PROTECTING A PUBLIC WATER SUPPLY SYSTEM

Florida water department enhances security to manage risk

For many Americans, confidence in the safety and security of our nation's drinking water systems changed after the tragic events of Sept. 11, 2011. Congress had the same concerns and quickly made it a priority to mitigate any risks of deliberate contamination to drinking water supply systems.

Roughly 84% of the population receives their drinking water from approximately 165,000 public drinking water systems. According to government statistics, there are also at least 16,000 publicly owned wastewater treatment systems in the U.S. It is imperative that there are processes in place to ensure the safety of drinking water and wastewater infrastructure.

Under the Bioterrorism Act of 2002, the U.S. Environmental Protection Agency (EPA) was given full responsibility for developing a comprehensive plan to protect and reduce risks to the water sector, which includes community drinking water and wastewater utilities. Through collaboration with public and private water utilities, state governments and national water sector associations, the EPA established vulnerability assessment guidelines to help water utilities evaluate their susceptibility to vandalism and sabotage.

Electronic barbell padlock

Collier County's Challenge

The Collier County Water Department (CCWD) provides drinking water service to more than 160,000 permanent residents and approximately 200,000 seasonal customers in the unincorporated areas of the county outside the city of Naples, Fla.

The department maintains an entire water system—from pumping the water out of the ground to delivering it. The water supply system covers about 240 sq miles and includes two hybrid water treatment plants, three water storage repumping facilities, three well fields and one aquifer storage and recovery well. Because CCWD's 103 wells are spread out over a large geographic area, it has two raw water booster repump stations in operation.

When the Collier County Water-Sewer District's Water Department conducted its EPA vulnerability assessment in 2002, it determined that its public water supply system needed security enhancements in order to meet the new Department of Homeland Security critical infrastructure guidelines.

James Price, technical support professional for CCWD, oversees security processes and special projects. "Collier County needed to perform at a higher level of security," Price said. "We were tasked with tightly controlling and tracking access to our critical assets in order to protect the public water supply."

Finding Solutions

After assessing the more immediate risks, Collier's management team turned its attention to finding the most effective way to control access to the well fields and other remote sites. While researching options, the team determined that the CyberLock system of electronic lock cylinders, electronic padlocks and programmable keys met its requirements.

CCWD first implemented the CyberLock system in 2004, and it continues to grow as the department brings new wells on line and expands its facilities. To date, more than 600 electronic locks have been installed. There are five types of electronic lock cylinders being used in the lock hardware on administrative office doors,


Electronic lock system on office door lock


James Price, technical support at CCWD


Padlock on a gate

repump stations and in the deadbolts on well house doors. There also are electronic padlocks on facility gates and underground sample stations.

"We continue to expand the system as we identify a need," Price said. "Our people have used CyberLock for an extended period of time, and they have confidence in the system. We keep electronic padlocks and several types of electronic door cylinders on hand. If a manager requests a number of electronic locks in a particular area, we can have them installed within a couple of days. For example, our wastewater department is preparing to install CyberLocks on facility gates, supply rooms and one of its more isolated buildings."

Software & Hardware Keeps Management Informed

CCWD uses the electronic lock system to its fullest capability. This includes the software's e-mail warning system, on-demand audit reports and running the program on laptop computers. The audit reporting ensures that employees are doing their jobs; water samples are being pulled at the right times and at the correct locations; and scheduled security checks are being made throughout the well fields.

"The system's auditing capabilities are of great importance to us," Price said. "The electronic locks and keys audit lock openings, including exceptions such as unauthorized attempts to enter. The system sends us e-mail notifications of denied access, employee access to the facility after hours and specific door openings at the water treatment plant. It also keeps us informed when someone is accessing a particular area of our facility."

The county has a network of CyberKey Authorizer keyports and hubs throughout its facilities. They are installed at entrances to the break rooms, control rooms, supervisor office areas and main entrances. The keyports have a display, PIN keypad and a connection for employee keys. Each employee receives their access permissions and entry authorization daily by inserting his or her electronic key in one of the keyports. At the same time, a record of the employee's activities is downloaded and sent via the hub to network PCs. The keyports and hubs allow management to control the access schedules in employee keys and audit site activity from one central location.

Contractor Access

Almost every CCWD team member and contractor carries an electronic key programmed to access specific locks that allow the individual to do his or her job.

"We have contractors that cut the grass around our water treatment plants and wells," Price said. "We issue an electronic key to each contractor so they can access the main gate. We let them know that any lock they open is being audited so we can confirm their activity while at a CCWD location. We explain the consequences if they try to access a lock that they are not authorized to open."

Sample Station Security

CCWD uses the electronic bar bell padlocks on its sample stations. Physical access to the stations is awkward; there is only a very small area to work in. The bar bell padlock is ergonomically designed for this type of application. The underground stations are extremely wet, and the bar bell is highly water resistant. Laboratory employees collect samples from various areas of the water distribution system on a daily basis. There is a mandatory route they must take for collecting samples.

"The audit report from the electronic padlocks and each lab employee's key should confirm that the employee is checking each sample at the location they indicate in their log," Price said.

Meeting State DEP Guidelines

The Florida Department of Environmental Protection (FDEP) is the primary regulatory agency for the CCWD. "They ensure we meet Homeland Security measures that have been put in place," Price said. "We have to demonstrate that we are performing at certain levels of security to keep our risks as low as possible. CyberLock provides a system of checks and balances to document that we are staying in compliance and can respond effectively to any decrease in water quality from malevolent actions.

"The electronic lock system not only elevates our level of security, but it allows us to be proactive by getting out in front of potential problems,"

Price continued. "We can immediately take corrective action should a discrepancy appear in the audit reports. The audit reports provide substantial proof to the FDEP that we are diligent in our efforts to secure our facilities and keep the public water supply safe."

Inspection Reports

The CCWD audits employees who are responsible for carrying out security inspections at re-pump stations and in the well fields.

"Our repump stations are CyberLocked," Price said. "A repump station can have as many as 10 electronic locks on it. When the employee performs a security check, they use their electronic key to open the locks on all the doors and panels. The audit trail that is downloaded from their key should confirm that they have checked everything at that repump station and it is secure. Management can run audit reports to make sure employees are inspecting doors on well houses and checking in-ground wells that are in vaults. The vaults can have as many as four electronic locks on them."

Operations Center Security

In addition to the two water treatment plants, the CCWD maintains an operations center comprising two buildings that house operations, well field and distribution employees and equipment.

"We have a combination of CyberLock access and card access in the operations center, and the two systems work well together," Price said. "In the well field section, key people may need to access an office or the supply room at night or during the weekend. On those particular doors, we have installed CyberLocks. With [it], we have the ability to grant or take away employee access to these areas as needed."

Strengthening Perimeter Security

Along with the lock system, CCWD has strengthened its perimeter security system at the two water treatment plants by installing additional CCTV cameras.

"We have added CCTV cameras at our repump stations, well fields and other remote sites," Price said. "Currently, the majority of our physical assets are fenced in, and we will soon have all of our facilities and remote sites secured."

Meeting Potential Risks Head On

The CCWD has taken great strides toward meeting the level of threat that faces water utilities today. The department has integrated up-to-date security technology, implemented access control processes, educated employees on the importance of security awareness, and developed sound, cost-effective security procedures. Assessing potential risks and developing ways to manage and reduce those risks are ongoing tasks. As EPA standards evolve and new security threats emerge, the CCWD is in a strong position to respond quickly and decisively to protect the public's water supply. WWD