNT IN THE SIMULTANEOUS FEASIBILITY TEST USED FOR THE CRR ALLOCATION PROCESS.

A. The CAISO simultaneous feasibility test for the CRR allocation will take ETCs, converted ETCs and TORs into account so that the CRRs allocated to LSEs will not cause revenue inadequacy. It will evaluate the feasibility of ETCs, Converted ETCs and LSE CRR nominations simultaneously, as well as any TOR capacity that has not been captured by adjustments to the network model. Higher priorities or weights will be assigned in Tier 1 to ETC reservations and converted ETCs than to LSE CRR nominations to ensure that LSE Tier 1 CRR nominations are prorated in Tier 1 to accommodate ETC reservations.

ETCs, whether converted or not, will be included in the simultaneous feasibility test for the CRRs allocated to LSEs by representing them in the powerflow model as fixed CRR obligations that have sources and sinks corresponding to the ETC entitlement. This modeling approach will reserve from the LSE CRR allocation process the transfer capability needed to support the obligation to provide transmission to the ETC customers between the source and sink. These CRR reservations will be represented in the

simultaneous feasibility test used to allocate CRRs, but will not be allocated to the ETC transmission customers.

The transmission capacity needed to support TORs either will be deducted from the annual or monthly network model or will be reserved, like ETC, in the simultaneous feasibility test for LSE CRR nominations.

Q. DOES THE CRR DESIGN ACCOMMODATE HOLDERS OF EXISTING TRANSMISSION RIGHTS?

A. Yes. The allocation of CRRs to CAISO LSEs will have no impact on the CAISO's ability to honor ETCs. The details of the treatment of ETCs under the MRTU market design are discussed in the testimony of Lorenzo Kristov.

Q. WHAT METHOD WILL BE USED TO DETERMINE WHICH LSE CRR NOMINATIONS ARE AWARDED AND WHICH ARE NOT, WHEN A REDUCTION IN AWARDED CRRS IS NEEDED TO MAINTAIN SIMULTANEOUS FEASIBILITY FOR A GIVEN RUN OF THE MODEL?

A. The reductions will be determined through the optimization formula used for the CRR allocation. This formula will maximize the total megawatts of CRRs that are allocated in each tier, so the determination of which CRRs are reduced depends on the relative effectiveness of reductions in the award of different CRRs in relieving constraints that are binding or overloaded in the power flow for the simultaneous feasibility test.

Higher weights will be assigned to ETC than to CRR nominations in Tier 1 of the simultaneous feasibility test, so that LSE CRR nominations will be reduced before ETC reservations. The same procedure will be used to represent any TOR that has not been removed from the network model prior to the simultaneous feasibility test.

Q. WHAT WILL HAPPEN IF TORS AND ETC RESERVATIONS ARE NOT FEASIBLE ON THE GRID MODEL USED FOR THE ANNUAL CRR ALLOCATION, EVEN BEFORE CONSIDERING LSE CRR NOMINATIONS?

A. The TOR and ETC reservations will be limited to those that are feasible on the annual grid model. The TOR and ETC will be honored in full, it is simply the reservations in the annual allocation and auction model that will be reduced. **[Lorenzo: check.]**

Q. WHAT WILL HAPPEN IF THE COMBINATION OF TORS, ETCS, CONVERTED ETCS AND LSE SEASONAL CRRS FROM THE ANNUAL ALLOCATION AND AUCTION DO NOT SATISFY THE SIMULTANEOUS FEASIBILITY TEST ON THE NETWORK MODEL USED FOR THE MONTHLY ALLOCATION AND AUCTION?

A. If the ETCs, converted ETCs, TORs and seasonal CRRs were not feasible for some reason, the ISO would adjust the transmission model to restore feasibility prior to evaluating the LSE CRR requests for a given month/time-of-use period. The CAISO will add outages to the network model, and adjust the rating limits on binding constraints just

enough to restore the feasibility of the seasonal CRRs. If, for example, the TOR, ETC, converted ETCs, and previously awarded CRRs caused 105 megawatts of energy flow on a transmission facility with a 100 MW limit, the ISO would increase the line limit on this transmission facility in order to restore feasibility, and to enable the ISO to run a simultaneous feasibility test for the monthly LSE CRR allocation.[75]

Q. WHY IS IT NECESSARY TO ADJUST THE MONTHLY TRANSMISSION MODEL IN THIS MANNER?

A. If no step were taken to restore the simultaneous feasibility of the TORs, ETCs, converted ETCs and previously awarded CRRs, then it would probably not be possible for any monthly LSE CRR awards to satisfy the simultaneous feasibility test, even if the awards had no impact on the overloaded transmission facility. This procedure will also make it possible to run a monthly CRR auction to allow the reconfiguration of previously awarded CRRs, even if outages have made the outstanding CRRs infeasible on the transmission grid network model used for the monthly auction.

Q. WON'T THIS PROCEDURE FOR RESTORING THE FEASIBILITY OF THE ETCS, CONVERTED ETCS AND TORS LEAD TO REVENUE INADEQUACY?

[75] MRTU Tariff Section 36.4.2. Simultaneous Feasibility.

A. It might, but if it does, the reason would be the initial infeasibility of the ETCs, converted ETCs, and TORs. The procedures that the ISO is planning to use, if needed, to address this infeasibility enable it to allocate CRRs to LSEs on behalf of native load, while doing its best to minimize the amount of revenue inadequacy that might result. Whether or not revenue inadequacy will actually occur is tied to the rules that the ISO plans to use for settling the congestion costs and congestion rents associated with ETCs, converted ETCs and TORs. A discussion of these rules is contained in the direct testimony of Lorenzo Kristov of the CAISO.

Q. ARE THERE ANY POTENTIAL DRAWBACKS TO THE PRORATION METHODOLOGY PROPOSED FOR THE CRR ALLOCATION?

A. Yes, but the overall allocation methodology has addressed this limitation. An equity issue can arise with the optimization formula because a very small difference in the shift factor of two CRR requests (i.e., requests from two different source/sink combinations) over a binding constraint can lead to a large reduction in the CRR request with the larger impact and no reduction in the CRR request with the smaller impact.

The tiering structure is intended in part to address this limitation of the proposed proration rule as discussed in Subsection 2 below.

Q. IS THE CAISO'S PROPOSED CRR ALLOCATION PROCESS USED IN OTHER REGIONS?

A. Yes. It has elements that are similar to both the PJM and MISO allocation processes.

2. Economic Rationale

Q. WHAT ARE THE ECONOMIC CONSIDERATIONS RELEVANT TO ASSESSING ALTERNATIVE CRR ALLOCATION MECHANISMS?

A. Five economic considerations govern the high level choices made in the CAISO's proposed approach to CRR allocation: allocative efficiency, facilitation of long-term contracts and hedging, equity, support for retail competition and minimization of administration costs.

a) Allocative Efficiency

Q. HOW DID A CONCERN WITH ACHIEVING ALLOCATIVE EFFICIENCY IMPACT THE DESIGN OF THE PROPOSED CRR ALLOCATION MECHANISM?

A. A very important consideration in the design of the CAISO's CRR allocation process was that the process should not give rise to incentives that could lead to inefficient operation in the CAISO energy market or to inefficient investment in infrastructure in either the short- or long-run. A key to achieving this goal is structuring the allocation process so that future CRR allocations will not be altered by the future operating, contracting or investment decisions of market participants. For this reason, the CAISO CRR allocation process does not tie the allocation of CRR awards to the future contracting decisions of

LSEs, nor does it tie allocation of CRR awards to the future dispatch of generation or to the scheduling of imports.

If CRRs sourced from locations that are expected to be low-priced were allocated to LSEs in proportion to future LSE contracts with generators at these locations, this allocation rule would tend to raise the value of contracts with such generators above the value of their energy. This would provide an inefficient incentive for such generators to remain in operation, or even for new generators to begin uneconomic operation at these locations.

Similarly, if the allocation to LSEs of CRRs sourced from external ties were tied to actual import schedules from these external ties, LSEs would have an incentive to schedule imports from these locations even during hours in which the imports were not economic in order to qualify for more valuable CRRs in the future.

Q. WHY IS THERE SOURCE VALIDATION OF CRR NOMINATIONS ONLY IN THE FIRST YEAR?

A. No source validation is applied to CRR nominations after the first year so as to avoid having the CRR allocation process distort future investment, contracting and operating incentives as discussed above. The application of source verification in the first year based on historical contracting and investment decisions does not distort future decisions because the verification is based on an historical period that has already occurred.

A number of market participants expressed a preference in the stakeholder process for a CRR allocation process based in part on validation of future CRR nominations against future power contracts or generation ownership. These preferences run directly counter, however, to the fundamental economic objective of designing a CAISO CRR allocation process that does not undermine allocative efficiency.

A secondary consideration in limiting source validation to the initial allocation is that it avoids the administrative costs that would be required for the CAISO to carryout source validation on an ongoing basis.

Q. WHY IS THE SOURCE VALIDATION BASED ON THE PERIOD SEPTEMBER 1, 2004 THROUGH AUGUST 31, 2005 RATHER THAN A PERIOD CLOSER TO MARKET STARTUP?

A. The consideration underlying the choice of the historical period is that by basing the CRR allocation on a period that has already occurred, the CAISO avoids the potential for the allocation process to distort going-forward contracting or operating incentives. The end date of the historical period was therefore chosen to correspond to the time frame in which the proposed validation rules were described to market participants.

Q. HOW DID THE CAISO DETERMINE THE PERCENTAGE OF NOMINATIONS IN THE FIRST YEAR THAT WILL REQUIRE SOURCE VALIDATION?

A. The percentage of CRRs requiring source validation reflects a balancing of multiple goals. On the one hand, requiring source validation for a proportion of the CRR nominations allows LSEs to obtain CRRs to hedge their existing long-term contracts. Limiting the validation process to Tiers 1 and 2 also provides more opportunity for LSEs lacking existing power contracts to nominate CRRs, hedging future purchases.

b) Facilitating Long-term Contracts and Hedging

Q. HOW DID THE CONCERN WITH FACILITATING LONG-TERM CONTRACTS AND HEDGING IMPACT THE DESIGN OF THE PROPOSED CRR ALLOCATION MECHANISM?

A. The CAISO allocation process accommodates hedging of long-term power contracts through the priority nomination process for previously awarded CRRs. The priority nomination process provides LSEs the assurance that once they are awarded a CRR that hedges congestion charges on deliveries from their own generation or deliveries under a long-term contract, they can continue to nominate and be allocated that CRR despite changes over time in the CRR nominations of other LSEs due to congestion patterns that may make that CRR more valuable (and thus more likely to be nominated by others).

Q. HOW DOES THE PROPOSAL ADDRESS THE HEDGING NEEDS OF EXISTING LONG-TERM CONTRACTS?

A. The validation process, which will be used only in the first annual CRR allocation, will permit parties with existing long-term contracts – including those sourced outside of the CAISO – to request CRRs sourced at the contract source in Tier 1 (i.e., the top priority tier of the annual allocation) or in Tier 2. Once awarded, these CRRs will be eligible for priority nomination in subsequent years so as to continue to hedge congestion charges under these contracts.

Q. WILL CUSTOMERS WHOSE POWER PURCHASE CONTRACTS PROVIDE FOR DELIVERY TO A TRADING HUB SUCH AS NP-15 BE ABLE TO NOMINATE CRRS IN THE FIRST TIER OF THE INITIAL CAISO ANNUAL CRR ALLOCATION PROCESS EVEN THOUGH THE CONTRACT DOES NOT SPECIFY THE LOCATION OF THE GENERATING UNIT PROVIDING THE POWER?

A. Yes. The CAISO's proposed validation rules for the initial annual CRR allocation would permit these customers to nominate CRRs from the NP-15 hub to the relevant LAP in Tier 1. If awarded, these CRRs would be eligible for priority allocation and thus could be retained in subsequent annual CRR allocation processes if the LSE continued to serve the same loads. If the LSE has contracts to buy power at the NP-15 hub, it will need CRRs between the hub and the LAP to hedge the congestion charges on these contract purchases. Parties lacking contracts could nominate CRRs sourced at the NP-15 hub in the non-validated tier of the CRR allocation process.

Q. THE VALIDATION PROCESS WILL PROVIDE AN OPPORTUNITY FOR LSES TO OBTAIN CRRS HEDGING CONGESTION CHARGES ON POWER PURCHASED UNDER LONG-TERM CONTRACTS. WILL TRANSMISSION CUSTOMERS THAT CURRENTLY PURCHASE ALL OF THE POWER NEEDED TO MEET THEIR CUSTOMERS' LOADS IN THE DAILY SPOT MARKET BE ELIGIBLE TO NOMINATE ANY CRRS IN THE FIRST YEAR OF CAISO CRR ALLOCATION PROCESS?

A. Yes. Transmission customers that have relied solely on the daily or real-time spot market to meet all of their load and have no contracts of even one month duration, will not be eligible to nominate CRRs from internal CAISO generation sources in Tiers 1 and 2 of the CRR annual allocation process for year 1 since they will not have any validated sources. They will, however, be able to continue to buy power in the spot market at the LAP price as they have in the past, which is the practice assumed by the question.

In addition these customers will have an opportunity to nominate CRRs for allocation under several provisions that do not require source validation. First, these customers will be able to nominate CRRs sourced from the external ties in Tier 1 and 2 of the initial annual allocation. CRRs from the external ties will not be allocated based on who historically scheduled power from these ties on a daily basis. In the first year allocation, Tiers 1 and 2 nomination rights will be validated and assigned to LSEs with generation resources or contracts supported by firm transmission to the CAISO border. The right to nominate CRRs utilizing 50% of the remaining transfer capability from the

interties to the LAP in Tiers 1 and 2 of the initial annual allocation process will be assigned to LSEs in proportion to their load, ensuring that all LSEs have an opportunity to obtain a fair share of CRRs sourced at the ties.[76] Thus, even LSEs that have historically served their entire load from purchases in the daily spot market will be assured of being able to nominate CRRs sourced at the ties in Tiers 1 and 2 of the initial annual allocation.

Second, LSEs lacking any forward power contracts will be able to nominate CRRs in Tier 3 of the initial CRR allocation and if these CRRs are awarded, they will be able to use the priority nomination process for these CRRs in subsequent annual allocation processes. To the extent that the CRR requests of LSEs that have entered into forward contracts do not exhaust the transmission system, LSEs that have relied solely on the spot market to meet their loads will be able to nominate and receive CRRs in Tier 3 of both the initial and subsequent annual CRR allocations.

Third, LSEs that have not entered into forward contracts but have instead purchased all of their power in the daily or real-time spot market will be able to request and be allocated CRRs sourced at internal CAISO generation in the monthly allocation process for each month because there is no verification in the monthly allocation process. Twenty-five percent of the transfer capability of the grid will be reserved from each annual allocation and will be available (after accounting for outages) to support the award of monthly CRRs.

[76] MRTU Tariff. Section 36.8.4.1 Import CRRs.

It is important to recognize that the validated CRR requests of LSEs with long-term power contracts will not exhaust the overall transfer capability of the CAISO grid since the CAISO transmission system is able to deliver power to meet 100% of load, not merely the 50% of load that caps CRR nominations in Tiers 1 and 2 of the annual allocation. The CRR requests of LSEs with long-term contracts will at most exhaust the transfer capability from the resources covered by those contracts. These CRR requests cannot exhaust the transfer capability from the resources actually used to meet the load of the LSEs lacking long-term contracts.[77]

Finally, it is important to keep in mind that there is a cap on Tier 1 nominations so that LSEs that have entered into even short term monthly contracts for just one-half of their load will be able to nominate CRRs in Tier 1 covering the same percentage of their load as every other LSE. If there are LSEs that have actually purchased 100% of their power in the daily spot market, there is a policy question of how far the CAISO and the FERC should bend over backwards to insulate those LSEs from the consequences of their 100% dependence on the daily spot market. If LSEs have not purchased 100% of their supplies in the daily spot market, then they will have generation sources (including trading hubs) that can be validated and nominated in Tiers 1 and 2 of the first annual CRR allocation process commensurate with the level of their load served by contracts of a month or more duration.

