



California ISO
Shaping a Renewed Future

2011 CRR Enhancements Issue Paper

March 4, 2011

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Table of Contents

1	Introduction	3
2	Plan for Stakeholder Engagement	3
3	Background.....	3
4	Scope of 2011 CRR Enhancements.....	5
4.1	Load Migration Issues.....	5
4.2	Revenue Adequacy Issues	7
4.3	Simplification of the Allocation Process.....	8
4.4	Issues Requiring Tariff Clarification.....	11
5	Additional Auction Functionality	13
6	Next Steps	14

1 Introduction

Congestion Revenue Rights (CRRs) are a financial instrument that enables market participants to manage the financial risks associated with congestion costs in the locational marginal pricing (LMP) energy market structure. CRR benefits belong to electricity end users who pay for the ongoing embedded costs of the grid with LSEs acting as CRR custodians for the load they serve. For three years, the ISO has conducted an allocation process and auction to distribute the benefits of the CRR market to load.

The purpose of the 2011 CRR Enhancements stakeholder initiative is to look for opportunities to streamline the current process for both market participants and the ISO. The initiative will look to simplify the burdensome load migration process, improve revenue adequacy, reduce the number of allocation tiers and address minor issues that require tariff clarification identified since the last CRR enhancement initiative. The Grid Management Charge (GMC) proposed redesign for 2012 will establish a separate cost category to recover costs associated with operating the CRR market. Thus any simplification and associated reduction in CRR costs will benefit market participants through lower GMC rates.

The proposals for simplifying load migration and streamlining the allocation process outlined below are illustrative of different approaches to achieve the objective to improve the CRR process efficiency for both market participants and the ISO. The ISO requests stakeholders to provide additional proposals in their comments, so that additional opportunities to streamline the process can be included in the development of the straw proposal.

2 Plan for Stakeholder Engagement

Item	Date
Post Issue Paper	March 4, 2011
Stakeholder Conference Call	March 11, 2011
Stakeholder Comments Due	March 18, 2011
Post Straw Proposal	April 8, 2011
Stakeholder Meeting	April 15, 2011
Stakeholder Comments Due	April 22, 2011
Post Draft Final Proposal	May 5, 2011
Stakeholder Conference Call	May 12, 2011
Stakeholder Comments Due	May 19, 2011
Board Meeting	June 29-30, 2011

3 Background

Congestion Revenue Rights (CRRs) are a financial instrument that enables market participants to manage the financial risks associated with congestion costs in the LMP energy market structure. Each CRR is defined by a source-sink pair, a MW quantity, and a term consisting of a season or a month and a time of use (on-peak or off-peak). CRRs are settled as the product of the MW quantity times the marginal cost of congestion at the sink location minus the marginal

cost of congestion at the source location in the day ahead market. Only congestion costs from the day ahead market are offset with CRR revenues. There are two types of CRRs which have different settlement rules. For Obligation CRRs, the settlement can result in positive or negative payment based upon the direction of the congestion. Nearly all ISO CRRs are Obligation CRRs. For Option CRRs, the settlement will always be positive. Option CRRs are only available to merchant transmission owners, i.e., parties that build transmission at their own expense to be placed under ISO operational control and do not request rate based cost recovery.

CRR benefits belong to electricity end users who pay for the ongoing embedded costs of the grid with load serve entities (LSE) acting as CRR custodians for the load they serve. The electricity end users are entitled to CRR benefits commensurate with their exposure to congestion. The benefits can take two forms: allocation of actual CRRs at no cost and/or revenue resulting from the CRR auction. LSEs, under the ISO's current design, receive CRRs through the allocation at no cost and indirectly the residual value from the auction as it is applied to measured demand.

