Market Design 2002 Project (MD02)
Strawman CRR Request Guidelines and Validation Rules for CRR Study 2

PURPOSE OF THIS PAPER

In preparation for CRR Study 2, participants who are eligible for CRR allocations will be asked to submit CRR requests to the ISO. For Study 2 the eligible parties are entities serving ISO control area load (LSEs, including ETC rights holders), previously converted ETC rights holders, and merchant transmission owners. The purpose of this paper is to provide guidelines to these parties for formulating their CRR requests and to describe the rules the ISO proposes to apply in validating their requests.[1] These guidelines and validation rules are called "strawman" because they are intended for the purpose of obtaining parties' non-binding CRR requests as input to CRR Study 2. As described below, "Final" CRR Request Guidelines and Validation Rules to be incorporated in the ISO's MD02 Tariff Filing will be developed, under the broader heading of "CRR Allocation Rules," through a stakeholder process that will begin in Summer 2004 and conclude some time after the release of the CRR Study 2 results. The ISO expects that the CRR Study 2 results will provide necessary information to guide the formulation of Final CRR Allocation Rules in a manner that best achieves the congestion hedging objectives of the CRR allocation process.

KEY MILESTONES AND PROPOSED TIMING

May 14 – Initial stakeholder discussion of CRR Request Guidelines and Validation Rules.

May 26 – Release Draft Strawman Request Guidelines and Validation Rules for stakeholder review (this document).

June 1 – Conference call to clarify May 26 draft and identify issues.

June 8 – Stakeholder meeting to discuss and evaluate options for resolving issues.

June 18 – Release revised CRR Request Guidelines and Validation Rules to initiate CRR request process for CRR Study 2.

Week of June 21 and subsequent – Conference calls and meetings as needed to discuss, clarify and perform any needed adjustment to Strawman CRR Request Guidelines and Validation Rules.

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[1] The guidelines described in this paper are tailored primarily toward LSEs who serve load within the ISO control area. Holders of non-converted ETC rights should follow the same guidelines to develop and submit their CRR requests. Parties who have previously converted their ETCs to FTRs under the ISO's current market design should also develop and submit CRR requests consistent with these guidelines to cover their load-serving requirements. The question of allocating additional CRRs to these parties is a matter for further discussion, and is not addressed in this paper. The question of how to allocate appropriate CRRs to merchant transmission is also a topic further discussion, not discussed in this paper. Some parties who use the ISO controlled grid but do not serve ISO control area load have argued that they should receive allocations of CRRs. This also is not addressed in this paper. The ISO intends to hold discussions on all these open questions in the context of the stakeholder process.

July 30 – LSE CRR Requests due to CAISO.

July (date TBD) – Initiate stakeholder process to address policy issues and other matters related to developing Final CRR Allocation Rules.

CRR Study 2 Report – December 2004 (tentative).

CONTEXT – THIS PAPER ADDRESSES THE FIRST OF TWO SEQUENTIAL OBJECTIVES

1. "Strawman CRR Request Guidelines and Validation Rules" – To enable CRR Study 2 to proceed, this strawman will provide guidance for parties eligible for CRR allocations to submit non-binding CRR requests and will describe procedures for ISO validation of submitted requests. These strawman rules are needed by mid June 2004.
2. Develop "Final CRR Allocation Rules" – Will include Final CRR Request Guidelines and Validation Rules, plus other features of the CRR allocation procedure such as CRR allocation/auction objective function, rules for adjusting CRR allocations to achieve simultaneous feasibility, etc. Many as-yet undecided elements of Allocation Rules will be scenario variables in CRR Study 2. Final CRR Allocation Rules will be included in MD02 Tariff filing.

   Once Objective 1 has been accomplished and parties have begun developing their CRR requests for CRR Study 2, the ISO will initiate stakeholder discussions to resolve the policy issues (as far as possible while awaiting CRR Study 2 results). Some of the open policy issues to be addressed under Objective 2 are identified at the end of this paper.

   - June – December 2004 – various dates TBD – continuing stakeholder process to address policy issues and develop Draft CRR Allocation Rules, to be finalized upon publication of CRR Study 2 results.
   - First Quarter 2005 – continuing stakeholder process to utilize CRR Study 2 results to identify needed modifications to Draft CRR Allocation Rules. Finalize CRR Allocation Rules for Tariff filing.

