

# Memorandum

**To:** ISO Board of Governors  
**From:** Steve Berberich, Vice President & Chief Operating Officer  
**Date:** May 11, 2011  
**Re:** **Operations Report**

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*This memorandum does not require Board action.*

## Background

The ISO operates 80% of the California high voltage electric grid, is responsible for balancing supply and demand conditions instantaneously and runs an \$8.5 billion balancing energy and ancillary services market. The ISO continually operates two control rooms with transmission, generation, renewable generation and scheduling desks that constantly monitor the system. In addition to the routine operation of the system, the crews respond to any incidents that frequently occur that impact transmission or generation like fires under transmission lines, power plant failures, earthquakes, tsunamis and periodically, sabotage.

From a market perspective, the ISO runs a day ahead market that optimizes the dispatch of the system considering bid in generation, transmission resources, least cost dispatch and system conditions like outages. In real time, 75 minutes before each hour, the ISO determines the need for imported power from the adjacent balancing authorities. Every five minutes the ISO runs a five minute market that dispatches the system to follow ramps up and down. Second by second, certain generating plants balance the system on a very fine scale.

A number of related functions are performed to operate the market. Prior to the market runs, scheduled outages must have an engineering review for their impact to the system. Schedules that market participants submit must also be administered and planned. After the market runs, all transactions must be settled. We run settlements every day and a schedule of resettlements that can stretch over 36 months. Reporting and controls support the process to ensure we comply with very strict federal compliance requirements.

## This Period's Conditions

Grid conditions were challenging in February and March largely because of weather. In several cases, the real time crews were required to take extraordinary actions to ensure system reliability. For instance, in February, we experienced a pattern of unusually cold weather conditions with

high winds and heavy snows resulting in isolated transmission outages. Those outages required the crews to re-dispatch the system very quickly by starting or quickly ramping generation to meet electric demand. Despite the repeated outages, there were no transmission load outages as a result of the storms. Also, during February, we encountered natural gas system supply issues in the San Diego area that severely threatened electric supply over a two day period. Only through extraordinary collaboration with natural supplier and the local utility were supply needs met. On March 11 the Humboldt Bay Generating Station was evacuated as a precaution due to tsunami concerns following the Japan earthquake. These issues are discussed further below.

April is normally a high outage period because of planned system maintenance before summer operations. This April has been consistent with that trend and we have had to carefully coordinate the outages to ensure we are able to maintain reliability and minimize cost impacts on power. Other than planned outages, there were no significant incidents on the system in April.

### **Noteworthy Grid Events**

Large natural gas customers in San Diego, Riverside and Imperial Counties – including generators - were curtailed for approximately 21-hours; residents and businesses were asked by San Diego Gas and Electric to conserve electric power and natural gas on February 2 and 3. Cold weather in Texas and the Rocky Mountains shut down natural gas fields and processing plants earlier in the week leading to the supply problems which were compounded by rolling blackouts in Texas. After further generating units came under threat of supply disruptions and wide scale load disruption became possible, the California Independent System Operator Corporation, SDG&E and Southern California Gas set up close coordination where the ISO would limit gas consumption through minimal generation in the San Diego area; and SCG would manage supplies to keep key generating units available. This close coordination resulted in no load disruption.

The end of February brought another unusually cold winter storm to northern and central California. The statewide demand and continued transmission outages because of wind and snow damage to the transmission system, required us to dispatch generation in unaffected areas, reroute power around damaged lines and, in several cases, manually dispatch the system to meet demand.

During the early morning of March 11 the ISO again adopted conservative operations when coastal facilities were at risk due to tsunami concerns following the earthquake in Japan. The ISO ordered the start-up of several inland generating units as a precaution should any coastal plants be forced out of service. As events unfolded, the tsunami threat was limited to one facility. At 4:05 a.m., the ISO received notice that Humboldt Bay Generating Station was to be evacuated upon order of the County Sheriff. PG&E initiated public appeals in the Humboldt area requesting energy conservation to reduce load on the local transmission and distribution facilities during the generation outage. At 6:48 a.m. approximately 15MW of customer load was interrupted (approximately 6,800 customers). At 7:51 a.m. the evacuation was lifted and generation resources began returning to service. Customer load was restored by 9:15 a.m.

