UPDATED
CRR Issues Paper

March 19, 2007

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Prepared for Discussion at Stakeholder Meeting on April 3, 2007

(Preview discussion during a March 26 conference call)

1 Purpose of this Updated Issues Paper

The "CRR Issues Paper" posted on February 21, 2007, and reviewed with stakeholders at a meeting on February 27th explained a number of issues related to Congestion Revenue Rights (CRRs) that needed to be resolved over the next few months in preparation for the beginning of the production process for the first annual allocation and auction of CRRs. These issues were generally categorized and framed for discussion, with a timeline proposed for resolving each issue.

This paper expands upon the earlier version by focusing upon those issues slated for earliest resolution. Specifically, **Section 4** of this paper offers proposals related to the following three issues identified as potential changes to CRR rules or business processes that are planned to be part of a filing to FERC on or before May 2nd.

- **Source Nominations at Trading Hubs:** The CAISO explains three options to address concerns raised by observations from the CRR Dry Run about the interaction between individual generator and Trading Hub nominations. All three options also address objections made previously by some stakeholders related to the prohibition of Trading Hub nominations within the Tier LT, and thus could allow the CAISO to amend its January 29th compliance filing[1] in order to allow Trading Hub nominations for LT-CRRs.
- **Set-aside of Import Capacity on each Inter-tie for CRR Auction:** The CAISO explains two proposals to deal with the uncertainty about the set-aside quantities that arises due to changing the historical reference year to 2006. This explanation includes a table of the CRR Dry Run results related to the set-aside that expands upon the information presented during the February 27th stakeholder meeting. This table of results will be posted as an Appendix shortly.
- **CRR Source Verification Rules:** The CAISO offers a proposal to expand and clarify the acceptable set of verifiable sources that are associated with contracts within the historic reference period.

In addition, Section 4 of this paper presents an explanation of a potential problem dealing with the ability to renew quantities of LT-CRRs or other expiring rights. This paper does not offer a proposal to resolve this potential problem, but instead presents the matter as a topic for further discussion.

All of the above issues will be previewed for discussion during a two-hour conference call scheduled on March 26th, and then be part of the agenda for discussion at an all-day stakeholder meeting on April 3rd.

[1] Following a six-month stakeholder process, the CAISO filed an plan to implement Long-Term CRRs that would comply with FERC Order Nos. 681 and 681-A.

Later this week the CAISO will post separate Issue Papers on "CRR Credit Issues" and the "Methodology for Determining CRRs for Merchant Transmission Upgrades." Separate conference calls are scheduled during the week of March 26th for each of these topics. The times and dial-in numbers for these conference calls are listed on the "Calendar" page of the CAISO's website.

The CAISO welcomes stakeholder input at any time, and will specifically request further written comments on these issues mentioned above to be submitted by Friday, April 6th, which is shortly after the April 3rd all-day discussion.

This paper is generally organized in a manner similar to the February 21st "CRR Issues Paper." Stakeholder comments that were submitted to the CAISO on March 9 are summarized by issue within this document.

- **Section 2** outlines the expedited process for resolving these CRR issues. Changes from the February 21st paper are bolded or shown in strike-out format.
- **Section 3** includes a full explanation of the modeling assumptions in the CRR Dry Run which seeks to answer and expand upon the discussion questions raised during the February 27th stakeholder meeting.
- **Section 4** explains the issues that have been raised as potential changes to the CRR rules or business processes and, as noted above, greatly expands upon the analysis of three issues.
- **Section 5** notes the process to be followed for resolving policy or business processes for three significant CRR issues:
    - CRR Credit Requirements
    - Methodology for Determining CRRs for Merchant Transmission Upgrades
    - Transfers from Load Migration
- **Section 6** notes the implementation features that are significant to the CRR process which were filed at FERC on March 9.
- **Section 7** reviews the CRR BPM process, where the resolution for many of these CRR-related issues will be memorialized.

2 Proposed Process and Milestones for CRR Issues Resolution

The following table contains each of the CRR activities that need to be completed along with anticipated dates that these projects will be filed with FERC. Many of the items that are being filed in the March timeframe are required in preparation for the first CRR allocation and auction that are planned for July 1. In planning the timeline for filings many details had to be considered including FERC response time, stakeholder involvement and implementation constraints and requirements.

The activities listed in the table below are in the same order and are listed by the same section numbers contained in this paper. In addition, this table lists the key activities in sequential date order.

Sec. Activity	Filing Date	Comments
3 CRR Dry Run Results	March 30	Intended to be filed after the completion of the dry run and stakeholder review.
4 Potential Changes to CRR Rules		
4.1 Source Nominations at Trading Hubs	May 2	Will be part of the rules on which the CRR allocation will be based. Must be approved prior to the allocation.
4.2 Set-aside of Import Capacity on Inter-tie for CRR Auction	May 2	The set-aside rules must be determined prior to the CRR allocation.
4.3 CRR Source Verification Rules	~~March 30~~**no later than May 2**	Change in the historical period in the tariff must be approved prior to the CRR Allocation.
4.4 Modeling of Transmission Outages in the CRR Network	August 3	Should be filed no later than 180 prior to the start of MRTU.
4.5 Use of Common Forecasts for Mo. CRR Eligibility and Mo. RA Showings	August 3	Should be filed no later than 180 prior to the start of MRTU.
4.6 Frequency of Monthly Allocation and Auction Process	August 3	Should be filed no later than 180 prior to the start of MRTU.
5 Outstanding CRR Process Issues		
5.1 CRR Credit Requirements	May 2	This must be filed in advance to receive approval for the methodology. A creditworthiness check will be required prior to the CRR auction.
5.2 Methodology for Determining CRRs for Merchant Transmission Upgrades	May 2	Methodology must in place by first allocation of long term CRRs, it is anticipated that this will occur soon after the CRR allocation/auction.
5.3 CRR Transfers due to Load Migration	August 3	T Should be filed no later than 180 prior to the start of MRTU.
6 Filing to FERC on Implementation Features		
6.1 Template for TRTC Instructions	March 9	Template ~~will be~~ filed in March in anticipation of FERC approval in time for stakeholder to complete and return to the CAISO prior to first auction/allocation. This

		information will be used for market simulation purposes as well as modeling ETC, TOR, CVR for auction/allocation.
6.2 Information Provision, Collection and Verification	March 9	CAISO seeking authority to conduct certain activity in preparation for the CRR allocation and auction.
6.3 Candidate CRR Registration and CRR Entity Agreement	March 9	Registration details and pro-forma agreement will be filed as FERC approval is needed in time for stakeholders to complete for participation in auction/allocation.
7 CRR Business Practice Manual	May 2	Filing with FERC in accordance with the time schedule set BPMs.

The following is a list of all key activities, tentative milestones and associated dates, beginning in February 2007 through MRTU start up. This list is a work in progress and may change as this document is updated.