PROPOSED "STRAWMAN" CRR REQUEST GUIDELINES AND VALIDATION RULES FOR CRR STUDY 2

NOTE: For reviewing the guidelines described below, it will be helpful to be familiar with the CRR Study 2 Scenario Matrix.

1. Total CRR MW request of each LSE should be no greater than a specified upper bound, based on annual peak, monthly peak, load duration curve, each computed separately for peak and off-peak hours. For example, under CRR Study 1 the upper bound for annual CRRs was 75% of the minimum of the 99.5% points on the 12 monthly load duration curves. For CRR Study 2 the term structure of CRR will be different from that of Study 1. Instead of CRRs having one-year duration, there will be a full-year allocation of monthly CRRs for peak and off-peak hours, plus a sequence of 24 monthly peak and off-peak "true-ups" to enable the full amount of available capacity to be allocated (see CRR Study 2 Scenario Matrix for details). Parties should therefore provide the data needed for determining the upper bounds for their CRR requests.

   - The ISO will provide a data template, into which the LSE should enter a full year of hourly load data for the year 2003 (the historical reference period or HRP), an hourly

load forecast for the 12 months of 2006 (the CRR study period), and the total amount of ETC coverage that the LSE will have for its load during 2006. The template will use a built-in macro function to calculate the maximum quantity of CRRs (i.e., the "upper bound") that the LSE may request for the full-year allocation of monthly CRRs for peak and off-peak periods.

- The LSE will then submit a CRR allocation request, consisting of 24 monthly peak and off-peak values, for the full-year allocation of monthly CRRs. The ISO will then run the simultaneous feasibility test (SFT) for the full-year allocations, and will submit the results of the allocation to LSEs along with upper bound numbers for the monthly peak and off-peak "true-up" CRR requests. LSEs will then submit 24 months of "true-up" requests to the ISO for the next SFT. The ISO will return to LSEs the results of this allocation.

2. The purpose of CRR Study 2 is to assess the adequacy of CRRs to hedge total congestion cost exposure from actual sources to load, not just from trading hubs to load. CRR requests should therefore have generation nodes or inter-tie scheduling points as source, if possible. In the event some CRRs requests go from a trading hub to load (instead of a generation node or inter-tie scheduling point), the ISO will review historical energy scheduling patterns and include a corresponding CRR from a physical source to the trading hub. The inclusion of these source-to-hub CRRs in the SFT will occur between the SFTs for the long-term and short-term allocations in the form of a simulated long-term CRR auction.
3. LSE cannot request more MW from a given source node than the generating capacity (i.e., the P-max in the generator's master file) or import capacity at that source node.
4. For a generating unit owned by a LSE, only that LSE can request CRRs from that generator, unless owning LSE agrees to allow another LSE to use that generator.
5. Requests by LSEs for CRRs from an inter-tie scheduling point will be limited to each LSE's historic use of that inter-tie to serve its load.
   - In this summer's discussions of Final CRR Allocation Rules we will consider how to allow LSEs to incorporate changes in their supply pattern, such as new bilateral contracts, that could require CRR allocations to deviate from historic inter-tie usage patterns. This issue will likely be too complicated to resolve prior to the start of CRR Study 2, however, so we will not consider such variances in the Strawman Rules.
6. Requests will all be Point-to-Point. LSEs will assign priorities according to the 4-level system discussed in the CRR scenario meetings.
   - Priority groupings for CRR requests will have 4 levels, and each level will contain 25% of a LSE's total MW CRR eligibility (along the lines of the SCE proposal).
   - Upon conclusion of on-going discussions with the CRR software vendor, the ISO will report in the near future on the feasibility of including Network Service CRR requests in Study 2.
7. Sink for each LSE's CRRs may be a Load Aggregation Point (LAP) or a specific node or set of nodes, but must be consistent with the geographic granularity of that LSE's scheduling and settlement. (Regarding MSS see item 9 below.)
   - As a scenario variable, Study 2 will model ETC CRRs using the LAP and using the actual load location (possibly a set of nodes).
   - Regarding the load eligibility of an ETC rights holder, the rights holder and the relevant PTO will need to agree on the total quantity of load that can be served under the ETC.

