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# Santa Margarita Water District Case Study



## About Santa Margarita Water District

The Santa Margarita Water District is the second largest retail water agency in Orange County, California. Formed in 1964 as a landowner district by a group of ranchers who wanted to create a reliable source of water for their cattle, the District serves over 155,000 customers in Mission Viejo, Rancho Santa Margarita and the unincorporated areas of Coto de Caza, Las Flores, Ladera Ranch, and Talega.

The District provides its customers with safe, affordable, and reliable water and wastewater services that maximize human, environmental, and financial resources to help guide South Orange County's water supply needs into the next century. To perform these services, the District carefully monitors and diligently maintains more than 1,200 miles of water and sewer lines across its 62,000 acre service area to ensure that customers receive the water they need.



# Conserving and Protecting a Limited Water Supply

## Panduit® helps the Santa Margarita Water District improve network reliability while achieving rapid deployment and high availability

### COMPANY

Santa Margarita Water District

### COUNTRY

California, USA

### INDUSTRY

Water/Waste Water

### BUSINESS CHALLENGES

Deliver a reliable, highly available, secure network infrastructure to improve the District's data communication capability while accommodating increased industry demands and reducing operational costs.

### PANDUIT SOLUTION

Integrated Network Zone System to support the demands of real-time control and data collection and help ensure the industrial networks and control systems operate at a sufficient performance margin within the specified environmental conditions.

### BUSINESS BENEFITS

A secure Integrated Network Zone System that enables network communications between the control room and manufacturing floor, providing high availability, scalability, and reduced deployment time by up to 75%.

**“We needed a structured approach that would improve network communications while increasing operational efficiency and reducing installation time and lifecycle costs.”**

Brian Harrison,  
SCADA Project Manager

## BUSINESS CHALLENGES

The Santa Margarita Water District's Chiquita Water Reclamation Plant (CWRP) operates around the clock seven days a week and processes six million gallons daily. As part of the District, the CWRP is a tertiary system that provides the surrounding communities with recycled water for irrigation and landscaping.

When the antiquated control and communication system at the remote CWRP began experiencing poor and delayed transmission, impacting communications, the District decided it was time to improve its network communications system by replacing RF communications with a fiber optic network and Wi-Fi coverage.

The CWRP had approximately ten Allen-Bradley® PLCs that controlled the entire process in the treatment plant. Initially, the PLCs were connected with radio links to a central control room. However, the radio links lacked longevity and added latency on screen updates, which limited reporting intervals.

It was also imperative for the District to retrieve real-time data, increase productivity, and allow safe, remote access for IT and SCADA staff to managed switches for network drops to control panels and field mounted devices.

Finally, the upgrade needed to be completed within a firm timeframe that would provide a seamless flow of services to customers as the improvements were being implemented.

According to Brian Harrison, SCADA Project Manager, “We needed a structured approach that would improve network communications while increasing operational efficiency and reducing installation time and lifecycle costs.”

## STRATEGIC OBJECTIVES

Upgrading the existing network infrastructure would keep the District at the forefront of technological advancements and provide it with the ability to maintain a competitive advantage in the waste water conservation industry. The upgrade would also provide quality service to its customers by increasing network uptime and availability.

In addition, the secure, sustainable, and future-ready network would enhance the company's ability to promote efficient use of water resources and conservation to achieve cost savings.





Along with physical security being a significant factor for this upgrade, the District needed a long-term, cost-effective solution that would require little maintenance or replacements.

## PANDUIT SOLUTION

To accommodate its requirements, the District designed the fiber optic network to help utilize the existing duct banks throughout the plant and transfer the PLCs to a very secure, high speed network. While researching terminating fiber at various locations, the District decided to also deploy the Panduit Integrated Network Zone System. Along with the Panduit solution, selected partners for this project were Rockwell Automation and Alpha Omega for the fiber installation portion of the project.