[77] If this were not the case, the CAISO would be unable to meet load

Q. DOES THE CAISO CRR ALLOCATION METHODOLOGY PRESERVE FLEXIBILITY IN CASE ONE PARTICULAR CLASS OF LSES IS NOT ALLOCATED ANY CRRS?

A. The only way an LSE could be allocated no CRRs would be if it chose not to request them. First, as noted above, all LSEs will have an opportunity in the first annual allocation to nominate a proportionate share of half of the uncommitted tie capacity. This will not be zero. If an LSE wants CRRs sourced at the ties, it will be allocated some. Moreover, the priority nomination process will ensure that it would be able to retain these CRRs in subsequent annual nominations. Second, as also noted above, even an LSE with absolutely no forward contracts will be able to nominate and receive CRRs in the monthly allocation process, as there is no validation nor priority nominations in the monthly CRR allocation.

Third, as observed above, neither validated requests nor priority nominations will use up the entire transfer capability of the CAISO transmission grid so LSEs will be able to nominate and be awarded CRRs from internal generation even after validated nomination requests are accommodated in the first annual allocation and after priority nominations are accommodated in Tier 1 in subsequent annual allocations. Moreover, any LSE with priority CRR awards for less than half of its eligible quantity will be able to nominate additional CRRs in Tier 2 of the annual nomination process.

Q. WHAT IS THE REASON FOR PLACING LIMITS ON THE AMOUNT OF INTER-TIE CAPACITY THAT IS AWARDED IN THE ALLOCATION PROCESS IN THE FIRST ANNUAL ALLOCATION AND RESERVING SOME CAPACITY FOR SALE IN THE ANNUAL AUCTION?

A. These provisions reflect an effort by the CAISO to accommodate existing contracts and ownership arrangements that provide for the sale of power either at the tie or delivered into California. The allocation proposal assures CAISO LSEs with external generation or contracts that they will be able to nominate CRRs hedging congestion charges on power sourced form these validated sources in the first tier of the first annual allocation. Reserving a portion of the remaining transfer capability for sale in the auction assures external suppliers that enter into delivered price contracts with CAISO LSEs that they will continue to be able to acquire CRRs through the auction process, just as they acquire FTRs over these constraints in the FTR auction today.

Q. IS THIS LIMITATION LIKELY TO HAVE A DRAMATIC IMPACT ON THE NUMBER OF CRRS SOURCED AT THE INTER-TIES THAT MAY BE NOMINATED BY LSES?

A. While this limitation provides some assurance to external suppliers that some CRRs will be available for purchase in the auction, CRR nominations were constrained from only two tie locations in the annual allocation in CRR Study 2 (Tracy-Tesla and Victorville). Table 15 shows the number of CRRs awarded plus ETC and TOR reservations from each

tie in the annual allocation of CRR Study 2 for August on-peak, compared to the capacity available from that tie point.

Table 15
CRR Study 2 Annual CRR Allocation on Inter-Ties
August On-Peak

Branch Group	CRR Awards Sourcing Externally in Annual Allocation using 75% of TORs	CRR Obligations (LSE and ETC) Sinking Externally in Annual allocation	Total Inbound Branch Group Utilization by Annual CRR Awards	Branch Group Limit 75%	Branch Group Limit	Utilization Rate Annual Allocation using 75% of TORs
BLYTHE_BG	0	0	0	65	87	0.00%
CASCADE_BG	0	0	0	60	80	0.00%
CFE_BG	0	0	0	600	800	0.00%
CTNWDRDMT_BG	0	0	0	240	320	0.00%
CTNWDWAPA_BG	0	0	0	1196	1594	0.00%
ELDORADO_BG	1125	0	1125	1166	1555	96.46%
IID-SCE_BG	443	75	368	450	600	81.73%
IID-SDGE_BG	122	0	122	169	225	72.44%
INYO_BG	0	0	0	42	56	0.00%
LAUGHLIN_BG	0	0	0	165	220	0.00%
LLNLTESLA_BG	0	0	0	111	148	0.00%
MCCULLGH_BG	0	0	0	1949	2598	0.00%
MEAD_BG	939	0	939	1043	1390	90.09%
MERCHANT_BG	0	0	0	484	645	0.00%
N.GILABK4_BG	160	0	160	180	240	88.89%
NOB_BG	484	0	484	1553	2071	31.13%
PACI_BG	2072	0	2072	2116	2821	97.94%
PALOVRDE_BG	2064	0	2064	2700	3600	76.45%
PARKER_BG	53	0	53	165	220	31.82%
RNCHLAKE_BG	0	46	0	968	1291	0.00%
SILVERPK_BG	0	0	0	13	17	0.00%
SUMMIT_BG	0	0	0	90	120	0.00%
SYLMAR-AC_BG	68	467	0	544	725	0.00%
TRACYWAPA_BG	887	0	887	951	1268	93.25%
TRCYTESLA_BG	753	300	453	453	604	100.00%
VICTVL_BG	1780	0	1780	1780	2374	100.00%
OLNDAWAPA_BG	0	0	0	638	850	0.00%

Q. WHAT IS THE PURPOSE OF THE PRIORITY NOMINATION PROCESS AFTER THE FIRST YEAR?

A. The priority nomination process provides LSEs that enter into long-term power contracts hedged by their CRR awards with a reasonable level of assurance that they will be able to continue to acquire these CRRs over the term of their power contracts.

Q. DOES THE PRIORITY NOMINATION PROCESS LIMIT THE FLEXIBILITY AND OPPORTUNITY FOR THE ENTRY OF MARKET PARTICIPANTS WHO WILL SEEK TO ACQUIRE CRRS FOLLOWING THE INITIAL ANNUAL CRR ALLOCATION?

A. No. LSEs that enter the market and LSEs that gain retail load will have a great deal of flexibility to acquire CRRs under the CAISO's proposed CRR allocation process, even to acquire CRRs that impact frequently binding constraints. The provisions relating to reallocation of CRRs as retail load shifts are discussed in detail in Section III.C below. LSEs that want to change their CRR nominations for existing load within frequently binding constraints will, however, have to compete with all other LSEs in the allocation process for CRRs impacting these constraints.

Q. WHY CAN'T THE ANNUAL CRR ALLOCATION PROCESS PROVIDE LSES THAT WISH TO ACQUIRE DIFFERENT CRRS THE SAME OPPORTUNITY TO ACQUIRE THE CRRS THEY WANT THAT IS ACCORDED TO LSES GAINING RETAIL LOAD?

A. The potential inability of LSEs that change their CRR nominations to be awarded the CRRs they want reflects a fundamental tradeoff. The CRR allocation rules must choose between the objectives of allowing LSEs that enter into long-term contracts to acquire and retain over a multi-year period CRRs hedging the congestion charges on power delivered under and those long-term power contracts or of allowing LSEs to change the CRRs they hold from year to year. On the one hand, the CRR allocation rules can assure

LSEs that have entered into long-term contracts hedged by CRRs that they will not have to give up the CRRs they have acquired to hedge congestion charges on long-term power contracts, and thus lose the hedge, even if congestion patterns change in a way that makes those CRRs more valuable to others.

Alternatively, the CRR allocation rules can assure LSEs that they will be awarded a load ratio share of the CRRs over any constraint they designate in any future annual allocation. A choice between the objectives must be made. It is precisely when congestion charges have risen between the generation source and the load that an LSE that has entered into a long-term contract will need to retain its CRR to avoid being disadvantaged by its long-term power contract, yet these are the circumstances in which other LSEs would like to alter their CRR awards to acquire more of these previously less valuable CRRs.

We explained in Section II.D.2 above how CRRs support long-term power contracting by enabling contract parties to lock in charges for congestion. This hedging role of CRRs requires that entities entering into long-term contracts be able to lock in the award of the CRR over the contract term as well. If the LSE that has entered into a long-term contract must purchase CRRs to hedge its contract in an annual auction, then any increase in expected congestion charges that occurs over the term of the contract will be reflected in an increase in the price that must be paid for the CRRs, so the LSE would not actually be hedged.

The CAISO has decided this choice in favor of a CRR allocation process that supports long-term power contracts. In our view, this is the right way to resolve this

tradeoff. The purpose of CRRs is to permit market participants to enter into long-term power contracts by providing the contract parties with a way to hedge themselves against long-term changes in congestion levels. Reallocating all CRRs from year to year, or assigning each LSE a load ratio share of total congestion rents, defeats the purpose of awarding CRRs in the first place.

Q. IS THERE ANY ALTERNATIVE TO THE PRIORITY ALLOCATION PROCESS FOR PROVIDING A MECHANISM FOR LSES TO HEDGE CONGESTION CHARGES ON LONG-TERM FORWARD CONTRACTS?

A. Yes. Another alternative would be to allocate CRRs through an auction in which a proportion of the transfer capability of the transmission system was made available to support the award of long-term CRRs in the auction. Such a long-term auction would also be inconsistent with an annual reallocation of CRRs or congestion rents on a load ratio share basis. Entities wanting to hedge congestion charges on long-term power contracts could buy long-term CRRs in the auction and, if congestion costs rose, the value of those CRRs would flow only to the entity that purchased them; they would not be available for allocation to other LSEs.

Q. CAN CRRS SINKING AT SUB-LAPS BE NOMINATED IN THE PRIORITY ALLOCATION PROCESS ONCE THEY ARE AWARDED?

A. No. Allowing CRRs sinking at the sub-LAPs to be nominated in the priority process would complicate subsequent Tier 1 simultaneous feasibility tests since sub-LAP priority nominations would need to be included in Tier 1. This would introduce the potential for unintended outcomes in the Tier 1 proration process. For instance, the award of CRRs to a particular sub-LAP might prevent the award of CRRs to the LAP as a whole in subsequent allocations. To avoid such possible unintended consequences, CRR awards sinking at sub-LAPS are not eligible for priority nomination under the CAISO proposal.

Q. DOESN'T THE INITIAL 33-1/3% CAP ON PRIORITY CRR NOMINATIONS IN YEAR 2 LIMIT THE ABILITY OF LSES TO ENTER INTO FORWARD POWER CONTRACTS AND OBTAIN LONG-TERM HEDGES AGAINST CHANGES IN CONGESTION COSTS?

A. Yes. There is an unavoidable tradeoff between providing LSEs that enter into forward contracts with the ability to hedge those contracts against changes in congestion charges over the term of the contract and, on the other hand, limiting the extent of the priority allocations so that entities that have in the past entered into few forward contracts have the ability to enter into forward contracts in the future and obtain congestion hedges for those contracts. The CAISO proposal strikes a balance.

c) Equity

Q. HOW DID EQUITY CONCERNS IMPACT THE DESIGN OF THE PROPOSED CRR ALLOCATION MECHANISM?

A. In principle, whatever CRR allocation market participants agree to can be viewed as equitable. In practice, market participants may not agree upon what is an equitable CRR allocation, requiring that the CAISO propose and FERC approve a CRR allocation that they believe equitably balances market participant interests, even though some market participants may not agree with it.

The equity of the CRR allocation, in a sense, will not impact economic efficiency in the short-run, because the allocation merely assigns congestion rents among LSEs; it does not directly alter costs or marginal incentives and, thus, does not impact the dispatch. In the long-run, however, there is a sense in which the perceived equity of the CRR allocation may impact economic efficiency in a way that is relevant to both the CAISO and FERC. It is in the long-run interest of the CAISO and its market participants for some adjacent control areas to join the CAISO. However, these control areas will not be likely to do so if they perceive that the allocation of CRRs to LSEs that join the CAISO will not reflect the LSE's prior entitlement to use of their transmission system without paying congestion when the system is constrained. If LSEs that do not currently

belong to the CAISO perceive that joining the CAISO will result in increased exposure to congestion costs for their customers,[78] they will not be inclined to join the CAISO.

Similarly, if it is perceived that control areas that do not join the CAISO largely avoid paying the costs of operating the CAISO, are not subject to restrictions placed on CAISO members, but at the same time are able to participate in CAISO markets on the same basis as CAISO market participants, then existing CAISO members (particularly the smaller ones that could potentially withdraw without causing the collapse of the CAISO) will see an advantage to withdrawing from the CAISO. The award of benefits (such as a free allocation of CRRs) to entities that do not join or that have withdrawn from the CAISO at the expense of the entities that remain in the CAISO will discourage smaller distribution company LSEs from remaining inside the CAISO. Thus, a CAISO CRR allocation process that treats LSEs and distribution company customers equitably relative to their historic entitlement to use of the CAISO transmission system serves to promote long-term economic efficiency by providing assurance of fair treatment to control areas that might in the future consider joining the CAISO and by not creating inefficient incentives for distribution companies to withdraw from the CAISO.

[78] By congestion costs we are referring not only to the congestion component of LMP prices but also the RMR and uplift costs borne by LSEs under the current zonal congestion pricing system or the need to run the LSEs high cost generation because of an inability to schedule transmission for entities outside the CAISO.

Q. ARE THERE ANY OTHER BROAD POLICY REASONS WHY AN EQUITABLE CRR ALLOCATION IS IMPORTANT TO LONG-RUN ECONOMIC EFFICIENCY?

A. Yes. From FERC's perspective the potential impact on long-run efficiency of the perceived equity of the CAISO's CRR allocation is more far reaching. If large LSEs in the Southeast and Pacific Northwest, and their regulators, perceive that if they were to form an RTO then FERC would require a CRR allocation that is inequitable, in the sense that it does not honor these LSEs' existing entitlement to use of their transmission systems and potentially shifts some of their rights to others, then these LSEs and their regulators could be expected to be less supportive of someday moving forward with the formation of an RTO in the region. Similarly, if small LSEs in the Southwest and Pacific Northwest were to perceive that were they to remain outside of any RTO that formed in their region, FERC would award them the same rights as LSEs that participated in the RTO and bore the costs of RTO formation and operation, these LSEs would be more likely to choose not to participate in any future RTO in their region, making RTO formation less likely and more operationally difficult if it were to proceed at all.

Q. DOES THE CAISO CRR ALLOCATION PROPOSAL ACCOMMODATE THESE EQUITY CONCERNS?

A. Yes. The concern with not dramatically reallocating congestion costs among LSEs or among customers of different distribution companies motivated the CAISO to develop an

allocation process that would enable CAISO LSEs to receive, on behalf of their loads, an allocation of CRRs reflecting their historic entitlement to use of the transmission system without paying congestion. This concern for equity led to the decision to apply source validation on an historic basis to a substantial proportion of the seasonal CRRs allocated in the initial annual process so that LSEs owning generation or with existing power purchase contracts would be able to nominate and be awarded CRRs from those sources to their load.

Q. ISN'T A PROCESS IN WHICH LSES ARE AWARDED CRRS WITH DIFFERENT SINKS, SOURCES AND VALUES INCONSISTENT WITH THE TRANSMISSION RATE DESIGN OF THE CAISO UNDER WHICH ALL TRANSMISSION CUSTOMERS PAY A COMMON ACCESS CHARGE?

A. No. While all LSEs pay a common transmission access charge they will not pay the same price for power purchased in the spot market nor will they pay the same congestion charges to deliver power from their generation to their load. Allocating each LSE a proportionate share of the total CAISO congestion rents, either directly or indirectly, would not necessarily result in them paying the same net congestion charges. In fact, the net congestion charges could differ widely.

Q. WON'T ALL LSES PAY THE SAME PRICE FOR POWER PURCHASED IN THE SPOT MARKET?

A. No. LSEs will purchase power at at least three different LAP prices. Even if all LSEs purchased all their power in the day-ahead spot market, the congestion charges reflected in the LAP price they pay for power would vary depending upon which LAP each LSE's load was located within. There would be further differences among LSEs in the price paid for power to the extent that some metered subsystem (MSS) entities elect net balancing and purchase power at distinct prices established for the MSS regions.