To the extent an ETC holder has additional load that is not served under an ETC, that additional load will be treated just like the load of any other LSE in this process.

8. Parties eligible for CRR Options must indicate if they prefer Options. The allocation of CRR Options to certain parties will be a scenario variable in Study 2. See the Scenario Matrix for details.
9. CRRs requested by MSS must sink at Load Aggregation Point, but the quantity may be gross or net depending on the MSS's chosen settlement option. For example, if the MSS intends to settle on its net load (after subtracting internal generation), then only that net load is exposed to congestion charges and needs an allocation of CRRs. The method of doing this will be a topic for further discussion. Two options to consider are the following.
   - Option 1. The netting of generation internal to the MSS against load would use an averaging process to take into account any use limitations on the generator. For example, suppose the MSS intends to net out a 100 MW generator that can only operate 200 hours of the year and the MSS intends to utilize it only in peak periods during the months of June through September (i.e., 50 hours for each of these months). Using the typical peak definition of 16 hours per day weekdays and Saturdays, excluding holidays, suppose the month of June has 25 peak-period days. When this generator runs it runs at full capacity. Therefore the average hourly contribution of this generator to the MSS load during peak periods will be [(50 hours * 100 MWh) / (16 hours * 25)] = 12.5 MWh. Thus the peak-period CRR allocation quantity for this MSS for the month of June would be 12.5 MW less than its eligibility if it did not net out the generator against its load.
   - Option 2. The netting would assume that the use-limited generator would be used only in the highest peak hours. Under this approach, following the example of Option 1, the 100 MW capacity of the generator would be subtracted from the hourly MSS load in the 50 highest-load hours of each of the four months. The hourly load data resulting from this modification would then be used to calculate the upper bound for the MSS.

AN ISSUE FOR FURTHER DISCUSSION

In the course of the CRR discussions over the past several weeks the ISO recorded a "parking lot" list of issues that will require discussion in future ISO documents and meetings on CRRs. The ISO intends to review this list with stakeholders at the next meeting in order to determine the appropriate sequence in which to address the issues. Specifically, issues that need to be resolved for CRR Study 2 should be addressed as soon as possible. The parking lot issues are therefore not discussed in this paper.

There is, however, one issue on which the ISO believes it would be useful to begin discussion, namely, the issue of requiring consistency between the source-sink patterns of LSE CRR requests and the actual or historic patterns of supply sources that LSEs use to serve their load. The following examples illustrate some of the reasons why the consistency issue is important for CRR revenue adequacy.

Consider a simple system with two supply sources:

- G1 in zone 1 @ $20/MWh
- G2 in zone 2 @ $100/MWh

The transmission capacity between the two zones is 600 MW. The two zones together comprise a load aggregation zone (LAP) for settlement with the load. The historical LDFs between the two zones are 95% for zone 1 and 5% for zone 2.

There are two SCs as follows:

- SC1 is a LSE with 19,000 MW load in zone 1 and 600 MW load in zone 2. It has supply contracts for 19,200 MW of supply in zone 1 and 400 MW in zone 2. Thus based on contractual/historical data, it is entitled to request CRRs to serve 19,600 MW of load in the LAP. Congestion cost hedging being the primary purpose of CRR allocation, the "unbiased" pattern of the CRR requests would be 19,200 MW (of CRR source) from zone 1 and 400 MW (of CRR source) from zone 2.
- SC2 is another LSE with 400 MW load in zone 2. It has a supply contract for 400 MW of supply in zone 1. Thus based on contractual/historical data, it is entitled to request CRRs to serve 400 MW of load in the LAP. The "unbiased" congestion-hedging pattern of the CRR requests would be 400 MW (of CRR source) from zone 1.