- February
  - 8 – Present March 9 Filing proposed changes (i.e., TRTC Instructions, Candidate CRR Holder Registration, pro forma CRR Entity Agreement, and authority for Information Provision, Collection and Verification) at Participant Readiness Advisory Group (PRAG) meeting
  - 13 – CRR Dry Run Results discussed in Executive Session at the Market Surveillance Committee (MSC)
  - 15 – Posted March 9 Filing proposed changes on CAISO website
  - 20 – MRTU Implementation Meeting - present March 9 Filing proposed changes to Stakeholders
  - 21 – Posting of “CRR Issues Paper”
  - 27 – CRR Stakeholder Meeting to review and obtain initial feedback on issues related to CRRs.
- March
  - 6 – Stakeholder Comments due on March 9 Filing materials
  - 7 – Board of Governors Meeting – Review of CRR Dry Run Results, Informational briefing on March 9 Filing
  - 9 – Initial Stakeholder Comments Due on Issue paper (tentative)
  - 9 – Filing of additional detail on TRTC Instructions tariff language, detail of Candidate CRR registration and qualification process, CRR Entity Agreement, authority to conduct CRR related activity in preparation for allocation and auction

- ~~15 – Updated Issue paper posted on website (tentative)~~
- **19 – "Updated CRR Issues Paper" posted on website**
- **20 – Updated "CRR Credit Requirements" paper posted on website**
- **22 – Updated "CRR Upgrades for Merchant Transmission" paper posted on website**
- **26 – Two-hour stakeholder conference call to preview proposals on 1) Source nominations at Trading Hubs, 2) Set-aside of import capacity on each inter-tie for CRR auction, and 3) CRR source verification rules.**
- **27 – Two-hour stakeholder conference call to preview proposal on CRR Credit Requirements**
- **29 – Two-hour stakeholder conference call to preview proposal for Methodology for determining CRRs for Merchant Transmission Upgrades**
- ~~22 – Stakeholder Conference Call (tentative)~~
- ~~23 – Stakeholder Comments Due on Issue paper that was posted on 3/15 (tentative)~~
- 30 – File Dry Run Results~~, Source Verification rules~~ with FERC

o April

- 2 – post updated CRR BPM on CAISO website
- 3 – Stakeholder Meeting ~~(tentative)~~
- 6 – Final Stakeholder Comments Due (tentative)
- 18 – Board of Governors Meeting – Decision on joint CRR Tariff changes
- **19 – File Source verification rules with FERC possibly as soon as April 19, and no later than May 2.**

o May

- 2 – File Source Nominations at Trading Hubs, Set-aside of Import Capacity on Inter-tie for CRR Auction, Methodology for Determining CRRs for Merchant Transmission Upgrades, CRR Credit Requirements, any necessary additional detail from the CRR Business Practice Manual with FERC.

o Future Months

- July through October – First annual allocation and auction of Seasonal CRRs; including Long-Term CRRs
- August 3 – File Modeling of Transmission Outages in the CRR Network, Use of Common Forecasts for Monthly CRR Eligibility and Monthly Resource Adequacy showings, Frequency of Monthly Allocation and Auction Process, CRR Transfers due to Load Migration with FERC.
- November through December – First monthly allocation/auction for February 2008.

3 The CRR Dry Run

The preliminary results of the CRR Dry Run were discussed at the February 27th stakeholder meeting. An expanded presentation of the Dry Run results related to the intertie set-aside will be included as an Appendix to this paper.

The CAISO staff remains available to meet with participants to review a financial analysis of their individual results and discuss any issues or questions.

The CAISO intends to file a "CRR Dry Run Report" at FERC on March 30th.

Summary of Stakeholder Comments (received March 9, 2007)

- The Alliance for Retail Energy Markets (AReM) asks the CAISO to consider providing some of the results in groups, such as ESPs, IOUs and POUs, to identify if significant differences are apparent in the results.
- AReM suggests further discussion on the use of an "open loop" model in the CRR Dry Run and LMP studies, especially the ramifications for LSEs in the use of this model.
- Pacific Gas & Electric (PG&E) notes that the preliminary Dry Run results provides valuable information and insights, but that a number of open questions remain, most significantly whether the CRR process will provide to LSEs sufficient hedges needed to address congestions risks under LMP.
- PG&E urges the CAISO to provide a Dry Run Report to FERC and stakeholders that includes comprehensive financial assessments, objective standards for hedging adequacy and all known study limitations.
- The California Department of Water Resources / State Water Project (SWP) requests the CAISO to provide more information about the Dry Run results in dollars, and to clarify what LMP study data was used to calculate the financial impact of the Dry Run results. SWP indicates its intent to seek a one-on-one discussion with CAISO staff.

3.1 Summary of Dry Run Process and Parameters

The CRR Dry Run process is quite familiar to participating entities, and the procedures, modeling parameters and data requirements for CRR nominations were documented in the "CRR Revised Dry Run Handbook" that was posted on May 12, 2006 at:
http://www.caiso.com/17f4/17f4e73724eb0.pdf

3.1.1 Key Modeling Assumptions used in the CRR Dry Run

3.1.1.1 Network Model in the CRR Dry Run

- The Full DC Network Model used in the CRR Dry run was consistent with the CAISO Summer 2007 peak-load planning model. The model provided a good representation of the model the CAISO will use initially for the first annual production process for CRRs. It consisted of 3930 buses and 5191 Branches (transmission lines and transformers.)

  For more details, please refer to the Business Practice Manual (BPM) for Managing the Full Network Model (FNM), which is located at:
  http://www.caiso.com/1840/1840b27422f60.html

- Although the CAISO's overall approach is to work toward including the full WECC in the Market FNM (including CRR FNM), data limitations outside the CAISO prevent the full model from being meaningful initially, the "open loop" model is used initially. The term "open loop" doesn't mean simply radial, though: there are external connections (small external loops) where multiple branches comprise a branch group, and in the New PTO model.
- With the "open loop" model, unrealistic constraints have arisen in recent results in both the CRR Dry Run and the LMP Study. The CAISO is exploring an addition of more external lines to make flows into the CAISO control area more realistic, i.e., a "partial loop" model.
- Additional analysis confirms that it would be premature to add external lines to make a fully "closed loop" model. However, the CAISO is actively participating in the WECC Seams Issues Subcommittee, and working with potential Adjacent Control Areas, to improve the modeling of external areas.

3.1.1.2 Constraints Modeled in the CRR Dry Run

One of the critical data inputs needed to conduct the CRR allocations and auctions for the CRR Dry Run was the operating constraints. For the Dry Run, the CAISO enforced all transmission lines (with the normal thermal limits) that are part of the CAISO Controlled Grid and whose "from" and "to" bus voltage rating is 60 kV or higher.[2] The CAISO enforced these constraints in each CRR Simultaneous Feasibility Test (SFT) which included thermal line and transformer[3] limits and 103 Interfaces, 43 variable branch group constraints and 60 fixed branch group constraints.

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[2] In market operations under MRTU, the CAISO has an obligation to ensure the reliable operation of all facilities that comprise the CAISO Controlled Grid, regardless of the voltage level.

In the LMP Study, where hourly variations in system conditions are being considered for all hours of the year, but where load variations at levels of the transmission network such as 60 kV cannot be modeled within a reasonable work effort, where transmission switching operations to transfer load between transmission circuits as needed to match short-term conditions similarly cannot be modeled, and where limited telemetry is available to validate simulation results, branch thermal limits have been enforced only for 115 kV and above, as stated in LMP Study reports. Nevertheless, checking of results for lower voltage branches shows that the number of branches that might be binding constraints is very limited. In these cases, the CAISO will be validating these branches' configuration before enforcing their limits in MRTU market operations.
In cases where potential constraints are known to occur by being defined in CAISO operating procedures, the LMP Study has enforced them regardless of voltage.

In the CRR Dry Run, where there is a more limited set of model runs and the results are therefore more feasible to validate, the CAISO has enforced the lower voltage limits. The CAISO's validation of the network configuration can pro-actively result in placing branches on the exception list until the validation issues are resolved. The CAISO's staff managing the CRR model will continue to enforce initially all constraints with the CRR SFT, but will not enforce those lines that are just being monitored.

