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PROJECT PROFILE

City of West Sacramento SCADA Integrated Video Surveillance

Located just west of California's capitol, the City of West Sacramento is a growing community of over 44,000 residents. It is one of the fastest growing areas in the country, projected to double in size by 2020.

This phenomenal growth requires a reliable stream of resources. At the top of that list is the clean, potable water that the City of West Sacramento Public Works Department supplies.

The federal *Public Health Security and Bioterrorism Preparedness and Response Act of 2002* required that all water systems serving populations greater than 3,300 perform vulnerability assessments. This assessment helped the City to understand the most likely threats against critical facilities and assets and the risk factors for those assets.

The City discovered certain challenges when securing the water system. Some of their more sensitive remote pump stations and tank sites had video surveillance, but it was based on older videotape technology, with limited motion sensing and alarming capabilities.

In addition, the Bryte Bend water treatment plant was about to undergo an expansion, allowing the Public Works Department to intake and process 60 million gallons per day from the Sacramento River. This investment in West Sacramento's infrastructure would need to be secured from vandals, trespassers, thieves and the omnipresent threat of bio-terrorism. This is particularly important when you understand that Bryte Bend is West Sacramento's only source of treated water.



The City of West Sacramento's Bryte Bend WTP. One of the surveillance cameras located at the plant is visible on the building to the right.

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Following the American Water Works Association (AWWA) security guidelines to overcome their previous challenges, the City began to make the needed changes. They replaced cyclone fencing with iron fences, installed super white lighting at some sites, and installed automated gate sliders. Additionally, a key-card based access control system is also under consideration. To cover automated intrusion prevention and deterrence for the water supply, Tesco Controls was contracted to develop a SCADA integrated video surveillance system.

The requirements for a successful project were many, and the questions came easily. What camera system? How will it alert personnel? How will it be integrated with SCADA?

Different solutions were evaluated and equipment from **Pelco** was found to suit the needs of the City and the requirements for SCADA integration.

At site #1, intrusion detection devices are placed on doors, ladders and tank hatches, along with the standard intrusion detection device for Tesco pump control cabinets. Motion detectors are installed, and an existing Tesco L2000 PLC is leveraged to handle alarm events on the SCADA network. When the intrusion or motion devices are triggered, an alarm is sent to both the on-site Digital Video Recorder (DVR) and the L2000. The DVR changes its recording rate to deliver a higher resolution recording of the event while the L2000 PLC generates a message which is transmitted to the Rockwell RSVIEW SCADA application via the city's radio system. The SCADA application then generates a real-time voice phone call to alert the designated personnel.

For immediate security in case of a potentially compromised water supply, the PLC is programmed to shut down and lock up the pump station when an intrusion is detected. If security is breached, only the water at the site would be compromised and would not be released into the city's water supply.

At site #2, Pelco Pan-Tilt-Zoom (PTZ) cameras are connected to motion sensors and a DVR. The PTZ cameras are in a "patrol" mode constantly scanning and recording activity at the site. When the motion sensors are triggered, the PTZ cameras return to a preset field of view depending on the alarm that was received. The same process is then enacted; The DVR begins recording video imagery at a higher rate to deliver a clear recording of the event, The L2000 PLC creates an alarm event which is sent back to the SCADA application via radio, and City employees are alerted.

This configuration is used at the Bryte Bend WTP as well, with the addition of physical camera controls and a large wall mounted LCD display to show the input of all 5 cameras at the site.

Ideally, multiple static cameras would be recommended for a security system of this type. Static cameras would provide pre-alarm capture capabilities while PTZ cameras in a patrolling configuration do not. West Sacramento had a specific need for the ability to manipulate the cameras and focus on different, manually targeted locations. That determining factor dictated the use of PTZ cameras.

In addition, the ability of static cameras to image the same location constantly with pre-event recording eliminates the need for the system to be actively monitored.

Overall, the problems of graffiti, vandalism, and theft have diminished significantly. The highly visible cameras in their weather-resistant enclosures have been more of an effective deterrent than expected. There have also been situations where having the cameras in place has been unexpectedly helpful.

Recently, there was an accident near the water treatment plant. A person riding a bicycle had been hit by a car which then continued on. When the California Highway Patrol responded, they had few clues about the vehicle that had been involved in the accident. The CHP officers noticed the surveillance cameras at the WTP, and asked to view the imagery. Tesco Controls personnel were on site within 30 minutes to assist in retrieving the data. While the camera was not focused on the roadway, the imagery was so clear that the CHP were able to identify the make, model and color of the vehicle. This enabled the CHP to find the vehicle on that very same day.

Why was Tesco Controls hired to develop the security system, and not a CCTV company? Water Services Superintendant Dan Mount says "We like that we can call one phone number for the whole system... cameras, PLCs, intrusion switches... the service and integration is seamless."

"To have some consistency, someone that knows the system first hand, and comes out for service calls every time gives us a feeling of security. We think the service and product is above and beyond what other companies have given us. There are always problems with systems integration, but on the whole- sales, service, maintenance- Tesco does a better job than anyone else."

Tesco Controls continues to fine tune the system which is now fully operational and monitoring the water system 24 hours a day. Additional sites have been planned and will be added as they come online and will be integrated with the rest of the system.

Established in 1972, Tesco Controls Inc. was quickly able to relate a sophisticated knowledge of electronic and electrical control systems to the fundamental needs of our industry.

We address customer needs through ingenuity and dedicated excellence in engineering, manufacturing, development and customer service. We offer a wide variety of both standard products and custom engineered systems.

We pride ourselves in being able to design, manufacture and service the broadest line of control systems available.

Tesco Controls' Supervisory Control and Data Acquisition (SCADA) systems have been providing state-of-the-art control and monitoring of treatment plants, water distribution and waste water collection facilities since 1979.

We continue to move forward with the development of new products and services, providing solutions which our customers have come to expect from an industry leader.

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