Assume the schedules match the contractual pattern. Thus the supply LMPs are $20/MWh in zone 1 and $100/MWh in zone 2, and the LAP price is 0.95*$20 + 0.05*$100 = $24/MWh. The congestion charges to the two SCs are:

- Congestion charge to SC1: $24*19,600 – ($20* $19,200 + $100*400) = $46,400
- Congestion charge to SC2: $24*400 - $20*400 = $1,600

The total congestion charge collected by the ISO is thus $48,000. This is the ISO's source of payments to the CRR holders.

In the following cases, assume that SC2's CRR allocation request is for 400 MW of CRRs from zone 1 to the LAP, commensurate with its historical scheduling and contractual data.

Case 1: Assume SC1's CRR allocation request is according to the expected congestion pattern for its schedule, i.e., 19,200 MW from zone 1 to the LAP and 400 MW from zone 2 to the LAP. Its requested CRRs would be simultaneously feasible with those of SC2 (for a total CRR allocation of 20,000 MW to the two SCs combined). To see this, note that the CRR sinks are broken down according to the LDFs as follows:

- For SC1: 19,600* 95% = 18,620 MW in zone 1, and 19,600 * 5% = 980 MW in zone 2.
- For SC2: 400* 95% = 380 MW in zone 1, and 400 * 5% = 20 MW in zone 2.

The total CRR sources and sinks are thus:

- Zone 1: CRR sources: 19,200+400 =19,600 MW; CRR sinks: 18,620+380 = 19,000 MW
- Zone 2: CRR sources: 400 MW; CRR sinks: 980+20 = 1,000 MW
- Net Flow from Zone 1 to Zone 2 resulting from simultaneous CRRs: 600 MW. This is within the transmission limit from Zone 1 to Zone 2 (i.e., 600 MW); thus the CRRs are simultaneously feasible.

With the schedules mentioned earlier, in the day-ahead market SC1 will be paid CRR revenues of 19,200 * ($24 - $20) + 400 * ($24 - $100) = $46,400. This hedges its congestion costs and leaves just enough to pay the CRR entitlement of 400*($24 - $20) = $1,600 to SC2.

Case 2: Assume SC1 had requested all its 19,600 MW of CRRs from zone 1 to the LAP. The sinks of the requested CRRs are still split according to the LDFs as in the previous case, but the sources are now all in Zone 1.

- Zone 1: CRR sources: 19,600+400 =20,000 MW; CRR sinks: 18,620+380 = 19,000 MW
- Zone 2: CRR sources: 0 MW; CRR sinks: 980+20 = 1,000 MW

- Net Flow from Zone 1 to Zone 2 resulting from simultaneous CRRs: 1,000 MW (exceeding the transmission limit from Zone 1 to Zone 2).

The CRR requests are not simultaneously feasible. The transmission limit requires a reduction of 40% (to reduce transmission flow from 1,000 MW to 600 MW which is the transmission limit). This means the total amount of simultaneously feasible CRRs will be 12,000 MW, assuming the objective is to maximize the CRRs (taking into account effectiveness is immaterial in this example as both CRRs are equally effective). This also means that each SC will be allocated only 60% of its CRR requests, i.e.:

- CRR allocation to SC1: 60%*19,600 = 11,760 MW
- CRR allocation to SC2: 60%*400 = 240 MW

The request by SC1 has resulted in a reduction of CRR allocation for SC2.

With the day-ahead schedules and prices mentioned earlier, SC1 will be paid CRR revenues of 11,760 * ($24 - $20) = $47,040. Thus, despite having been awarded only 60% of its requested CRRs, SC1 receives $640 more than the congestion charges it would have to pay ($46,400). By contrast SC2's CRR revenues would be 240* ($24 - $20) = $960, i.e., $640 less than the congestion charges it would have to pay ($1,600). Thus by its CRR request being different from its expected congestion hedging pattern, SC1 has caused financial harm to SC2 whose CRR requests were commensurate with its congestion-hedging needs.

Case 3: Assume SC1 had requested only the 19,200 MW of CRRs from zone 1 to the LAP (and not the 400 MW from zone 2 to the LAP). The CRR sinks are broken down according to the LDFs as follows:

- For SC1: 19,200* 95% = 18,240 MW in zone 1, and 19,200 * 5% = 960 MW in zone 2.
- For SC2: 400* 95% = 380 MW in zone 1, and 400 * 5% = 20 MW in zone 2.