Q. WHAT IS THE RELEVANCE OF THESE DIFFERENCES IN CONGESTION CHARGES TO CRR ALLOCATION?

A. Suppose the congestion rents collected by the CAISO in the day-ahead market were returned prorata to all load in the state on the premise that all load pays the same transmission access charge. The price the LSEs would pay for power would vary across the LAPs with differences in congestion, so load in LAPs with little congestion could get a congestion rent credit that greatly exceeds the congestion component of the LAP price they pay while LSEs in the constrained area could receive a congestion rent credit that is much less than the congestion component of the LAP price they pay.

In LMP Study 3b, for example, the SCE LAP price was typically much higher than the PG&E or San Diego LAP prices. If the LMP Study 3b price forecasts prove to be accurate and consumers in the SCE LAP were to pay the SCE LAP price but only

received a prorata share of total CAISO congestion rents, the power costs of consumers in the SCE LAP could rise materially relative to the net charges they pay today.[79]

Q. IF SOME LSES HAVE MORE GENERATION AT LOWER-PRICED LOCATIONS THAN OTHERS, ISN'T IT UNFAIR TO GIVE THEM MORE THAN A PRO-RATA SHARE OF THE CONGESTION RENTS?

A. Not necessarily. It should be kept in mind that for generation resources owned or under contract to an LSE, the cost of power is not the same as the LMP price at the resource's location. Generation owned by an LSE that is located at a bus with a typically high LMP price may be an infra-marginal low cost resource that bids into the market at a low price, is fully dispatched and does not set the price at its location. The cost of meeting load with this resource will be low because both the congestion charge and the generation cost will be low. A resource with exactly the same cost structure could also be located at a bus with a typically much lower LMP price, in which case the LSE owning the resource would incur significant congestion charges to deliver its power to load at the LAP. If both LSEs historically were able to use these resources to meet their load without paying congestion, it will not be perceived as equitable by potential ISO participants if the

[79] Similarly, it was seen in the example in Appendix 4 that CRR ownership reduced Blue LSE's net congestion charges under expected conditions from $7,900 to $3,325. Suppose, however, that half of Blue's CRRs had been allocated to LSEs serving load in another LAP in which there was no congestion, so that the Blue LSE was allocated 75 B-LAP CRRs, 75-C-LAP CRRs and 150 zero-valued CRRs in another LAP. Blue LSE's net congestion charges would then have been over $6,600 ($7,900 – $2,287.5 = $6,612.5) at expected day-ahead prices and would have risen from $4,625 to over $8,600 at the high prices $12,750 - $3,562.5 - $500 = $8,687.5.

congestion charges paid by the entity with generation at the low cost location are refunded pro rata to all LSEs, leaving the LSE paying the high congestion charges with a higher cost of serving its load than it incurred historically and greater exposure to increases in congestion costs.[80]

Q. WERE OTHER FEATURES OF THE CAISO CRR ALLOCATION METHODOLOGY MOTIVATED BY EQUITY CONCERNS?

A. Yes, equity influenced the design of the CRR allocation process in a number of ways. Several elements of the allocation methodology were chosen to strike an equitable balance between the interests of different groups of stakeholders. Other elements were chosen so as to equitably and consistently apply the allocation rules across different situations. Finally, some elements of the allocation process were chosen to try to avoid unintentionally skewed allocation outcomes. In general, these design choices were impacted by a tradeoff between the desire to obtain an equitable allocation outcome and the administrative complexity of the allocation process.

Q. WOULD YOU IDENTIFY ASPECTS OF THE ALLOCATION METHODOLOGY WHICH WERE CHOSEN SO AS TO ACHIEVE EQUITABLE OUTCOMES ACROSS STAKEHOLDERS?

[80] A numerical example illustrating this outcome is provided in Appendix B.

A. Yes. The award of CRRs based on multiple nomination tiers, the ability of LSEs to nominate MPT-CRRs, and the ability of LSEs to nominate CRRs sourced at trading hubs and external generators are all features of the CAISO market design that were motivated, at least in part, by equity considerations.

Q. WHAT WAS THE EQUITY RATIONALE FOR INTRODUCING MULTIPLE TIERS OF CRR NOMINATIONS AND AWARDS?

A. The tiered approach to CRR nominations and awards is intended to achieve a more equitable allocation than would potentially result from applying the simultaneous feasibility test and prorating CRR awards in a single step based on one set of equally weighted LSE nominations. The Simultaneous Feasibility Test applied in CRR Study 2 evaluated the feasibility of ETCs, Converted Rights and LSE CRR requests simultaneously, with higher weights assigned to the award of ETCs and converted rights in carrying out proration of infeasible CRR nominations.[81] In CRR Study 2, nominations for all LSE priority levels were evaluated in a single SFT run, with different weights (bids) assigned to represent each CRR priority level. Thus, if pro-rationing was required to achieve simultaneous feasibility, this approach was intended to result first in a reduction in the award of CRRs based on lower-priority CRR nominations that impacted the overloaded binding transmission constraints.

[81] TORs were evaluated in a prior step.

The objective function that the CAISO proposes to use in the CRR allocation process to determine which CRRs will be curtailed/prorated in order to satisfy the simultaneous feasibility test will be to maximize the priority-based value of the allocated CRRs, thus taking into account the priorities associated with different CRR types as well as the impact of different CRRs on binding constraints.[82]

This objective function has the property that it will cause the proration process in the simultaneous feasibility test to prorate the CRR nominations with the largest impact on a constraint first, and only prorate other nominations once the CRR nomination with the largest impact is prorated to zero. This rule has the potential to apply prorationing to CRR nominations in a way that is extremely asymmetric across CRR nominations, resulting in potentially inequitable outcomes across LSEs. Thus, a LSE nominating CRRs from a resource with a slightly higher impact on the binding constraint than other resources could have its nomination prorated to zero before any proration was applied to the CRR nominations of other LSEs. This possibility was recognized by the CAISO and a tiering (priority) system was applied in CRR Study 2 in part to decrease the likelihood that the proration required to maintain simultaneous feasibility would fall entirely on a small subset of LSEs.

[82] CRR Study 2, p. 12. MRTU Tariff. Section 36.13.6. Clearing of the CRR Auction.

Q. HOW DOES TIERING REDUCE THE POTENTIAL FOR ASYMMETRIC PRORATION OUTCOMES?

A. A tiering or priority system tends to reduce the potential degree of inequity across LSEs in the application of prorationing by applying prorationing to nominations on the highest tier (or lowest priority) first. If an LSE spreads its nominations from a particular source across tiers, some of the nominations will be awarded, even if CRRs from that source have a larger impact than CRRs from other sources.

Q. DOESN'T THE ABILITY OF LSES TO NOMINATE MPT-CRRS SERVE THE SAME PURPOSE AS TIERING?

A. Yes, to a degree. The ability of LSEs to nominate MPT-CRRs enables LSEs to reduce the likelihood that they will be awarded virtually none of the CRRs they nominate, by providing what are essentially backup CRR nominations. The nomination of MPT-CRRs does not, however, ensure that each LSE is awarded at least some of the CRRs it most values; it only increases the likelihood of being awarded some CRRs. Tiering helps assure that all LSEs are awarded some of the CRRs they most value.

Q. WHY IS THE TIERED ALLOCATION PROCESS IN THE CAISO PROPOSAL SEQUENTIAL RATHER THAN A SIMULTANEOUS CLEARING OF VARIOUS PRIORITY NOMINATIONS AS IN CRR STUDY 2?

A. There are three reasons for this approach. First, the sequential approach permits LSEs whose CRR nominations are subjected to proration in the higher priority tier to adjust their nominations in the later tiers. If LSEs must submit all of their CRR nomination requests without knowing which requests will be subjected to proration at the margin in priority 1 as in CRR Study 2, there is a potential for skewed allocation results across LSEs if certain CRR nominations become prorated in accommodating even priority 1 CRR nominations. The CRR nomination process is a black box for LSEs in the sense that an individual LSE will not know which CRR sources other LSEs will choose to nominate in each priority level. As a result, there is a potential for surprises. These surprises could result in particular LSEs being awarded few or none of the CRRs they nominate in Tiers 2 and 3. LSEs may therefore find that given the nominations of other LSEs, they would have been better off nominating a different set of CRRs. This potential for asymmetric allocation results across LSEs is somewhat reduced, but definitely not eliminated, by the introduction of sequential nominations which allows LSEs encountering proration of their tier one requests to shift their CRR nominations to other sources.

Q. WERE THERE OTHER EQUITY CONSIDERATIONS IN CHOOSING A SEQUENTIAL RATHER THAN SIMULTANEOUS NOMINATION AND CLEARING OF DIFFERENT CRR NOMINATION PRIORITIES?

A. Yes. The sequential approach also avoids the potential for the MW maximization proration rule to result in unintended asymmetric proration of LSE CRR requests. The proration rule that the CAISO has proposed to utilize in the CRR allocation process maximizes the number of CRRs awarded. If CRRs have differential impacts on an overloaded constraint, this rule will prorate those with the largest impact. Among CRRs having the same impact on an overloaded constraint, as would be the case for CRRs across a closed interface, the nominated CRRs would be prorated proportionately. If CRR nominations with multiple priority levels were cleared in a single proration step, there would be a potential for the proration of low priority CRR nominations to result in differences in the proration of higher priority CRR requests, leading to unintended differences in the allocation of high priority CRRs across LSEs.[83] This potential would be particularly important if LSEs operating metered subsystems and electing net balancing were permitted to nominate CRRs sinking at their MSS sub-LAP. In this situation, priority 1 CRR nominations sinking at the LAP and a particular sub-LAP might have exactly the same impact on the constraint limiting the award of high-priority CRRs from this source, yet have very different proration applied because the nominations to the LAP and sub-LAP might have a different impact on a constraint limiting the award of lower priority CRR nominations. Differential proration across LSEs of high priority

[83] This kind of outcome was observed in CRR Study 2. It appeared to occur on a large scale in the Sensitivity 7 and base case CRR allocations, because CRRs in all priority levels were defined to sink at sub-LAPs for the purpose of applying the simultaneous feasibility test. CRR Study 2, pp. 72-73.

CRR nominations sinking at different LAPs could also result from constraints that would only be binding on the allocation of low priority CRRs.

Q. WERE THERE ANY OTHER REASONS FOR ADOPTING THE SEQUENTIAL APPROACH TO CLEARING CRR NOMINATIONS?

A. Yes. Under the sequential approach market participants receive information in the course of the CRR allocation that they can use to adjust their CRR nominations. This means that: a) each LSE has a better chance of receiving an allocation of CRRs that is close to its allocation cap; b) the process may lead overall to the allocation of more CRRs than would have been allocated through a one-step allocation process with multiple priority levels. Part of the reason that increased allocation may occur is that nominations in Tier 2 can take account of information about the counterflow supplied by Tier 1 awards, or can be for partial hedges that are requested after taking into account the constraints binding in Tier 1; c) the multi-step tiering process enables LSEs to more finely adjust their portfolio of CRR awards than would a single-step SFT. Thus, they can see exactly which CRRs they were awarded in Tier 1, and can then request Tier 2 CRRs that fill in the gaps in the hedges that they need. The point here is that the tiering process not only enables LSEs to receive more CRRs, it also enables them to request specific CRRs in Tier 2 to provide the hedges that they did not receive in Tier 1.

Q. DOES THE TIERED ALLOCATION PROCESS PROVIDE A SAFEGUARD AGAINST DISPROPORTIONATE AND INEQUITABLE PRORATIONING?

A. Yes.

Q. IN ADDITION TO TIERING AND THE SEQUENTIAL APPLICATION OF THE SIMULTANEOUS FEASIBILITY TEST, WHAT OTHER ELEMENTS OF THE DESIGN OF THE CRR ALLOCATION PROCESS WERE INCLUDED TO AVOID UNINTENTIONALLY INEQUITABLE ALLOCATION OUTCOMES?

A. The percentages used for the nomination limit for the second tier are intended to make sure that an LSE that receives few CRRs in the first tier has a greater likelihood of receiving CRRs in the second tier, relative to other LSEs. Thus an LSE that covers a relatively large percentage of its load with priority CRRs in Tier 1, say 45%, will be able to nominate fewer CRRs in Tier 2 than an LSE that has only received CRRs for 10% of its load in Tier 1. This occurs because the Tier 2 nomination limit is 50% of the LSE's load metric minus the LSE's allocation of Tier 1 CRRs.

Q. WHAT WAS THE EQUITY RATIONALE FOR PERMITTING LSES TO NOMINATE CRRS SOURCED AT TRADING HUBS OR EXTERNAL GENERATORS?

A. This allocation rule was adopted because the purpose of validation is to provide LSEs with an equitable opportunity to obtain CRRs to hedge their existing long-term contracts, some of which have delivery points at the trading hub or at the ties.

Q. TO WHAT DEGREE DOES THIS CRR ALLOCATION DESIGN ALLOW THE CAISO TO FULLY ALLOCATE THE COLLECTED CONGESTION RENTS?

A. Scenario IV Sensitivity 5 in CRR Study 2 best corresponds to the CAISO's CRR allocation proposal. In this scenario, LSEs are awarded CRRs defined as obligations; CRRs may be sourced at trading hubs; and CRRs sinking at a LAP must satisfy a simultaneous feasibility test applied at the LAP level. The ratio of CRR payments to congestion rents over the year as a whole in this scenario is 101.24%, reflecting a slight revenue inadequacy. This revenue inadequacy a result of the major transmission outages that occurred during March 2003 and were modeled as occurring in March of the simulated year in LMP Study 3b. If the March congestion rents and CRR payouts are excluded, the payout ratio for the remaining eleven months is 84.75%.[84]

It is anticipated that some of the changes in the CRR allocation rules between those used for CRR Study 2 and those in the CAISO's MRTU tariff filing will tend to raise the payout ratio. In particular, using a seasonal load cap on CRR nominations rather

[84] CRR Study 2, p. 82, Table 39.

than a monthly cap is expected to somewhat raise the level of CRR awards and the payout ratio.

The payout ratio calculated in CRR Study 2 was also very strongly impacted by the congestion patterns in LMP Study 3b, in particular the many negatively valued CRRs in some months. With different congestion patterns that result in fewer negatively valued CRRs, the payout ratio observed in practice may be materially higher.

Q. IS THE CAISO'S TREATMENT OF EXTERNAL LSES IN THE CRR ALLOCATION PROCESS EQUITABLE?

A. Yes. LSE's serving loads external to the CAISO can purchase CRRs hedging congestion charges on prospective wheeling through or out transmission usage in the CAISO's CRR auctions without incurring the cost of CAISO membership or being required to purchase firm transmission service on the CAISO transmission system. This is much more favorable treatment than is available to CAISO LSEs on transmission systems external to the CAISO.

Q. DO YOU EXPECT THAT LSES SERVING EXTERNAL LOAD WILL MAKE EXTENSIVE USE OF THIS OPPORTUNITY TO ACQUIRE CRRS THROUGH THE ALLOCATION PROCESS?

A. No. As observed above, external LSEs will receive a tremendous benefit from the CAISO and its transmission owners in being allowed to acquire CRRs as needed in the

CAISO coordinated CRR auctions without being obligated to pay embedded cost charges on a prospective basis. It is likely that most external LSEs will acquire the CRRs they need to hedge potential wheeling through and out transactions in the CRR auction and only pay embedded cost usage charges to the extent they actually use the system.

Q. IS THIS TREATMENT OF LSES SERVING LOADS EXTERNAL TO THE CAISO CONSISTENT WITH THE TREATMENT OF EXTERNAL LSES BY EASTERN ISOS?

