Memorandum

To: ISO Board of Governors

From: Eric Schmitt, Vice President, Operations

Date: March 15, 2012

Re: **Decision on Transmission Reliability Margin**

This memorandum requires Board action.

EXECUTIVE SUMMARY

Management proposes to refine its operational practices, to provide greater clarity in the California Independent System Operator Corporation's management of transmission constraints at interties in the real-time market. Currently, the ISO performs reliability adjustments to intertie schedules within the operating hour, which can be disruptive to market participants' commercial transactions when bilateral trades are curtailed, as well as to the ISO's operations when reduced imports must be replaced from others sources. Using a mechanism known as transmission reliability margin, the ISO will be able to manage these transmission limitations in advance by reflecting the limitations in the hour-ahead scheduling process thereby reducing the impact to market participants. The proposed use of hourly transmission reliability margin values will be limited to the current day, no earlier than two hours in advance of dispatch. For the day-ahead market and longer time horizons, the ISO will not limit intertie capacity through the transmission reliability margin mechanism. The system changes to OASIS are planned to be implemented in the fall of 2012. The ISO is currently working on an interim solution so the transmission reliability margin can be utilized during the summer months when it is most beneficial.

This memo describes three operational issues that will be addressed by implementing a transmission reliability margin, and presents the proposed implementation plan:

1. Unscheduled loop flow through the ISO grid from schedules between other balancing authority areas;

2. Forecast uncertainty in transmission system topology, such as forced or maintenance outages; and

3. Simultaneous interactions between intertie paths into the ISO and paths through other balancing authority areas.

These three issues are described in further detail in this memo.

Moved, that the ISO Board of Governors approves the proposed transmission reliability margin proposal, as described in the memorandum dated March 15, 2012; and

Moved, that the ISO Board of Governors authorizes Management to make all necessary and appropriate filings with the Federal Energy Regulatory Commission to implement the proposed tariff change.

BACKGROUND

This proposal responds to concerns raised by market participants. The ISO can reduce intertie schedules to manage unscheduled flow, topology issues, and simultaneous path flows only within operating hours, but the tariff does not allow the ISO to proactively manage these issues at its interties. Thus, a scheduling coordinator can be awarded an energy schedule on the intertie in the hour-ahead scheduling process, and the ISO must then cut the schedule in real-time to manage the identified issues, even if they can be anticipated before the start of the operating hour. This can be very frustrating to market participants as their awarded schedules are curtailed at times when they have little recourse in finding alternative sources or sinks of energy, and increases the manual work for the ISO operators, including procurement of imbalance energy to replace the curtailed schedules. In addition, because the calculations of available transfer capability are established before the beginning of the operating hour, the ISO's OASIS data currently continues to show that capacity is available even when the occasional curtailments in real-time have affected market schedules.

NERC's reliability standards allow transmission operators to use transmission reliability margin values in establishing the available transfer capability value for any given period for an intertie interconnection. Transmission reliability margin is a limitation on transmission transfer capacity that is necessary to provide reasonable assurance that the interconnected transmission network will be secure when accounting for various types of inherent uncertainty in system conditions.

The proposed tariff amendment would allow the ISO to impose a transmission reliability margin value shortly in advance of the hour-ahead scheduling process to account for three potential uncertainties: (1) unscheduled parallel loop flow; (2) uncertainties in transmission system topology (e.g., unplanned outages due to an encroaching fire or other circumstance); and (3) simultaneous path interactions. Each of these three elements of uncertainty is an expressly permitted use for transmission reliability margin under applicable NERC reliability standards. The ISO would employ transmission reliability margin only when these circumstances occur and only for the affected interties. While the use of transmission reliability margin will reduce the available scheduling capacity, it will have the benefit of reducing the frequency with which awarded schedules are curtailed in real time, within operating hours, as a result of these three elements of uncertainty.

Management is also proposing related tariff changes to better align the ISO's terminology and methodology to revised mandatory reliability standards which establish certain requirements for how transmission operators are to calculate available transfer capability for interties with other transmission operators.

The transmission reliability margin proposal will improve the transparency of the ISO's processes through publication of the specific adjustments made by the ISO, rather than market participants simply being informed of schedule curtailments. In addition to providing advance notice of the expected capacity reductions, at a time that allows market participants to make final adjustments to their own schedules, the ISO will publish the values for each of the three individual components that contribute to the ISO's transmission reliability margin calculation.

This proposal addresses limits that must be enforced as scheduling limits across the ISO's interties, and does not address operational procedures to conform the physical MW flow-based limits of transmission constraints in the market model within the ISO controlled grid to actual physical conditions. The ISO's operational procedures for conforming flow-based transmission constraints have been explained, and policy issues of data release have been addressed, in a previous stakeholder process.