The Panduit Integrated Network Zone System with the Allen-Bradley® Stratix Industrial Ethernet Switch enables network communications between the control room and manufacturing floor of the District's industrial facility. This capability allows for more efficient and future ready communications, as users migrate proprietary manufacturing floor networks to a single network technology using the EtherNet/IP open protocol to achieve IT and automation best practices. Integrating with the Allen-Bradley® Stratix Switch enables the District to achieve rapid deployment and offers management and diagnostics from within IT and controls environments, and optimizes network traffic.

The versatile zone enclosures were placed at eight selected locations throughout the plant. The final termination is within zone enclosures distributed throughout each floor of the building, allowing cables to be managed and patched in a single enclosure. It also helps reduce the number of home runs throughout the plant and abandoned cable in plenum spaces, allowing the plant to run more efficiently and safely.

The Integrated Network Zone System includes copper uplinks with redundant power supplies and the pre-installed Panduit Industrial Network Uninterruptible Power Supply (UPS). The Panduit UPS uses ultracapacitor technology instead of batteries, eliminating the number one cause of conventional UPS failures. The no battery design is maintenance-free, delivering 2X better ROI and 50 – 70% lower cost of ownership than a battery-based UPS. This allows the District to maintain operational efficiency more effectively through improved device management, employing a smaller width that saves valuable space and allows better integration and zone monitoring. The UPS solution works in conjunction with the Integrated Network Zone System to lower the risk of downtime associated with power interruptions to keep the plant's critical equipment operating at full capacity.

According to Harrison, “The zone architecture approach provides a solution that is robust and easy to deploy and troubleshoot for all areas of the facility while providing access to the network for both operations and IT.”



To round out the system, the District deployed the following Panduit technologies:

- Opticom® Rack Mount Fiber Trays and Fiber Adapter Patch Panels to provide a flexible and modular system for managing fiber termination, connections, and patching for all applications
- PatchLink™ Horizontal Cable Managers to provide neat and efficient management of patch cables and flexible fingers to organize the patch cords, simplifying moves, adds, and changes
- Opticom® OM3 Multimode Duplex Fiber Patch Cords to connect the ETAPs by running from the fiber output of one ETAP to the fiber input of another ETAP
- LC Opticom® Angled Fiber Adapter Panels (FAPs) and adapters to conserve enclosure space

The Panduit Network Identification Solution ensures that the District can quickly and accurately identify system components and connections.

The Panduit network security lock-in/block-out devices are deployed on connection points to block unauthorized access to the existing network infrastructure and help ensure the safety and security of the District's network infrastructure.



## BUSINESS BENEFITS

The deployed solution allows District personnel to quickly report issues, which increases reliability and productivity, and optimizes available resources. Refresh rates were also improved, from five minutes on a report by exception basis to real-time data transfer, which means there is now reliable remote access and personnel no longer has to perform message handling to tag data points and PLCs.

Providing Ethernet to all locations was important for the District to experience high speed network communications, increasing productivity while improving performance for IT and PLC networks.

The CWRP was part of a larger project to upgrade SCADA systems, therefore the District was very pleased when Panduit delivered this portion of the project within a three month timeframe, allowing almost immediate deployment, well ahead of the one year estimation.

The implementation of the Integrated Network Zone System allowed the District to achieve:

### Speed of Deployment

- Delivers up to 75% reduction in deployment time compared to systems that are not pre-engineered, validated and tested
- Provides single part number ordering to a full solution for zone architecture deployment in an industrial environment
- Enables scalability on a global basis for greater agility and faster time to production

### Mitigated Risk of Downtime

- Allows rapid expansion of switch and ports as the network grows
- Provides consistent high network performance with active equipment delivered within an optimized physical layer

### Reliability

- Localizes network traffic to improve resiliency
- Significantly reduces costs and complications associated with integrating the manufacturing floor and enterprise networks

“The project was a tremendous time savings and allowed the District to continue its business operations seamlessly. We have peace of mind knowing that we now have rapid and consistent transmission of data from our corporate network to the equipment on the factory floor, and the necessary environmental protection,” said Harrison. “Everything works and the solution is very turnkey – that’s how easy it was. Working with Panduit was money well-spent.”

# PANDUIT®

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