The CAISO generally categorizes these constraints into two groups: **single line normal thermal constraints** and **generalized group constraints (GGC):**

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

  These limits generally do not vary by time of use (on-peak and off-peak) but do vary in two defined periods throughout the year. Period 1 is November to March and Period 2 is April to October. The CAISO's Regional Planning department refers to period 1 as winter period and period 2 as summer period.

  Thus, the winter limit (November through March) is generally higher than the summer limit (April through October) due to the generally colder ambient temperatures surrounding the transmission line (which dissipates more of the thermal heat from the transmission line.)

  For purposes of the CRR Dry Run, the CAISO used the winter limits for season 1 (Jan-Mar) and used the summer limits for the remaining three seasons. Although season 4 (Oct-Dec) includes only one summer month, the CAISO took the more conservative approach in the seasonal allocation and auction and utilized the generally lower summer limits for season 4. The CAISO expects that during the actual CRR production process, the winter limits would be used for the monthly processes that include November and December.

  The limits for the normal thermal constraints were derived as follows:

  - The start limit is the actual normal thermal limit. This limit is specified in MVA.
  - The CAISO then reduced this limit by 3% to account for the reactive power modeling that is absent in the DC FNM.
  - The CAISO then reduced the limit by a specified amount to account for the absence of loss modeling in the DC FNM. The CAISO used a flat rate of 3% in the annual allocation and auction process. By the time the monthly allocation and auction process was conducted within the CRR Dry Run, the CAISO had calculated more accurate percentage factors associated with transmission losses. These new factors were applied in the CRR Dry Run's monthly process.

    These new factors were determined for transmission line kV levels. These factors are:

    - 500 kV: 1.0%
    - 230 kV: 1.3%
    - 115 kV: 1.7%
    - 70 kV and below: 2.0%

- **A generalized group constraint (GGC)** is comprised of one or more transmission lines. Associated with each transmission line is a weighting factor . In determining the flow on the GGC, each weight is applied to the flow (as calculated via the SFT) on the

corresponding transmission line and this product is summed over all transmission lines within the GGC.

The limit for the generalized group constraint is generally not determined from the normal operating thermal limits of the transmission lines that comprise the GGC. Rather, these limits are based on: (i) emergency thermal limits (ii) MW limits that prevent voltage stability/collapse problems or (iii) MW limits that prevent transient stability problems. In day-to-day operation, many of the GGC limits vary by hour, where as other GGC limits may stay constant over a period of time (may vary by season and may change due to certain network configuration as noted in the counts of 60 fixed and 43 variable).

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

For each SFT conducted within the CRR Dry Run, the CAISO enforced 103 GGCs. The 103 GGCs come from a) the path ratings derived from the CAISO's historical limit duration curves or b) directly from CAISO operating procedures. Note that the transmission lines that are part of the interconnections with other control areas are not enforced as single thermal limits. These lines are part of GGCs.

The limits for the GGCs were derived as follows:

- For those GGC limits that are constant, the correct limit was taken from the corresponding CAISO operating procedure taking into consideration the season.
- For those GGC limits that vary by hour, the CAISO staff developed historical limit duration curves and chose appropriate limits based on this historical data.
- The GGC limits for the import direction of Branch Groups (the GGCs that represent the interconnections to adjacent control areas) were reduced prior to running the annual allocation process to account for capacity that is set-aside for the annual auction. In calculating the set-aside amount, the result can be zero up to 50% of the limit on a particular Branch group. This set-aside reduction is also done prior to the monthly allocation process.
- To account for transmission losses that are not modeled in the DC Full Network Model, the GGC limit was reduced by 3%.

3.1.1.3 Outages modeled in the CRR Dry Run

For the CRR Dry Run annual allocation and auction process, all transmission lines were assumed to be in service. For the two monthly allocations and auctions (April and August) that were part of the CRR Dry Run, the CAISO derated the monitored facilities by a flat percentage, depending upon the kV rating of the line: 500 kV lines were derated by 4%, and 230kV lines were derated by 1%. These deratings were in addition to the derates that may have been attributed to each line for losses.

3.1.1.4 Modeling of Existing Rights and Contracts

Existing rights and contracts were taken into consideration for the CRR Annual and Monthly Allocations. In order to account for Transmission Ownership Rights or TORs which are not subject to congestion charges, the TOR capacity was removed from the system by modeling them as point to point CRR options in tiers 1 – 3 of the annual and tiers 1 -2 of the monthly allocations.

Existing Transmission Contracts or ETCs were modeled as point to point CRR obligations, where the sink is modeled at the actual ETC load location rather than being included as part of a default load aggregation point.

Those entities that currently own Converted Rights (represented as Firm Transmission Rights or FTRs), which include the City of Anaheim, the City of Azusa, the City of Banning, the City of Pasadena, the City of Riverside and the City of Vernon, are not subject to congestion charges in the forward market for the portion of their schedule that is subject to the perfect hedge. These CVRs were represented as point to point CRR obligations.

4 Potential Changes to CRR Rules

This section provides an overview of issues that may necessitate changes to CRR rules or business processes.

4.1 Nominations of CRRs sourced at Trading Hubs in the Seasonal and LT-CRR allocation processes

Summary of Stakeholder Comments (received March 9, 2007)

- AReM reiterates that any solution must allow the CAISO to remove its prohibition on obtaining LT-CRRs at Trading Hubs.
- The Energy Users Forum (EUF) urges solution to the problem of insufficient CRRs at the Hubs.
- PG&E does not support alternatives to lower the transmission capacity of Pmax in Tier 1 because both alternatives create an undue preference for Hub nominations at the expense of PNode nominations PG&E suggests that redefinition of Hubs should not be considered further due to numerous legal and commercial agreements dependent upon the current Trading Hub definition.

  PG&E recommends further consideration to the “basket of individual CRRs’ approach.” PG&E further suggests that retaining the status quo also may represent a viable approach.
- Sacramento Municipal Utility District (SMUD) urges resolution of this issue with a thorough stakeholder review.
- Southern California Edison (SCE) comments that proposals to reduce the amount of requests or the amount of grid capacity in the first tier are not sufficient to address the problem because participants likely would nominate more Trading Hubs.

SCE concludes that, once a binding constraint is reached, hub requests should be broken into the components of the hub and effectively turned into multi-point requests. SCE recognizes that reducing the point within the hub that has created the binding constraint results in an instrument that does not precisely match the hub definition. However, SCE comments that stakeholders would be better served receiving a right that may not be a complete hedge rather than receiving no hedge at all.

- SWP proposes to match evenly the sink and source Tier's SEQ percentage allocation for each Tier of the seasonal allocation. Specifically, Tier 1 nominations for sources and sinks should be limited to 50% of SEQ; Tier 2 nominations should be limited to 75% of SEQ; and Tier 3 nominations should be permitted up to 100% of the SEQ.

Discussion of Options

Nomination of CRRs sourced at Trading Hubs in the Seasonal and LT CRR allocation processes.

Based on concerns expressed regarding the observed interaction between individual generator and Trading Hub source nominations in Tiers 1-2 of the CRR Dry Run, plus the objections expressed by some parties to the CAISO's proposal not to allow nominations of LT-CRRs sourced at Trading Hubs, the CAISO has investigated three options described here for addressing these concerns.

As explained below, all three options would allow Hub or "Hub-like" CRR sources to be nominated and awarded as LT-CRR. The CAISO's preference at this point is for Option 1, based on the various pros and cons of the three options as indicated below. The other two options are described in some detail, however, as stakeholders expressed significant interest in these at the February 27 meeting.