### **Water Summary**

A series of storms in late February and March resulted in significant contributions to the water supplies in the state. The statewide snowpack percent of normal on March 30 was 165%. That level of snow pack is providing ample hydro generation that should last until late summer.

While a net positive, we have had times during high hydro runoff and high wind production where over generation conditions occurred or were close to occurring. We expect that to be a growing phenomenon as more wind is added to the grid and we have high hydro conditions.

### **Other Noteworthy Information**

We commenced 24x7 renewable desk operations on April 1. We had previously staffed two 10-hour shifts, one shift from 7 a.m. to 5:30 p.m. each day and another from 4 p.m. to 2:30 a.m. Monday through Thursday. That desk is responsible for monitoring and forecasting the growing intermittent generation capacity on the system.

### **Operations Highlight Report**

Attached is a report highlighting key operational statistics and system costs. Each report contains a detailed explanation of the report and what is measured but below is a summary of the reports.

Outages on the System – The ISO tracks planned and forced outages on the system because of the impact of outages on system operations and to track the numbers against like numbers in other balancing authorities.

Control Performance Standard 1 and 2 – Control performance standards (CPS) are a measure of how well the grid operator is managing system frequency and error around that frequency. CPS1 measures control area variability while CPS2 measures the magnitude of the control error because it impacts surrounding balancing areas. The standards are no longer in effect and have been replaced by reliability based control standards that allow these metrics to “wander” more than allowed under the old standard. Therefore, while we show the minimum requirements, they are historic and no longer applicable but ISO management finds them useful for comparison purposes.

Reliability Based Controls – Reliability based controls (RBC) are the new standards replacing CPS 1 and 2. These standards measure system control through a metric balancing frequency and total error around the frequency target. The ISO is required to conform to these standards and we are currently fully in compliance.

Operational Transfer Controllable Events – This report measures violations of path limits (transmission line overloads). The ISO has strict limits on transmission path capacity that is constantly monitored and mitigated. When a limit is exceeded because of a disturbance on the grid (outages, etc), the ISO grid operators have thirty minutes to correct the overload condition. We have had no reportable events.

Frequency Disturbances – The ISO is required to recover frequency within a specified period when a loss of generating resources occur. This report measures those incidents and whether we have successfully recovered from the loss of generator per the standard. In all cases, we have.

System Unaccounted for Energy – In all electric systems, there is loss of energy because of a number of factors like transmission losses. We track those losses for comparison purposes and to make sure there are no spikes that require investigation. The percentage loss will change as we receive final settlements so the uptick indicated by the March numbers is likely to change downward.

Reliability Must Run – The ISO has the authority to designate units are needed for reliability and that have not been committed through the resource adequacy program. There is a tariff based compensation regime for those units and the costs are passed on to the market. We track those costs, as shown in the report for comparisons year to year.

Resource Adequacy and ICPM – Resource adequacy is the PUC based program that ensures adequate capacity on the system. We track the capacity available through that program and represent it on the report. Additionally, the ISO has the authority through the capacity procurement mechanism to procure resources on a monthly basis that are not covered by resource adequacy yet are need for reliability purposes. This report indicates that amount of capacity procured under that program.

Ancillary Services and RUC Compliance – Ancillary services are services other than energy procured by the ISO. It includes both spinning and non-spinning reserves and regulation services. RUC is the residual unit commitment reliability product procured through the daily and real time execution of the markets. Generators are required to comply with those unit commitments and when there is non-compliance, the ISO charges a “no pay” regime. This report shows the amount of the “no pays”.

Closed Dispute History – After settlement statements are published, market participants have the ability to dispute line items for a variety of reasons. Our goal is to minimize disputes by having the most accurate market inputs and outputs as possible. We monitor the volume of disputes as representative of how well we are controlling those inputs and outputs and this report is a tracking mechanism of that performance.