Obligation CRRs can be obtained through both annual and monthly allocations and auctions. The maximum volume of CRRs for nomination in the allocation is determined by the LSE's historical/forecast load, and the CRR paths they can nominate are restricted by a predefined set of sources and sinks. Sources can be any Pricing Node associated with one or more Generating Units, Trading Hubs and Scheduling Points. Sinks are restricted to Default Load Aggregation Points (DLAPs), Sub-LAPs, MSS LAPs, Custom LAPs and scheduling points for those LSEs (OBAALSEs) that are outside of the CAISO Balancing Authority Area.

The CRR market is organized in annual and monthly processes, which includes both allocations and auctions. CRRs are released on a seasonal basis during the annual processes. In annual allocations, participants can be entitled to both Short-Term (ST) and Long-Term (LT) CRRs, according to the rules described in the CRR Business Practice Manual and the tariff. In the annual process, up to 75 percent of the transmission capacity is released. The remaining 25 percent of the capacity is released in the monthly processes. Although two types of products can be found in the ISO's CRR market: obligations and options; only obligation CRRs are released in allocations and auctions. The allocation and auction processes release as much transmission capacity as is determined by the Simultaneous Feasibility Test (SFT) of all CRR portfolios. Even though market participants can nominate up to a certain volume of CRRs, there is no guarantee that all of their nominations can be allocated, due to the SFT constraint.

Only (candidate) CRR holders that are also LSEs or qualified Out of Balancing Authority Area Load Serving Entities (OBAALSEs) can participate and obtain CRRs through CRR allocations. The CRR eligible quantity is the starting point for calculating a LSE's nomination limits. CRR eligible quantities for the annual and monthly CRR allocations are based on the LSEs historical and forecast load, respectively. The reference period for historical load includes the most recent and full calendar year. The historical load data is then grouped by season and TOU to derive a load duration curve. The LSE's seasonal CRR load metric for each season and TOU period is the MW level of load that is exceeded only in 0.5 percent of the hours based on the LSE's historical load data. For monthly allocations, a similar approach is followed for each TOU but using forecast load instead. With the participants' nominations available, the CAISO runs a SFT to determine the maximum number of CRRs that can be allocated while enforcing all transmission constraints defined in the full network model of the transmission system.

The ISO utilizes a SFT to ensure that CRRs which are both allocated and auctioned are fully funded. All CRR holders will be settled at the CRR's full face value and not be subject to shortfalls resulting from differences between the CRR network model and actual day ahead

congestion. Additionally, the overall system should be revenue adequate and not require cross subsidization between source-sink pairs or subsidies from measured demand to balance CRR payments and congestion rents.

Since CRRs are purely a financial transaction, a CRR participant does not necessarily have to participate in the ISO energy market. Allowing a larger number of participants through the auction process creates a deeper and more liquid market resulting in more efficient pricing. Because CRR obligations can result in both a payment and a liability, the primary limit on participation in the CRR auction is that entities must be credit worthy.

4 Scope of 2011 CRR Enhancements

4.1 Load Migration Issues

The ISO, on a monthly basis, transfers CRRs from the annual and long-term allocation process as load migrates between LSEs. The proliferation in the number of CRRs which must be tracked is the result of (1) the number of CRRs initially allocated and (2) the level of granularity which is tracked (currently 0.001 MW). As seen in Table 1 below as of February 1, 2011 the current process has resulted in 768,518 CRR records currently being tracked. The large number of individual CRRs is burdensome both for market participants and the ISO. The ISO will seek to address both root causes. First, by reducing the number of allocated CRRs through the redesign of the proposed allocation process (see Section 4.3). Secondly and with the largest impact, reduce the granularity of CRRs which are tracked to 0.1 MW and evaluate changing from truncation to rounding to distribute percentage shares of allocated CRRs.

During the early development of the current load migration process, the basic principle was when a percentage of load migrated, the equivalent percentage value of the CRR portfolio held by the load-losing LSE should transfer to the load-gaining LSE. Value is not determined solely by MW quantity, but by the relative value of the different sources.

