



PROFILE

The California Independent System Operator Corporation (ISO) manages the flow of electricity across the high-voltage power lines that make up 80 percent of California's power grid

CHALLENGE

Implement a state-of-the-art control center incorporating situational intelligence

SOLUTION

Space-Time Insight's Market Intelligence, Grid Intelligence, Renewable Integration and Crisis Intelligence solutions

RESULTS

- Real-time visualization of the grid and pricing nodes leads to economic efficiencies across the value chain
- The correlation of weather and grid elements facilitates informed and timely decisions and actions that optimize grid reliability
- The ISO can now maximize the use of alternative power sources through easy assessment of, and response to, current conditions, helping California meet emission goals
- Visual applications help grid operators manage transmission bottlenecks and dispatch the lowest cost power plants
- Operators and dispatchers collaborate across disciplines, ensuring coordinated responses to potential and unplanned abnormal conditions

NOT ON OUR WATCH

The Northeast Blackout of 2003 affected over 55 million people in the United States and Canada, caused 11 fatalities, and shut down the delivery of critical consumer services for several days. The U.S-Canada Power System Outage Task Force's findings of why the blackout occurred were clear: operators were unaware the system was being operated outside acceptable guidelines, the deteriorating condition of the system was not recognized, and effective real-time diagnostic support for the interconnected grid was not available.

Situational intelligence became the centerpiece of the California ISO's new state-of-the-art control center to help ensure a crisis scenario of this magnitude does not happen in California. Quick glances at the geospatial displays on the 80 x 6.5 foot video wall that fronts the control center, allow operators and dispatchers to instantly detect and act on anomalies, or simply gain the assurance that everything is in fact running normally.

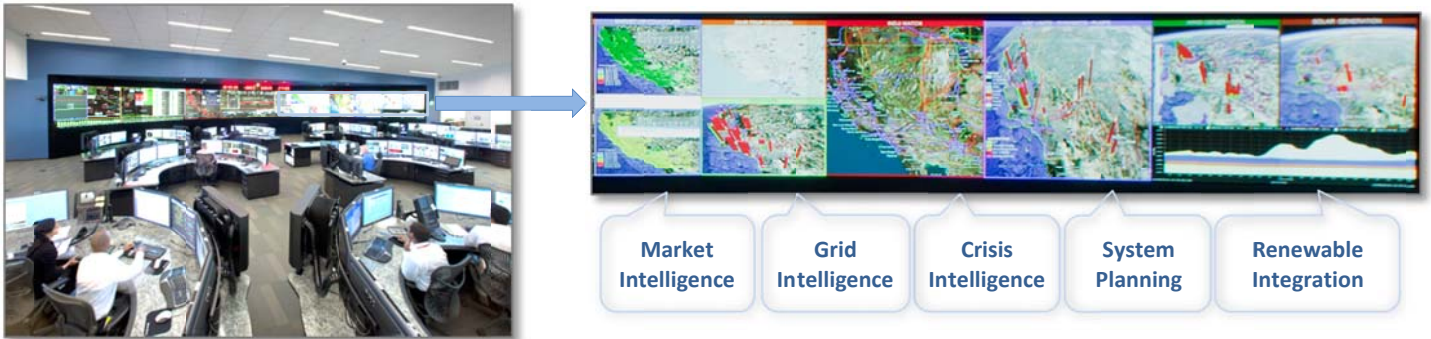
MAKING EVERY SECOND COUNT

Prior to implementing situational intelligence, operators might have had to scour numerous pages of tabular information to spot those anomalies. In addition, each discipline had their own independent monitoring displays, making synchronization of information across teams a manual process prone to misunderstandings and delays, and allowing critical information to fall through the cracks. And when unplanned outages or potential power generation issues can put lives and millions of dollars at stake, every second counts.

To be sure, managing the delivery of 50,000 megawatts over 25,000 miles of power lines is no simple task. The ISO operators need access to not just the information provided by PI and the Energy Management System (EMS) and Market Systems, but also external information about weather, cloud cover and fires. As Brian Murray, Operations Specialist of Real Time Operations at the ISO puts it, "Our operators were dealing with so much raw data that it was often challenging. What they needed was quick actionable information."

VISUALIZING THE GRID

Courtesy of Space-Time Insight, information is what they got in the form of dynamic real-time visual displays. Now they can correlate and overlay any information they need on a map to, for example, instantly understand the impact of cloud cover on renewable power generation or determine the potential risks from fires burning in a specific area.



The ISO state-of-the-art control center with Space-Time Insight's applications highlighted

WHERE'S THE FIRE?

The need to identify the impact of burning fires on California's grid led to the ISO's first Space-Time Insight system. The application combines information received from CAL FIRE showing areas that have already burned, input from an infrared system that highlights areas where the fire is still burning, and wind speed and trajectory data, to determine a fire's path. When overlaid on a map of the transmission system, operators can track a fire's progress, determine which lines are at risk, and develop appropriate action and contingency plans with local utilities.

Space-Time Insight allows our operators to see trends at-a-glance and easily spot anomalies that require action

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THE PRICE IS RIGHT

In 2009, the ISO embarked on a Market Redesign and Technology Upgrade (MRTU) initiative to improve the efficiency of the wholesale electricity market and ultimately ensure consumers pay the lowest price possible for electricity and receive the most reliable service. As part of this initiative, Space-Time Insight helps the ISO visualize real-time, day-ahead and forward markets across three thousand pricing nodes, and monitor congestion anywhere on the grid. "The Space-Time Insight application's use of contours and colors allows our operators to see pricing trends at a glance and easily spot anomalies," commented Murray. "Previously they would have been looking through data tables to get this information."

GREENING CALIFORNIA

The ISO's renewable integration system helps renewables and generation dispatchers optimize the use of renewable energy sources and react to sudden changes in the environment, such as unexpected storms, cloud cover, or wind speed. Their ability to assess current conditions and make appropriate adjustments ensures greater grid reliability. And by staying within defined limits on the circuit path, the ISO also avoids damaging the power system infrastructure and millions of dollars in potential fines.

GETTING EVERYONE ON THE SAME PAGE

Many of the ISO's operators and dispatchers had not previously used geospatial displays in their work, but they quickly came to relish their power and ease-of-use. Murray said, "The Space-Time Insight application displays contain user-selectable layers that pull data from many core data systems to provide a complete picture of information for our operators."

In addition, the systems have been a boon in terms of user collaboration. Previously, each functional area was isolated causing information that might be valuable to other users to be lost, misunderstood or simply not communicated. The Space-Time Insight applications allow multiple disciplines to view the information and to all be on the same page when action is required. And when everyone is in synch, the value of situational intelligence is fully realized.