

Memorandum

To: ISO Board of Governors
From: Steve Berberich, President and Chief Executive Officer
Date: December 13, 2016
Re: CEO report

This memorandum does not require Board action.

OVERALL SYSTEM CONDITIONS

Overall system conditions are normal for early winter operating conditions. Loads are generally modest with very low net loads in the middle of the day and extreme late afternoon ramps as the solar generation fades away and evening lighting load kicks in. In the last two months, we have had minimal weather impact or other events affecting transmission, thermal, wind or solar generation.

From a year in review perspective, our peak load occurred on July 27 of 46,232 MW. The minimum load was 18,287 MW on Feb 14 at 3:59 am while the minimum net load (net of renewables) was 11,663 MW on May 15 at 1:31 pm. The maximum upward ramp over a one hour period was 5,512 MW on November 17 while the maximum three hour ramp was 11,375 MW on November 29.

For renewables, the peak solar generation was our current peak of 8,545 MW on September 14. We did not set new peaks in other forms of renewable generation this year but we did hit over 50% of the load served by renewables on multiple occasions.

NOVEMBER 9, 2016 LOW FREQUENCY EVENT

Associated with a series of technology issues, on Wednesday November 9 at 1:33 PM the ISO market software erroneously sent out decremental dispatch instructions of approximately 2,500 MW to multiple generator resources before the ISO's System Operators could block or override the dispatch instructions. The ISO's operators verbally instructed Scheduling Coordinators to not follow the dispatches, but 1,214 MW of fast moving solar generation resources and 730 MW of other resources quickly and automatically responded to the dispatch signal and reduced their output over an 11 minute period. This reduction in generation output caused the ISO area control error ("ACE") and system frequency to deviate significantly. Starting at 1:33 pm ACE and frequency declined over a 12 minute period. At 1:35 pm system limits were exceeded. At 1:45 pm ACE was at its lowest point -3,245 MW and frequency was at its lowest was 59.834 HZ. Operators took

action to restore normal operations and by 1:53 pm the system was already within limits and ACE and frequency were recovered.

An internal review found that no NERC standards were violated and a NERC Event Analysis was submitted to WECC who reviewed the report and closed the matter. We are performing a root cause analysis, have already made several software changes to enhance protections from erroneous dispatches and are performing a lessons learned review with the Operations crew on shift.

METERING RULES ENHANCEMENTS

Metering is a critical component of managing the electric markets but also a major costs for those engaged as Participating Transmission Owners or in the energy imbalance market. Correspondingly, the ISO is continually seeking solutions that will provide additional flexibility to market participants and reduce costs of metering. For example, through prior stakeholder initiatives on demand response, the energy imbalance market, and distributed energy resource aggregation, we revised the ISO's metering requirements to provide additional flexibility to these market participants by expanding eligibility for an existing less onerous metering option ("scheduling coordinator metered entity"). In this month's Board meeting, we are building on these prior efforts by proposing to further expand the use of scheduling coordinator metered entities to certain market resources that otherwise must be ISO metered entities today. This expanded options will enable a wider group of market participants to use lower cost metering options.

MOODY'S ISO CREDIT RATING

Moody's affirmed our credit rating at A1 with a stable outlook citing the essential and established role the ISO plays in California's electricity markets. Moody's report indicates that the rating recognizes stable financial performance that is underpinned by supportive and transparent federal regulation. They also cited that increased diversification in the ISO markets from material regional expansion could be a factor that could lead to a credit rating upgrade.

RENEWABLE ENERGY PRODUCTION

There have been no new renewable production peaks since the last Board meeting. The most recent solar peak of 8,545 MW occurred on September 14, 2016 at 12:06 pm. The wind generation peak of 4,769 MW was set on April 12, 2014.