The total CRR sources and sinks are thus:

- Zone 1: CRR sources: 19,200+400 =19,600 MW; CRR sinks: 18,240+380 = 18,620 MW
- Zone 2: CRR sources: 0 MW; CRR sinks: 960+20 = 980 MW
- Net Flow from Zone 1 to Zone 2 resulting from simultaneous CRRs: 980 MW (exceeding the transmission limit from Zone 1 to Zone 2).

The CRR requests are not simultaneously feasible. The transmission limit requires a reduction of 39% (to reduce transmission flow from 980 MW to 600 MW which is the transmission limit). This means again that the total amount of simultaneously feasible CRRs will be 12,000 MW, assuming the objective is to maximize the CRRs (taking into account effectiveness is immaterial in this example as both CRRs are equally effective). It also means that each SC will be allocated only 61% of its CRR requests, i.e.:

- CRR allocation to SC1: 61%*19,200 = 11,755 MW
- CRR allocation to SC2: 61%*400 = 245 MW

Again the request by SC1 involving only part of its eligible CRR allocation pattern has resulted in a reduction of CRR allocation for SC2.

With the day-ahead schedules and prices mentioned earlier, SC1 will be paid CRR revenues of 11,755 * ($24 - $20) = $47,020. Thus, despite having requested a smaller quantity of CRRs (19,200 MW instead of 19,600 MW) to the LAP, and having been awarded only 61% of that requested amount, SC1 receives $620 more than the congestion charges it would have to pay

($46,400). By contrast SC2's CRR revenues would be 245* ($24 - $20) = $980, i.e., $620 less than the congestion charges it would have to pay ($1,600). Thus by requesting only the "revenue generating" leg of its eligible CRRs (i.e., refusing the "counterflow" CRRs), SC1 has caused financial harm to SC2 whose CRR requests were commensurate with its congestion-hedging needs.

Case 3 (Variant): Assume that the CRR simultaneous feasibility rules are changed to allow SC1 to request and be granted only a part of its CRR MWs (i.e., instead of 19,600 MW CRRs from both zones, it requests only 19,200 MW from zone 1 to the LAP) simultaneously with the 400 MW of SC2's CRRs from zone 1 to the LAP2. With the LMPs and the LAP as computed above, SC2 would be entitled to CRR revenues of 19,200 * ($24 - $20) = $76,800. SC2 is entitled to CRR revenues of 400*($24 - $20) = $1,600. Thus the ISO is liable for total CRR payment of $78,400 against congestion charges of $48,000 that it has collected. The ISO can thus pay only 61.2 cents to a dollar. This means SC1 gets CRR payments of $47,020 (which exceeds its $46,400 congestion payment for a net profit of $620) and SC2 gets CRR payments of $980 (which is less than its $1,600 congestion payment, for a net shortfall of $620).

The above examples illustrate the following concerns:

1. Allowing LSEs to pick and choose their CRR sources independently from expected congestion patterns, would lead to perverse CRR request incentives. In other words, the LSEs would have to request CRRs not based on their congestion-hedging needs, but based on their expectation of what other LSEs might be requesting with a profit maximizing objective. This is clearly incompatible with a CRR "allocation" philosophy. It would be more in line with competitive auction. The distinction is that in CRR allocation, the ISO is expected to come up with a fair allocation but in an auction the market participants are free to bid as they wish.
2. Unless CRRs are allocated based on "congestion hedging needs" the ISO could run into serious CRR revenue shortfall to the detriment of the entities that are not eligible for CRR allocation, but need CRRs to hedge their congestion cost exposure.

[2] If the sink of the requested CRRs are split according to the LDFs (for both SCs), then the 19,200 MW request of SC1 would not be simultaneously feasible with the 400 MW of SC2 both from zone 1 to the LAP since there would be 19,600 MW of injection (CRR source) in zone 1, matched by 18620 MW of sink in zone 1 and 980 MW of sink in zone 2. The latter exceeds the transmission capacity between the zones (980 MW compared to 600 MW). Simultaneous feasibility would then reduce the CRRs requested proportionately (11, 755 MW for SC1 and 245 for SC2).