The ISO is open to other potential simplification approaches to load migration, but any simplification would need to try to preserve the principle discussed above. For example, rather than transferring a percentage share of the load-losing LSE's CRR portfolio, a single Trading hub to default load aggregation point (DLAP) CRR could be transferred to the load-gaining LSE by creating a corresponding counter flow CRR for the load-losing LSE. This approach would require an algorithm to equate portfolio value to the value of the individual trading hub CRR. In addition if a method could be developed to address previously migrated CRRs, this would result in the largest reduction in load migration CRRs tracked.

Table 1 - Load Migration CRRs by MW Granularity (as of February 1, 2011)

	Record Count	MWs		
Total LM Inventory Records	768,518	13,383		
	Record Count	% of Total Records	MWs	% of Total MWs
Greater than or Equal to 0.1MW	25,128	3.270%	7,577	56.617%
Less than 0.1MW	743,390	96.730%	5,806	43.383%
Less than 0.05MW	722,316	93.988%	4,352	32.519%
Less than 0.01MW	590,222	76.800%	1,600	11.955%
Less than 0.005MW	474,675	61.765%	842	6.292%
Equal to 0.001MW	258,482	33.634%	258	1.928%

Table 1 above illustrates the total count of load migration CRRs by various levels of granularity. As shown, if the truncation level was set at 0.1 MW or greater, the number of tracked CRRs would be reduced from 768,518 to 25,128. However, the total MW value tracked would also be reduced from 13,383 MW to 7,577 MW. The ISO will seek to balance the cost savings associated with tracking fewer individual CRRs and maintaining the value transfer principle.

Table 2 - All Non-Load Migration CRRs by Year - Includes Annual, Seasonal and LT

	Record Count	MWs		Record Count	MWs
2011	61,559	500,353	2016	4,487	57,094
2012	4,703	99,670	2017	4,487	57,094
2013	4,487	57,094	2018	1,530	24,119
2014	4,487	57,094	2019	649	8,647
2015	4,487	57,094	2020	230	2,185

Table 3 - Load Migration CRRs by Year - All Load Migration CRRs

	Record Count	MWs		Record Count	MWs
2011	150,639	2,844	2016	95,775	1,655
2012	95,775	1,655	2017	95,775	1,655
2013	95,775	1,655	2018	33,947	500
2014	95,775	1,655	2019	8,111	94
2015	95,775	1,655	2020	1,181	13

Table 4 - Load Migration CRRs by Year - MW Tracked Less than 0.1 MW

	Record Count	MWs		Record Count	MWs
2011	145,087	1,170	2016	92,703	722
2012	92,703	722	2017	92,703	722
2013	92,703	722	2018	33,019	235
2014	92,703	722	2019	7,917	57
2015	92,703	722	2020	1,159	9

Tables 2 through 4 above provide additional context to assess the relative value of tracking at lower levels of granularity and highlights the impact of tracking LT CRRs and annual CRRs. Table 2 shows by year the total CRRs that were created through either the allocation or auction and not through load migration. Table 3 shows by year the total load migration CRRs that are currently being tracked. Table 4 identifies the subset of CRRs tracked with a MW quantity less than 0.1 MW. By comparing the data in Table 3 and Table 4, two conclusions can be reached. First, the impact of migrating LT CRRs at low .001 MW is the primary driver of CRR proliferation. By comparing year 2012, which only contains LT CRRs, a 97% reduction in CRRs tracked can be achieved at 0.1 MW while only reducing the MW quantity tracked by 56%. Second, the impact on annual CRRs can be calculated by subtracting the 2012 count and MWs from 2011 data. The total annual CRRs tracked are 54,864 and 1189 MW and CRRs tracked with a MW value less than 0.1 MW are 52,384 and 448 MW. Thus, a 95% reduction in CRRs tracked can be achieved at 0.1 MW while only reducing the MW quantity tracked by 62%.

