Notice of Clarification of MRTU Design Features

January 13, 2006

In the last quarter of 2005 the CAISO conducted twelve days of intensive stakeholder review of the draft MRTU tariff. This effort sought to ensure the draft tariff language was consistent with the resolution of various MRTU policy issues that had been completed with extensive stakeholder input over an eight-month period.

More recently the CAISO has undertaken the task to reconcile and align the tariff with the software implementation. As a result of this effort the CAISO has identified the following items that need to be clarified. Many of these items below have been discussed previously in other public stakeholder meetings, but the CAISO wants to clarify how these MRTU features are being developed.

At a later date, the CAISO will follow up with an additional notice on the policy and tariff reconciliation addressing non-CPUC-jurisdictional entities' Resource Adequacy provisions and generator performance metrics.

The CAISO offers this summary to stakeholders prior to the MRTU tariff filing for informational value so that stakeholders will not miss these details in the large MRTU tariff filing.

The CAISO will conduct a conference call with stakeholders on Friday, January 20, 2006 from 1:00 pm to 3:00 pm PST to answer questions and provide further clarification of these design features.

The conference number is: **888-261-7938**

The conference code is: **8107101**

Clarification of MRTU Design Features

1. **Partial Resource Adequacy Resources:**
    A software change order is being implemented with the vendor to ensure that resources that are only partially committed for RA can be accommodated in MRTU Release 1. This would allow a generating unit to have only part of its MW capacity designated for RA purposes within the CAISO markets.

2. **RA for Use-Limited Resources:**
    The CAISO is implementing software to support Use-Limited resources so long as the Use-Limitation can be expressed in terms of a limited quantity of energy available over 24 hours of a day. The HASP and RTM software also will have features to track and manage a limited quantity of energy. For resources that have Use-Limitation that cannot be expressed in terms of energy or limited numbers of starts per day, the software will not have an explicit feature to manage other types of Use-Limitations other than what can be converted and expressed within one's bid.

3. **Trading Hub and LAP Price Calculation:**
    The CAISO is implementing systems to allow the calculation of Hub prices in the IFM and RTM. These EZ Generation Hub prices will represent the average price paid to generation within the zone and, as such, will be based only on LMPs at generation nodes. The hub prices will be weighted averages of the generation LMPs in the relevant zone.

    The weights will be based on the average MWh output of the generation units and will be differentiated by peak and off-peak periods as well as seasonally. The definition of seasons and the EZ Generation Hub weights will correspond exactly to the seasons and weights used for the CRR allocation. In contrast, for LAP price calculation the weights (load distribution factors) will be determined in the IFM and RTM, and as a result will not be identical to the LAP LDFs used in the CRR allocation and auction process.

4. **Metered Subsystem (MSS) Functionality:**
    The CAISO now proposes certain changes to the November 19, 2004 MSS White Paper. These changes are described in greater detail in a posted Board memorandum for the CAISO Board of Governors meeting on January 25, 2006.

5. **Pumped Storage Data Model:**
    The CAISO will incorporate a "Pumping Conversion Factor" in MRTU that allows
    an entity to indicate how much of the energy expended to pump water into storage can then

be used to produce energy. A 0% conversion factor implies that no energy generating capability is produced, while a 100% conversion factor implies that the full amount of energy expended is available for generating. For example, if a factor other than 0% is elected, and the resource is an energy-limited pumped storage, the pumped energy will increase the generation energy quota for the rest of the current scheduling period based on the specified % of pumped energy.

Market participants will have the option of using the factor in the optimization process. Through the development of Business Practice Manuals and MRTU training programs, stakeholders will gain knowledge of the benefits of using this pumped storage data model.

6.   Adjacent or Embedded Control Areas:

A software change order is being implemented with the vendor to ensure that the CAISO's network model will include embedded and adjacent control areas that are predominately within California. The MRTU tariff will reflect this but the CAISO recognizes that detailed stakeholder discussion and review will be needed to resolve technical issues.

7.   Ancillary Services Self-Provision at the Interties:

MRTU Release 1 will not automatically reserve transmission capacity to allow market participants to self-provide A/S through the interties. This restriction was stated in the MRTU tutorial, but not explicitly discussed at the Tariff page turn. This functionality will be considered as a feature for Release 2.

8.   Ancillary Services Exports:

MRTU Release 1 will not automatically reserve transmission capacity to export A/S, except for ETC or TOR schedules at the interties. Extending this functionality to all market participants and automating it will be considered as a feature for Release 2.

9.   Constrained Output Generators bidding ability:

In the course of MRTU Tariff page turn discussions, the question came up whether the Constrained Output Generators (COGs) could submit market bids for their start up and minimum load (which in their case equals their maximum load) or are subject to the same treatment as other units. It was agreed that the COGs could submit market based bids for their minimum load, with the same bid price for all hours of the day. The bid would be converted to an energy bid price (for pricing purposes) by dividing the minimum load bid price by the minimum load MW of the unit, and would be subject to market power mitigation.

Further scrutiny of the MRTU Release 1 software revealed that there is no market power mitigation for the COGs in Release 1. COGs are modeled as flexible units in the Day-Ahead IFM, i.e., their lumpiness (Pmin = Pmax) and inter-temporal constraints (minimum run time)

are ignored. In fact, in IFM they are treated as flexible in both in the scheduling and pricing runs, and settled on that basis. However, in pre-IFM, RUC, Short-Term Unit Commitment (STUC), and HASP/Real-time they are modeled with their technical and inter-temporal constraints in the scheduling run. Because local market power mitigation takes place in pre-IFM and HASP/Real-time, and because COGs are treated as "lumpy" in the scheduling runs in these market applications, there is no room for incremental movement of the COG units between LMPM Pass 1 and Pass 2, and thus they escape market power mitigation in both day-ahead IFM and real-time under the Release 1 design. Changes to remedy the problem are slated for Release 2, along with the potential revamping of market power mitigation including improvements suggested by LECG in their February 2005 MRTU review report.

