Memorandum

To: ISO Board of Governors

From: Benjamin F. Hobbs, Chair, ISO Market Surveillance Committee

Date: November 6, 2014

Re: **Briefing on MSC Activities from September 9, 2014 to October 26, 2014**

This memorandum does not require Board action.

1. Overview

Over the time period covered by this memorandum, the Market Surveillance Committee (MSC) held a general session meeting at Folsom on October 15, 2014 in which the following topics and ISO initiatives were addressed:

- Definition of day-ahead and fifteen minute requirements for the flexible ramping product;
- Capacity procurement mechanism and availability incentive mechanism;
- Pricing enhancements initiative; and
- Allocation of revenue inadequacy of capacity revenue rights.

Individual MSC members have interacted informally with staff and stakeholders on these initiatives.

The remainder of this memo provides summaries of the issues discussed at the MSC general session meeting on October 14, 2014.

2. Definition of day-ahead and fifteen minute requirements for flexible ramping product

Following a presentation by Don Tretheway, Lead Market Design and Policy Specialist at the ISO, on alternative statistical approaches to define flexible ramping requirements, the MSC members and attending stakeholders discussed a number of issues. One issue that was examined was whether it is desirable to allow bids on flexible ramping product in order to reveal the costs of providing it. The MSC tends to agree with the assumption in the design being discussed that the major cost consists of opportunity costs, which are automatically calculated by the market software and included in the price.

The MSC and attendees also discussed the comparability between the flexible ramping product and non-contingent reserves, in terms of costs imposed on generators and prices.
An issue raised by MSC member Dr. Scott Harvey was the need to ensure that the real-time markets are designed so that flexible capacity that is reserved day-ahead is allocated and conserved so that a sustained ramp across multiple real-time intervals won't quickly exhaust the available ramp capacity. This exhaustion of ramping capacity has been observed in the Mid-Continent ISO markets.

The MSC will be submitting a formal opinion on the flexible ramping product at an appropriate time.

3. Capacity procurement mechanism and availability incentive mechanism

MSC member Dr. Shmuel Oren made a presentation summarizing conclusions from the literature concerning the advisability of using pay-as-bid mechanisms for pricing in electricity markets, and the applicability to the capacity procurement mechanism. He concluded that when outputs from different producers are substitutable, then pay-as-bid can result in inefficiencies because resources may be operated out of merit, since they will be setting their bids close to what they anticipate will be the highest clearing offer rather than bidding their costs.

However, he concluded that pay-as-bid is appropriate for the capacity procurement mechanism for the following reasons:

- Using long term (monthly) standing offers will minimize the impact of bidders adjusting their offers in anticipation of the highest clearing offer.
- Backup capacity offers are heterogeneous (i.e. have limited interchangeability) since they are selected based on specific characteristics such as location and resource capability. This implies that the market for each resource category is too thin to provide a reliable competitive clearing price in a uniform clearing price auction, as opposed to a pay-as-bid auction.
- Although a pay-as-bid auction is appropriate for the capacity procurement mechanism, it will not provide a price signal that can guide the determination of compliance incentives for the flexible resource adequacy must offer obligation.

Dr. Oren then discussed the issue of whether there should be a single availability incentive/performance penalty for all resources that are contracted under the resource adequacy mechanism, or if it should be differentiated between flexible and non-flexible resources. He presented a schematic of the decisions faced by a resource that must decide, first, whether to contract itself in the flexible or non-flexible resource adequacy markets and, second, whether to bid flexibly, self-schedule, or not make itself available in the spot market. He showed that a single price penalty can be set that will provide the correct incentives for both flexible and inflexible resources to make the best decisions for the market (i.e., contract in the correct resource adequacy market, and to bid flexibly if the resource is flexible). In the ensuing discussion, MSC members supported a single penalty approach.

The MSC intends to submit a formal opinion on the capacity procurement method at an

appropriate time.

4. **Pricing enhancements initiative**

Dr. Guillermo Bautista-Alderete, Manager of Market Validation and Quality Analysis at the ISO, made a presentation summarizing the four components of the pricing enhancements initiative. These include the administrative pricing initiative when normal market procedures are suspended; priority for schedules protected with existing transmission rights; minimizing the impact of compounded pricing of multiple contingencies; and elimination of multiple prices which occur when a market solution is mathematically degenerate. The MSC members and stakeholders focused their discussion on the last two components.

The pancaking or compounding of penalties in the scheduling run of the market software can result in very high locational marginal prices. The proposed solution is to have a single relaxation variable in the pricing run of the software to represent relaxation of the constraint upon a transmission component's capacity, even if several contingency constraints are involved. A MSC member pointed out that this will not eliminate all compounding problems (for instance, if two transmission constraints are in series, the price at the load end of those constraints may reflect compounding of contingencies in both lines), but it will eliminate many if not most of them.

Dr. Benjamin Hobbs, chair of the MSC, then made a presentation on eliminating multiple prices, using simple examples to present the mechanics of several different methods (essentially, providing small amounts of artificial supply or demand at a constraint). An issue he pointed out is that which method is chosen can affect the market price outcomes, favoring some market parties and not others. He argued that this means that it is important that the method implemented by the ISO be adequately documented so that the market impacts are understood. The choice of method to resolve multiple prices is not only a technical software issue, but can also impact the level of prices.

6. **Allocation of revenue inadequacy of capacity revenue rights**

When the set of awarded financial transmission rights would imply a power flow distribution that would violate transmission constraints, then the congestion revenues obtained in the market may be insufficient to cover all payments due to rights holders. This often occurs because transmission elements are derated or taken out of service. The Department of Market Monitoring has posted a white paper describing a proposed method for allocating such shortfalls to rights holders whose rights flow across the derated transmission elements.[1]

MSC member Dr. Harvey began the discussion at the MSC meeting with a presentation that summarized the range of reasons why shortfalls occur. Mr. Ryan Kurlinski, Manager, Analysis and Mitigation, Department of Market Monitoring, then made a presentation summarizing the

[1] California ISO Department of Market Monitoring, "Allocating CRR Revenue Inadequacy by Constraint to CRR Holders," www.caiso.com/Documents/AllocatingCRRRevenueInadequacy-Constraint-CRRHolders_DMMWhitePaper.pdf.

proposed methodology. MSC member Dr. Oren then presented a simple example that shows that the proposed approach to limiting payments to holders of rights on derated transmission elements might result in overcorrection of the problem, such that a congestion revenue shortfall can become a surplus. This implies that the proposed method may need modifications to prevent this problem, such as allocating the resulting surplus back to constraints where flow has decreased due to derating.