4.2 Revenue Adequacy Issues

Experience with CRRs since the start-up of the LMP markets has shown that CRR revenue adequacy may be improved through improved modeling of transmission capacity available for CRRs so as to better account for the impact of expected transmission outages and de-rates. In particular, outages and de-rates on the interties have constituted the largest contributions to CRR revenue inadequacy since start-up. For this reason, prior to the 2011 Annual Allocation process, the ISO proposed a new methodology for determining intertie capacity for use in the SFT. The proposal was to select an Operating Transfer Capability (OTC) value for each intertie that would have resulted in revenue adequacy during the prior year. The proposed methodology would have reduced the number of CRRs allocated versus the existing method of using 100% of the rated capacity of the intertie. The proposed change was not supported by stakeholders under existing tariff language and therefore only an incremental change was made for the 2011 annual process to utilize the median OTC value using OTC data for the prior three years. This change was relatively minor with little or no impact on the OTC value used for the 2011 annual process. Thus through this stakeholder initiative we will revisit how best to account for expected outages and de-rates in determining available capacity for running the CRR allocation and auction processes.

The intent of the proposal is to select the appropriate OTC level at which to release CRRs, based on historical hourly OTC levels, so that CRR revenue adequacy would have been achieved during each season/TOU combination for the prior operation of the LMP markets, if this OTC value had been used.

Through the development of metrics to analyze CRR revenue adequacy, the ISO used a mathematical derivation¹ to compute the breakeven point for each transmission interface of the ISO market. Based on historical data, this breakeven point is a value on the OTC duration curve for which a particular interface would have resulted in being revenue adequate, for a particular season and TOU period. As was noted in the CRR revenue adequacy report referenced above revenue adequacy is typically defined on a system wide basis but due to the typically radial nature of the major transmission interfaces it is realistic to expect that revenue adequacy can be achieved by selecting the break-even point on an OTC duration curve by transmission element. If the ISO had chosen this value, for each interface, as the basis for the CRR release amounts, then for that season and TOU, there would have been CRR revenue adequacy. Based on the derivation of the breakeven points for individual transmission interfaces, the main steps of the resulting process for using the OTC duration curves is as follows:

1. Prior to collecting the OTC data to be used and prior to the start of the annual process, the ISO develops a list that contains those interfaces that will be included in the annual study review. These interfaces include those that have constraint limits assigned through the CRR full network model (FNM) and also have scheduling points associated with them, specifically those that can be scheduled on in the day-ahead market. This list excludes nomogram constraints that have more complex formulations as they are used in the day-ahead market, based on operating procedures.
2. Each year, around the end of April, the ISO gathers the historical hourly OTC data for the last three-year period that ends on March 31st of the current year.
3. Taking this historical data set, the ISO computes the break-even points on the OTC curve for each interface for each season/TOU, and determines at which exceedance value this break-even point occurs.
4. Once the various break-even points on the OTC duration curves are known, the ISO lists all interfaces, the respective break-even OTC values (if applicable) and the associated percentiles on the OTC duration curve and the annual and monthly OTC values, sorted by interface, season and TOU. Following the same process that is used today this data would be released to CRR NDA holders as part of the CRR FNM data release package.
5. The set-aside process and the modeling process for the 30-day monthly outages will not be impacted by the methodology for selecting the OTC values.

The ISO believes that this methodology adequately addresses ongoing concerns with revenue adequacy. This approach will target the areas that have historically contributed to revenue inadequacy while not impacting those areas that have not had adverse effects on revenue adequacy and the benefits of this approach will be utilized to lower the value of the Global Derate Factor (GDF) in the monthly CRR allocation and auction. Since the monthly GDF is a broad tool, the use of this more focused approach to developing OTC values will limit the need for a large monthly GDF and enable the ISO to use a minimal GDF for the monthly CRR processes.

4.3 Simplification of the Allocation Process

The ISO believes that the existing issues with load migration and the resource intensity of the current allocation and auction processes demonstrate that CRR market participants and the ISO would greatly benefit from process simplifications. The simplification proposal outlined below

¹ Details of the derivation, as well as the analytical results, can be found in the ISO's April 2010 study of Revenue Adequacy of Congestion Revenue Rights, which is available on the ISO website at <http://www.caiso.com/2788/2788d5f71ae60.pdf>.

would increase the quantity of CRRs cleared through the auction, reduce the number of sequential steps or tiers in the annual and monthly allocation release processes, and reduce the quantity of annual CRRs subject to load migration, without compromising the long-term certainty LSEs currently desire regarding their CRR holdings.