Option 1. Utilize nomination limits only. No disaggregation or redefinition of EZGen Trading Hubs.

1. For CRR Year One, limit Tier 1 nominations from each verified source, including each Trading Hub, to 50% of the seasonal verified quantities (equivalent to 37.5% of the total verified quantities). This was sensitivity analysis #2 as reported in the CAISO's February 27 presentation.[4] Then in Tier 2 allow LSEs to nominate the 100% of seasonal verified quantities (75% of total verified quantities). This addresses the problem of zero or near-zero MW of Trading Hub CRRs clearing in Tier 2 due to particular generator constraints becoming binding in Tier 1.

2. For CRR Year One, allow LSEs to nominate for LT-CRR some of the Trading Hub CRRs they were awarded in Tiers 1-2, but limit the quantity of these nominations in order to minimize the trading hub bias in the single-tier LT-CRR allocation. There are alternative ways to apply such a limit.

[4] Sensitivity analysis #1 reported in that presentation involved reducing overall network capacity for Tier 1, and then restoring the full 75 percent in Tier 2. The CAISO believes that sensitivity #2 is the better option because it is targeted more precisely at the problem to be solved, and thus minimizes unintended consequences and preserves an appropriate balance of opportunities in Tiers 1 and 2 between individual generator and Trading Hub CRR sources.

a. Fixed upper bound on hub source nominations. For example, allow LSEs to nominate up to 50% of awarded Hub CRRs from Tiers 1-2 into Tier LT. Under this approach LSEs who rely predominantly on Hub sources can get some LT-CRR, although in lesser quantities than LSEs who rely more on point injection sources.

b. Upper bound a function of the LSE's reliance on hub supply sources. This approach would take into account the mix of source types awarded in the verified tiers, so that LSEs whose Tier 1-2 awards are substantially comprised of hub sources would be able to nominate more hub sources into Tier LT than LSEs who depend less on hubs. For example consider the following formula for the upper bound on Tier LT nominations at hub sources:

50%(awarded Tier 1-2 Hub CRRs) * [1 + (awarded Tier 1-2 Hub CRRs)/(75%SEQ)]

An LSE whose entire Tier 1-2 eligible quantity (= 75%SEQ) was fulfilled with allocated Hub CRRs in Tiers 1-2 would be allowed to nominate those Hub CRRs for the full amount of its normal Tier LT eligibility. The table below illustrates how this formula would work under different source mix scenarios.

3. For CRR Year Two and subsequently, Option 1 could continue to include nomination limits in the Priority Nomination Tier (Tier 1); the CAISO would like to discuss this matter with stakeholders. For Tier LT after CRR Year 1, the same limit would apply as in Tier LT for CRR Year One, using whichever of version (a) or (b) above is ultimately adopted.

Metered Data	
ALM	266.67
SEQ	200
75%SEQ	150
50%SEQ	100

Step1: One LSE with 7 scenarios of varying amounts of TH and Gen/Imports verified sources

Step2: SVS = Seasonal Verified Amounts

Step3: Set the Sink upper bounds (UB) using the metered data. Use the 37.5% limit on T1 verified sources.

Step4: T1 noms limited by the lesser of the source limits or the sink limits

Step5: Assume amounts nominated were fully cleared

Step6: T2 limits for the sink and the sources

Step7: Noms based on the limits of lesser of the sources or the sink

Step8: Assume cleared = noms

Step9: Total cleared = T1 cleared + T2 cleared

Step10: Based on the equation below this is the "factor"

Step11: This is the limit for trading hubs into the long term process for each scenario. Note as the factor goes to zero, the amount of TH limit also goes to zero.

	Full Verified Source (FVS)			**SVS = 75% FVS**			**T1 Limits**			**T1 Noms**		**T1 cleared**		**T2 Limits**			**T2 Noms**		**T2 Cleared**		**Total Cleared**		**Factor**	**Long Term**
Scenario	Total FVS	TH	G/I	Total SVS	SVS for TH	SVS for G/I	Sink UB	37.5% FVS TH	37.5% FVS G/I	TH Nom	G/I Nom	TH	G/I	Sink UB - T1	SVS TH - T1 cleared TH	SVS G/I - T1 Cleared TH	TH Nom	G/I Nom	TH	G/I	TH	G/I	(T1 TH + T2 TH)/(75% SEQ)	LT TH Limit
1	300	300	0	225	225	0	100	112.5	0	100	0	100	0	50	125	0	50	0	50	0	150	0	1.000	150.00
2	300	250	50	225	187.5	37.5	100	93.75	18.75	93.75	6.25	93.75	6.25	50	93.75	31.25	50	0	50	0	143.75	6.25	0.958	140.76
3	300	200	100	225	150	75	100	75	37.5	75	25	75	25	50	75	50	50	0	50	0	125	25	0.833	114.58
4	300	150	150	225	112.5	112.5	100	56.25	56.25	56.25	43.75	56.25	43.75	50	56.25	68.75	50	0	50	0	106.25	43.75	0.708	90.76
5	300	100	200	225	75	150	100	37.5	75	37.5	62.5	37.5	62.5	50	37.5	87.5	37.5	12.5	37.5	12.5	75	75	0.500	56.25
6	300	50	250	225	37.5	187.5	100	18.75	93.75	18.75	81.25	18.75	81.25	50	18.75	106.25	18.75	31.25	18.75	31.25	37.5	112.5	0.250	23.44
7	300	0	300	225	0	225	100	0	112.5	0	100	0	100	50	0	125	0	50	0	50	0	150	0.000	0.00

$$\text{LT Limit} = 50\%(\text{T1 TH} + \text{T2 TH}) + \underbrace{\left(\frac{\text{T1 TH} + \text{T2 TH}}{75\%\ \text{SEQ}}\right)}_{\textit{Factor}} \cdot 50\%(\text{T1 TH} + \text{T2 TH})$$

Option 2. Disaggregate EZGen Hubs in the CRR SFT; no redefinition of EZGen Hubs.

LSEs would nominate EZGen Hub CRRs, then the ISO would disaggregate these into individual PTP CRRs from all generator PNodes making up the EZGen Hub, based on the EZGen Hub weighting factors. As a result, LSEs would receive bundles of PTP CRRs rather than Hub CRRs.

Most likely the MW shares of some of the EZGen Hub component PNodes would be reduced relative to the Hub weighting factors, while other PNodes would not. Thus we can think of the CRRs awarded to LSEs as a certain quantity of Hub CRRs plus a bundle of extra PTP CRRs that add up to something similar to the Hub CRR but not exactly. This bundle of extras would be deficient in some MW of those PNodes where other LSEs' PTP CRR nominations caused individual generator constraints to become binding.

Under this option, LSEs could nominate any CRRs awarded in Tiers 1-2 for LT-CRRs. In Tier LT any nominations of Hub CRRs would be disaggregated into component PNodes as in Tiers 1-2.

Option 3. Create Alt-Hubs corresponding to EZGen Hubs; no disaggregation of EZGen Hubs.

An Alt-Hub would be defined for each EZGen Hub with the following properties:

1. Alt-Hub uses a small set of PNodes compared to EZGen Hub – maybe 10%. The intent of this provision is to reduce substantially the number of potentially binding constraints, thus enabling more Alt-Hub CRRs to clear when EZGen Hub CRRs may be unavailable due to binding constraints.
2. Alt-Hub hourly price is highly correlated with EZGen Hub price and is unbiased. The intent of this provision is to make Alt-Hub CRRs a useful financial instrument for managing congestion associated with contracts that will be settled at EZGen Hub prices in the IFM.