A. Yes. PJM, ISO-NE and MISO all permit LSEs serving external loads to purchase long-term firm point-to-point transmission service at embedded cost rates and will allocate the LSE CRRs (FTRs) between the source and sink points of that long-term firm service.[85] Like the CAISO, PJM, ISO-NE and MISO also permit LSEs serving external loads to purchase CRRs in their CRR auctions to hedge congestion charges on wheeling through-and-out transactions without being obligated to pay embedded cost transmission charges. In practice, LSEs serving load external to these eastern ISOs appear to find it much more attractive to acquire CRRs through the auction process than to purchase long-term firm service at embedded cost rates. All current long-term firm point-to-point service held by

[85] See ISO-New England Transmission Markets and Services Tariff, December 27, 2004, Sheets 7221, 7704; MISO Tariff Sheets 291, 886, 608, 608A, 609; PJM FERC Electric Tariff Sheets 77, 245-246A. See also "FERC FTR Allocation Order," PJM Market Implementation Committee, October 26, 2004; PJM Manual 06 Financial Transmission Rights, pp. 15-16.

LSEs serving loads external to PJM, ISO-NE and MISO appears to be transmission service acquired pursuant to pre-ISO grandfathered contracts.

The only way an LSE serving load external to the NYISO can obtain CRRs is by participating in the auction. As explained above, however, this is a bargain for the external LSEs compared to buying long-term firm point-to-point transmission service on a prospective basis at embedded cost rates.

d) Support Retail Access Competition

Q. HOW DID CONCERNS WITH SUPPORTING RETAIL COMPETITION IMPACT THE DESIGN OF THE PROPOSED CAISO CRR ALLOCATION MECHANISM?

A. A core element of the CAISO CRR allocation proposal is that LSEs that lose retail access load to competitors will have to forgo priority nomination in the annual allocation of a similar proportion of the CRRs awarded in the prior annual allocation, making the underlying transfer capability available to support the award of CRRs in Tier 2 to the LSEs that gain this load. The details of these elements of the CAISO proposal are discussed in Section III.C below.

e) Simplicity/Administrative Cost

Q. HOW DID CONCERN WITH MINIMIZING ADMINISTRATIVE COSTS IMPACT THE DESIGN OF THE CAISO CRR ALLOCATION PROCESS?

A. The ideal CRR allocation mechanism from the standpoint of administration costs would require the CAISO to expend few resources in carrying out the allocation that would not be required to run the subsequent CRR auction. Similarly, it would require as few market participant resources as possible beyond those that the market participants would need in any event to determine which CRRs to purchase or sell in an auction.

Q. DOES THE CAISO CRR ALLOCATION PROPOSAL ACHIEVE THIS IDEAL?

A. No. The CAISO proposal compromises simplicity and low cost administration in order to address other objectives.

In particular, there is a fundamental conflict between low administrative costs and the equity concerns that are addressed by rerunning a multi-tier CRR allocation process every year. Market participants have expressed a strong preference to not be locked into the same initial allocation of CRRs each year nor to immediately implement an auction-only allocation process. Honoring these preferences requires rerunning the CRR allocation process on an annual basis. This annual allocation process is the main source of ongoing administrative cost and complexity in the CAISO proposal.

Q. HOW DID A CONCERN WITH ADMINISTRATIVE SIMPLICITY AFFECT THE DESIGN OF THE CAISO CRR ALLOCATION METHODOLOGY?

A. Several elements of the CAISO CRR allocation process are intended to reduce administration costs and to make the process more manageable from an implementation

cost and timeline standpoint. First, the number of sequential tiers has been limited to three in the annual allocation process and two in the monthly process. While a larger number of tiers might enable the CAISO proposal to better address some equity objectives, additional tiers would adversely impact implementation costs. While each sequential tier provides the opportunity for market participants to revise their nominations based on the results in the prior round, each sequential tier also requires the CAISO to process nominations from market participants, run the CRR allocation and simultaneous feasibility test, review and verify the allocation results and communicate the results to market participants. There will be material administrative costs to implement the CAISO tiering proposal; adding additional tiers would further raise CAISO administrative costs.

Second, the CAISO has limited the "annual" CRR allocation process to the nomination and award of seasonal rather than monthly CRRs. While permitting LSEs to submit distinct CRR nominations in the annual allocation for each month would provide LSEs with some additional flexibility and was desired by some LSEs, this would triple the number of annual allocation processes for which the CAISO would need to receive and process nominations, run the CRR simultaneous feasibility test, review and verify the allocation results, and communicate the results to market participants. Even carrying out the "annual" CRR allocation process on a seasonal basis will require substantial CAISO resources. The resource cost would be increased further if there were distinct nominations and awards for every month in the "annual" allocation. Since LSEs will also be able to nominate and be awarded CRRs on a monthly basis in the monthly allocation,

there does not appear to be sufficient benefits from allocating CRRs annually on a monthly basis to justify the additional CAISO administration costs.

Third, the process for accommodating retail load switching and transferring CRRs between load serving entities has been structured to avoid the need to track shifts of a large number of fractional CRRs among LSEs. Some alternatives for transferring CRRs to accommodate retail load shifts could greatly increase the administrative costs of the CRR allocation. This is discussed in more detail in a later section on retail access.

Fourth, although the decision not to tie future CRR allocations to future contracting and output decisions is primarily motivated by the intent to avoid creating inefficient contracting and dispatch incentives, avoiding a validation process for CRR nominations after the first year also reduces the administrative burden on the CAISO.

Q. IS THERE ANY POTENTIAL FOR REDUCING THE ADMINISTRATIVE COSTS OF THE CAISO CRR ALLOCATION PROCESS IN THE LONG-RUN?

A. Yes. Once market participants become familiar with the design and operation of the MRTU markets and its congestion patterns, there will be an opportunity to convert priority CRRs into auction revenue rights assigned to each distribution company's retail load, with all CRRs allocated in an auction. This approach to CRR allocation would eliminate the need for the CAISO to conduct an annual CRR allocation process in addition to the auction, eliminate the need for the priority nomination process, and allow market participants to purchase long-term CRRs in an auction.

Q. ARE THERE ALTERNATIVE METHODS FOR ALLOCATING CRRS THAT COULD BE IMPLEMENTED IN 2007 AND WOULD REDUCE ADMINISTRATIVE COSTS?

A. Yes. Dr. Wolak and Dr. Bushnell of the CAISO Market Surveillance Committee proposed a prorata allocation of CRRs among LSEs based on a snapshot of an historic dispatch. This approach would define a pool of CRRs from all CAISO generation to all load, rather than basing the CRRs allocated on LSE choices. This pool would then be divided pro rata among the LSEs, greatly simplifying CRR allocation relative to the CAISO proposal.[86]

In addition to simplicity, this proposal has several other attractive characteristics. Like the CAISO proposal, this alternative would avoid introducing allocative inefficiency because it would not tie future CRR awards to LSE's future contracting, investing or operating decisions. This alternative would also sustain retail access competition because the CRR allocation would proportionately shift among LSEs with shifts in retail load among LSEs. Moreover, if the CRR allocation were based on a single snapshot of generation sources and load distribution factors for each time of use period and season, the allocation would be relatively straightforward for the CAISO to administer.[87]

---

[86] Frank Wolak and James Bushnell, "A Proposal for Pro-Rata Congestion Revenue Right Allocation," October 6, 2005.

[87] The original proposal did not mention seasonal/time of use snapshots for the CRR allocation but if this approach were not taken, the CRRs defined by a on-peak summer load peak might have negative values during

Q. WOULD THE CRRS ASSIGNED THROUGH SUCH AN ALLOCATION PROCESS HEDGE LSES ENTERING INTO LONG-TERM GENERATION CONTRACTS AGAINST VARIATIONS IN THE CONGESTION CHARGES THE LSES WOULD INCUR IN MEETING LOAD?

A. No. Since the CRRs allocated to an LSE would be sourced proportionately from all generation sources operating during the snapshot hour, the sources would not match any LSE's actual generation sources. Similarly, since the CRRs would sink proportionately at all load buses, rather than at each LSE's LAP, the sink would not match the location at which any individual LSE purchases power. Since the CRRs allocated to LSEs would not match either the source or sink required to hedge congestion charges in using generation at particular locations to meet load at particular LAPs, LSEs would need to buy the CRRs they need for hedging long-term contracts in the auction. The allocated CRRs would, therefore, effectively be auction revenue rights which the LSEs would sell in the auction. LSEs would then buy in the auction the CRRs needed to hedge congestion charges on their individual generation sources and load sinks.

---

the winter or even during the off-peak hours in the summer. The generation sources would also need to be scaled down by the ratio of load to generation in the hour, since total injections would exceed total withdrawals by the amount of losses.

Q. DOES THIS ALTERNATIVE APPROACH HAVE ANY OTHER LIMITATIONS THAT MIGHT OFFSET ITS LOWER ADMINISTRATION COSTS?

A. Yes. First, because LSEs would be purchasing the CRRs needed to hedge their specific generation sources in the auction, there would be no mechanism for obtaining long-term CRRs to hedge long-term contracts unless a long-term CRR auction were introduced. This could be accomplished by allocating auction revenue rights rather than CRRs to LSEs and structuring the auction to sell a fixed proportion of the system in the form of long-term CRRs.

Q. WHY IS AN ALLOCATION OF AUCTION REVENUE RIGHTS COMPATIBLE WITH THE SALE OF LONG-TERM CRRS IN THE AUCTION, WHILE A FULL ALLOCATION OF CRRS IS NOT?

A. Allocating auction revenue rights rather than CRRs would allow the sale of long-term CRRs because the auction revenues can be allocated to the LSE entitled to the auction revenue in each year and it is not necessary to know which LSE will get the money at the time the auction is held. Suppose that auction revenue rights were allocated for 100% of the transmission system. (This assumption is made for simplicity; the example can be extended to include grandfathered rights, for example.) In year 1, suppose that 25% of the system were sold as five-year CRRs in the auction and the rest of the system were sold as annual CRRs. After the year 1 auction, one-fifth of the revenue from the sale of the five-year CRRs, and all of the revenue from the sale of the annual CRRs would be distributed

to the owners of the ARRs. The remaining money from the sale of the five-year CRRs could be held in escrow and distributed at the end of each of the following four years to the ARR holders at that time: ¼ of the money remaining would be distributed at the time of the second annual auction, 1/3 in the third year, ½ in the fourth year, and all of the remainder in the fifth year.

An inconsistency would occur if CRRs were sold in the auction for five years, and their was also an intention to allocate 100% of the system as annual CRRs, or as a combination of annual and monthly CRRs, as proposed in California. In order to avoid "double booking" the system, the annual allocation would need to take into account the transmission capacity already allocated in connection with the five-year CRRs.

Q. DOES THIS ALTERNATIVE APPROACH HAVE ANY OTHER LIMITATIONS?

A. Yes. Because all LSEs would be awarded the same CRRs or auction revenue rights, from all generation to all load, regardless of their past entitlement to use of the transmission system, this approach could lead to substantial cost shifts across LSEs that might not be perceived as equitable by some CAISO LSEs. Moreover, as a precedent, the cost shifts resulting from approach might not be perceived as equitable by LSEs in regions considering RTO formation, such as the Pacific Northwest, or regions that may someday again consider RTO formation, such as the Southeast.

Q. COULDN'T THIS EQUITY CONCERN BE ADDRESSED BY ALLOCATING CRRS FROM THE SNAPSHOT OF ALL GENERATION SOURCES PROPORTIONATELY TO EACH LAP, RATHER THAN TO ALL LAPS, AND ALLOCATING LSES SERVING LOAD IN A PARTICULAR LAP CRRS SINKING AT THAT LAP?

A. No. Such an alternative approach might lead to even more dramatic cost shifts across customers. If CRRs were allocated from each generation source dispatched in the snapshot to meet load proportionately in each LAP, this would mean that CRRs would be assigned from sources in each LAP to sink in each other LAP; this construction of the underlying pool of CRRs is essentially the same as if CRRs were defined to all load sinks. The difference is that the CRRs sinking at a particular LAP would be assigned to specific LSEs. If there were differences in congestion across LAPs, there would be a large range in values across these CRRs; some of these would have large negative prices, while others would have large positive prices.

Suppose, for example, that the SCE LAP were relatively high priced, as in LMP Study 3b, while the San Diego LAP were low priced. CRRs sourced from generation in the SCE LAP and sinking at the San Diego LAP would have large negative values. In fact, the CRRs allocated to San Diego loads might have a negative value in aggregate because of the low San Diego LAP price, so that the allocation of CRRs might actually raise the cost of meeting load for the San Diego LSEs.

Q. COULD THIS APPROACH BE MODIFIED TO RETAIN THE SIMPLICITY BUT ELIMINATE THE POTENTIAL FOR INEQUITABLE COST SHIFTS?

A. The likelihood of the kind of cost shifts described above could be reduced under such an alternative approach by defining CRRs from generation located within a given LAP to sink at the same LAP in which the generation source is located. A rule would then be needed, however, to handle situations in which a particular LAP was exporting power to other LAPs during the snapshot hour. Another rule would be needed to determine the LAP sink for CRRs sourced at the ties.

The need to define rules to match sources to LAPs is avoided under the CAISO proposal by allowing LSEs to choose their CRR sources, subject to the priority nomination process and verification of initial nominations. The CAISO proposal avoids using an arbitrary rule to match CRR sources to LAPS, but at the expense of the administrative complexities discussed above.

Q. ARE THERE ANY OTHER POTENTIAL PROBLEMS WITH USING A "SINGLE SNAPSHOT" TO DETERMINE CRR SOURCES?

A. Yes. If a single snapshot were used to define the CRR sources for the entire year, there would likely be problems because many of the CRRs allocated from the tie lines to the LAPs based on a peak hour summer snapshot would potentially be negatively valued during off-peak and winter hours. It is possible that these negative values could be large enough that the entire allocation of CRRs would have a negative value during the off-

peak and winter periods. Thus, rather than the allocated CRRs serving to distribute congestion rents back to LSEs, they might require LSEs to pay additional charges that would further increase the surplus in the congestion rent account. These unintended outcomes could be reduced by using a different CRR allocation for each season and each time of use period based on a different peak hour snapshot for each season and time of use period. Nevertheless, any particular hour that is used as the base would still have the potential to result in the award of a large number of CRRs that while positively valued in that hour because of conditions specific to that hour would be negatively valued over much of the rest of the season. These kinds of outcomes are avoided under the CAISO proposal by allowing LSEs to nominate sources, rather than using a fixed rule that might or might not always produce reasonable outcomes.

C. CRRs and Retail Choice

Q. HOW DOES THE CRR ALLOCATION PROPOSAL ACCOMMODATE RETAIL CHOICE IN CALIFORNIA?

A. The CAISO CRR allocation proposal has several provisions to ensure that retail load that shifts between LSEs will not be unduly disadvantaged by that shift and, moreover, that competition among LSEs will serve to pass the economic value of CRRs through to loads. These provisions are consistent with the CAISO's previously articulated view that the economic value of CRRs belongs to loads, and are awarded to LSEs on behalf of the

loads they serve. These provisions apply to LSEs that lose or gain load over the course of the allocation period.

In addition, different rules apply to load shifts at the time of the annual allocation, between annual allocations, at the time of the monthly allocation, and in between monthly allocations.

Q. WHAT ARE THE PROPOSED RULES FOR ACCOMMODATING RETAIL CHOICE AT THE TIME OF THE ANNUAL ALLOCATION?

A. Under the CAISO CRR allocation proposal, LSEs that lose load through retail competition will forgo the right to renominate a corresponding proportion of their CRRs from the prior annual allocation (on a source by source basis) in Tier 1 of the annual allocation (i.e., the priority allocation Tier). The CAISO CRR allocation rules thereby make the transfer capability used by these CRRs in the prior allocation available to support the award of CRRs to other LSEs in Tier 2 of the current annual allocation process. The CAISO will reserve CRRs in the priority allocation (Tier 1) corresponding to the CRRs released by LSEs whose priority nomination limits were reduced due to load migration.

