CUSTOMER CASE STUDY

The PI System™ helps Sempra Energy see the light

Sempra Energy – www.sempra.com
Industry – Power Generation

Sempra Energy has a large footprint in the energy production world but lacked a system to share information across its operations sites. The PI System enhanced the organization's data quality and operational intelligence by creating "one version of the truth." It also saved hundreds of thousands of dollars through increased process efficiency.

Goals

- A single user interface to manage the 70,000 data points spread across five sites
- A unified view of data across the organization to better understand site assets
- The ability to lower future costs and initiate rapid deployment when necessary

Challenges

- Five separate SCADA systems created a cumbersome process for operators
- Those systems also required expensive maintenance and high upgrade costs
- Generating meaningful reports was difficult across multiple, unlinked systems

Results

- Hundreds of thousands of dollars in savings, both in current operations and future upgrade costs
- "One version of the truth" for operators across the organization
- Better, more accurate reporting from a unified data system in emergencies

Sempra Energy is one of the largest energy providers in the United States. With more than 3000MW of solar, wind, and energy storage, Sempra is committed to bringing renewable energy to more than 32 million customers around the world. The company expanded even more when it acquired Great Valley Solar, which is a 200MW solar facility just outside of Fresno, California. Each of the plants had its own SCADA system used to control and manage each plant. The systems did not talk to one another, which created inefficiencies and slowed the company's responses to outages and other natural disasters. The PI System united the SCADA systems and provided consistent data throughout the organization.

Managing a complex network

Spanning nearly 1200 football fields of solar modules, the Great Valley Solar complex provides enough energy to power nearly 90,000 homes. Site construction was done in phases, resulting in four plants tied together with one single substation.

Managing five separate SCADA systems is a time-consuming process. Any new assets needed to be individually connected to, and configured in, the SCADA system, which created a network of PLCs and DCSs that tied more than 70,000 manually configured data points together. With five licenses to maintain, the site was looking at high O&M costs as well as a high price for a contractor to manage the SCADA systems. All in all, it was a very expensive undertaking.

The SCADA systems weren't just costly; they were also difficult to operate. The site needed to ensure that all five HMIs were running to give plant operators visibility. If an issue did occur, operators had to cycle through separate screens to isolate the problem. The site also needed a separate data historian to archive incoming data.

However, consolidating the five SCADA systems wasn't an option because there were too many data points. Given the size, the PLCs would simply collect data versus controlling the power coming from the solar farm.

"My license fee was topping just below $100,000 a year. Now it's just a fraction of that."

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David Jeon,
Fleet Technical Manager, Sempra Energy

Solving multiple problems at once

Further complicating the situation, Sempra's SCADA systems were also tied to Microsoft's Windows 7 operating system, which would reach end of life in 2020 and require an upgrade. To combat all these challenges, the company turned to the combination of the PI System and PXiSE to deploy a system that would offer endless flexibility and scalability, both now and in the future. PXiSE is an advanced grid control solution that comes with an embedded PI System. The team needed only one license to deploy it as a single SCADA program to manage each of the five sites.

Leveraging the more than 400 interfaces within the PI System, they were able to easily connect assets across the complex to the system. Using the Asset Framework, they built out asset hierarchies and templates that were self-replicating, which significantly shortened deployment time. For example, they only needed to configure one inverter, and the system would automatically use that template to configure the rest. With the old SCADA systems, they needed to manually configure each one.

"Once we had control over the network, we put a parallel PXiSE SCADA system on top of it," Jeon said. "It took two weeks to deploy, where they'd been working on [the original SCADA system] for almost four months."

"The graphics will tell them where the problems are instead of them actually cycling through every one of the screens."