PROPOSAL

The proposed tariff amendment will allow the ISO to designate a transmission reliability margin under specified circumstances, and better align the ISO's terminology with the terminology and methodology approved by NERC and FERC in the NERC MOD-001, MOD-008, and MOD-029 reliability standards that became effective on April 1, 2011. The impacts of these proposed changes will include: (1) changes to current OASIS posting practices for total transfer capability and available transfer capability values; (2) temporary reductions to permitted scheduling limits at certain intertie points in instances where a transmission reliability margin is applied; (3) correspondingly, less frequent real-time schedule curtailments at those intertie points in periods when a transmission reliability margin is in effect; and (4) better transparency for stakeholders concerning operator decision making in addressing intertie constraints.

The following discussion further reviews the basis for the three transmission reliability margin components that Management proposes to implement and provides an overview of how Management intends to calculate the transmission reliability margin value for each component.

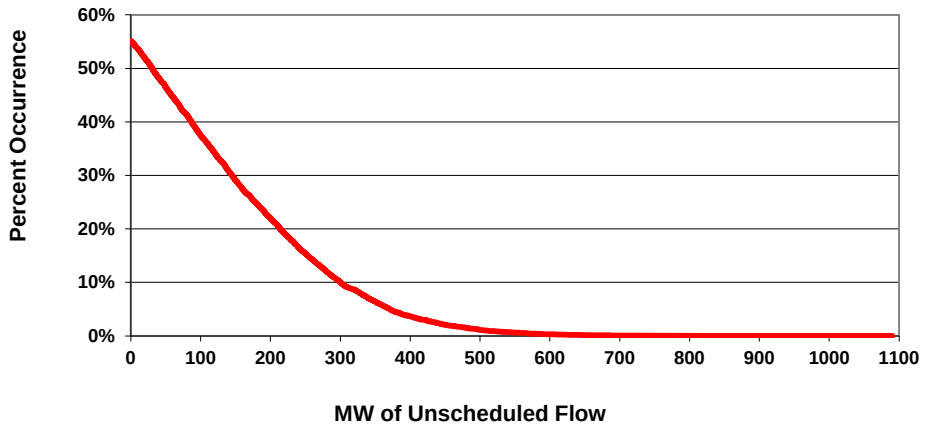
1. Unscheduled loop flow through the ISO grid from schedules between other balancing authority areas

Unscheduled flow is the difference between the scheduled and actual energy flow as it travels across the transmission grid throughout the WECC system. Because this grid essentially circles the region and the California-Oregon Intertie being a major path

within the grid, the California-Oregon Intertie is susceptible to significant amounts of unscheduled loop flow.

The following graph illustrates the frequency of occurrence of unscheduled flow on California Oregon Intertie, in the form of a duration curve showing that some amount of north-to-south unscheduled flow occurs 55% of the time, exceeds 200 MW 22% of the time, and exceeds 500 MW only 1% of the time.

California Oregon Intertie Unscheduled Flow
12/1/2010 to 11/30/2011



The combination of scheduled and unscheduled flows on a transmission path may cause the path to overload. In some hours, the unscheduled flow on California Oregon Intertie, combined with scheduled flow, results in schedule curtailments through WECC's Unscheduled Flow Mitigation Procedure. The California Oregon Intertie is the only WECC "qualified path" under ISO's control. . As the path operator, the ISO's responsibilities include keeping actual flows within its transfer capability limits using available tools including the Unscheduled Flow Mitigation Procedure which requires the ISO to accommodate unscheduled flow up to 5% of the total transfer capability. Without the use of transmission reliability margin, the ISO curtailing schedules to facilitate the required accommodation. Currently, the ISO reduces net schedules required by the Unscheduled Flow Mitigation Procedure by curtailing previously awarded hour ahead scheduling process schedules within the operating hour, which as discussed above is frustrating to market participants and imposes operational difficulty for the ISO. Under the transmission reliability margin proposal, the ISO would seek to avoid such operating hour curtailments by establishing, shortly before the hour ahead scheduling process run, a transmission reliability margin that is based on the expected impact of unscheduled flow anticipated to trigger an Unscheduled Flow Mitigation Procedure of step 2 or higher. If conditions and expected unscheduled flow are not forecasted to

trigger Step 2 or higher of the Unscheduled Flow Mitigation Procedure for that path, then the transmission reliability margin value for that hour would be zero.

This transmission reliability margin value would apply only for intertie paths that are subject to the curtailment procedures outlined in the Unscheduled Flow Mitigation Procedure, which as discussed above is limited to paths that meet the "qualified path" criteria set by WECC. Currently, California Oregon Intertie is the only ISO intertie path that meets WECC's "qualified path" criteria.