In addition, under the CAISO's proposed CRR allocation rules, LSEs gaining load will have a corresponding right to nominate additional CRRs in Tier 2 of the allocation process. The reduction in the number of CRRs nominated in the priority allocation tier by the LSE losing retail load will free up transfer capability in Tier 2. This

transfer capability will be available to support CRR nominations in Tier 2 only by LSEs that are awarded Tier 1 CRRs for less than one-half of their eligible retail load and by LSEs gaining retail load as a result of load switches under retail access programs. Thus, LSEs gaining retail access load will only compete for CRR awards in Tier 2 with nominations from other LSEs gaining retail access load and LSEs having a low proportion of Tier 1 CRR awards. This allocation process ensures that the LSEs gaining retail load through retail competition will be able to nominate and receive Tier 2 CRRs utilizing much or all of the transfer capability released in Tier 1 by LSEs losing retail load.

Q. WHY DOES THE PROPOSED CAISO CRR ALLOCATION METHODOLOGY REQUIRE LSES LOSING LOAD TO PROPORTIONATELY REDUCE THEIR ABILITY TO NOMINATE CRRS AWARDED IN THE PRIOR YEAR, EVEN THOUGH THEY HAVE TO REDUCE THEIR NOMINATIONS OF CRRS ANYWAY IF THEY LOSE RETAIL LOAD DUE TO THE LOAD CAP ON TIER 1 CRR NOMINATIONS?

A. The Tier 1 cap on nomination of priority CRRs will likely require LSEs to give up some priority CRRs awarded in the prior year when they lose retail load, but the cap would permit the LSE to give up its least valuable CRRs rather than a proportional slice of all of its CRRs.

For instance, suppose that Blue LSE had been awarded 500 CRRs hedging 750 megawatts of eligible load in the prior annual allocation process; 100 CRRs worth $10,000 each, 150 CRRs worth $5,000 each; 150 CRRs worth $2,000 each and 100 CRRs worth $1,000 each. Thus, the total expected annual value of its CRRs would be $2,150,000. Under the CAISO proposal, if Blue LSE lost 10% of its load, Blue LSE would have to give up the right to nominate 10% of each of its CRRs in Tier 1, foregoing priority nominations on CRRs worth $215,000.

If the only requirement were that the LSE give up enough CRRs to stay under the long-run 66% cap on priority CRRs in the annual allocation, Blue LSE would just have to give up 10% of its priority CRRs in total to stay under the limit, from 500 to 450, giving up 50 of the CRRs worth $1,000, for a total value of $50,000. Thus, 10% of the load that left would be accompanied by a little more than 2% of the value of Blue's CRRs. This outcome would result in the value of the CRRs remaining with LSEs that lost retail load, and would prevent retail competition from forcing CRR values to be passed through to retail consumers.

If the LSE competing to acquire retail load knows that it will acquire a slice of CRRs with a value of $15/MW along with the retail load, the value of the CRRs would be reflected in the retail price it would offer. Conversely, if the LSE losing load could merely give up its least valuable CRRs, this would be reflected in the retail price offers for new competition. In effect, such a rule would transfer the value of the CRRs from the retail consumers to the LSEs currently serving that load.

Q. DOES THE CAISO CRR ALLOCATION PROCESS ENSURE THAT THE LSES GAINING LOAD WILL BE ALLOCATED ALL OF THE SAME PRIORITY CRRS THAT ARE RELEASED BY THE LSES LOSING LOAD?

A. No it does not. The CAISO proposal does not require that an LSE gaining load nominate CRRs from the same source as the CRRs given up by the LSE that lost the retail load. As a result if there are multiple LSEs gaining retail load, it will not necessarily be the case that an LSE gaining load will be able to nominate and be awarded exactly the same CRRs given up by the LSE, from which it gained load, even if it chose to nominate those CRRs. LSEs gaining load will be able to nominate CRRs that cross the same transmission constraints as the surrendered priority CRRs, but the new CRRs may be sourced from different generation and may have very different impacts on other constraints.

Q. WHY DIDN'T THE CAISO CHOOSE SIMPLY TO GIVE THE SURRENDERED PRIORITY CRRS OF LSES LOSING LOAD PROPORTIONATELY TO THE LSES GAINING LOAD?

A. There are several important drawbacks to such an approach. First, the LSEs gaining load might not want the CRRs of the LSEs losing load. More important, however, the proposed method of accounting for retail load shifts is less likely than alternative approaches to cause retail load shifts to result in shifting tiny fractions of megawatts of CRRs between specific LSEs. Releasing all of the transmission capacity used by all

CRRs given up due to retail shifts gives LSEs gaining load more opportunity to nominate and be awarded meaningful quantities of CRRs from specific sources.

From the stand point of the CAISO, the proposed approach to reallocating CRRs among retail competitors significantly simplifies administration. If LSEs gaining retail load were entitled to receive a proportionate share of the CRRs held by the specific LSE from which they gained the load, the CAISO would not only need to track which LSEs lost load and gained load, the CAISO would have to track all of the load shifted back and forth among the LSEs. Thus, under the CAISO proposal, if the Blue LSE lost 5% of its load, and the Red, Orange, Green, Yellow, and Gray LSEs each gained load equal to 1% of Blue's load, all the CAISO would need to do would be to reduce the cap on priority CRR nominations by Blue by 5% for each source, and allow Red, Orange, Green, Yellow and Gray LSEs to nominate additional CRRs in Tier 2.

Suppose, alternatively, that LSEs gaining load acquired the specific CRRs given up by the specific LSE from which they gained load. In the example described above, suppose that the Blue LSE actually lost 2% of its load to Red, 1 % to Orange, 3% to green, and 1% to Yellow and gained 2 % from Gray. Gray on the other hand, gained load from Green, and Green gained load from Red as well as from Blue. In this case, the reallocation of CRRs would be complicated and likely entail tracking the allocation of small fractions of MW of CRRs between LSEs. It would become even more complex in the next annual allocation when LSEs might lose these fractional CRRs back and forth in further fractional quantities as a result of further shifts in load. Under such an allocation

process, the CAISO costs of tracking these CRR shifts might come to exceed the value of the CRRs being shifted.

Q. IS THERE ANY REMAINING POTENTIAL FOR INEQUITABLE OUTCOMES WHEN LOAD SHIFTS BETWEEN LSES?

A. Yes. As we have noted above, any nomination based CRR allocation process will operate like a black box for LSEs making nominations, as they will not know what nominations are being made by other LSEs. There is a potential for LSEs gaining load to nominate CRRs in Tier 2 that are not feasible and thereby be awarded few or no CRRs when they gain retail load. This is the same risk faced by all LSEs in the initial allocation process, however,

Q. IS THERE ANY WAY TO IMPROVE THIS FEATURE OF THE ALLOCATION PROCESS?

A. Yes. More tiers would reduce the potential for this outcome, but more tiers would raise administrative complexity for both market participants and the CAISO and raise overall costs. Whether this possibility will manifest itself in practice is uncertain. If the blackbox nature of the allocation process becomes unattractive to market participants, it may be appropriate to consider shifting to an auction process.

Q. WHY WOULD SHIFTING TO AN AUCTION PROCESS AVOID THESE COMPLICATIONS?

A. An auction process would address the issues described above in two ways. First, because market participants can submit bids into an auction with any number of different bid price levels, an auction is like an allocation process with hundreds of tiers. Second, an auction process separates the process of obtaining CRRs from the process of allocating the value of the existing grid. With an allocation process these processes are combined, so if an LSE is not allocated CRRs, it receives none of the economic value of the existing grid, and also does not receive congestion hedges. With an auction process, an LSE may be outbid for every CRR it seeks to buy in the auction, but it would still receive the benefit of the economic value of the existing grid when the auction revenues are credited to the LSE or against the transmission access charge paid by the LSE.

Q. HOW WILL THE CRR ALLOCATION BE ADJUSTED FOR LOAD MIGRATION THAT OCCURS BETWEEN ANNUAL ALLOCATIONS?

A. If there is mid-year load migration among LSE, the LSE that has lost load must compensate the LSE that has gained the load in one of two manners. First, the LSE losing the load may choose to transfer a percentage of each of the seasonal CRRs that it has been allocated for the year (both on-peak and off-peak) to the LSE gaining load. The percentage transferred would be proportional to the percentage of load lost to the other LSE, and the effective date of the transfer would be from the date at which the load was

lost to the end of the CRR allocation season. Alternatively, the LSE losing load may choose not to transfer these CRRs, but, instead to make payment to the LSE gaining load equal to the per hourly CRR congestion rents that would have been paid to this set of CRRs. This alternative may be useful, for instance, if the LSE losing load has sold some or all of its seasonal CRRs.[88]

Mid-year adjustments to seasonal CRR holding will only occur from the time of the shift in load until the end of a year, at which time any load that has migrated during the year will be accommodated in the annual allocation for the next year.

Q. HOW WILL THE MONTHLY CRR ALLOCATION, WHICH WILL BE FOR APPROXIMATELY 25% OF THE SYSTEM, ACCOMMODATE LOAD SHIFTS AMONG LSES?

A. The loss of load will be taken into account in determining nomination caps for the monthly allocation, which will be based on forecast load.[89]

Q. HOW ABOUT SHIFTS IN LOAD THAT OCCUR WITHIN MONTHS? HOW WILL THIS IMPACT THE ALLOCATION OF MONTHLY CRRS?

[88] MRTU Tariff. Section 36.8.5.1.1 Mid-Year Adjustments in Seasonal CRR Holdings.

[89] MRTU Tariff. Section 36.8.5.2 Load Migration in the Monthly Allocation Process.

A. The tariff does not provide for intra-month adjustments, reflecting a decision by the CAISO and its stakeholders that the administrative cost of such an adjustment would be likely to exceed its benefit.

D. CRR Auctions

Q. YOU STATED PREVIOUSLY THAT THE CAISO WILL MAKE CRRS AVAILABLE THROUGH CRR AUCTIONS, IN ADDITION TO ALLOCATING CRRS. PLEASE DESCRIBE THE PROPOSED TIMING OF THE CRR AUCTIONS

A. The CAISO will hold auctions for CRR obligations annually and monthly, following the annual and monthly processes for allocating CRRs.

Q. WHAT WILL BE THE TERM OF THE CRRS SOLD IN THE CRR AUCTIONS?

A. The term will be the same as in the immediately preceding CRR allocation process. Thus, the annual allocation will sell CRRs for each season of a year, for both on-peak and off-peak periods. The monthly auctions will sell on-peak and off-peak CRRs with a one-month duration.[90]

[90] MRTU Tariff. Section 36.3 CRR Specifications.

Q. WHY AREN'T CRRS WITH TERMS LONGER THAN ONE YEAR AVAILABLE IN THE ANNUAL AUCTION?

A. Since the CAISO is making 100% of the grid capacity available in the CRR allocation process, it cannot sell CRRs in the auction that have a longer term than the CRRs that are allocated. The CAISO could run an auction in which two-year CRRs could be purchased in the year 1 auction only for the transfer capability not allocated in year 1, but such an auction would be complex to administer.[91] If the CAISO were to sell a CRR with a two-year term, the transmission capacity needed to support this CRR in the second year would need to be withheld from the annual allocation process in the second year in order to assure the revenue adequacy of the awarded CRRs. Thus, the grid capacity used to support the second year of CRRs sold in the year 1 auction would not be available for allocation in year 2.

Q. IS THERE A MORE WORKABLE METHOD FOR THE CAISO TO MAKE LONGER-TERM CRRS AVAILABLE IN THE AUCTION?

A. Yes. The CAISO could reserve a proportion of the grid's transmission capacity from the allocation process in order to support the sale of longer-term CRRs in the auction. The

[91] In particular, it would be desirable to apply the simultaneous feasibility test to the year 2 CRRs in combination with CRRs awarded in Year 1 and separately to the CRRs awarded for years 1 and 2. There would also be a pricing problem since year 2 CRRs can be purchased only in combination with year 1 CRRs: how will year 2 CRRs be priced relative to bids just for year 1 CRRS?

process for doing this is known; it is the same process that will be used to limit the annual allocation to 75% of the transmission capability.[92]

Q. WHAT ENTITIES WILL BE PERMITTED TO PARTICIPATE IN THE CRR AUCTIONS?

A. Any party that passes the CAISO's creditworthiness requirements may buy or sell CRRs in the CRR auction.

Q. WILL LSES RECEIVING CRRS IN THE ALLOCATION PROCESS BE PERMITTED TO SELL THOSE CRRS IN THE CRR AUCTIONS?

A. Yes, but initially these sales will be somewhat indirect due to limitations of the initial auction software. The CAISO's original MD02 proposal did not permit LSEs to use the auction process to sell CRRs that they had been allocated. This feature of the CAISO proposal has been changed to allow LSEs to sell these CRRs in the auction; however, the initial deployment of the auction software is based on the MD02 specification and will not have the capability to accept bids to sell previously awarded CRRs. The auction

[92] One issue that would need to be addressed under such an approach would be how to allocate the auction revenue from the sale of the longer-term CRRs. In principle, this money should go to the LSEs that would be receiving a smaller allocation of CRRs as a result of the reservation of transmission capacity in the allocation process to facilitate the auction of longer-term CRRs. This money could be allocated directly to the LSEs that would otherwise have received a CRR in the allocation process, as PJM does through its system of auction revenue rights. Alternatively, the money could be allocated along with all of the other residual revenue from the auction, in proportion to transmission access charges. This alternative socializes the revenue distribution, however, and is less consistent with the objectives that the CAISO has used to guide the allocation of the existing value of the grid.

software, however, has the capability to evaluate bids to buy CRRs, and a bid to buy a CRR from A to B is exactly the same from the standpoint of the auction-clearing process as a bid to sell a CRR from B to A. Thus, the sale of a B to A CRR will initially need to be carried out by purchasing an A to B CRR. Under the MRTU tariff LSEs will initially be able to "sell" CRRs that they received in the allocation process by offering to "buy" the corresponding counterflow CRR in the auction , i.e., a market participant would sell a CRR from B to A by offering to buy a CRR from A to B at any price below its reservation price for selling the B to A CRR.

Q. WOULDN'T THE PROCESS YOU DESCRIBE FOR LSES TO SELL CRRS IN THE AUCTION USING THE PHASE 1 SOFTWARE MEAN THAT THEY WOULD SELL CRRS BY OFFERING TO BUY CRRS IN THE AUCTION AT NEGATIVE PRICES?

A. Yes. Suppose that an LSE were allocated a B to A CRR, and that based on its hedging strategy and its valuation of the CRR, the LSE determines that it would be willing to sell the CRR in the auction for no less than $100. To obtain this result, the LSE would offer to buy a CRR from A to B at a price of no more than -$100. If the LSE were to obtain the A to B CRR at price of, say, -$105, this would be equivalent to being paid $105 to sell its B to A CRR.

Q. WOULD THE CONGESTION RENT SETTLEMENTS ON THE LSE'S A TO B CRR AND B TO A CRR NET OUT TO ZERO?

A. Yes; the settlements would net to zero.

Q. WHAT OTHER PARTIES MIGHT OFFER TO SELL CRRS IN THE AUCTION?

A. In addition to LSEs that may choose to sell CRRs that they have been allocated, market participants may choose to offer counterflow CRRs for sale in the auction. Thus, a market participant might find it profitable, based on its portfolio position, to sell an A to B CRR, which would make a B to A CRR available to a purchaser in the auction.

Q. WHAT WILL BE THE FORM OF A BID TO BUY A CRR IN THE AUCTION?

A. The bidder will provide information on the season or month, time-of-use, source and sink of the CRR that it wishes to purchase, a maximum megawatt quantity that it is willing to purchase, and the prices that it is willing to pay for different quantities of CRRs. The bid price information will be provided in the form of a monotonically decreasing bid curve, which shows the quantity of CRRs that the bidder is willing to purchase at each price. Monotonically decreasing means that the software will expect the bid price to decline as the quantity of CRRs purchased increases. The megawatt quantities must be in increments of a least 1/10 of a megawatt. The bid prices may be negative.