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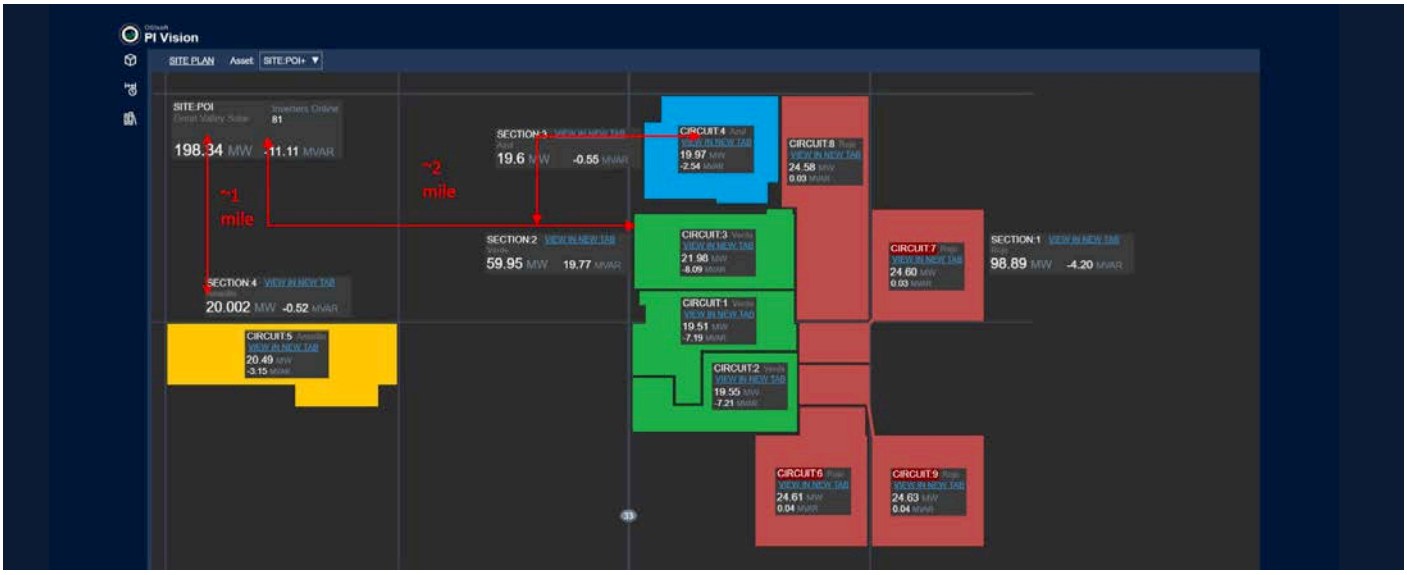
David Jeon,
Fleet Technical Manager, Sempra Energy

Not only was the system easier to deploy, but the PI System also easily managed the 70,000 data points, all without additional procurement. Now, operators can visualize data using a single PI Vision display that gives them rapid insights into each of the five sites. "It's by exception reporting," Jeon said. "The screen was built, there's alarm screens tied to it, but the graphics will tell them where the problems are instead of them actually cycling through every one of the screens."



The PI System gives engineers rapid insights into each of the four plants at the complex, acting as the single HMI for all the sites.

A new way of responding to disasters

One of the most difficult aspects of running an energy company is preparing for and responding to natural disasters. Fires can burn utility poles, high winds can damage equipment, and mudslides can expose gas lines. It can be difficult to send personnel to affected areas and even more difficult to communicate with customers and emergency managers.

The PI System can't change the weather, but it has helped Sempra Energy respond to changing conditions. It allows Sempra's staff to monitor real-time information from its sites and deploy resources where they're needed most and only when it's safe to do so. The company used data from the PI System to deploy drones to impacted areas and get a better view of whether the conditions had improved enough to begin sending repair staff.

A company as large as Sempra Energy is often dealing with multiple incidents at once and has limited resources available to combat them. The PI System allows them to prioritize those resources and communicate more effectively with local emergency management about what services are impacted and when essential services might be back online.

Sempra's customers also benefit from the increased visibility into outages and other issues. The company can make information available to them in real time and on demand, reducing the need for customer service personnel and creating a more seamless customer experience.

> "Our operators now have the most relevant information to make the most informed decisions in operating our power systems."
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> **Patrick Lee,**
> President, PXise, a subsidiary of Sempra Energy

For Sempra Energy, the combination of the PI System and PXiSE gave its Great Valley Solar complex better functionality at a significantly better price – and without the need to upgrade based on a Windows program.

Citation:

Jeon, David. "Redefining Renewables SCADA" <https://www.osisoft.com/Presentations/New-Approach-to-SCADA-at-Solar-Farms/>

Lee, Patrick. "Improved Emergency Response using Drones and the PI System for Community" <https://youtu.be/637U347fKbE>