CAISO Responses to Clarifying Questions Regarding CRR allocation and auction process:
February 4 Draft

1.   Paragraph 65 of the July 21 Proposal states: "An important characteristic of trading hubs is that their definitions do not change over time and their LDFs and weighted average prices are always based on the total quantity of load that is served at each node of the hub."
This statement appears contradictory. Is the definition of the trading hubs fixed, i.e., the weighting of the nodes composing the hub whose prices are averaged to determine the hub price remains fixed or does the weighting of the nodes composing the hub vary with the loads at those nodes?

        ISO Response: The characteristics of a Trading Hub that is comprised of more than one node include the set of underlying nodes along with weighting factors for each of these nodes. The weighting factors will be applied to the LMPs for each settlement period to determine a Trading Hub price for that period. These weighting factors should not change frequently, but should be fixed for the term of the Trading Hub. If the Trading Hub were used in the CRR Allocation, then the term of the Trading Hub would be consistent with the term of the CRRs that are being allocated. For example, if a Trading Hub is used in an annual allocation, the term of the Trading Hub would be one year, and the set of underlying nodes and the weighting factors for that Trading Hub will be fixed for that year. Assuming parties will want to use the same Trading Hub in acquiring monthly CRRs, the same weighting factors used in the annual auction would of course be retained. Finally, the ISO agrees that the second half of the sentence quoted above does seem contradictory and must be a typo. The sentence should read:

                "An important characteristic of trading hubs is that their definitions – i.e., trading hub name, underlying set of nodes, and weighting factors – remain fixed over time, so that the actual LMPs for each settlement period are the only elements that contributed to changes in Trading Hub prices."

2.   What is the difference between the PG&E load aggregation zone (July 21 Proposal, paragraph 64) and the PG&E Trading Hub (paragraph 65)?

        ISO Response: The proposal is that the PG&E Trading Hub would include all load nodes within the PG&E transmission service area. This set of nodes would include those nodes not included in the Standard Load Aggregations, such as load nodes for Metered Sub-systems, ETC load and Pump load. Note, that there may be situations where at a particular node there is load modeled that includes load for one of these exceptions and the remaining load is Load Serving Entity (LSE) load. In this case the Trading Hub would consider this entire load in developing the weighting factors, where as the Standard Load Aggregation would only consider the LSE portion of the load. Another important difference concerns the weighting factors. The weighting factors for a Trading Hub will be fixed for a

relevant period, such as the duration of CRRs using the Trading Hub. In contract, the weighting factors for a Load Aggregation Zone will reflect the actual load either scheduled (for forward market aggregate prices) or metered (for real-time aggregate prices).

3.   How will the LDFs used for the three load aggregation zones in the CRR auction and day-ahead market be determined? Will they be the same or different? [1]

ISO Response: It is important to clarify that LDFs are used in the forward markets prior to the running of the IFM for distributing submitted load bids and self-schedules to the constituent nodes of the relevant Load Aggregation Point. In contrast, Load Aggregation Point prices are determined after the running of the IFM and are based on the actual amounts of load scheduled at each node rather than on the LDFs. These actual load quantities will generally differ from the LDFs because the IFM will adjust loads at individual nodes in performing congestion management. The Load Aggregation Point prices calculated in this way will be used to calculate both congestion charges and CRR settlements.
The LDFs for distributing submitted load bids and self-schedules in the Day-ahead market will attempt to reflect the current conditions of the actual load distribution in the various Load Aggregation Points. At the start of the new LMP market, these LDFs will likely be based on a small number of representative base cases, to represent peak versus off-peak as well as seasonal variations in load distribution to some degree. As time goes by, the CAISO will create a more extensive library of LDFs based on solutions of a State Estimator, so that the Day Ahead IFM will see a distribution of load that resembles expected real-time load conditions as closely as possible.
The LDFs (or allocation factors) used for Standard Load Aggregation Points in the CRR Allocation/Auction will of necessity have to be a single set of values that is representative of the load conditions over the term of the CRR (but different for peak from off-peak since distinct CRRs will be offered for these periods). Thus the LDFs used for allocating and auctioning Load Aggregation Point CRRs will be different from the LDFs used for distributing load bids and schedules prior to the IFM, and both will be different from the weights used to calculate Load Aggregation Point prices. Although this may seem complicated, the underlying principle is that a CRR defined to a Load Aggregation Point will be settled using the actual Load Aggregation Point price in each hour, rather than a price based on the LDFs used at the time of the auction. This will give CRR holders a more exact hedge against Day Ahead congestion charges. If parties wish to propose alternative approaches to the question of LDFs for CRR allocation and auction the ISO is open to further discussion of

4.   Paragraph 69 of the July 21 proposal states: "all ETC schedules and real-time deviations will be treated the same as those of other ISO grid users in the settlement process and thus will be assessed all applicable charges, such as

---

[1]   Para 63 refers to the use of the state estimator to determine real-time LDFs, but there is no mention of forward market LDFs.

congestion charges and real-time uninstructed deviation penalties." This statement appears to indicate that ETC transactions not scheduled day-ahead would be charged real-time prices for congestion.