Q. HOW MUCH WILL A WINNING BIDDER PAY FOR CRRS IN THE AUCTION?

A. All bidders will pay the market clearing price for the CRRs that they are awarded. For any CRR, the market clearing price will not necessarily be equal to its bid price. If a bidder is awarded the maximum quantity of CRRs that it has bid to purchase between a given source and sink, the market clearing price for all of these CRRs may be less than its bid for the last CRR that it buys. On the other hand, if the bidder is awarded a quantity of CRRs that is less than the maximum on its bid curve between a given source and sink, then the market clearing price for these CRRs should be equal to the bid that it has made for the last CRR that it is awarded.

Q. WHAT SOURCES AND SINKS MAY BE DESIGNATED IN BIDS TO BUY AND OFFERS TO SELL CRRS IN THE ISO AUCTIONS?

A. Allowable CRR sources and sinks in the auction will be more flexible than in the CRR allocation; they may be generator pricing nodes, scheduling points (external ties), trading hubs, LAPs and sub-LAPs.[93] Participants may also bid for multi-point CRRs, in which case a monotonically decreasing bid curve must be provided for each CRR source and a monotonically increasing bid curve must be provided for each CRR sink.

Q. PLEASE DESCRIBE THE OBJECTIVE FUNCTION THAT WILL BE USED IN THE COMPUTER SOFTWARE TO DETERMINE WHICH BIDS AND OFFERS ARE ACCEPTED IN THE CRR AUCTIONS.

[93] MRTU Tariff, Section 36.13.5.

A. The computer software will maximize the bid-based value of the accepted bids to buy, subject to the constraint that the final set of CRRs must be simultaneously feasible.[94] This objective function thus provides the desirable economic outcome of maximizing the welfare surplus of the buyers and sellers into the auction.

Q. WHAT TRANSMISSION MODEL WILL BE USED IN THE AUCTIONS TO EVALUATE THE SIMULTANEOUS FEASIBILITY OF THE CRRS?

A. All auctions will be based on the same transmission grid model used to evaluate the feasibility of CRRs in the immediately preceding CRR allocation process.

Q. HOW WILL OUTSTANDING AND VALID CRRS, ETC, CONVERTED ETC AND TOR BE TREATED IN THE CRR AUCTION MODEL?

A. The simultaneous feasibility test for the CRR auction will evaluate the CRR bids made by market participants on a grid model that includes representations of the ETCs, converted ETCs, TORs and the CRRs already allocated to the LSEs. The ETCs, converted ETCs, and TORs will be represented in exactly the same way as they were modeled in the simultaneous feasibility test for the preceding CRR allocation. The CRRs allocated to the LSEs in prior allocations for the same time period as the auction will be obligations, so

[94] Since offers to sell are bids at negative prices, this is equivalent to maximizing the bid-based value of offers to buy minus the bid-based value of accepted offers to sell CRRs in the auction.

each CRR will be represented as a fixed injection at the source location for the CRR, and a fixed withdrawal at the sink location for the CRR.

Q. WILL PRO-RATIONING BE USED IN THE CRR AUCTION?

A. It is not expected that it will be needed routinely. The CRR auction will use the bids of the market participants to determine the auction winners, subject to the requirement for simultaneous feasibility. However, the tariff also includes a provision to pro-rate CRRs between bidders in the situation in which there are two or more identical bids for the same CRR and not all of the bids can be awarded without violating a constraint.

Q. HOW WILL MARKET-CLEARING PRICES BE DETERMINED IN THE CRR AUCTIONS?

A. Market-clearing prices in a CRR auction will be determined in essentially the same way as LMP prices; they will be determined by the shadow prices of the binding constraints in the optimization model that evaluates CRR bids and performs the auction simultaneous feasibility test. Thus, any CRR that has no impact on any binding constraint in the simultaneous feasibility test would have a price of zero. CRR bids will be awarded unless the award of the CRR would impact a binding constraint, in which case the CRR bids placing the highest value on flows impacting the constraint will be awarded. The shadow price of each constraint is determined by the last bid accepted that causes flows

over the constraint. The price of CRRs will be determined by the sum of the price of their impact on each binding constraint.

Q. ARE THERE SIMILARITIES BETWEEN THE DESIGN OF THE CRR AUCTION PROPOSED BY THE CAISO AND THE CRR AUCTION USED IN OTHER ISOS OPERATING LMP-BASED MARKETS?

A. Yes. Most elements of the auction design are the same, such as the objective function and the calculation of market-clearing auction prices. Moreover the proposal to hold auctions annually and monthly matches the periodicity in most ISOs. A difference is that the CAISO will make seasonal CRRs available in the annual auction in addition to the annual CRRs available in other regions such as PJM. A second difference is that the first version of the CAISO's auction software will not provide functionality to directly permit sales of CRRs in the auction. As discussed previously, however, CRR sales can be accommodated as purchases of counterflow CRRs. As in New York, CRRs may be sourced or sunk at any generator bus or load zone.

Q. DO OTHER ISOS ALLOCATE CRRS PRIOR TO HOLDING CRR AUCTIONS?

A. Yes. The MISO conducts an allocation prior to holding its FTR auction and this was also the procedure used for many years in PJM prior to their transition to a system of allocating auction revenue rights prior to the auction.

Q. IN THE OTHER ISOS, IS THE AUCTION VIEWED AS AN IMPORTANT ELEMENT OF THE CRR MARKET DESIGN, IN ADDITION TO THE CRR ALLOCATION?

A. Yes. The importance of the auctions is indicated by the volume of transactions in these auctions, which is discussed in more detail below.

Q. WHAT IS THE PURPOSE OF USING BOTH AN ALLOCATION PROCESS AND AN AUCTION PROCESS FOR DISTRIBUTING CRRS?

A. The auction provides market functions that are important to market participants and that are not provided by the allocation process. An ISO-coordinated auction provides an opportunity for market participants that do not acquire CRRs in the allocation process to purchase CRRs. The auctions also provide an opportunity for LSEs that receive CRRs in the allocation process to reconfigure these CRRs to better meet their needs. For instance, the monthly auctions would enable a market participant owing a seasonal CRR to sell that CRR for just one month of the season, or to reconfigure the source location of the CRR for one or more months.

Q. SINCE UNDER THE CAISO PROPOSAL ALL OF THE TRANSFER CAPABILITY OF THE GRID IS MADE AVAILABLE FOR ALLOCATION AT A PRICE OF ZERO, WHY WOULD ANY VALUABLE CRRS REMAIN TO BE ACQUIRED IN THE AUCTION?

A. It is not correct that all of the transfer capability will be allocated prior to the auctions. First, 50% of the residual inter-tie capacity will be reserved for sale in the annual auctions. Second, LSEs receiving CRRs in the allocation process whose hedging needs change could make CRRs available for sale in the auction. For example, some months of CRRs awarded seasonally might be sold in a monthly auction. Third, market participants may see potentially profitable opportunities to sell counterflow CRRs in the auction, which would support the sale of more CRRs. Fourth, entities seeking to hedge wheeling through-and-out transactions may purchase CRRs that impact different constraints than those binding in the allocation.

Finally, it is likely that some valuable CRR will remain available following the CRR allocation, because the quantity of CRRs that LSEs will be allocated is capped by their load. CRRs that are feasible and valuable that sink at specific nodes or sub-LAPs on constraints within the LAPs may be available at the end of the allocation process, even if few CRRs remain that are feasible sinking at the LAPs. Additionally, some CRRs may remain that have a low expected value but are nevertheless useful for hedging uncertain outcomes, especially within a larger portfolio of CRRs and energy contracts.

Q. IS THERE A VALID CONCERN THAT ALLOCATING CRRS WILL REDUCE LIQUIDITY IN THE CRR AUCTIONS?

A. A number of market participants have expressed such a concern but it is not clear that their concern has a valid basis. One rationale that has been expressed for such a concern

is that there could be limited liquidity in the auction because LSEs will not offer CRRs for sale in the auction for less than their value. This is not a legitimate concern regarding auction liquidity The appropriate question is whether CRRs will be available for purchase in the auction at prices consistent with their expected value.

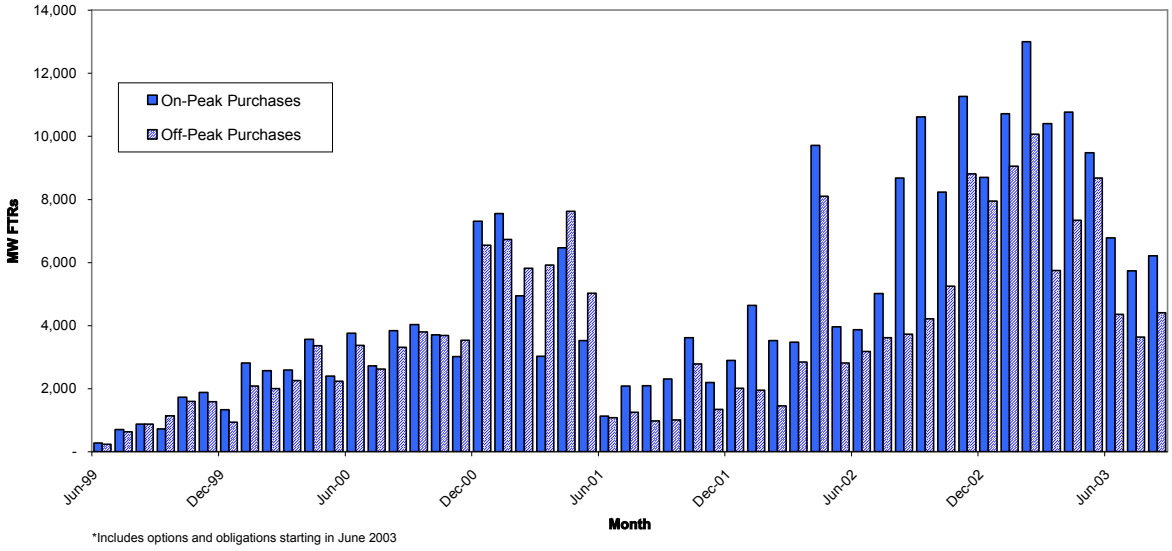
A second reason articulated for why CRRs might not be offered for sale by LSEs in the auction at prices reflecting their expected value is that regulated LSEs may be concerned that they could be second-guessed by regulators if they were to sell CRRs in the auction at prices that turned out in retrospect to be lower than the actual payout to the CRR over the subsequent period. If regulated LSEs anticipated such second guessing by regulators, however, the effects would be complex and would not necessarily result in CRRs being withheld from the auction. LSEs could also fear being second guessed for a failure to sell CRRs whose auction prices turn out to be greatly in excess of the actual CRR payout with the result that such LSEs could be reluctant to hold CRRs, preferring instead to sell all of them in the auction.

Q. DID THE ALLOCATION OF FTRS TO THE PJM LSES REDUCE LIQUIDITY IN THE PJM AUCTIONS PRIOR TO THE SWITCH TO AN ALLOCATION OF AUCTION REVENUE RIGHTS?

A. We have not seen evidence that the allocation of FTRs reduced liquidity in the auctions in PJM. This assessment is based on looking at the data from PJM monthly auctions before and after their switch to auction revenue rights in June 2003.

The volume of FTRs acquired in the monthly PJM auctions was relatively low when the auctions first began but it rose rapidly as shown in Figure 16. While the volume of FTRs acquired in the auctions does not necessarily demonstrate that there was a relatively elastic supply around the expected value of each FTR, the large volume of FTR purchases does not suggest an overall liquidity problem.

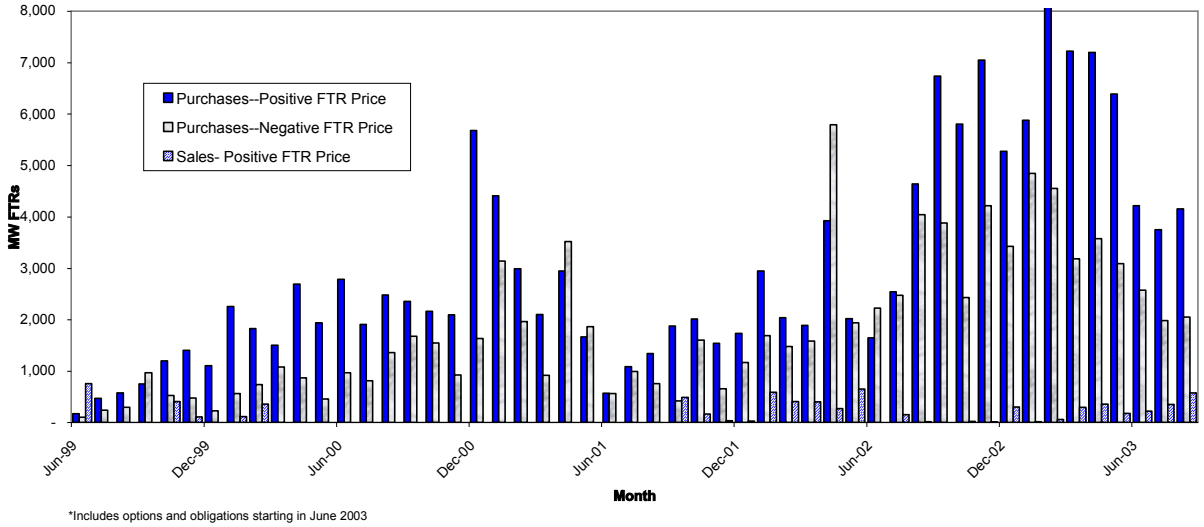
Figure 16
PJM Monthly FTR Auctions
FTR Purchases



Q. DOESN'T THE LACK OF FTR SALES IN THE PJM DATA SUGGEST A LIQUIDITY PROBLEM?

A. No. While there are not that many sales of FTRs in the PJM data, Table 17shows that there were many purchases of FTRs at negative prices, which is equivalent to the sale of an FTR.

Table 17
PJM Monthly FTR Auctions
On-Peak FTR Purchases and Sales*



*Includes options and obligations starting in June 2003

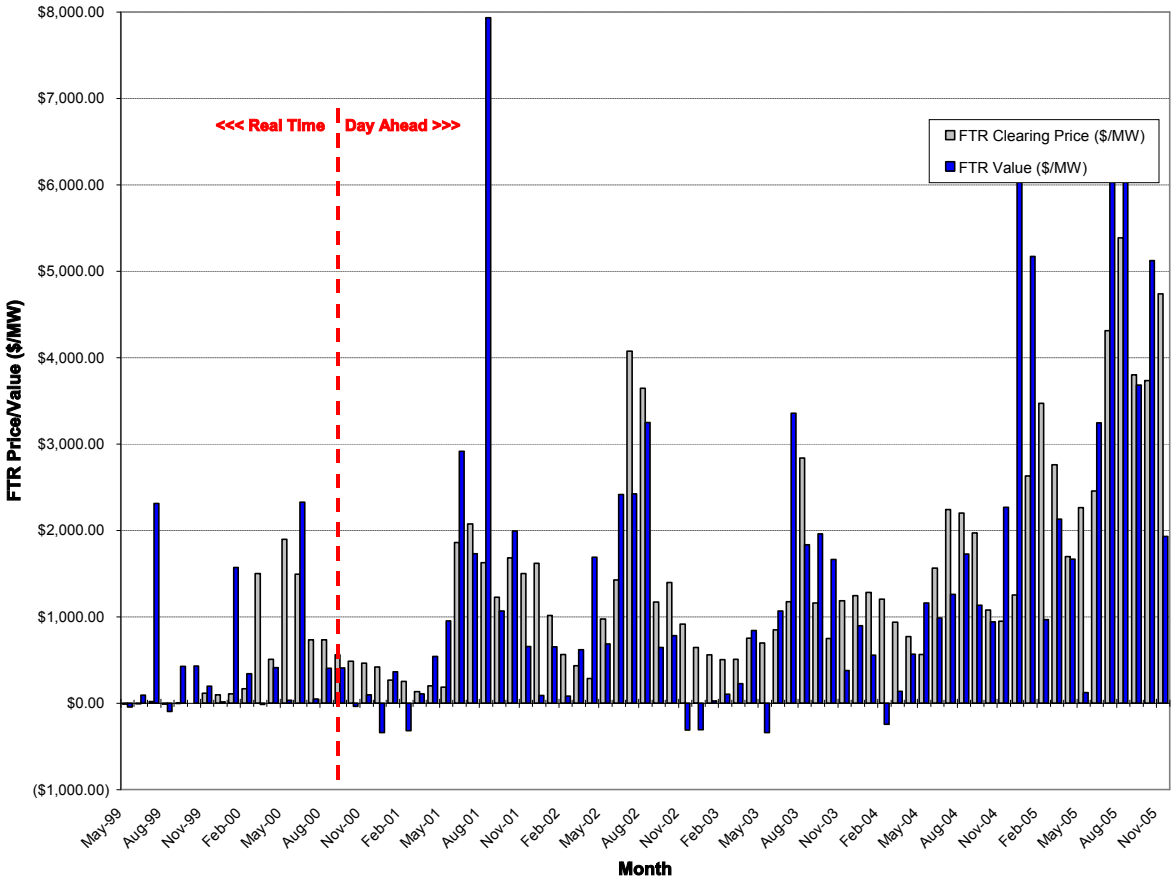
Another way of examining auction liquidity is to compare prices in the auction to the actual FTR payout to see if FTRs were consistently selling for a large premium over the payout, which could reflect a premium relative to the expected value resulting from a lack of liquidity in the auction.