Because of this shortcoming in Release 1 the bidding options for COGs will be limited to the following two elections:

(1)   The default bidding options for a COG unit minimum load cost and start up cost will be similar to those of other units, i.e.:

    a.   Cost-based on heat-rate and start-up fuel cost (adjustable by fuel prices for gas-fired resources, or registered costs, otherwise). The resource can bid between $0 and the cost-based amount.

    b.   Registered (in the Master File) where the resource is limited to a bid based on a 6-month value. The bid-based price will not be adjusted for fuel cost changes. The resource cannot bid above or below the Master File $ amount.

There will be no separate Energy bid cost. It will be computed from the minimum cost and MW for use in pricing runs.

All COG features will apply in this option. For example, the computed energy price will be eligible to set the price (with no market power mitigation) in the pricing runs, the COG will be eligible for bid cost recovery, etc.

(2)   The COG unit may elect to be modeled with slightly different Pmin and Pmax. For some COG units these are physical, i.e., the output of the unit does have a few MWs of room for change. For other units a difference of a couple of MWs will be accommodated. The unit will then be treated like other units, with the short segment between Pmin and Pmax being bid based, subject to LMPM. It will not be treated as a COG unit in the sense that it will be not be scheduled between 0 and its Pmin in any market application for either scheduling or pricing runs. However, it will be able to set the price based on its market energy bid in the small MW range between its Pmin and Pmax, and will be eligible for bid cost recovery for its start up and minimum load like any other unit.

10. SIBR Bid Validation Rules:

The Business Practice Manuals will include a summary of the SIBR bid valuation rules that will be reviewed by stakeholders.

11. Selection of Contingency Only Flag:

In MRTU Release 1, due to software design limitations, the A/S Contingency Only Flag for a resource is a daily selection. In other words the "Contingency Only" status for a resource must be set to the same value for all hours of an operating day; it cannot vary hourly. Provisions for hourly designation of A/S Contingency Only Flag is deferred to Release 2.

12. Combined Cycle Modeling:

Combined cycle units are modeled in the current (Pre-MRTU) market as a composite resource across various sequential combined cycle configurations. Since the composite resource must have a monotonic incremental heat rate, some heat rate segments are exaggerated in this design. This is because the incremental heat rates for various configurations are not really collectively monotonic. In fact, the incremental heat rate at a given operating point may drop largely after a configuration change. Thus, composite modeling of combined cycle resources results in unnecessary increase in the modeled incremental heat rates.

An approach was shared with the stakeholders recently to change this modeling approach. The combined cycle units would be modeled as a separate generation resource for each configuration. This would solve the above problem among others. It would, however, require a different resource registration for each Combined Cycle configuration.

After further scrutiny with the software vendor, it is now concluded that what could be done in Release 1 would create worse problems than the problem it is trying to solve. A correct solution was identified, but it cannot be implemented until Release 2. The result is that MRTU Release 1 will continue with the existing (Phase 1b) modeling of combined cycle units as a composite resource.

13. ETC/TOR/Converted Rights Metered Demand:

SCs who schedule for ETC, TOR and Converted Rights will need to submit settlement quality meter data that identifies and distinguishes the demand served under their relevant rights. Load served under ETC, TOR or Converted Rights will be settled at the applicable nodal Locational Marginal Price, whereas the other load will be settled at the applicable LAP price. The implementation of this requirement will be reviewed with the development of the Business Process Manuals.

14. **Allocation of CRR Auction Revenues:**
The MRTU Tariff filing will be consistent with the policy set in the CAISO's July 21, 2003 conceptual design, which is for the CAISO to distribute the CRR auction revenues to the PTOs to offset their transmission revenue requirements and thereby reduce access charges. The suggestion made at the December 2005 Tariff page-turn – i.e., to allocate the auction revenues to the CRR Balancing Account in order to enhance the revenue adequacy of CRRs – may be discussed with stakeholders later this year as a possible alternative.

15. **CRR Monthly Auction with Infeasible Seasonal CRRs Due to Monthly Transmission Outages and Derates**
Consistent with the July 2003 MRTU filing, the network model used for the annual CRR allocation and auction process will assume all lines in service, whereas the network model for the monthly process will reflect anticipated transmission derates and outages. In extreme cases this may cause the seasonal CRRs released in the annual process to be infeasible on a particular monthly network model. In such cases the CAISO will, in preparing the network model for the monthly allocation and auction process, replace outaged lines by equal and opposite injections and increase the rating of the derated lines just enough to make the seasonal CRRs feasible without creating any additional available capacity on these facilities.

This will ensure that the monthly auction always results in non-negative net revenues, but will also increase the risk of revenue shortfall for CRRs in the day-ahead hourly markets, just as daily and hourly transmission outages or derates may do.

16. **Ancillary Services Bids Below Zero**
The CAISO will allow for an A/S Bid floor of a value less than zero (-$30).

17. **Participating Intermittent Resources Program (PIRP)**
The CAISO is developing a RUC procurement target setting process that will incorporate day-ahead forecasts for PIRP resources, independent of any submitted or accepted day-ahead PIRP schedules. This process will be documented as part of a Business Process Manual.

18. **Dispatch and Pricing of Intertie Resources That Participate in the Real Time Market**
Intertie resources that are dynamically scheduled will be dispatched economically by the 5-minute Real Time Economic Dispatch (RTED) and settled based on real-time prices. All other intertie resources will be dispatched on a 60-minute basis in the Hour Ahead Scheduling Process (HASP) and settled based on HASP prices.