2. Forecast uncertainty in transmission system topology, such as forced or maintenance outages

In the event that there is uncertainty about the real-time availability of specific transmission resources due to potential forced outages, the ISO would manage risk and reliability by using a transmission reliability margin value up to the amount of the expected reduction in the path limit for the impacted interties. For example, a source of uncertainty in the available capacity of interties is the movement of fires near transmission lines or other transmission system resources. When a fire is approaching transmission facilities that may impact intertie capacity and the fire is expected to require a path limit reduction (i.e., a derate), the ISO would be permitted to impose a transmission reliability margin value for the intertie path in an amount up to the amount of the expected derate. Because these expected conditions generally can only be known close to real-time, the ISO would establish this transmission reliability margin component shortly before the hour ahead scheduling process run.

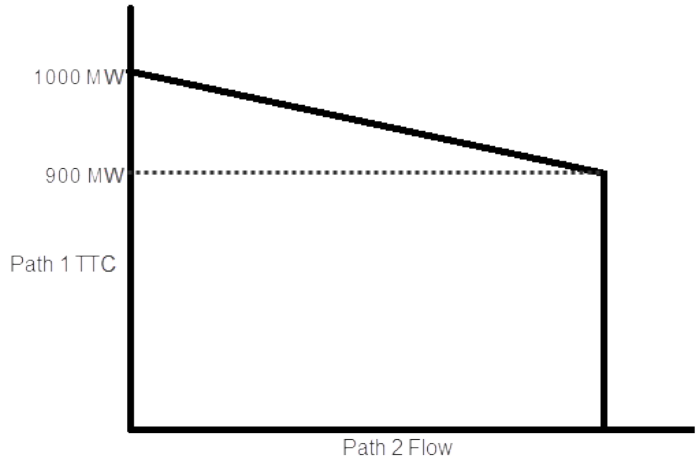
3. Simultaneous interactions between intertie paths into the ISO and paths through other balancing authority areas

In addition to transmission constraints that the ISO must enforce in the form of single-branch capacity limits and total flow on transmission corridors consisting of multiple parallel branches, the ISO must consider simultaneous interactions between transmission corridors. When the actual flow from market schedules on the affected transmission corridors is known with sufficient accuracy, such as within the ISO's balancing authority area, the ISO is able to enforce these limitations in both the day-ahead and real-time markets. Because of uncertainty in the actual real-time flow on interties, which are affected by sources and sinks that are not scheduled in the ISO's markets, the ISO does not enforce the constraints that affect interties in the day-ahead market. Rather, the impact of the interaction between multiple paths is currently accounted for with constraints that are enforced in real-time, either in an automated manner through market systems or manually through monitoring by operations staff, to ensure there are no violations of the total transfer capability.

The ISO manages a number of interties that have simultaneous interactions with paths outside the ISO. In some cases, the ISO can anticipate real-time flows on non-ISO paths with reasonable certainty before the start of the operating hour. When the ISO can project that one or more interties will be constrained due to interactions with other

non-ISO paths, the ISO would utilize the transmission reliability margin mechanism to ensure there are no violations of the total transfer capability of the ISO's intertie. The amount of transmission reliability margin value assigned will be set to be no greater than the impact of the anticipated interaction with the non-ISO paths.

For example, if the limit of an ISO intertie depends on another path, shown below as Paths 1 and 2 respectively, and ISO can reasonably project the real-time flow on Path 2, the ISO would limit hour-ahead schedules through a transmission reliability margin applicable to Path 1. Limiting the schedules awarded in the hour-ahead scheduling process would avoid curtailing the awarded schedules on Path 1 within the operating hour.



In this example, the ISO would limit the transmission reliability margin reduction of Path 1's capacity to 100 MW if the ISO forecasts that Path 2 flow would be at its maximum.

POSITIONS OF THE PARTIES

This proposal responds to concerns raised by market participants, as well as to ISO operational needs. Stakeholder comments by Powerex and Southern California Edison support Management's proposal. NRG Energy supports Management's proposal and further asks for similar information to be provided for transmission constraints within the ISO, but as noted above, this was addressed in a previous stakeholder process. PG&E supports Management's proposal and suggests that the ISO could further address transmission scarcity on key transmission paths through the transmission planning process, but this is outside the scope of this stakeholder process.

MANAGEMENT RECOMMENDATION

Management requests approval of this proposal for implementing the transmission reliability margin mechanism as set forth in this memo. These revisions will position the ISO to effectively manage the available capacity of the ISO's interties, while reducing impacts on market participants that result from current procedures.