This statement appears to differ from descriptions provided in the context of the initial CRR study. CAISO Responses to Questions Submitted on the CRR Study 1, October 27, 2003 states Q19, p. 7: "The ISO intends to fully honor the ETCs by giving the rights holders scheduling priority in the forward markets, by allowing them to submit schedule changes after the close of the hour-ahead markets if their rights so allow, and by taking appropriate actions in real time, such as redispatch, to accommodate real-time ETC changes."?

Is it intended that the ETC holders that do not schedule transactions in the Cal ISO DAM will pay real-time congestion charges on real-time transactions that were not scheduled in the day-ahead market, is it intended that the redispatch costs of accommodating real-time transactions covered by ETC contracts will be included in Cal ISO uplift, or is something else intended?

ISO Response: It is important to understand that this question is primarily about the ISO's proposal on how to honor ETCs under MD02. The ISO will shortly be initiating a stakeholder process to discuss the ISO's ETC proposal in its entirety and to resolve several unresolved issues. The present answer therefore represents the ISO's thinking at the time the July 2003 Amended MD02 proposal was filed, which provides the working assumptions for CRR Study 2 because this study must begin as soon as possible and proceed in parallel with the stakeholder processes on both the ETC proposal and the development of CRR allocation rules.

Under the July 2003 proposal ETC schedule changes would still be accepted in the HA market with the same priority they enjoy in the DA market, to the extent such changes are simultaneously feasible without impinging on the final DA schedules of all parties. ETC schedule changes accepted in the HA market would be subject to HA prices, not RT prices. Thus, RT prices would be applicable only to ETC schedule changes that were not accepted in the HA market, including any portions of ETC schedule changes that were submitted to HA but were found not to be feasible, as well as changes that were submitted after the close of the HA market. The settlement details this question asks about will be discussed in the context of the stakeholder process on the ETC proposal.

5.   The July 21 Proposal states in paragraph 88: "Once the NS-CRR is issued the distribution factors for the injection nodes will be fixed."

   a. Is this intended to convey that the source location for the NS CRRs will be fixed or does it mean something else?

       ISO Response: The NS-CRR is a device to enable a party requesting CRRs to submit a CRR request that specifies multiple injection nodes with a

preferred distribution of the total requested CRR MW across those nodes. In the CRR allocation/auction process, if the simultaneous feasibility criterion prevents allocating the full amount of the request, the auction software will select a final distribution of CRR MW to injection nodes for the NS-CRR so as to minimize reduction of the MW quantity requested. Once the auction software has done this, this distribution of NS-CRR MW over the injection points will be fixed for the term of this CRR. The important point for parties to realize is that this definition of "network service" may be a misleading term because it is not the same as the more familiar conventional concept of network service. In particular, the MD02 definition of NS-CRR is not intended to hedge hour-to-hour changes in how the NS-CRR holder utilizes different energy sources located at different nodes; rather, the settlement of the NS-CRR will always be based on the MW distribution that resulted from the allocation/auction process.

b. Do the "distribution factors" of NS-CRR source buses refer to load distribution factors or to generation shift factors?

ISO Response: See answer to part (a) of this question.

6. What is meant by "specified priority levels" for NSR nominations in the allocation process? How would these priority levels be utilized in the allocation process?

ISO Response: In a NSR nomination, multiple Sources can be used to serve a Sink (unlike a Point-to-Point CRR with just one Source and just one Sink). The market participant (MP) can thus submit multiple Sources (along with maximum MW) to serve the Sink. The MP can also include a preference on which Sources they would like to be used first to serve the Sink. They provide this preference through associating a priority with each Source (priorities are 1 to 4, with 1 being the highest priority). There are no priorities on the Sinks; they have an implicit priority of 1. The Allocation process will attempt to use the Sources with the highest priority before Sources with lower priorities. The CAISO is in the process of preparing a White Paper on the NSR definition for CRR allocation. The CAISO has already published a NSR definition for CRRs acquired in the auction. In the NSR right for the auction, there are bids associated with both the Sinks and Sources within a NSR. You can think of the priorities as replacing the bids in the allocation process.

