

Clarification of CAISO Provisions Regarding Resource Adequacy Capacity and Exports Under MRTU

For discussion at Seams Issues Subcommittee, May 30-31, 2007

Overview

1. This document explains the relationship, in the context of the CAISO's redesigned MRTU markets, between the status of generating capacity within the CAISO control area as Resource Adequacy (RA) capacity or non-RA capacity, and the treatment of exports being supplied by such capacity. In particular, this document is intended to affirm and clarify the fact that export schedules established in the MRTU markets – the day-ahead Integrated Forward Market (IFM) and the real-time Hour Head Scheduling Process (HASP) – are firm energy schedules consistent with the conventional meaning of “firm” as used in the western region.¹ Once export schedules have been established in the MRTU markets they will be tagged as “firm.” Paragraphs 2-4 below summarize the basis for this fact; the remainder of the paper provides additional details.
2. Much of the misunderstanding around the matter of the firmness of energy schedules under MRTU stems from the need to distinguish two aspects of the treatment of exports.
 - A. The rules and procedures for establishing firm export schedules in the MRTU markets (IFM and HASP); and
 - B. For firm export schedules that have been established as part of a final IFM or a final HASP schedule, whether there are circumstances under which such schedules might subsequently be curtailed by the CAISO.

The distinction between RA and non-RA capacity is relevant for (A) but not (B). MRTU does specify certain rules affecting the ability to establish firm export schedules in the IFM and HASP, depending on whether an export bid submitted to one of these markets is linked to non-RA generating capacity offered into the same market. However, once an export bid clears the market and becomes part of a final IFM or HASP schedule, the distinction between RA and non-RA capacity has no relevance to the firmness of that schedule. All such final schedules are firm and will be tagged as such.

3. Regarding item (A), because RA capacity is paid for by load-serving entities (LSEs) who serve load within the CAISO control area, capacity that is under contract to meet RA requirements must be available to meet CAISO control area load and operational needs through participation in the Day Ahead Market (DAM), which includes both the Integrated Forward Market (IFM) and the Residual Unit Commitment (RUC), as well as the Real Time Market (RTM) which includes the Hour Ahead Scheduling Process (HASP). This principle and the distinction between RA and non-RA capacity will affect the ability of parties to establish firm export schedules in the IFM and in the HASP. In particular, certain special provisions in MRTU allow parties additional flexibility to establish firm day-ahead (IFM) and hour-ahead (HASP) export schedules that explicitly rely on non-RA capacity.

¹ The use of the terms “firm” and “firm schedule” in this paper refer only to firm energy transactions and schedules. There is no discussion of firm versus non-firm transmission because that is not the subject of this paper. It is important to recognize, however, that all transmission service offered by the CAISO, both in the current system and under MRTU, is firm. The CAISO does not today and will not under MRTU offer non-firm transmission service.

4. Once the DAM has concluded and day-ahead export schedules are established, such export schedules are firm in the usual sense of the word regardless of whether they are served by RA capacity, non-RA capacity, or simply by “the market” which will typically include both RA and non-RA capacity. “Firm” in this case means that the CAISO carries required operating reserves to support these exports, and they are treated as fixed schedules and afforded the highest priority against any reduction in the subsequent RTM/HASP market processes. Similarly, once the HASP has concluded and hour-ahead export schedules are established, such export schedules are firm without regard to their reliance on RA or non-RA capacity, and they are supported by CAISO-procured reserves.

