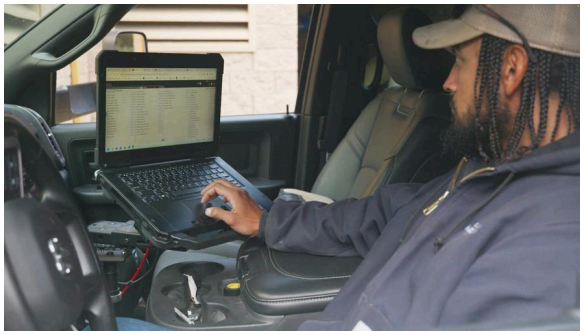
Water Utility Implements Ignition System to Improve Efficiency, Compliance, and Reporting

Despite its close proximity to the Pacific Ocean, water is a precious commodity along California's central coast. California American Water — a division of American Water Corporation that serves about 675,000 people — found that the SCADA system at its Monterey facility was consistently faulting and struggling to maintain the high standards required of a water utility, especially one in a "hydraulically challenged" area. California American Water – Monterey chose system integrator Flexware Innovation to replace its legacy Supervisory Control And Data Acquisition (SCADA) system with Ignition — an industrial automation platform for SCADA, HMI, IIoT, MES, and more — to improve efficiency, compliance, and reporting.

Creating a Framework for Success

Flexware's relationship with American Water Corporation originated with a project to develop a framework for standardizing color scheming, symbol layouts, and faceplates across the enterprise. Previously, each American Water location was responsible for its own visualization, resulting in a lack of consistency between facilities, and making remote troubleshooting efforts confusing and difficult.



Operators are able to create their own custom trends through the UI itself.

To create this framework, Flexware chose Ignition not only for its rapid development environment with reusable templates and tag structures, but also because Ignition's unlimited licensing model meant that American Water could implement the framework without needing to consider the individual size of each facility.

As the developer of the framework, Flexware was chosen as the "gatekeeper" for each Ignition implementation. While some installations have been handled by other integrators, Flexware vets any additions or modifications to maintain high quality. "[American Water] tasked us with developing a SCADA platform that any SI [System Integrator] can come in and use," said TJ Holt, Team Lead at Flexware.

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–TJ Holt
Team Lead, Flexware Innovation

A SCADA Runs Through It

For the implementation at Monterey, Flexware worked closely with California American Water to develop a solution for migrating from a legacy SCADA system to a mature and mobile-friendly distributed Ignition system. The new system monitors and controls close to 130 remote sites, while providing Key Performance Indicator (KPI) data to American Water's enterprise portal.

California American Water's legacy SCADA system could not meet current operational needs, offering a clunky interface that required operators to drill down through multiple screens to view KPIs and excessive implementation time to add new sensors or pumps. Beyond its inefficient interface, the legacy system lacked the capability to upgrade to Industry 4.0 standards like mobile accessibility, advanced data analytics, and modern cybersecurity measures.

The sheer magnitude and scope of the facility made the idea of migrating to a new system a daunting task. The system encompasses over 120,000 tags, over 13,000 OPC tags, and 140 PLCs, all on one Ignition gateway. However, using Ignition's unlimited licensing model in conjunction with the flexibility and dynamism of the established framework, Flexware was able to rapidly scale out the solution despite the size of the project. "I honestly don't think I could have done this project in any other software," Holt said.

Eye-Catching, Yet Understated

Flexware designed the system's visualization following ISA-101 high-performance HMI standards, replacing the legacy system's bright colors and inconsistent screens with streamlined grayscale to emphasize changes and alarms. For navigation through the HMI, Flexware took American Water's existing structure and separated it by sub-area, then moved critical KPIs to headers so that parts of the system, like wells and tanks, can be constantly monitored.

The new Ignition HMI has been especially beneficial for California American Water's alarm management. "Having this ISA-101 standard template is probably the best way to identify where those problems are before they actually become a real problem," said Mike Grondin, SCADA Manager for California American Water. In the legacy system, low-level alarm notifications had a tendency to be lost in the overly colorful display.