The simplification proposal would have two benefits. First, the cost of running each additional allocation tier can be avoided for both the ISO and market participants. Secondly, each allocation tier comprises approximately one week of the CRR process. The gained time by eliminating the lower tiers can be divided between the ISO and market participant to enable more time to complete each step in the annual and monthly process.

The ISO recognizes that in the development of the current CRR design, LSEs expressed a strong preference for receiving CRR benefits through direct allocation. If an LSE has concerns with elements of the initial proposal outlined below, the ISO requests that the market participant provide specific examples that illustrate how their concerns will result in lower benefits returned to load than the existing process in their stakeholder comments to this issue paper. In addition, the ISO seeks additional proposals as to simplify and streamline the existing allocation process.

4.3.1 Benchmarking of Other ISOs

The ISO's CRR market design is similar to PJM Interconnection (PJM) and Midwest ISO (MISO); however, they utilize Auction Revenue Rights (ARR) which has led some to believe that ARRs should be implemented in the ISO to simplify our process. ARRs as implemented by PJM and MISO both rely on the allocation of source-sink pairs to LSEs based upon how the LSE has historically served load. LSEs are then allocated the auction revenue associated with the source-sink pairs. LSEs are allowed to self schedule the allocated source-sink pairs in the auction and historically 60-70% of LSEs elect to do so. To think of it another way, LSEs are only selling 30-40% of their source-sink allocations. The ISO model effectively self schedules all LSE allocation CRRs and if an LSE chose to sell via the auction 30-40% of their portfolio, the end result would be no different than if the ISO had implemented ARRs similar to PJM/MISO. Since ISO LSE's have the auction option as well as the bilateral market and do not sell CRRs at a 30-40% level, it suggests that ISO LSEs would self schedule a very high portion of allocated source-sink pairs. Thus any simplification benefit of the PJM/MISO ARR model would most likely not be realized in the ISO.

Another model is implemented by ISO New England (ISO-NE). ISO-NE does not perform an allocation prior to conducting the auction. All market participants (LSEs and financial players) must bid for the CRRs. Auction revenue is then distributed to LSEs based upon their level of load. The approach implemented by ISO-NE is far simpler to manage; however, enhancements could be made to ensure LSEs receive benefits directly correlated to their actual congestion exposure.

The ISO believes that transitioning the ISO market to a PJM/MISO ARR type process would not achieve the simplification benefits desired; however, the approach of ISO-NE does contain some elements which could be incorporated in to the ISO design while maintaining the long term certainty elements of the ISO's current design desired by LSEs.

4.3.2 Maintain Annual PNP and Tier LT as Designed

The ISO makes available 75% of network capacity for the annual process. The Priority Nomination Process (PNP) – the first tier of the annual allocation process – allows LSEs to nominate high priority CRRs from the prior year for allocation which they wish to retain in the current year. This process increases LSE certainty that they can retain CRRs from year to year without designating the CRR as a long term CRR, and therefore is valued by LSEs as a

practical and in some ways preferred alternative to holding LT CRRs. During the PNP, LSEs can nominate up to 66.7% of their Seasonal CRR Eligible Quantity (SEQ). Thus, the LSE has high confidence that each year it will be awarded CRRs equivalent to 1/2 (66.7% of 75%) of their historical load. After the PNP, if an LSE seeks additional long term certainty, the LSE can nominate CRRs it received in the PNP up to 50% of their adjusted load metric and secure those CRRs for nine additional years. Because LSEs continue to value the year-to-year certainty these features provide, the ISO would propose to retain them in their current form.