Figure 18 shows the relationship over time between the price of an on-peak Western Hub to PECO FTR in the monthly auction and its payout. It is apparent that the payout has been highly volatile; the reason that market participants would want to hold FTRs is to hedge against these variations. Over the period May 1999-November 2005, however, the payout has averaged 104.67% of the monthly purchase price. The payout averaged 95.88% during the period June 2001 through May 2003 during which FTRs

were allocated, and 99.25% during the period June 2003 through May2005 in which FTRs were sold in an annual auction, and then reconfigured in the monthly auction.[95] This 3.5% difference is miniscule compared to the standard deviation of the monthly returns (112).

[95] FTR values are available through November 2005. To hold seasonal effects constant, the comparison is based on June-May periods.

Figure 18
FTR Monthly Auction Clearing Prices and Day-Ahead Values:
Western Hub - PECO (Obligations)
May 1999 - Nov 2005
On-Peak



Moreover, the PJM allocation and auction processes illustrate the fundamental equivalence of the two processes. Any PJM LSE that wants to be allocated an FTR rather than an auction revenue right merely has to self-schedule its auction revenue right in the auction and it will be allocated an FTR. The real difference between allocation and auction processes is in the ability to hold long-term auctions for CRRs as discussed above.

Q. SOME PARTIES EXPRESS THE VIEW THAT THE CAISO SHOULD EXCLUSIVELY ALLOCATE CRRS RATHER THAN ALLOWING THEM TO BE PURCHASED AND SOLD IN THE AUCTION IN ORDER TO ENSURE THAT THEY ARE ACQUIRED BY LSES AND NOT BY GENERATORS, SINCE CRR OWNERSHIP MIGHT MAKE WITHHOLDING PROFITABLE FOR SOME GENERATORS. IS THIS A VALID CONCERN?

A. It is certainly true that if a generator located within a load pocket held CRRs sourced outside the load pocket and sinking inside the load pocket, this CRR holding would increase the profitability to the generator of economically or physically withholding output. However, the ownership of CRRs acquired in the auction will be observable by the CAISO, FERC and all CAISO market participants, If a generator located within a load pocket were to assemble such a CRR position, and it was known that the position did not hedge a corresponding energy sale, the impact of this position on the generators incentives would be transparent and could be taken into account. Similar incentive impacts would arise if a generator located within a load pocket were to buy power within the load pocket forward through CFDs or analogous transactions.

The empirical evidence with which we are familiar does not suggest that CRR ownership has caused a problem with generator withholding in practice. Generators in New York, for example, do not appear to purchase TCCs sinking at the same zone as their generation. Table 19 portrays the holders of the TCCs purchased in the last two capability period auctions in New York: Spring 2005 and Fall 2005. Only five generators purchased TCCs in these auctions (PP&L, Constellation, Mirant, Select and PSEG).

None of these entities own generation located in the New York City load pocket. PP&L owns some GTs in the Long Island load pocket but PP&L did not acquire any TCCs sinking on Long Island.

Table 19
Total Number of TCCs by Holder in
NYISO Spring and Fall 2005 Capability Period TCC Auctions

Primary Holder	Total TCC MW Purchased in Spring 2005 Capability Period Auction	Total TCC MW Purchased in Fall 2005 Capability Period Auction
Amerada_Hess	0	29
Brascan_Energy_Marketing_Inc	526	569
Citadel_Energy_Products_LLC	0	900
Con_Edison_Solutions_Inc	0	25
Consolidated_Edison_Co_of_New_York_Inc	77	75
Consolidated_Edison_Energy_Inc	1325	1490
Constellation_Energy_Commodities_Group_Inc	153	363
Coral_Power_LLC	387	1424
DC_Energy_LLC	2	4
Edison_Mission_Marketing___Trading_Inc	990	0
Exelon_Generation_Company_LLC	1585	1006
HQ_Energy_Services_(US)	384	0
J_Aron___Company	198	790
Long_Island_Power_Authority	151	207
Merrill_Lynch_Commodities_Inc	2336	4436
Mirant_Americas_Energy_Marketing_LP	0	200
Morgan_Stanley_Capital_Group_Inc	50	0
Niagara_Mohawk_Power_Corp	2011	684
PP_L_EnergyPlus_Co_(EPLUS)	1756	1571
PSEG_Energy_Resource___Trade_LLC	1437	1987
Quark_Power_LLC	0	30
RAM_Energy_Products_LLC	50	25
Select_Energy_New_York_Inc	150	0
Sempra_Energy_Trading_Corp	31	14
Susquehanna_Energy_Products_LLC	1229	1038

Based on the ease of monitoring possible withholding by a generator acquiring CRRs sinking in a load pocket, and the empirical evidence we are aware of, there does not appear to be a strong rationale for restricting access to CRRs.

Q. ARE THERE ANY BENEFITS FROM ALLOWING ENTITIES OTHER THAN LSES TO BUY CRRS IN THE AUCTION?

A. Yes. First, allowing other market participants to buy and sell CRRs in the auction supports market participants lacking generation within a constrained region in assembling supply packages to sell power to LSEs on a delivered basis. This may be beneficial economically because these other entities may be better suited than the LSEs for assembling portfolios that hedge the cost of delivered power, utilizing CRRs, other financial instruments and physical assets to hedge their positions. Second, while market participants will likely not want to hold large unhedged counterflow positions, it is anticipated that risk-taking entities, such as hedge funds, will be willing to hold small unhedged positions if the demand for hedges causes CRR prices to rise above expected price differentials. Their participation will provide liquidity in the market and increase the supply of congestion hedges. Third, non-LSE auction participants may provide further liquidity in the CRR auction by arbitraging differences between the CRR prices and forward power prices. Fourth, generators may participate in the auction, not to buy CRRs sinking at the location of their generation, but instead to sell counterflow CRRs sourced at their generation. This would be economically attractive for the generator if the

forward congestion in the CRR auction exceeded the congestion levels expected by the generator. The sale of these counterflow CRRs will similarly increase the supply of congestion hedges for purchase by LSEs.

Q. COULDN'T GENERATORS SELL COUNTERFLOW CRRS THROUGH BILATERAL TRANSACTIONS WITHOUT THE NEED FOR A CAISO-COORDINATED AUCTION?

A. Yes. But the bilateral market is a complete substitute for a CAISO-coordinated auction only if the counterflow CRR that a generator is willing to hold is exactly the reverse of the CRR that a LSE wishes to acquire. It is likely to be the case that generators would be willing to hold counterflow CRRs from their generation to a trading hub while LSEs would want to acquire CRRs from a specific generator to the LAP. The auction allows both parties to buy and sell any CRRs they want.

Q. IN ADDITION TO THE CAISO-COORDINATED PROCESSES FOR ALLOCATING CRRS, WILL MARKET PARTICIPANTS BE ABLE TO ACQUIRE CRRS THROUGH BILATERAL ARRANGEMENTS?

A. Yes. Market participants may buy, sell or trade CRRs bilaterally, provided that the new CRR holder meets certain standards of eligibility, namely creditworthiness. Transfers of CRRs must be in increments of at least a tenth of a MW and be for at least a full day-term, for either the on-peak or off-peak period. Changes in the ownership of CRRs as a

result of bilateral trading must be registered through the CAISO's Secondary Registration System, in order to be taken into account in the CAISO settlement process.

Q. PLEASE EXPLAIN THE CAISO'S ROLE IN THE SECONDARY CRR MARKET.

A. Aside from coordinating periodic CRR auctions, the CAISO's role in the secondary market for CRRs will be limited to recording bilateral sales in the registration system, CRR holders will be able to record sales with the CAISO if the buyer is able to satisfy CAISO credit worthiness requirements for the new CRRs it would hold.

Q. PLEASE EXPLAIN THE PRINCIPLES UNDERLYING THE DISTRIBUTION OF REVENUES FROM THE CRR AUCTIONS.

A. There will initially be two payment streams from the CRR auction. First, there will be payments to market participants purchasing CRRs at negative prices. (These purchases at negative prices are effectively sales at positive prices as discussed above.) These payments will be determined by the price of the CRR purchased in the auction. Second, there will be a residual stream of auction revenues that will be credited against TAC charges, i.e., it will flow into the TAC accounts of the relevant PTOs.[96]

[96] The CRR auction revenues are paid to the entities selling CRRs in the auction. Any residual auction revenues will be allocated to the transmission owners for crediting against transmission access charges. The revenue adequacy theorem also governs auction revenues. If the CRRs that were allocated prior to the auction are

E. Transmission Expansion

Q. WILL ADDITIONAL CRRS BE AVAILABLE IN THE FUTURE IF NEW TRANSMISSION FACILITIES ARE CONSTRUCTED?

A. Yes. The general principle is that entities paying from transmission upgrades whose costs are not recovered in rate base will be awarded CRR options consistent with the increase in the transfer capability of the grid that is attributable to the upgrade.

Q. HOW WILL CRRS AWARDED TO ENTITIES PAYING FOR TRANSMISSION UPGRADES BE TREATED IN THE CRR ALLOCATION AND AUCTIONS?

A. Before the start of an annual or monthly CRR allocation and auction process, the CAISO will adjust the network model used in the allocation or auction to reflect CRRs allocated to entities that have funded transmission projects. Incremental CRRs allocated for transmission upgrades will be fixed, or reserved, in the network models used for CRR allocation and auction processes held during the term in which the incremental CRRs are valid.

---

simultaneously feasible on the auction grid and if the CRRs outstanding at the end of the auction are simultaneously feasible on the auction grid, then the auction will be revenue adequate.

IV. CONCLUSIONS

Q. DID THE CAISO DISCUSS OTHER ALLOCATION AND AUCTION PROCEDURES WITH STAKEHOLDERS, IN ADDITION TO THE RULES PROPOSED IN THE CURRENT FILING?

A. Yes. The CAISO discussed with its stakeholders a number of allocation alternatives that are very different from the present proposal, as well as minor variations. A few stakeholders favored a "full auction" process that would have eliminated the CRR allocation in favor of an allocation of auction revenue rights. There are a number of advantages to this approach, namely the ease of auctioning long-term CRRs, and it has been implemented in the NYISO and PJM. However, many stakeholders did not support a full auction in conjunction with the initial implementation of an LMP market in California.

In addition, there was extensive discussion of "simplified" approaches, particularly a proposal to allocate CRRs or congestion rents pro-rata to LSEs. However, as discussed in our testimony, such an approach entails cost-shifting and there was opposition to an approach that would have substantially changed the historical entitlements to use the transmission system without paying an additional charge for congestion.

The CAISO also discussed CRR allocation approaches that would have dropped the simultaneous feasibility test for CRRs and funded infeasible CRRs from CRR auction revenue or other sources.

Finally, discussion with stakeholders investigated many variations to the rules that have been proposed, such as different numbers of allocation tiers, different validation rules, and different rules for the priority allocation tier. In some cases, as discussed in our testimony, there was a clear equity or efficiency basis for choosing one variation over another. In other instances, the final choice of one design variation over another reflects a compromise reached in order to control administrative costs, or to balance stakeholder interests.

Q. HOW DOES THE PROPOSAL FOR THE DEFINITION, ALLOCATION AND AUCTION OF CRRS BALANCE THE INTERESTS OF DIVERSE CAISO MARKET PARTICIPANTS?

A. The CRR proposal of the CAISO reflects an enormous effort to listen to stakeholder views and to take these views into account in the proposed rules for the CRR allocation and auction. The interests of the stakeholders are diverse and in many cases are orthogonal. Therefore, the final proposal, in attempting to balance stakeholder interests, is unlikely to please any stakeholder group entirely.

Some examples of the ways that the proposal balances stakeholder interests are: the treatment of inter-tie capacity, which balances the interests of CAISO LSEs participating in the allocation against external suppliers buying CRRs in the auction; the CRR allocation rules for LSEs losing load versus LSEs gaining load; the decision to require validation for some, but not all, tiers of the first annual allocation, which balances

the need to support forward contracting with providing some flexibility for LSEs to nominate different CRR sources than they did in the past; and the decision to allow trading hubs and external locations to be validated CRRs sources, in addition to generation sources.

Overall, the proposal attempts to ensure that parties have a reasonable opportunity to participate in the allocation and auction process, to provide flexibility for market participants to adjust their holdings of CRRs, to give parties a reasonable ability to hedge their long-term energy commitments, and to avoid substantial cost shifts.

Q. OVERALL, HOW DOES THE CAISO PROPOSAL FOR THE DEFINITION, ALLOCATION AND AUCTION OF CRRS COMPARE TO THE PROCEDURES USED IN OTHER ISOS?

A. There are a number of important high-level similarities. First, the definition of CRRs is essentially the same as that used elsewhere. Second, in the CRR nomination process proposed by the CAISO for the first year, most LSE CRR nominations must be linked to historical entitlement to use of the transmission grid without paying congestion. A similar linkage was made in the allocation of ETCNL in New York, in the ARR allocation rules used in PJM starting in 2003 and in the MISO FTR allocation rules. The details of this linkage differ in the different ISOs but, interestingly, it is present in all of these cases and shows that all of the stakeholder processes found the need to include a linkage to grid use in order to limit cost shifts. Third, the priority nomination proposal, while different in

some respects from the earlier systems, is intended to support long-term energy contracts in the absence of a long-term CRR auction. It serves a purpose that other regions have attempted to address by auctioning longer-term CRRs (New York) or by tying the CRR allocation to installed capacity resources (PJM, 1999-2003). Finally, the CAISO proposal includes both an allocation and an auction as in other regions, and the auction structure is very similar to that used in other ISOs.

In a number of instances the CAISO proposal also has benefited from the experience in other ISOs, for instance in the design of rules regarding the allocation of CRRs under retail access, through the inclusion of a CRR auction in addition to the allocation, and in consideration of the importance of simplification.

Q. IN YOUR VIEW, IS THE CAISO PROPOSAL FOR THE DEFINITION, ALLOCATION AND AUCTION OF CRRS REASONABLE?

A. Yes. The overall CAISO proposal is a reasonable implementation of CRRs in the context of an LMP-based market. The CAISO has made a number of compromises and has added some complexity to meet market participant concerns. On the whole, however, the proposal will lead to an allocation and auction of CRRs that will support the implementation of LMP. In particular, the proposal preserves the purely financial characteristic of CRRs, which enables LMP to facilitate efficient and reliable energy markets.