Background on Bid Submission: Economic Bids and Self Schedules

5. A “bid” is the generic name for the template that each Scheduling Coordinator (SC) submits to the CAISO – on a daily basis for the Day Ahead Market (DAM) and on an hourly basis for the Real Time Market (RTM) and Hour Ahead Scheduling Process (HASP).
6. Within a bid there are two main ways that energy supply (generation and imports) and demand (load and exports) can be submitted: (1) as an “economic bid” – having MWh quantities and a bid price associated with each quantity, or (2) as a “self-schedule” – having MWh quantities without any prices associated. In the RTM and HASP parties cannot submit self-schedule changes for internal load, so their actual RT load deviation (from DA schedule) is deemed to correspond to any self-scheduled supply changes in HASP.
7. The self-schedule provision was designed into MRTU to allow for the preference of some participants to serve their demand using their own resources or bilateral contracts, without buying or selling energy in the CAISO markets.
 - Under MRTU – in contrast to today’s CAISO markets – there is no requirement for submitted self-schedules to be balanced. Moreover, in almost all cases the market optimization does not recognize any linkage between the supply bids or self-schedules and the demand bids or self-schedules submitted by an SC. Rather, the optimization looks at the entire set of submitted bids and self-schedules for supply and demand, and clears the market as a whole and calculates energy prices at each grid location (LMPs) that are used for settlement. (One special case, of course, is the special treatment available for exports discussed in the next section.)
 - Even if an SC does submit balanced supply and demand self-schedules, such schedules are still using the CAISO grid and must settle for the costs of congestion and losses, even though they are not transacting energy in the markets. For an accepted self-schedule that has balanced quantities of supply and demand, settlement based on the LMP differential between the supply and demand locations will reflect the costs of congestion and losses. (See the separate presentation for detailed examples of how this works.)
8. When the market optimization runs, it will try to “clear the market” – that is, balance supply against demand plus losses for the system without violating any transmission constraints – using only the economic bids, that is, by treating all the submitted self-schedules as effectively fixed² and not making any adjustments to them.

² The submitted self-schedules are effectively fixed relative to economic bids by using extremely high-priced extensions to form a bid curve around the self-schedule, to ensure that economic bid adjustments are made prior to non-economic adjustments to self-schedules.

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9. If it is not possible to clear the market using only economic bids, then the optimization will make “non-economic” adjustments to submitted self-schedules in order to balance the system and eliminate congestion. When such adjustments are necessary, two rules apply:
 - A. First, the optimization follows a “scheduling priority” sequence among self-schedules. Starting with the LAST ones to be adjusted (that is, the highest scheduling priority), the order in the DAM is as follows:
 - Reliability Must Run (RMR);
 - Transmission Ownership Rights (TOR);
 - Existing Transmission Contracts and Converted Rights (ETC and CVR);
 - Regulatory Must Run and Regulatory Must Take; and
 - “Generic” energy self-schedules, the first to be adjusted. (See filed Tariff Sec. 31.4. Priority sequence for RTM/HASP is a little different; see Sec. 33.3.)
 - B. Second, within each priority level, the optimization will usually adjust the most effective self-schedules first in order to minimize the total MW amount of submitted self-schedules that are reduced.
10. Because self-schedules do not indicate the prices they are willing to accept for supply or the prices they are willing to pay for demand, accepted self-schedules are settled as price takers. As noted above, for an SC whose accepted self-schedule features a balanced quantity of supply and demand, the settlement based on the LMP differential between the supply and demand locations will reflect only the costs of congestion and losses.

Resource Adequacy (RA) Capacity and Exports in the DAM

11. In general, exports submitted as self-schedules in the DAM are “generic” self-schedules with respect to the scheduling priorities listed above.
12. Within the class of generic self-schedules, generic export self-schedules usually have lower scheduling priority than generic internal demand self-schedules. This means that if the market optimization cannot clear the market using only economic bids, because the amount of available supply in the market is not sufficient to cover both self-scheduled internal demand and self-scheduled exports, the self-scheduled exports will be reduced first.
13. The reason for establishing this priority is because LSEs serving load within the CAISO were required to procure RA capacity to meet a specified planning reserve requirement, and this capacity must be offered into the DAM. In the extreme situations where such capacity is not enough to meet self-scheduled internal demand, the LSEs who paid for the RA capacity get the first opportunity to utilize the associated energy in the DAM.
14. There are two ways for a party to submit self-scheduled exports and receive scheduling priority in the DAM that is equal to the scheduling priority of generic internal demand.
 - A. Submit a wheeling schedule, in which the MW of self-scheduled exports are matched with equal MW of self-scheduled imports. The optimization will see the two sides of this self-schedule as matched and either will not adjust them at all or will adjust them in a balanced manner. Moreover, any such adjustment would only occur as a result of congestion, not for a supply-demand imbalance. The reason is that adjusting a wheeling schedule would always adjust supply and demand in equal quantities and thus would have no effect on relieving a supply-demand imbalance.