One possible variant, however, could include an LT CRR auction if stakeholders identify this functionality as a high priority. In that case, it may be more efficient to combine the current Tier LT with a long-term CRR auction as discussed above, in which case the current Tier LT design would change and may need to be performed at a different point in the annual sequence than it is today.

4.3.3 Merge Annual Tier 2 / Tier 3 Allocation and Auction

In contrast to the PNP, the Tier 2 and Tier 3 allocations are free choice tiers in the sense that LSEs can nominate any CRR source locations they desire, and as such these tiers do not fully contribute to LSEs' ability to maintain their current CRR holdings in subsequent years. The purpose of the two tiers is to allow additional opportunities for the LSE to be allocated CRRs for the remaining 1/3 of SEQ plus whatever amount they may have nominated and not been awarded in the PNP. Thus Tiers 2-3 and the annual auction process can be combined into a single auction step, without compromising the long-term certainty LSEs enjoy through the PNP and Tier LT. The elimination of the two allocation tiers will increase the quantity of CRRs which are cleared through market mechanisms, which will increase the liquidity of the auction and result in auction clearing prices that better reflect the expected value of each CRR source-sink pair.

In conjunction with this change to the allocation process, it is important to restructure the way auction proceeds are handled. Specifically, since LSEs will be obtaining 1/3 or more of their SEQ in this new combined auction, they should receive shares of the auction proceeds directly, rather than redistributing all auction proceeds through the CRR balancing account. An element of this proposal then is to allocate shares of proceeds from each new CRR auction (i.e., the combined Tiers 2-3 plus current auction design) in proportion to the load's exposure to congestion charges. The proposed distribution of auction revenues is discussed in section 4.3.5.

One potential issue for LSEs is that increased participation in the auction could lead to increased credit requirements; however, the issue could be addressed based upon how the anticipated auction proceeds are included in the calculation of credit requirements prior to the auction.

One additional feature of the proposal is to retain a current property that relates the outcomes of Tiers 2-3 to the following year's PNP. Tiers 2-3 provide value in the next year's annual process as allocated CRRs in these tiers are eligible next year for nomination in the PNP, whereas under today's rules CRRs received in the auction process are not eligible for nomination in the next year's PNP. With the new combined Tier 2-3 and auction, we propose to allow LSEs to nominate in the next year's PNP any CRRs received in that process that sink at the LSE's load location, within the current quantitative limit to the PNP of course.

4.3.4 Merge Monthly Tier 1 / Tier 2 Allocation and Auction

In the monthly process, the remaining 25% less outages of network capacity is made available for allocation and auction. Monthly CRRs are not eligible for the following year PNP and are not

considered in load migration, thus there is not a long term benefit associated with allocated CRRs during the monthly process. As a result, the ISO proposes to consolidate all tiers in to a single auction process.

4.3.5 Separate the Balancing Account from the Auction Proceeds

Currently, the ISO maintains a balancing account to ensure that monthly CRRs are fully funded. If the balancing account is positive, the benefits are returned to measured demand. However, if the balancing account is negative, the costs are first covered by the auction proceeds. If after applying the auction proceeds, the net amount is negative, then measured demand is charged for the shortfall.

The ISO proposes to separate the balancing account and auction proceeds. The balancing account will still be cleared against measured demand. However, since we are proposing to increase auction participation (both annual and monthly) and consequently auction proceeds, we recommend a different methodology to distribute auction proceeds. Auction proceeds will be distributed based upon weighted exposure to congestion based upon where the load is settled. For example, if a DLAP had 40% of the congestion and an LSE had 20% of the load settled in that DLAP, the LSE would receive 8% of the total auction proceeds for that month.

As a result of eliminating tier 2 and tier 3 from the annual allocation process the number of CRRs that must be migrated will further be reduced. The load gaining LSE will be eligible to receive a portion of the annual and monthly auction proceeds based upon their actual congestion exposure. Thus, the exposure to congestion will transfer CRR benefits from load losing LSEs to load gaining LSEs for CRRs which are cleared through the auction.