Table 7
Percentage of Long and Short Contracts of all Open Futures
Held by Non-Commercial and Commercial Traders for Report Date 10/18/2005

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]
Market_and_Exchange_Names	CFTC Market Code	Number of Open Contracts	Percent of Long Positions Held by Commercial Traders	Percent of Short Positions Held by Commercial Traders	Percent of Long Positions Held by Non-Commercial Traders	Percent of Short Positions Held by Non Commercial Traders	Percent of Spread Positions Held by Non-Commercial Traders	Percent of Long Positions Reported Traders	Percent of Short Positions Reported Traders	Percent of Long Positions Non-Reported Traders	Percent of Short Positions Non-Reported Traders
WHEAT - CHICAGO BOARD OF TRADE	CBT	293651	58.5	47.9	17.8	22.6	15.4	91.6	85.9	8.4	14.1
WHEAT - KANSAS CITY BOARD OF TRADE	KCBT	120791	37.9	69.3	45.1	6.2	5	88	80.5	12	19.5
WHEAT - MINNEAPOLIS GRAIN EXCHANGE	MGE	35673	40.7	70.6	30.8	2	2.3	73.8	74.9	26.2	25.1
CORN - CHICAGO BOARD OF TRADE	CBT	797135	55.1	46.9	19	20.4	8.1	82.3	75.4	17.7	24.6
OATS - CHICAGO BOARD OF TRADE	CBT	6897	12.9	76.9	51.4	5	0.6	65	82.6	35	17.4
SOYBEANS - CHICAGO BOARD OF TRADE	CBT	298791	52.5	46.1	20.4	16.4	10.9	83.8	73.4	16.2	26.6
SOYBEAN OIL - CHICAGO BOARD OF TRADE	CBT	170678	44.9	73.6	25.5	5.6	12.8	83.3	92	16.7	8
U.S. TREASURY BONDS - CHICAGO BOARD OF TRADE	CBT	594283	65	49.2	15.6	20.3	0.7	81.3	70.1	18.7	29.9
NO. 2 HEATING OIL, N.Y. HARBOR - NEW YORK MERCANTILE	NYME	175228	57.7	61.5	11.2	13.9	12.7	81.6	88.1	18.4	11.9
NATURAL GAS - NEW YORK MERCANTILE EXCHANGE	NYME	556099	44.3	47.2	10.1	14.5	33.7	88.2	95.3	11.8	4.7
M-3 BASIS SWAP - NEW YORK MERCANTILE EXCHANGE	NYME	101262	79.8	84	8.4	3.8	2.3	90.5	90	9.5	10
TCO BASIS SWAP - NEW YORK MERCANTILE EXCHANGE	NYME	55219	77.6	71.7	10.7	15.1	0	88.3	86.8	11.7	13.2
MALIN BASIS SWAP - NEW YORK MERCANTILE EXCHANGE	NYME	70209	88.6	64.9	0	29.3	2.2	90.8	96.5	9.2	3.5
PG&E CITYGATE BASIS SWAP - NEW YORK MERCANTILE EX	NYME	70256	48.9	70.2	35.9	16	4	88.9	90.2	11.1	9.8
NGPL TEXOK BASIS SWAP - NEW YORK MERCANTILE EXCH	NYME	63890	94.4	75.8	0	7.2	2.1	96.5	85.1	3.5	14.9
SUMAS BASIS SWAP - NEW YORK MERCANTILE EXCHANGE	NYME	65528	84.3	70.4	0	13.5	4	88.3	87.9	11.7	12.1
NGPL MID-CON BASIS SWAP - NEW YORK MERCANTILE EXC	NYME	45901	81.1	84.3	0	4.9	1	82	90.1	18	9.9
DOMINION BASIS SWAP - NEW YORK MERCANTILE EXCHAN	NYME	57843	64.4	75.8	10.4	2.4	10.3	85.2	88.6	14.8	11.4
SOYBEAN MEAL - CHICAGO BOARD OF TRADE	CBT	135432	52.6	57.5	15.2	13.8	11.1	78.9	82.5	21.1	17.5
1-MONTH LIBOR RATE - CHICAGO MERCANTILE EXCHANGE	CME	29793	56.1	74.6	29.7	6.2	1.5	87.3	82.3	12.7	17.7
COTTON NO. 2 - NEW YORK BOARD OF TRADE	NYBT	122932	54.5	68.5	27.7	18.5	7.1	89.3	94.1	10.7	5.9
HENRY HUB GAS SWAP - NEW YORK MERCANTILE EXCHAN	NYME	1364215	55	74.6	25.1	6.1	18.2	98.3	98.9	1.7	1.1
HENRY HUB PENULTIMATE GAS SWAP - NEW YORK MERCA	NYME	250677	48	48	28.2	28.7	22.5	98.6	99.2	1.4	0.8
ROUGH RICE - CHICAGO BOARD OF TRADE	CBT	7474	31	64.2	35.1	9.7	12.1	78.2	85.9	21.8	14.1
FRZN CONCENTRATED ORANGE JUICE - NEW YORK BOARD	NYBT	27981	32.6	67.9	44.3	18.7	7.7	84.6	94.3	15.4	5.7
2-YEAR U.S. TREASURY NOTES - CHICAGO BOARD OF TRAD	CBT	355080	53.3	47.1	26.4	24.3	0.6	80.3	72	19.7	28
10-YEAR U.S. TREASURY NOTES - CHICAGO BOARD OF TRA	CBT	1678231	60.8	53.1	24	21.8	2	86.8	76.9	13.2	23.1
5-YEAR U.S. TREASURY NOTES - CHICAGO BOARD OF TRAD	CBT	1353179	69.3	45.4	18.8	31.3	1.9	90	78.7	10	21.3
30-DAY FEDERAL FUNDS - CHICAGO BOARD OF TRADE	CBT	423027	42.9	52.7	32.8	24.9	14.2	90	91.8	10	8.2
MILK - CHICAGO MERCANTILE EXCHANGE	CME	19762	66.5	46.5	2	12.3	2.5	71	61.3	29	38.7
LEAN HOGS - CHICAGO MERCANTILE EXCHANGE	CME	110126	42.6	30.6	21.4	18.5	22.8	86.8	71.9	13.2	28.1
FRZN PORK BELLIES - CHICAGO MERCANTILE EXCHANGE	CME	1433	11.6	8.9	47.4	34.8	3.6	62.5	47.3	37.5	52.7
LIVE CATTLE - CHICAGO MERCANTILE EXCHANGE	CME	165123	43.3	47.5	30.9	9.9	14.2	88.4	71.7	11.6	28.3
RANDOM LENGTH LUMBER - CHICAGO MERCANTILE EXCHA	CME	3896	21.5	28	26.9	25	3.5	52	56.6	48	43.4
FEEDER CATTLE - CHICAGO MERCANTILE EXCHANGE	CME	27479	26.4	29.6	44.2	10.9	11.4	82	51.9	18	48.1
PJM ELECTRICITY MONTHLY - NEW YORK MERCANTILE EXC	NYME	76100	50.2	72.5	36.3	13.7	13.2	99.7	99.4	0.3	0.6
NYISO ZONE A LBMP SWAP - NEW YORK MERCANTILE EXC	NYME	27598	71.7	71.1	18.8	17.6	9.1	99.6	97.8	0.4	2.2
NYISO ZONE G LBMP SWAP - NEW YORK MERCANTILE EXC	NYME	9243	65.4	37.8	8	35.6	26.5	100	100	0	0
ISO NEW ENGLAND LMP SWAP - NEW YORK MERCANTILE E	NYME	17530	69.8	65.2	16.5	22.1	11.2	97.6	98.5	2.4	1.5
PJM CAL MONTH OFF PK LMP SWAP - NEW YORK MERCANT	NYME	24366	43.6	92	46.6	0.5	6.3	96.5	98.8	3.5	1.2
ISO NEW ENG OFF PK LMP SWAP - NEW YORK MERCANTILE	NYME	9656	71.5	89.2	16.9	1.2	8.5	96.9	99	3.1	1
CRUDE OIL, LIGHT SWEET - NEW YORK MERCANTILE EXCH	NYME	860139	63.9	58.5	14.4	17.4	15.6	93.9	91.5	6.1	8.5

Table 7 (continued)
Percentage of Long and Short Contracts of all Open Futures
Held by Non-Commercial and Commercial Traders for Report Date 10/18/2005

[A]	[B]	[C]	[D]	[E]	[F]	[G]	[H]	[I]	[J]	[K]	[L]
Market_and_Exchange_Names	CFTC Market Code	Number of Open Contracts	Percent of Long Positions Held by Commercial Traders	Percent of Short Positions Held by Commercial Traders	Percent of Long Positions Held by Non-Commercial Traders	Percent of Short Positions Held by Non Commercial Traders	Percent of Spread Positions Held by Non Commercial Traders	Percent of Long Positions Reported Traders	Percent of Short Positions Reported Traders	Percent of Long Positions Non-Reported Traders	Percent of Short Positions Non-Reported Traders
COCOA - NEW YORK BOARD OF TRADE	NYBT	133853	69.6	72.2	22.4	22.4	1.4	93.4	95.9	6.6	4.1
PALLADIUM - NEW YORK MERCANTILE EXCHANGE	NYME	13255	10.8	76.7	68.4	18.6	1.2	80.5	96.5	19.5	3.5
PLATINUM - NEW YORK MERCANTILE EXCHANGE	NYME	12560	6.8	85	74.5	4.3	0.1	81.4	89.3	18.6	10.7
SUGAR NO. 11 - NEW YORK BOARD OF TRADE	NYBT	475768	43.2	78.8	34.8	8.3	6.2	84.2	93.4	15.8	6.6
COFFEE C - NEW YORK BOARD OF TRADE	NYBT	85868	54.5	60.3	20.9	18.7	11.4	86.8	90.4	13.2	9.6
SILVER - COMMODITY EXCHANGE INC.	CMX	142530	18.7	70	46.5	8.4	9.3	74.5	87.8	25.5	12.2
COPPER-GRADE #1 - COMMODITY EXCHANGE INC.	CMX	107427	40.4	48.6	35.8	29	10.5	86.8	88.1	13.2	11.9
GOLD - COMMODITY EXCHANGE INC.	CMX	362699	14.2	69.2	61.9	14.9	8.3	84.5	92.5	15.5	7.5
CANADIAN DOLLAR - CHICAGO MERCANTILE EXCHAN	CME	112354	23.8	77.8	45.6	7.5	0.7	70.2	86	29.8	14
SWISS FRANC - CHICAGO MERCANTILE EXCHANGE	CME	80322	72.8	13.5	17.4	55.9	0	90.2	69.4	9.8	30.6
MEXICAN PESO - CHICAGO MERCANTILE EXCHANGE	CME	63100	48.2	79.9	42.6	10.4	0	90.8	90.4	9.2	9.6
BRITISH POUND STERLING - CHICAGO MERCANTILE E	CME	83729	63.8	33.4	12.6	37.8	0	76.5	71.2	23.5	28.8
JAPANESE YEN - CHICAGO MERCANTILE EXCHANGE	CME	199678	75.1	36.5	10.1	43.5	0	85.2	80	14.8	20
U.S. DOLLAR INDEX - NEW YORK BOARD OF TRADE	NYBT	24239	4	70.3	70.2	13.8	8.3	82.6	92.4	17.4	7.6
EURO FX - CHICAGO MERCANTILE EXCHANGE	CME	144421	50.6	47.3	17.5	16.9	0.5	68.6	64.7	31.4	35.3
UNLEADED GASOLINE, N.Y. HARBOR - NEW YORK MEI	NYME	133768	61.9	81.9	20.7	2.9	8.2	90.7	93	9.3	7
NEW ZEALAND DOLLAR - CHICAGO MERCANTILE EXC	CME	10099	23.3	83.4	61.5	5	0	84.8	88.4	15.2	11.6
VIX FUTURES - CBOE FUTURES EXCHANGE	E	13038	26.2	66.6	40.9	9.7	8.1	75.2	84.4	24.8	15.6
DOW JONES INDUSTRIAL AVERAGE - CHICAGO BOARI	CBT	36278	65	49.1	16.2	19.7	0	81.2	68.8	18.8	31.2
DOW JONES INDUSTRIAL AVG- x $5 - CHICAGO BOARI	CBT	69682	32.7	33.2	39.8	50.7	0.9	73.4	84.8	26.6	15.2
3-MONTH EURODOLLARS - CHICAGO MERCANTILE EX	CME	8426832	65.4	57.2	10.9	12.7	13.3	89.6	83.2	10.4	16.8
S&P 500 STOCK INDEX - CHICAGO MERCANTILE EXCH	CME	644666	71.4	72.7	9.4	10.5	0.3	81.1	83.5	18.9	16.5
E-MINI S&P 500 STOCK INDEX - CHICAGO MERCANTILI	CME	1050108	58.1	59.7	14.5	28.8	1.2	73.8	89.7	26.2	10.3
NASDAQ-100 STOCK INDEX - CHICAGO MERCANTILE E	CME	64079	52.8	60.7	12.6	25.1	0	65.5	85.8	34.5	14.2
NASDAQ-100 STOCK INDEX (MINI) - CHICAGO MERCAN	CME	412587	77.1	27.7	17.9	49.9	0.6	95.7	78.2	4.3	21.8
AUSTRALIAN DOLLAR - CHICAGO MERCANTILE EXCHA	CME	63897	44.1	68.3	30.4	13	0	74.5	81.3	25.5	18.7
RUSSEL 2000 STOCK INDEX FUTURE - CHICAGO MER	CME	34459	85.7	66	2.2	20.6	0	87.9	86.6	12.1	13.4
RUSSEL 2000 STOCK INDEX (MINI) - CHICAGO MERCAI	CME	265998	91.6	70.8	4.9	23.6	0.5	97	95	3	5
NIKKEI STOCK AVERAGE - CHICAGO MERCANTILE EX	CME	58951	49.8	57.4	28.9	29.6	1.2	80	88.3	20	11.7
NIKKEI STOCK AVERAGE YEN DENOM - CHICAGO MER	CME	37182	62.3	9.6	27.8	4.1	0	90.1	13.7	9.9	86.3
INTEREST RATE SWAPS 10YR - 3MO - CHICAGO BOAR	CBT	34929	73.8	87.5	24.8	10.3	0.2	98.8	98	1.2	2
INTEREST RATE SWAPS 5YR - 3MO - CHICAGO BOARI	CBT	14531	98.1	87.3	1.9	11.8	0	100	99.1	0	0.9
S&P 400 MIDCAP STOCK INDEX - CHICAGO MERCANTI	CME	12943	52.6	86	9.6	5.3	0	62.2	91.3	37.8	8.7
E-MINI S&P 400 STOCK INDEX - CHICAGO MERCANTILI	CME	34533	71	62.3	17.6	17.1	0	88.6	79.3	11.4	20.7
3-MO. EUROYEN TIBOR - CHICAGO MERCANTILE EXCH	CME	33868	49	82.6	4.8	6.2	0	53.7	88.9	46.3	11.1

Source: www.cftc.gov/dea/history/dea_fut_xls_2005.zip

Notes:
[I] = [D] + [F] + [H]
[J] = [E] + [G] + [H]
[K] = 100 - [I]
[L] = 100 - [J]

Commercial & Non-commercial Traders – When an individual reportable trader is identified to the Commission, the trader is classified either as "commercial" or "non-commercial." A trading entity generally gets classified as a "commercial" by filing a statement with the Commission (on CFTC Form 40) that it is

Spreading - Spreading measures the extent to which each non-commercial trader holds equal long and

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

California Independent System Operator Corporation))	**Docket No. ER06-___-000**

I, Susan L. Pope, declare under penalty of perjury, that the foregoing questions and answers labeled as the Testimony of Scott M. Harvey and Susan L. Pope regarding Congestion Revenue Rights were prepared by us, with the assistance of others working under our direction and supervision; and that the facts contained in those answers are true and correct to the best of my knowledge, information and belief.

Executed on: Feb. 6, 2006
Date

Susan L. Pope
Susan L. Pope