- B. Submit an export self-schedule linked to an equal MW quantity of non-RA capacity that is offered – with either a self-schedule or economic bids – into the DAM (which may be used in the IFM or the RUC), and into the RTM if the unit is physically capable. In this case the market optimization might not even schedule energy from the non-RA capacity, but the fact that it was offered is sufficient to obtain scheduling priority for the self-scheduled export that is equal to the priority for self-scheduled internal load.
15. Once an export that is registered in the Master File as firm clears the DAM and is part of a final DA schedule, it is a firm schedule consistent with the conventional meaning of that term. Under current WECC MORC, this means the CAISO as the sending Control Area will ensure sufficient operating reserves are procured to support the firm export. In doing so, the CAISO expects such firm export to be tagged accordingly. Moreover, as a firm schedule that has cleared the DAM, the export also has the highest priority against any subsequent curtailment in the RTM/HASP processes, as described below.

RA Capacity and Exports in the HASP

16. Bids are submitted no later than T-75 to be used in the HASP and RTM processes.³ In the HASP, all of the economically bid and self-scheduled supplies (generation and imports) are cleared against the CAISO's forecast of internal RT demand plus all the economically bid and self-scheduled exports.
17. As in the DAM, the market optimization tries to clear the market using only economic bids, treating all the submitted self-schedules as fixed. In this optimization, the final DA schedule is also treated as fixed and cannot be adjusted. If economic bids are not sufficient to clear the market in the HASP, then “non-economic” adjustments are applied to newly-submitted self-schedules in a manner analogous to the DAM, following the sequence of scheduling priorities.
18. Analogous to the DAM rule for “generic” self-schedules, export self-schedules in HASP have lower priority than the CAISO forecast of internal demand, which means that if there is not enough supply to meet the internal demand forecast, export self-schedules will be reduced.
19. As in the DAM, a party wishing to submit an export self-schedule in the HASP and receive equal scheduling priority to the internal demand forecast can submit either a wheeling self-schedule, or an export self-schedule that is linked to an equal MW quantity – that is offered into the RTM – of non-RA capacity or even to RA capacity that was not scheduled in the DAM (IFM or RUC).
20. As in the DAM, once an export clears the HASP and is part of a final HASP schedule, it is a firm schedule consistent with the conventional meaning of that term. Under current WECC MORC, this means the CAISO as the sending Control Area will ensure sufficient operating reserves are procured to support the firm export. In doing so, the CAISO expects such firm export to be tagged accordingly.

RA Capacity and Exports in the Real Time Operating Time Frame

21. Although the CAISO has tariff and operating provisions that allow it in principle to curtail exports in RT under contingency conditions, in practice the CAISO has consistently avoided such action because it is not viewed as an effective way to manage contingencies. That is,

³ Actually, the HASP is one of the several market processes that comprise the RTM. The best way to think about HASP is as the MRTU equivalent – with some additional functionality – of today's Real Time Pre-dispatch by which the CAISO procures Supplemental Energy from imports.

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CAISO operators fully expect that any RT curtailment of exports would be promptly offset by a comparable curtailment of our imports, resulting in zero net impact.

22. The CAISO believes that its emergency provisions allowing curtailment of exports in RT are fully equivalent to the capabilities all western control area operators or balancing authorities have available to them to manage emergencies, and therefore should not be viewed as in any way degrading the firmness of established DAM or HASP export schedules.