4.4 Issues Requiring Tariff Clarification

4.4.1 Clarification of PNP Upper Bound

In October 2010, California Department of Water Resources (CDWR) highlighted an issue with a strict interpretation of the existing tariff language regarding the determination of upper bound for the Priority Nomination Process (PNP). The current tariff language from Section 36.8.3.5.1 is noted below:

In all annual CRR Allocations after CRR Year One, an LSE or a Qualified OBAALSE may make PNP nominations up to the lesser of:

(1) two-thirds of its Seasonal CRR Eligible Quantity, minus the quantity of previously allocated Long Term CRRs for each season, time of use period and CRR Sink for that year; or,

(2) the total quantity of Seasonal CRRs allocated to that LSE in the previous annual CRR Allocation, minus the quantity of previously allocated Long Term CRRs for each season, time of use period and CRR Sink, and minus any reduction for net loss of Load or plus any increase for net gain of Load through retail Load Migration as described in Section 36.8.5.1.

The issue arises in criteria (1) because the current wording accounts for all long term CRRs whereas it should more precisely state only the prior year awarded long term CRRs apply. By including all long term CRRs, in effect, the impact of long term CRRs are counted twice by being included in both criteria for the PNP upper bound.

4.4.2 Reconfiguration of Previously Released CRRs

The tariff currently provides for reconfiguration of outstanding long-term CRRs when there are changes to the ISO grid that remove CRR source or sink locations. There are no analogous provisions, however, for reconfiguration of outstanding annual CRRs or the next year's PNP eligibility when such grid changes take effect during the year. We expect that the approach for the LT-CRRs could be adapted for the annual CRRs and the PNP eligibility, but this would require a tariff change and therefore should be included in the stakeholder initiative.

4.4.3 Remove mandatory CRR training requirement from tariff

The current tariff language of Section 36.5.2 is noted below:

CRR Holders and Candidate CRR Holders must attend a training class at least once prior to participating in the CRR Allocations or CRR Auctions. The CAISO may update training requirements annually or on an as-needed basis. Unless granted a waiver by the CAISO, Candidate CRR Holders and CRR Holders shall at all times have in their employment a person, or have obtained the services of a third party or consultant, that has attended the CAISO's CRR training class and shall notify the CAISO as soon as practicable of a change in such status.

The ISO is proposing to modify the language to state that the CAISO will make training available to CRR Holders and Candidate CRR Holders on a voluntary basis and will not require CRR market participants to take the training. The CAISO believes that CRR market participants are better equipped than the CAISO in determining the training needs of their personnel.

4.4.4 Allow manual SRS vs existing software process

The current tariff language requires that the ISO offer a computer interface and automated process to implement the Secondary Registration System (SRS). The currently language of Section 36.7.1.2 relating to the specific provisions for the transfer of Long Term CRRs is below:

A CRR Holder that holds Long Term CRRs may sell or transfer through the Secondary Registration System MW portions and temporal segments of a Long Term CRR corresponding to the current calendar year as well as the calendar year covered by the most recently completed annual CRR Allocation.

In Appendix A, the Secondary Registration System is defined as:

The computer interface through which CRR Holders and Candidate CRR Holders register any bilateral CRR transactions with the CAISO.

Market participants have not utilized the SRS as often as previously planned. To date, only a couple of transactions, when entities traded their entire CRR portfolio, have the market participants used the SRS. The ISO proposes to remove from the tariff prescriptive language that assumes a software system is used to manage the process of bilateral trades. Given the low use of the existing SRS, the ISO believes a manual process is sufficient to manage trades and will avoid software maintenance costs currently being incurred to support the automated system.

4.4.5 Clearing Auction Price Calculation

The CRR BPM states that the CRR clearing price for each CRR is calculated as the difference between the CRR source price and CRR sink price. This equation holds true under most circumstances; however, in those circumstances in which either the CRR source or a CRR sink

is disconnected from the network in a contingency case and the non disconnected source or sink has a non-zero shift factor associated with a binding constraint in the same contingency case, the resulting price is not consistent with this general rule. In such cases, after the CRR auction is completed, the application generates following sets of outputs: (1) CRR cleared MW and (2) the Shadow price for each binding constraint. Note that the ISO settlements system uses the correct CRRs clearing prices. In the case outline above the simple difference between CRR source price and CRR sink price does not hold.