Both Alt-Hub and EZGen Hub would co-exist and be used in the following manner:

3. EZGen Hub is retained for energy market settlement (IFM and RTM).
4. Both EZGen Hub and Alt-Hub would be available for CRRs.
5. If LSE has EZGen Hub as a verified source, it can choose to use Alt-Hub for some or all of the verified MW. The underlying concept is that the LSE may be able to get a larger quantity of CRRs if it nominates some Alt-Hub CRRs instead of only EZGen Hub CRRs; the tradeoff for this is that the Alt-Hub CRR settlement is not identical to the market energy settlement. This concept is based on the idea that whereas EZGen Hub CRRs may not be available after Tier 1, some Alt-Hub CRRs may still be available because they have fewer constraints to bind. Of course, to achieve this objective the PNode composition of the Alt-Hubs will need to be carefully chosen.

   Note: Under this approach, the LSE could try to optimize its CRR awards using MPT CRR nominations, with EZGen Hub CRRs as first priority and Alt-Hub CRRs as second priority.
6. Both EZGen Hub and Alt-Hub CRRs may be nominated as LT-CRRs, but as in Option 1 there would be a limit on such nominations that may be lower than the limit on point-source CRRs.

NOTE: All three options enable LSEs to obtain LT Trading Hub or "Hub-like" CRRs.

	PRO	CON
Option 1 – Nomination Limits (sensitivity analysis #2 approach)	Improved equity between PTP Gen CRRs and Hub CRRs, in comparison to sensitivity #1 in which overall network capacity was derated in Tier 1. Should be simple to implement.	Limits would be set somewhat arbitrarily.
Option 2 – Disaggregation of EZGen Hubs	Should maximize total quantity of CRRs released. No limit, in principle, on LT Hub CRRs. No new or increased limit on Tier 1 CRR nominations from generation sources. Equal treatment of all CRR nominations – whether sourced at a Hub or generation source.	Bundle of awarded PTP CRRs will be biased toward higher price gen PNodes, so hedge value of awarded HubCRRs will be less than congestion cost from EZGen Hub. CRR Awards may not match congestion exposure for Hub contracts. Will require increasing the granularity of MW denominations of CRRs – down to .01 at least, or maybe even .001 MW to allow transfer for load migration. Will require systems changes.[5] Will require modification to CRR tracking system to differentiate between generation sources awarded as components of hub nominations versus generation sources awarded based on generation source nominations. May also be complex from the perspective of stakeholders seeking to nominate, buy and sell CRRs.
Option 3 – Alt-Hubs Co-exist with EZGen Hubs	Allows LSEs to manage risk of obtaining fewer EZGen CRRs versus more Alt-Hub CRRs that don't exactly hedge congestion. Energy contracting may evolve to use Alt-Hubs over time if these	May take considerable time, effort and stakeholder process to arrive at robust Alt-Hub specs. Will require some changes to validation features of the CRR software to track verified source

[5] For the NP15 and SP15 EZGen Hubs, the largest distribution factors are on the order of 0.1 and such values apply to only a small portion of the total PNodes comprising the hubs. The vast majority of the constituent PNodes have distribution factors on the order of 0.01 or less. Currently the design of the CRR systems is based on resolution of CRR MW amounts to 0.1 MW, so that any MW quantities that would not be rounded up to 0.1 MW (i.e., values of 0.05 MW or less) will be set to zero and lost. This means, for example, that a 50 MW CRR nomination from NP15 Hub to the PG&E LAP would be worth 47.8 MW as a "bundle" of the individual generation PNodes comprising the NP15 Hub. If the system were reconfigured to track CRR MW amounts to 0.01 MW, the bundle would be 49.9 MW.

	are well specified. Could be combined with Option 1.	nominations distributed across two allowable trading hubs.

4.2 Set-aside of Import Capacity on each Inter-tie for the CRR Auction

FERC's MRTU September 21 Order requires that the CAISO further evaluate whether our proposal to set aside 50 percent of the intertie capacity needs to be modified and if necessary to make a compliance filing. In our November 20, 2006 compliance filing, the CAISO reiterated its commitment to further evaluate its set-aside proposal based on the results of the CRR Dry Run and that it would place this issue on the agenda for further discussion. (*See* http://www.caiso.com/18b5/18b5b82957db0.html)

On November 20, 2006, the CAISO also filed for informational purposes some initial Dry Run data, which only addressed the results at the interties for the annual CRR Dry Run allocation.

Summary of Stakeholder Comments (received March 9, 2007)

- PG&E reiterates its position that a certain percentage of all available transmission capacity (not limited to only InterTies) should be dedicated to LT-CRR, annual and monthly CRR auctions.
- Powerex comments that changing the historical reference period has an unknown impact upon the set aside quantities at the interties. Powerex believes this change in historical reference period could reduce the intertie capacity that is set aside.

  Powerex further notes that in Year 2, LSEs could nominate intertie CRRs in Tier 2 and thereby erode the import capacity set aside. Powerex urges that the intertie set aside for Year 2 and subsequent years should be performed after Tier 1 and not Tier 2.
- SCE reiterates its position that all CRRs should be allocated to load and that no set aside should be made for the auction. SCE recognizes the set aside is an effort to balance competing stakeholder interests but strongly objects to any increase in the current 50% rule. SCE believes the best course of action is simply leave the current rules in place.
- SMUD reiterates its objection to the prohibition for out-of-control-area LSEs to use interties as a verifiable source. SMUD urges sufficient capacity to be set aside to ensure that out-of-control-area LSEs have access to CRRs.

Discussion of Options

Set-aside of import capacity for the CRR Auction

The proposals discussed in this section address the uncertainty that arises due to changing the historical reference period. As a result of this change, the set-aside quantities reported for the Dry Run would be superseded by new calculations based on new source verification showings, which are not known at this time.

The CAISO is required to report to FERC on the adequacy of the import set-aside based on the Dry Run; per an earlier compliance filing, the CAISO committed to make a recommendation regarding the set-aside in conjunction with the filing of the Dry Run report (March 30), or at the latest as part of a CRR 205 filing on May 2. Even by that time, however, the CAISO will not have enough information on the revised source verification showings to actually calculate a revised set-aside.

Option 1 addresses this uncertainty by revising the rules for calculating the set-aside so that the quantities determined in the CRR Dry Run would serve as "soft" lower bounds on the amounts of the set-aside calculated based on the 2006 historic reference year. In conjunction with this revised calculation there would also be a change to how the set-aside is calculated in CRR Year Two and later years. Option 2 is a different approach that simply sets aside a fixed percentage of each inter-tie's import capacity. For information purposes the CRR Dry Run results related to this issue are presented in a table.

Option 1:

1. For CRR Year 1, if the source verified import quantities based on the new historical verification period and rules are greater for any particular intertie than the quantities based on the 2004-5 historical period, then this impact will be absorbed by the LSE share of the residual capacity as far as possible before reducing the set-aside that was calculated based on 2004-5. If, alternatively, the 2006 verified quantities are lower than the 2004-5 quantities, then the filed rule for the set-aside calculation would apply.

   For example, suppose ATC = 200 MW (after removing TOR, ETC, CVR), and based on 2004-5 the verified quantity was 120 MW. Then 40 MW would be set aside for the auction, and the last 40 MW would be available for LSEs to nominate in the allocation. Now suppose that based on 2006 the verified quantity is 140 MW. Then under the proposed rule, 40 MW would still be set aside for the auction, and only 20 MW would be available for LSEs beyond the verified amount.