7. Were any nomograms governing transmission constraints incorporated in the initial CRR study SFT?

ISO Response: Yes, but not in the form of the original nomogram. For example, the import of power into San Francisco is managed by an operating nomogram. For every MW of load above a certain level within San Francisco, there needs to be a certain amount of internal San Francisco generation dispatched. For CRR Study 1 this nomogram was converted to an operational import limit on the

transmission branch group into San Francisco. In CRR study 1 only interface constraints and branch thermal limits were used as constraints.

a. If not, will these nomograms be reflected in the final CRR allocation and auction model?
ISO Response: In CRR Study 2, the CAISO will investigate if the explicit use of nomograms in the allocation/auction process is applicable and doable.

b. If not, will these nomograms be reflected in the day-ahead market?

ISO Response: The Integrated Forward Market software will have the capability to handle linearly represented nomograms using load, generation and interface flows as parameters. The CAISO has not yet determined which of the current operating nomograms will be explicitly modeled in the Forward Market.

c. If not, will these nomograms be reflected in the real-time dispatch?

ISO Response: The Real-time Market software will have the capability to handle linearly represented nomograms using load, generation and interface flows as parameters in a manner consistent with the IFM. The CAISO has not yet determined which of the current operating nomograms will be explicitly modeled in the Real-time Market.

8. Did the initial CRR study SFT take account of post-contingency thermal limits?

ISO Response: CRR Study 1 did not incorporate contingency analysis. Rather, various interface limits were enforced and these interface limit values already have the post-contingency thermal limits of the remaining lines in the interface.

a. If not, will these post-contingency limits be reflected in the final CRR allocation and auction model?

ISO Response: The CAISO may incorporate contingency analysis for a certain set of contingencies, however, this has not been decided yet.

b. If not, will these post-contingency limits be reflected in the day-ahead market?

ISO Response: The CAISO may incorporate contingency analysis for a certain set of contingencies. However, this has not been decided yet. All other interface limits that will be enforced have post-contingency values incorporated.

c. If not, will these post-contingency be reflected in the real-time dispatch?

ISO Response: The CAISO may incorporate contingency analysis for a certain set of contingencies. However, this has not been decided yet. All other interface limits that will be enforced have post-contingency values incorporated.

9.   It is unclear from the discussion on page 19 of the initial CRR study how exactly the external WECC transmission system was modeled given the aggregation of buses to reflect the external loads but the assumption that there are no external loads. Did the shift factors used in the SFT reflect the existence of the external grid? Was any account taken of loop flows created by external load and generation? If so, what assumptions were made about these loop flows?

ISO Response: The transmission system external to the CAISO control area transmission was equivalenced and this external loop was modeled in the network model used in CRR Study 1. Thus, if there was a Source at COI and a Sink in SP15, most of the resulting flow would go through Path15, and the remaining would flow around the eastern side of the CAISO control area and for example flow into SP15 through the Palo Verde branch. There was no modeling of "external loop flow" created by generation and load outside of the CAISO control area. For CRR Study 2 the CAISO is planning on using an open loop system, consistent with the Full Network Model the CAISO intends to utilize when the LMP market is first implemented.

10.   The July 21 proposal indicates that CRRs would be reallocated between LSEs to follow loads.

a.   Is it intended that this reallocation would be implemented on a daily basis or on some other basis?

ISO Response: Suppose a load is a direct-access load and it has an Energy Service Provider (ESP) that also acts as the LSE. This LSE may request CRRs through the CRR Allocation process. If the load switches ESPs, the CRRs allocated to the original LSE should be transferred to the new ESP. The assumption is that this transfer of load between LSEs would take effect at a specific point in time and that the CRR reallocation would take effect at that same point in time. If the movement of direct access customers from one LSE to another requires some new CRRs (for example, ones that utilize a different source point), this will have to occur in the first monthly CRR allocation process following the transfer of the customer.

b.   Is it intended that fractional CRRs would be tracked and reallocated?

ISO Response: The current design of the CRR software system allows the storing of the CRR MW value to increments at the first decimal place (i.e. xxx.x). Thus, we would be able to handle transactions to that level.

We were initially looking at whole MW increments but are open for discussion on this topic.

c.   Would this CRR reallocation be proportional to all CRRs allocated to an LSE? Would account be taken of purchases and sales in the reconfiguration auctions?

