California Independent System Operator Corporation

Draft Proposed tariff Language – Transmission Constraint Management

December 3, 2009

27.5.1 Network Models used in Description of FNM for CAISO Markets.

27.5.1   Full Network Model

The FNM is a representation of the WECC network model including the CAISO Balancing Authority Area that enables the CAISO to produce a Base Market Model that the CAISO then uses as the basis for formulating the individual market models used to conduct power flow analyses to identifymanage transmission Constraints for the optimization of each of the CAISO Markets.

27.5.1.1 Base Market Model used in the CAISO Markets.

Based on the FNM the CAISO creates the Base Market Model (BMM), which is used as the basis for formulating, as described in section 27.5.6, the individual market models used in each of the CAISO Markets to establish, enforce, and manage the transmission Constraints associated with network facilities. The Base Market Model is derived from the FNM by: 1) simplifying portions of the FNM that are external to the CAISO Balancing Authority Area; 2) introducing locations for modeling intertie schedules; and 3) introducing market resources that do not currently exist in the FNM due to their size and lack of visibility. In the Base Market Model, External Balancing Authority Areas and external transmission systems are modeled to the extent necessary to support the commercial requirements of the CAISO Markets. For those portions of the FNM that are external to the CAISO Balancing Authority Area, the Base Market Model may model the resistive component for accurate modeling of Transmission Losses, but accounts for losses in the external portions of the market model separately from Transmission Losses within the CAISO Balancing Authority Area. As a result the CAISO Markets do not allow the external losses to determine the Marginal Cost of Losses in the LMPs. For portions of the Base Market Model that are external to the CAISO Balancing Authority Area, the CAISO Markets only enforce network Constraints that reflect limitations of the

transmission facilities and Entitlements turned over to the Operational Control of the CAISO by a Participating Transmission Owner, or that affect Congestion Management within the CAISO Balancing Authority Area or on Interties. External connections are retained between Intertie branches within Transmission Interfaces. Certain external loops are modeled, which allows the CAISO to increase the accuracy of the Congestion Management process. Resources are modeled at the appropriate network Nodes. The pricing Location (PNode) of a Generating Unit generally coincides with the Node where the relevant revenue quality meter is connected or corrected, to reflect the point at which the Generating Units are connected to the CAISO Controlled Grid. The Dispatch, Schedule, and LMP of a Generating Unit refers to a PNode, but the Energy injection is modeled in the Base Market Model FNM for network analysis purposes at the corresponding Generating Unit's (s) (at the physical interconnection point), taking into account any losses in the non-CAISO Controlled Grid transmission network leading to the point where Energy is delivered to DemandCAISO Controlled Grid. Based on the BMM, Tthe FNM market models used in each of the CAISO markets incorporates physical characteristics needed for determining Transmission Losses and models network Constraints within the CAISO Balancing Authority Area, which are then reflected in the Day-Ahead Schedules, AS Awards and RUC Awards, HASP Intertie Schedules, Dispatch Instructions and the LMPs resulting from each CAISO Markets Process. In operating the CAISO Markets, the CAISO establishes, enforces, and manages the transmission limits and Constraints associated with network facilities modeled in the FNM, as further described in the Business Practice Manuals. For portions of the FNM that are external to the CAISO Balancing Authority Area, the CAISO may model the resistive component for accurate modeling of Transmission Losses, but accounts for losses in the external portions of the FNM separately from Transmission Losses within the CAISO Balancing Authority Area, and does not allow such losses to determine the Marginal Cost of Losses in the LMPs that apply to the CAISO Markets. For portions of the FNM that are external to the CAISO Balancing Authority Area, the CAISO only enforces network Constraints that reflect limitations of the transmission facilities and Entitlements turned over to the

Operational Control of the CAISO by a Participating TO, or that affect Congestion Management within the CAISO Balancing Authority Area or on Interties. Further, in formulating the market models fFor the HASP, STUC, RTUC and the RTD processes, the Real-Time power flow parameters developed from the State Estimator are applied to the Base Market ModelFNM.

New Definition:

Base Market Model:

A computer based model of the CAISO Controlled Grid that is derived from the Full Network Model as described in Section 27.5.2 and that, as described further in Section 27.5.6, is used as the basis for formulating the market models used in the operations of each of the CAISO Markets.

NEW Tariff Section:

27.5.6   Management and Enforcement of Constraints in the CAISO Markets

The CAISO operates the CAISO Markets through the use of a market software system that utilizes various information including the Base Market Model, the State Estimator, submitted Bids including Self-Schedules, Generated Bids, and transmission Constraints, including Nomograms and Contingencies transmission and generation Outages. The market model used in each of the CAISO Markets is derived from the most current Base Market Model available at that time. To create a more relevant time-specific network model for use in each of the CAISO Markets, the CAISO will adjust the Base Market Model to reflect Outages and derates that are known and applicable when the respective CAISO Market will operate, and to compensate for observed discrepancies between actual real-time power flows and flows calculated by the market software. Through this process the CAISO creates the market model to be used in each Day-Ahead Market, HASP, and each process of the Real-Time Market. The CAISO will manage the enforcement of transmission Constraints, including Nomograms and Contingencies, consistent with good utility practice, to ensure, to the extent possible, that the market model used in each market accurately reflects all the factors that contribute to actual Real-Time flows on the CAISO Controlled Grid and that the CAISO Market results

are better aligned with actual physical conditions on the CAISO Controlled Grid. In operating the CAISO Markets, the CAISO may take the following actions so that, to the extent possible, the CAISO Market solutions are feasible, accurate, and consistent with good utility practice:

1. The ISO may enforce, not enforce, or adjust transmission Constraints, including Nomograms and Contingencies, if the CAISO observes that the CAISO Markets produce or may produce results that are inconsistent with observed or reasonably anticipated conditions or infeasible market solutions either because (a) the CAISO reasonably anticipates that the CAISO Market run will identify Congestion that is unlikely to materialize in Real-Time even if the transmission Constraint were to be ignored in all the markets leading to Real-Time, or (b) the CAISO reasonably anticipates that the CAISO Market will fail to identify Congestion that is likely to appear in the Real-Time.

2. The ISO may enforce or not enforce transmission Constraints, including Nomograms and Contingencies, if the CAISO has determined that non-enforcement or enforcement, respectively, of such Constraints may result in the unnecessary pre-commitment and scheduling of use-limited resources.

3. The CAISO will not enforce transmission Constraints, including Nomograms and Contingencies, if it has determined it lacks sufficient visibility to conditions on transmission facilities necessary to reliably ascertain Constraint flows required for a feasible, accurate and reliable market solution.

4. For the duration of a planned or unplanned Outage, the CAISO may create and apply alternative transmission Constraints, including Nomograms and Contingencies, that may add to or replace certain originally defined Constraints.

5. The CAISO may adjust transmission Constraints, including Nomograms and Contingencies, for the purpose of setting prudent operating margins consistent with

good utility practice to ensure reliable operation under anticipated conditions of unpredictable and uncontrollable flow volatility consistent with the requirements of Section 7.

To the extent that particular transmission Constraints, including Nomograms and Contingencies, are not enforced in the operations of the CAISO Markets, the CAISO will operate the CAISO Controlled Grid and manage any Congestion based on available information including the State Estimator solutions and available telemetry to Dispatch resources through Exceptional Dispatch to ensure the CAISO is operating the CAISO Controlled Grid consistent with the requirements of Section 7.