   Only if the 2006 verified quantity exceeds 160 MW would the set-aside quantity be reduced. For example, if the 2006 verified quantity is 175 MW then 175 MW would be available for LSE nomination in the allocation and 25 MW would be set aside for the auction.

The second modification applies to CRR Year 2 and beyond, and is intended to address the concern raised in certain comments that by calculating the set-aside after Tier 2 of the annual process (as the 2/06 filed tariff proposed), it is possible that import capacity on the valuable interties will be completely used up, because Tier 2 is a free-choice tier for LSEs. Therefore the following change is proposed.

2. For CRR Year 2 and beyond, the import set-aside for the annual auction process will be calculated based on the results of Allocation Tier 1, the Priority Nomination Tier.

Option 2:

Instead of calculating set-aside quantities for the auction based on the LSE CRR source verification results, set aside a fixed percentage of the import capacity on each inter-tie.

4.3 CRR Source Verification Rules – Allowable set of verified sources

This issue deals with finalizing the rules regarding which CRR Sources qualify for LSE nomination in Tiers 1-2 of the seasonal and Tier 1 of the monthly processes for Year 1.

Summary of Stakeholder Comments (received March 9, 2007)

- AReM supports staying with the current requirement of a minimum contract length of 30 days.
- PG&E recommends that verification be expanded to include RA showings and Long Term procurement plans.

  PG&E comments that source verification should be retained in Tier 1 of the monthly process.

  PG&E supports retaining the provisional CRR Dry Run rules that allow verification and pro-rata treatment of contracts as short as one day.
- Powerex comments there is no reasonable basis to allow daily contracts at the interties to count towards source verification.
- SCE comments that a contract duration of one day does not demonstrate a commitment to serve load from a resource. SCE believes the current "30-day" rule should remain in place.
- SMUD comments that single-day contracts pro-rated to reflect energy over the CRR term should be allowed. SMUD suggests that restrictions for specific generators should be eliminated and SMUD should be treated similar to internal LSEs.
- SWP recommends that source verification be required for Tier 3 of the Year 1 seasonal allocation, and that source validation should be maintained beyond Year 1.

Discussion of Options

Allowable set of verified sources

The following proposal responds to expressed concerns about basing source verification for Long Term CRRs on an LSE's sources that delivered energy during a single historical reference year. Following upon the discussion of this matter at the February 27 stakeholder meeting, the CAISO now offers the proposal below as a potential way to address this concern by expanding the eligible set of sources while still retaining the 2006 reference year. Towards the end of this description the CAISO also mentions a couple of variants of the proposal which we believe merit further discussion, particularly because they may be simpler while still effectively addressing the concern.

1. Under the filed February 2006 MRTU Tariff the CAISO would perform CRR source verification one time only, for the CRR Year 1 allocation prior to the start-up of the MRTU markets. The filed source verification rules require that verified sources must have delivered energy to the LSE during a historic reference period, which was specified in the filed tariff to be 9/1/04 to 8/31/05. Thus there was no provision in the filed tariff for verification of sources associated with contracts for energy delivery at a date later than the historic reference period.

While this limitation was deemed appropriate under the filed CRR structure – specifically the one-year time horizon for the release of CRRs – several parties have argued that the addition of 10-year CRRs (LT-CRR) to the MRTU design should be accompanied by a revision to the source verification rules to allow the initial award of LT-CRRs to align better with LSEs' actual supply arrangements. In response to these arguments the CAISO proposed, in its 1/29/07 filing in compliance with FERC's LT-FTR Rule (Order 681), to change the historic reference period to 2006. Then in the CAISO's 2/21 "CRR Issues Paper" and at the 2/27 stakeholder meeting the CAISO raised the idea of expanding the set of sources acceptable for verification to include sources other than those that delivered energy during the historic reference period.

The present paper now offers a specific proposal for expanding the set of verifiable sources for the CRR Year 1 allocation process. The CAISO will continue with the policy of performing source verification for CRR Year 1 only.

2. As proposed in the CAISO's January 29 Long Term CRR filing, the historic reference period will be calendar 2006 instead of the period specified in the filed tariff, i.e., 9/1/04 to 8/31/05.

3. Under the 2/06 MRTU Tariff, verified sources must be either LSE-owned generation or energy contracts of at least one month in duration. Note that the one-month minimum was not enforced in the Dry Run – contracts as short as one day[6] were allowed, with the MW values prorated by the proportion of the CRR term the contract covered.

   Proposal: The present proposal would retain the Dry Run approach rather than the filed one-month minimum duration.

4. Plant ownership and contract energy delivery time periods must match the terms of the CRRs being requested (i.e., the corresponding season or month and TOU of the historic reference period).

5. Contract time periods can be shorter than CRR terms (e.g., one-month contract used for requesting a seasonal CRR), in which case the MW value of the contract is prorated by the portion of the CRR term it covers. Contract time periods can also overlap multiple CRR terms, with MW proration as appropriate.

6. Under the filed tariff, energy contracts must have been for delivery of energy during the historic reference period. Under the present proposal, in addition to sources that delivered energy during the historic reference period, LSEs may submit as verified sources energy contracts that were signed no later than 12/31/06 for delivery of energy at a later date. Such contracts must specify a definite delivery start date, delivery period (e.g., season or month and TOU), and delivery location to be acceptable for CRR source verification. Note that this provision does not require that a contract have been submitted as part of a procurement showing to the CPUC or other regulatory authority; it simply requires that the contract be consistent with the parameters described above and be submitted for verification purposes to the CAISO.

7. This proposal is not intended to increase any LSE's overall eligibility for CRR allocation. In other words, no matter how many MW of verified sources are qualified under these new rules, the LSE's overall eligibility is limited to the Adjusted Load Metric (ALM) and Seasonal Eligible Quantities (SEQ) described in the tariff.

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[6] "One day" for the purpose of CRR source verification means all the hours comprising the time-of-use period of the CRR being nominated, i.e., all on-peak hour or all off-peak hours.

8. This proposal would not increase network capacity available for CRRs. That is, any proposed new transmission facilities or facilities that may be required in association with a new generation source would not be included in the model for the SFT. If some of the future contracted deliveries are from new generation facilities, such facilities would be assumed to connect at PNodes and utilize transmission capacity that is already in the model for the current year CRR processes.
9. Where source verification is for power delivered at one of the inter-ties and imported into the CAISO control area, the filed MRTU Tariff requires that the LSE demonstrate that it has procured external transmission to transport power from the actual generation source to the CAISO Scheduling Point. The present proposal would retain this requirement.
10. By expanding the time period for verification of sources beyond one year there will be some multiple counting of supply sources. For example, suppose LSE1 has a 2006 energy contract with Generator A for 100 MW, and LSE2 has a 2008 contract with Generator A for 100 MW, and the P-max of Generator A is only 100 MW. In such cases the CAISO proposes to assign pro rata shares of the generator to each of the LSEs to use as verified sources. Such shares would be proportional to the duration of the LSEs' contracts. For example, if LSE1's contract with Generator A covers all three months of the spring quarter in 2006, whereas LSE2's contract covers all three months of spring 2008 and 2009, then LSE1 and LSE2 would be allowed to use 33.3 and 66.7 MW, respectively, of Generator A in the verified tiers.[7]

There are some additional open questions on which the CAISO requests stakeholder views.

First, should there be any time limits on the time periods specified in point 6? There are two time periods in question. First, should we require that contracts be signed during 2006, or simply no later than 12/31/06, for example during 2005? Second, should the allowable future delivery start date be open ended or should there be a specific end point?