ISO Response: This only applies to CRRs that were allocated. The principle underlying allocation to LSEs is that the entitlement to CRRs actually belongs to the customers themselves, with the LSE acting as the custodian of the CRRs on behalf of its customers. When a customer switches LSEs, the two LSEs involved in the switch would need to determine what applicable amount of CRR transfer is appropriate. If a LSE has many loads that it serves, then the amount of CRRs transferred may be proportional to the load that transfers. If a LSE also participates in the CRR auction, that activity is considered separate and distinct from its custodianship of the CRRs allocated on behalf of the loads.

11.   Some large load aggregation regions were broken down into smaller load group regions for the purpose of the SFT analysis in the initial CRR study:

ISO Response: It is important to understand the rationale for breaking load aggregation areas into smaller load groups in the CRR allocation and auction process. In the running of the IFM, load bids and self-schedules will be distributed to individual nodes, and the loads at these individual nodes will be adjusted as needed to clear congestion. This works in the IFM because specific loads and supply resources not locked together to be adjusted in a balanced manner; rather, they can be adjusted independently in the IFM. In contrast, in the CRR allocation/auction process each CRR bid or request represents a specific MW quantity at specific injection points balanced against specific load points. When the load is at a large load aggregation point, and the injection points and load points are required to be balanced, the SFT may cause a large reduction in the allocated CRR MW because of a constraint that could be resolved with only a small reduction if the load and injection points were independently adjustable. By breaking the load aggregation points down into smaller areas with roughly uniform LMPs (based on our LMP studies), we can minimize the potential for such excessive reductions in the CRR SFT. At the same time, it is not practical to break the load aggregation zones all the way down to individual nodes for the CRR SFT. Because of the requirement for CRRs to be balanced, trying to break the load aggregation zones all the way down to individual nodes would require over a million different source-to-sink CRR combinations. The ISO therefore decided to use a small number of uniform-LMP areas as a way to keep the number of different CRR types manageable while minimizing the possibility for excessive reduction of CRR requests.

a.   It was stated that the "resulting cleared bids were subsequently 'reassembled' to arrive at the total quantity of cleared bids from the original source to the original load aggregation area.," does this mean that the CRRs to the smaller load group regions were reaggregated to the original load aggregation area to the extent possible based on the original LDFs with some CRRs to the smaller load group regions not reaggregated, or does this mean that all CRRs to the smaller load group regions were redefined as CRRs to the original load aggregation region without regard to the SFT?

ISO Response: The latter. Once the Allocation was finished, the Sink MW for each of the smaller areas would be reaggregated to get the MW for the original submitted Load Aggregation Point.

b.   If not all CRRs to the smaller load group regions are reaggregated, which LSEs are allocated CRRs to the smaller load group regions?

ISO Response: Not applicable. See answer to 11.a.

c.   What is the criterion for determining whether a large load aggregation region is to be broken down into smaller load group regions for the purpose of the SFT analysis in the actual CRR allocation process?

ISO Response: The breakdown was based on areas of uniform LMPs as generated in the ISO's LMP studies.

d.   Will CRRs defined to these smaller load group regions be accommodated in the periodic CRR auctions?

ISO Response: In the initial CRR Study the breakdown of the large load aggregation into smaller uniform-LMP areas was only done for the purpose of the SFT, to allow simultaneous feasibility to be achieved without having to reduce the quantity of load (and hence the quantity of CRRs allocated) over the entire load aggregation area. Once the SFT was completed, the resulting CRRs were defined as sinking in the original, large load aggregation area. We are currently envisioning using this methodology in the allocation process only but are open to discussing the use of this methodology in the auction process also.

12.   The July 21 proposal states that demand reduction by loads will be settled at the appropriate locational nodal price, rather than at the load aggregation price. [2]

a.   Will such loads buy power in the day-ahead market at these nodal prices or would demand reduction loads buy power in the day ahead market at the load aggregation price?

---

[2] July 21 Proposal Paragraph 124.

ISO Response: The ISO's initial concept is that loads will buy power in the forward markets at load aggregation prices, but will earn real-time nodal prices when they reduce in response to a real-time dispatch instruction. The ISO is currently considering whether it is feasible to allow such loads to sell demand response (load reduction) at locational prices in the Day-ahead Market, as if they were supply resources. One way this might work is for the load to buy energy in DA at the load aggregation price just like any other load, then also sell energy (using a distinct resource ID) at the nodal price as a supply resource.

b.   If such loads buy power in the day-ahead market at nodal prices, would they be able to acquire CRRs sinking at their node rather than the aggregate load zone?

ISO Response: The ISO's proposal has not yet addressed this possibility, so we do not have a definite answer at this time. From a conceptual viewpoint, however, it would seem that if such loads are treated as generators for the purpose of selling DA demand reduction, they would probably want CRRs whose source is the actual load location and whose sink is the load aggregation zone.