California Independent
System Operator Corporation

Memorandum

To: ISO Board of Governors

From: Keith Casey, Vice President, Market and Infrastructure Development

Date: October 21, 2009

Re: **Allocation of Real-time Imbalance Energy Offset Charges and Payments**

This memorandum does not require Board action.

EXECUTIVE SUMMARY

In September, Management presented to the ISO Board of Governors its analysis of the real-time imbalance energy offset charges observed during the month April, the first month after the start of the new market. Since then, we have extended our analysis to the months of May, June and July, focusing on the root causes of the persistent price differentials between the hour ahead scheduling process (HASP) and real time dispatch (RTD). Although the offset charges are declining, we believe that additional analysis should be conducted and additional actions be taken to mitigate the causal factors of these offsets before developing a methodology for allocating offset charges to market participants.

In recent months, net charges accrued in the real-time imbalance energy neutrality offset charge codes have decreased from $21.01 million in May, to $9.69 million and $6.89 million in June and July, respectively. This noticeable decline is largely due to operational improvements adopted by the ISO that have reduced the frequency and magnitude of HASP and RTD price differences. Even so, Management's following observations from April remain the same:

- Most monthly offset charges occur during a small number of hours; and
- Most of the offset charges occur during a few hours when there are large energy price differentials between RTD and HASP combined with a large volume of HASP energy sold as exports at the inter-ties.

In essence, in these few hours, large offset charges arise when the ISO procures energy from internal generation at much higher RTD prices to offset the sale of HASP energy to exports at

lower prices. Moreover, offset charges vary significantly from month to month as a result of the highest charges coming from a small number of hours.

At this time, Management recommends that that the ISO defer the consideration of an alternative offset charge allocation methodology until we first eliminate, or mitigate to the extent possible, the idiosyncratic root causes of large price differentials. Then we will be in a better position to determine the appropriate next steps. Management will continue its analysis and the stakeholder process and will report any further developments at subsequent Board meetings.

DISCUSSION AND ANALYSIS

The difference between RTD and HASP energy prices is the driving force behind large real time imbalance energy offset charges. Management has conducted a thorough study of the real-time market results to determine the reasons for these infrequent, yet large price differentials. We have found four root causes that drive RTD prices higher than HASP prices:

- RTD prices jump significantly above HASP prices when the load forecast is revised between HASP and RTD, and the forecast used in RTD is several hundred MW higher than the load forecast used in the HASP. This happens because, in RTD, the volume of supply available for dispatch is significantly less than the volume of supply available in HASP, due to ramping constraints of internal generation and the ISO's inability to re-dispatch hourly ties.

- Severe over-generation occurs during off-peak periods and during steep load ramping-up periods, leading to very low (often negative) prices in HASP. By selling energy in HASP, the ISO dispatches internal generators upward above their minimum loading levels in RTD so that the ISO can dispatch these units downward to meet load variation in real time.

- Operators sometimes need to adjust flow limits on major internal branch groups in RTD after the execution of HASP. For example, after losing the Pacific DC inter-tie on May 19, operators adjusted the flow limit on PATH 26 from north to south, to facilitate the dispatch of generating units in the south to higher operating levels. At this limited transfer capability on PATH 26, the market software relaxed the branch group constraint limit at the scheduling run penalty price in RTD. This caused congestion on PATH 26 which caused the energy price to rise above one thousand dollars.

- The loss of several hundred MW or more of generation capacity in RTD can also cause HASP and RTD prices to diverge. When this occurs, RTD prices are significantly more sensitive to loss of additional generation capacity, changes in load or other deviations in this situation.

Addressing the large price differences

Since the start of the new market on April 1, 2009, we have made a significant effort to address volatility and the occasional extreme real-time prices. In order to mitigate real-time price volatility and the price differential between RTD and HASP, we have:

- Developed a systematic procedure for operators to perform load forecast and branch group adjustments;
- Improved the resolution for hour-ahead load forecasting and load forecast alignment between HASP and RTD;
- Improved accounting of inter-tie hourly ramp when dispatching in HASP; and
- Enabled the use of regulating reserve to balance high frequency load fluctuations by allowing limited relaxation of the power balance constraint through a lower scheduling run penalty price.

Offset charge allocation options

Although Management recommends that no offset charge allocation methodology be developed and adopted until the root causes of large price differentials are addressed, we have discussed cost allocation options with stakeholders, which include a two-tiered allocation and a single-tiered allocation. We will continue to consider these and other options in the ongoing process.

MANAGEMENT RECOMMENDATION

Management recommends that we continue our efforts to address the factors causing the price differentials between HASP and RTD. Once more progress is made in this area, we will be better able to determine the appropriate solution for the imbalance energy offset cost problem. If we are successful at mitigating the price differences, the cost allocation may no longer be an issue. On the other hand, if significant imbalance energy offset costs continue even after these efforts, with further analysis we will be in a better position to determine whether a more appropriate cost allocation scheme or a more significant redesign of the real-time market settlement is necessary to address the offset charges. For these reasons, we propose to continue with our analysis and stakeholder process, and do not propose any changes to current policy at this time.