5 Additional Auction Functionality

The ISO seeks stakeholder comment on if the LT Auction, Flexible Term Length LT CRR, and other auction enhancements are still desired. The ISO does not plan to address the additional auction functionality in this initiative; however, if market participants do not believe that a LT Auction is needed in the ISO market, we would respond to the July 2007 FERC order that a LT Auction is not needed.

5.1.1 Long Term Auction

FERC's July 6, 2007 Order on CRRs encourages the ISO to initiate a stakeholder process and file tariff language to implement an auction for residual LT CRRs in a future release of the new market. Although there was expressed interest in the LT CRR auction in the process leading up to that order, stakeholders have not expressed recently that LT auction functionality is a high priority. Thus, the ISO requests stakeholder input on the priority of this design element, supported by an explanation of the business needs or other benefits that would justify the cost of developing, implementing and conducting it on an annual basis.

Regardless of whether an LT CRR auction is determined to be needed, the ISO believes that it two other CRR-related items may need to be addressed: (1) multi-period optimization algorithm, and (2) flexible term lengths of LT CRRs. The ISO also requests stakeholder input on the prioritization of these design elements.

The multi-period optimization algorithm was recognized by the ISO as an important CRR enhancement to enable the LT CRR release process to recognize future changes in transmission encumbrances over the horizon of the nominated LT CRRs (mainly the expiration of ETCs, CVRs and previously-released LT CRRs). The multi-period optimization algorithm will thus enable the ISO to find a more optimal balance between the competing objectives of releasing as many LT CRRs to the market as possible while minimizing the risk of CRR revenue inadequacy. In the context of an auction for LT CRRs, the multi-period optimization will result in auction prices that more accurately reflect the expected values of the LT CRRs being awarded. The ISO therefore believes that the multi-period optimization algorithm would be valuable both in its own right without an LT CRR auction, and as an essential component of a LT CRR auction should we decide to develop one.

With regard to flexible term lengths for LT CRRs, the implementation of the multi-period optimization algorithm will make it possible to allow additional choices by market participants beyond the current single 10-year term provided under the existing rules. The exact nature of the allowable choices will be a topic for discussion with stakeholders as the policy and design of this item are developed. FERC's July 6, 2007 Order on CRRs encourages the ISO to consider future flexibility to allow: (i) LT CRRs in excess of 10 years, or (ii) annual CRRs with guaranteed renewal rights up to year 10, or (iii) LT CRRs with terms ranging from 2 to 9 years. FERC notes that any subsequent change in the available term lengths would have to respect the rights of the holders of any outstanding 10-year CRRs. Such an enhancement would be useful with or

without an LT CRR auction, and would definitely require the adoption of the multi-period functionality described above.

5.1.2 Balance of Planning Period Auction Functionality

The ISO currently has a robust monthly auction and has recently made enhancements to meet the needs of market participants. For example, the ability for market participants to offer in the monthly Auction CRRs they currently hold (either through allocation or the annual auction). While a market participant always had the opportunity to bid a counter flow CRR to reverse their CRR holding, it resulted in holding two CRRs because the opposite positions did not net.

Market participants have requested additional functionality to expand the intra-year monthly offerings to go beyond the current month to release CRRs for all future months remaining in the year, i.e. the balance of the planning period. This functionality would require implementation of the multi-period optimization discussed above for LT CRR allocation and auction.

6 Next Steps

The ISO will discuss the 2011 CRR Enhancements Issue Paper with stakeholders during a teleconference to be held on March 11, 2011. The ISO is seeking comments on the proposed scope of the initiative. Stakeholders should submit written comments by March 18, 2011 to 2011CRREnhancements@caiso.com.