Second, the change in historic reference period and the expansion of the set of eligible sources could have as-yet unknown impacts on the FERC-approved set-aside of import capacity for the annual and monthly CRR auction processes. Thus there is potential conflict between the two objectives of expanding the set of eligible sources for LSEs and ensuring the availability of meaningful quantities of import capacity for auction participants. In the next section of this paper the CAISO offers a proposal for addressing this dilemma; stakeholders are invited to offer other workable ideas they may have.

Variant 1: Limit the expansion of eligible resources only to imported sources. That is, source verification with respect to internal generators would be limited to arrangements that delivered energy during the 2006 historical reference year, but for nominating imports as verified sources LSEs could also submit contracts signed no later than 12/31/06 for delivery of energy at a future date. All the other requirements mentioned above regarding source verification would still apply.

One simplification of this variant is that the CAISO would avoid the need to determine pro rata shares of the verified sources claimed by multiple LSEs, as described above with respect to multiple LSE claims on the same generating capacity of an internal generator. With respect to the inter-ties, rather than limit each LSE's nominations by an ex ante pro-rationing formula, the import limit on each inter-tie (after subtracting the set-aside quantities for the auction) would

[7] One reason to perform ex ante pro-rationing rather than allow LSEs to nominate MW quantities that might in total exceed the P-max of an internal generator and rely on the SFT to perform appropriate pro-rationing of the nominations, is that such an approach would defeat the purpose of the Trading Hub nomination limits discussed earlier.

allocate shares of import capacity through the SFT. In contrast to the internal generators, where allowing nominations in excess of generator P-max and pro-rationing through the SFT would undermine any solution to the trading hub problem, the inter-ties are not included in the trading hubs.

Variant 2: Limit the expansion of eligible sources only to imported sources, and reserve a pre-specified quantity of intertie capacity for the auction. Under Variant 2, the ISO would determine each LSE's share of the total quantity of verified sources that LSEs as a whole have submitted for each inter-tie for the verified tiers. Under this variant the CAISO would calculate each LSE's eligibility to nominate each inter-tie in the verified tiers, such that the sum of the LSE shares of each inter-tie do not exceed the import capacity at that inter-tie (after subtracting the set-aside quantity for the auction).

Note that under both Variant 1 and Variant 2 the CAISO would set aside certain MW quantities of import capacity on each inter-tie for the CRR auction process. Under either variant these quantities could be calculated based on the verified import quantities submitted by the LSEs, or could be set independently as specific percentages of available import capacity.

4.4 Increasing the Certainty of LT-CRR Renewals and Conversion of Expiring ETCs and CVRs

The CAISO's LT-CRR filing proposed to allow holders of expiring ETCs to nominate CRRs corresponding to their expiring ETC rights in the PNT for the first year after expiration, consistent with their MW quantity eligibility determined in the usual fashion by the Adjusted Load Metric and Seasonal Eligible Quantity formulae. Once they receive such CRRs through the PNT, they can nominate these as LT-CRR in Tier LT, subject to the relevant quantity limitations. Similarly, the LT-CRR proposal described how holders of expiring LT-CRRs can renew these for additional 10-year terms using a two-step process of the PNT followed by Tier LT in the allocation process for the first year following allocation.

Since that filing was made on 1/29/07, some stakeholders have identified an aspect of the Year 2 and beyond multi-year network modeling approach for LT-CRR that could negatively impact the ability of the holders of expiring rights to renew their entire quantities of LT-CRRs through the proposed process. The CAISO has considered the issues raised by these stakeholders and now presents the matter as a topic for further discussion.

At this point the CAISO does not have a proposed course of action. Rather, this paper describes the problem and identifies a few possible approaches and their pros and cons.

Description of the Problem

Consider the following example. Suppose the CAISO is processing the first annual allocation in the summer of 2007, and in the network model for the SFT there is a particular constraint (call this "Path A") with a limit of 1600 MW. For the allocation of Seasonal CRRs 75% of the capacity or 1200 MW on Path A are available, and for the LT-CRR allocation 60% or 960 MW on Path A are available.[8] Assume that the Seasonal and LT available capacities are both totally allocated in the 2007 annual process for CRR Year 2008 and the LT process for 2008-2017, respectively.

[8] This example ignores any applicable set-aside of capacity for the auction. We can assume that the quantities have been adjusted to account for the set-aside, and if we assume further that the set-aside is constant over the years of the example there is no effect on the example.

Consider two LSEs who are similar in size but have made different choices with respect to LT-CRRs. LSE1 and LSE2 both have Adjusted Load Metrics (ALM) = 800 MW, which translates to Seasonal Eligible Quantities (SEQ) = 600 MW, and LT-CRR eligibility = 400 MW. Assume these quantities all remain constant over the time period of this example, no load growth or migration. In CRR Year One, LSE1 nominated and was allocated its maximum amounts in both the Seasonal and the LT process, and holds 400 MW of LT-CRR over Path A for the period 2008-2017, which it hopes to renew for a second ten-year period in the 2017 process. In contrast, in the initial 2007 process LSE2 was allocated its maximum amount in the Seasonal process but did not nominate any LT-CRRs. Since all 960 MW of LT-CRR over Path A were assumed to be allocated, 560 MW must be held by LSEs other than LSE1 and LSE2. Note also that since LSE1 holds 400 MW of LT-CRR its eligibility for the Priority Nomination Tier (PNT) is zero, so if it holds any Seasonal CRRs (over Path A or anywhere else in the system) it cannot use the PNT to renew them.

Now go forward in time to the year 2015, when the CAISO is conducting the annual process for 2016. To keep the example simple (you gotta be kidding!) suppose there were no transmission upgrades, and no additional LT-CRRs were issued since the first round in 2007 so the only LT-CRRs that exist are the ones that will expire at the end of 2017. As we begin the 2015 process, the network model for 2016 includes 960 MW of LT-CRR on Path A, but for the release of Seasonal CRRs there are still 240 MW of additional capacity available on Path A.[9] Because LSE1 holds 400 MW of LT-CRRs its eligibility for Seasonal CRRs is 200 MW, whereas LSE2's eligibility for Seasonal CRRs is 600 MW. Thus, if LSE1 wants to obtain any additional Seasonal CRRs on Path A, it could potentially get all 200 MW at best, but it cannot use the PNT and if there is significant competition for Path A from other LSEs, their aggregate eligibility combined with PNT eligibility could drastically limit what LSE1 can get. Suppose that LSE1 gets 40 MW of Seasonal CRRs for 2016 on Path A, while LSE2 and other LSEs obtain 200 MW, thus using up the full amount of Path A capacity available for Seasonal CRRs.

Now step forward to the 2016 PNT process for 2017. Because LSE1 still holds 400 MW of valid LT-CRR for 2017, its eligibility in the PNT is zero so it can't nominate any of the Seasonal CRRs it acquired the previous year. Meanwhile other LSEs will have obtained 200 MW of Seasonal CRRs on Path A for 2016 which are now eligible for nomination in the next PNT, and assuming these nominations are awarded and the holders are eligible for LT-CRRs, can be nominated in Tier LT. Note that the SFT for Tier LT will cover the period 2018-2026, and since the previously awarded LT-CRRs expire at the end of 2017, the Tier LT SFT will show 960 MW available on

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9 There is an additional complication that is not necessary to consider for this example, but which could affect the phenomenon described here. Recall that in this CRR Year One process, the Tier LT SFT will be a single optimization for the entire nine-year time period 2009-2017 (for each Season/TOU). Starting in CRR Year 2, however, with the annual allocation and auction process conducted in 2008 for the period starting in 2009, the CAISO plans to introduce a multi-period optimization capability into the Tier LT SFT. This means that the Tier LT SFT conducted in 2008 for the nine-year time period 2010-2018 will actually perform nine separate optimizations for each Season/TOU, and will impose multi-period constraints so that the MW of each LT-CRR awarded will be constant over the whole time period. The advantage of this approach is that system conditions can be modeled differently for each year. Although the filed LT-CRR proposal would not incorporate anticipated transmission upgrades into this SFT, it would model the expiration of any rights that are scheduled to expire in any given year. Thus, as in this simple example, the models for 2010-2017 would include the LT-CRRs awarded in the 2007 process, but the model for 2018 would not because these LT-CRRs will have expired at the end of 2017.