To make alarm response easier, an in-application alarm dock aggregates all alarms and gives supervisors control of alarm severity. "Anybody at the supervisor level and above is able to make changes to what calls out, what alarm calls out, and what level of alarm it is," said Grondin. Beyond

that, simplified rosters allow supervisors to easily toggle between the pump, treatment, and wastewater groups to dictate alarm and schedule management.

Large-Scale Solution in Your Back Pocket

One of the most critical features of the new Ignition system was mobile-responsiveness and accessibility. This was accomplished using Ignition's Perspective Module, allowing Flexware to develop screens and templatized views that smoothly transition from desktop to tablet and mobile.

"The automatic scaling allows all different devices to be used," Grondin said. "An operator can be sitting at the tank or a pump site and be able to view the active values of the site on their mobile phone without having to log in anything and be connected just about anywhere." Combined with the high-performance framework, these screens have enabled operators to quickly ascertain the status of the system, whether they are on the plant floor or traveling to a remote site.

The increased accessibility also solved another issue with the legacy system. "One of the problems we had previously was to view the SCADA system, it had to be in a secure network. One thing that we were able to do with the Ignition system is make a view-only that doesn't go into the secure side," Grondin said.

A Swift Migration

Flexware was able to work in the background because implementing Ignition did not require shutting down operations. Both systems were run in parallel until the legacy system could be shut down completely. "Installing the Ignition system on the Stratus server, it was virtually seamless. [Flexware] had a link into where they could download the project onto the server. It was already preloaded with everything they needed," Grondin said.

One critical aspect of migrating the system was adding devices and updating tag locations for PLCs. Ignition's server-centric deployment and Historian Module made this easy. "Add the location and it updates the SQL table and it automatically populates the navigation header in the SCADA app," said Holt.

"The Historian being integrated into the system also is a huge benefit. It's a SQL base. So getting the information out and updating the new tag location is all integrated. So that doesn't require any special programming or changes," said Grondin.

Just like the seamless installation, making changes to the current Ignition system is quick and simple. "The way that Ignition handles the upgrade is far superior than any other software I've touched before. It's zero impact onto production, and there's no gotchas," said Holt.

Keeping up with Trends

For operators, every new system will have a learning curve, but to ease the transition, Flexware moved certain Ignition gateway functions into the UI itself. "The operators are able to create their own custom trends ...

They can export all of that data into a CSV format and they can get KPI values in a report format for compliance reasons," said Holt. "Everything is available to them through the UI."

Generating reports with the legacy system had been a nuisance. Conversely, the Ignition system makes reporting immediate, with the option to log, download, and save reports and trends. "The trending option allows those engineers to go in and grab the data for one point or multiple points for any time period that they need. Simply download, and then they can put in charts, Excel, whatever they need to use it for, which takes a lot off of my plate," said Grondin.

Paving the Way

Leveraging Ignition, California American Water's Monterey facility now has a system that is infinitely scalable into the future and adheres to modern best practices. Additionally, maintenance has been almost nonexistent. "Once we've established the project, established all the tags, everything is talking. We have their views configured. It just runs," said Holt.

Currently, 30-40 employees use the Ignition system at the Monterey facility and California American Water plans to implement Ignition in Southern California shortly, and Northern California after that. However, everyone in American Water Corporation can view the system in read-only mode. "Everybody can look in, even from the CEO down to the office clerk. So virtually thousands of employees could be using it," said Grondin.

Holt applauds American Water's urge to be the "forward thinkers" of the water/wastewater industry. "I really enjoy working with American Water. They have a lot of sites, they know they have a lot of data, and they want to do something with it," Holt said. "It's really great to be a part of a company who wants to put the money and capital towards this, to pave the way for other industries to follow."

Flexware Innovation is a leading technology integrator who helps forward thinkers in manufacturing and related industries build comprehensive and long-lasting solutions with ease. Founded in 1996, Flexware continues to help companies leverage technology to solve real business problems with teams of engineers focused on software development, automation engineering, manufacturing systems integration, business intelligence, and Internet of Things (IoT) devices. Their passion is helping customers avoid costly architectural mistakes and design, architect, and build solutions that stand the test of time. For more information, visit flexwareinnovation.com.