Path A. Thus it is quite likely that the 200 MW on Path A awarded in the PNT will be awarded for LT-CRRs as well.

Now step forward to the 2017 PNT process for 2018. LSE1's holdings of LT-CRR are expiring so it can nominate its 400 MW on Path A in the PNT. Also, all other LSEs that held the other 560 MW of LT-CRRs on Path A can nominate them in the PNT. The network model will have 200 MW of LT-CRRs on Path A that were awarded the previous year, so there will be 1000 MW available to accommodate the full 960 MW of nominations from the holders of LT-CRRs who want to renew them. Now we go to Tier LT, however, and the capacity available for LT-CRRs is only 760 because 200 MW were awarded the previous year. Thus the holders of the original 960 MW of LT-CRRs would not be able, under the assumptions of this example, to fully renew their LT-CRRs on Path A.

Potential Approaches

The CAISO does not at this time have a recommendation on this matter. As a first step we offer three potential courses of action and indicate some of their pros and cons.

Option 1 and Option 2 both focus on the 2016 process for 2017 in the above example. In the 2016 Tier LT the CAISO awards 200 MW of LT-CRRs on Path A because the Tier LT SFT covering the period 2018-2026 does not include the 960 MW of LT-CRRs that expire at the end of 2017. If these expiring rights are retained in the model for the running of the 2016 process then there will be no allocation of LT-CRRs on Path A in 2016, and therefore the renewal nominations in 2017 will have greater chance of clearing more fully. Note that there is still no guarantee that the 960 MW of renewals will clear fully, because other LSEs may have obtained some Seasonal CRRs on Path A in the 2017 PNT that they wish to nominate in Tier LT, thus pushing the total nominations above 960. But one could argue that this is no different than the situation originally faced by LSEs in 2007 when they competed for LT-CRRs the first time, hence a reasonably level playing field.

Option 1 would retain the 960 MW of LT-CRRs in the 2018-2026 network as CRR Obligations. This may be the simplest to implement and run in production, but is unrealistic because it does not recognize that LSEs who hold LT-CRRs may choose not to renew them. In other words, it tests simultaneous feasibility of net LT-CRR nominations based on the assumption that all the previously released ones will still exist beyond their expiration. If some of these are not nominated for renewal, then the newly released LT-CRRs may not be simultaneously feasible and there will be increased risk of revenue shortfall to be made up through the balancing account and possibly result in an uplift charge. The CAISO is concerned that such infeasibilities and associated revenue shortfalls cannot be considered rare or unlikely, because the LT-CRRs most likely not to be nominated for renewal are those whose value decreased significantly or even turned negative during their 10-year term. The failure to renominate these "counterflow" LT-CRRs would very likely undermine the feasibility of the remaining LT-CRRs whose renewal is sought by the holders.

Option 2 would retain the 960 MW of LT-CRRs in the 2018-2026 network as CRR Options. This would be realistic because it would reflect the fact that holders of LT-CRRs have the option to nominate them for renewal or not. However, it would make for a much more complicated Tier LT process and would likely result in fewer LT-CRRs being released. If there is any doubt about the complexity, take a look at the last footnote which discussed the multi-period optimization and imagine having to run a more complex optimization algorithm that includes both CRR Options and CRR Obligations.

Option 3 is to take no action to address this matter. The example was carefully constructed to illustrate a potential phenomenon, but at this time it is impossible to know how likely this is to arise or how great its impact will be.

4.5 Modeling of Transmission Outages in the CRR Network Model

Resolution for this issue is slated to be incorporated in a FERC filing in early August. Thus, the CAISO will offer proposals for stakeholder consideration in future iterations of this paper.

4.6 Use of Common Forecasts for Monthly CRR Eligibility and Monthly RA Showings

Resolution for this issue is slated to be incorporated in a FERC filing in early August. Thus, the CAISO will offer proposals for stakeholder consideration in future iterations of this paper.

4.7 Frequency of Monthly Allocation and Auction Process

Resolution for this issue is slated to be incorporated in a FERC filing in early August. Thus, the CAISO will offer proposals for stakeholder consideration in future iterations of this paper.

5 Outstanding CRR Process Issues

This section provides an overview of the process for resolving three significant CRR-related issues that need more defined business processes.

5.1 CRR Credit Requirements

A revised paper on the CAISO's proposed CRR Credit policy, which will be posted during the week of March 19, will provide further details on the CRR auction requirements, credit requirements for holding CRRs, determination of the CRR credit margin, adjustments required in required credit coverage and options for the valuation of Long Term CRRs. A stakeholder conference call on this topic will be held on March 27th from 9:00 am -11:00 am, during which the CAISO's staff and Scott Harvey of LECG will be reviewing the topic and previewing stakeholder questions or discussion points.

On April 3rd, the CAISO will further discuss this proposal as part of the agenda for the all-day stakeholder meeting on CRR-related issues. The determination of the numerical value of the CRR credit margin will require additional analysis and the ISO will inform the Market Participants when the results of this analysis become available.

The design for CRR Credit Requirements is expected to be finalized before May 1st for inclusion in the tariff or BPM.

5.2 Methodology for Determining CRRs for Merchant Transmission Upgrades

A revised paper on the CAISO's proposed policy for determining the CRRs to be awarded for merchant transmission upgrades will be posted during the week of March 19. A stakeholder

conference call on this topic will be held on March 29th from 1:00 pm -3:00 pm, during which the CAISO's staff and Ben Hobbs of the MSC will be reviewing the topic and previewing stakeholder questions or discussion points.

On April 3rd, the CAISO will further discuss this proposal as part of the agenda for the all-day stakeholder meeting on CRR-related issues.

The business processes for this methodology are expected to be finalized before May 1st for inclusion in the tariff or BPM.

5.3 CRR transfers due to Load Migration

Resolution for this issue is slated to be incorporated in a FERC filing in early August. Thus, the CAISO will offer a more defined process for consideration of proposals in the near future.

6 Filing to FERC on Implementation Features

Certain implementation features related to the CRR production process were previously reviewed with stakeholders. The CAISO submitted a filing to FERC on March 9th related to these implementation features.

7 CRR Business Practice Manual

The CAISO posted revised draft BPMs to its website on January 19, 2007 for stakeholder review and comment. The CRR BPM was also posted at that time. The revised draft BPMs can be found on the CAISO website on the MRTU Business Practice Manuals (BPM) page at: http://www.caiso.com/17ba/17baa8bc1ce20.html.

BPM Stakeholder Process Timeline:

January 19: Post Revised BPMs
January 20-March 2: Stakeholder Review and Comment Period
April 2: Post Reconciled BPMs and draft MRTU Tariff Language
April 2-April 13: Stakeholder Review and Comment period
Week of April 16: Conference Call on proposed MRTU Tariff Language
May 2: File additional proposed MRTU Tariff language to support BPMs.
June/July: Proposed Timeframe for FERC Technical Conference