



# The San Francisco Public Utilities Commission Water Enterprise

Essential Services 365 days a year

## RESULTS

- The San Francisco PUC saved \$1.3 Million by upgrading with GE
- By standardizing on GE at its water treatment plants it decreased the cost of spare parts
- The smaller form factor of the PACSystems\* allows for more capacity
- Legacy applications were supported, now and into the future
- Company's knowledge base was sustained; reducing training overhead

The San Francisco Public Utilities Commission (PUC) is a department of the City and County of San Francisco and is the third largest municipal utility in the state of California.

It provides drinking water and wastewater services, hydroelectric and solar power to 2.6 million residential, commercial and industrial customers throughout the San Francisco Bay Area.

Water coming into the system is among the purest in the world. Starting in the Sierra Mountains of Northern California water is captured from spring snowmelts and is stored in the Hetch-Hetchy watershed, an area of Yosemite Valley.

From there, the San Francisco PUC operates a large and complex water transmission and treatment system that moves water from the Hetch-Hetchy reservoir to the San Francisco Bay Area through a series of reservoirs, pipelines and treatment systems. Amazingly, the system operates with very few pumps and is sustained almost completely on gravity to move the water more than 200 miles.

Since no filtration is required, the water can be brought directly to customers throughout the Bay Area. However this is not always practical so water is also diverted to a number of reservoirs throughout the Bay Area to be used as needed. Watersheds in close proximity also feed these reservoirs. Any water that comes from these reservoirs is filtered in two larger water treatment plants, the Harry-Tracy Treatment plant in San Bruno, California and the Sunol Valley Treatment plant in Sunol, California. Each of these plants is capable of producing up to 180 MGD (Millions of Gallons per Day).



Recently, the two-filtration plants, the Harry-Tracy and the Sunol Valley Treatment plants, began an infrastructure upgrade. "We knew that some of our control equipment would no longer be supported. It was just coming to the end of its lifecycle and we needed to make a change," said Travis Hoff, IS Senior Engineer, San Francisco Public Utilities Commission. The PUC had an eight-month window and they needed to get ahead of that and make some decisions operationally about what they would do.

On the table were two choices – expand the current project as part of a larger modernization effort and earthquake retrofit which would have included re-writing programs, taking out controllers and rewiring all the devices in a full and complete plant renovation or seek out options to expand the life of their current control system.

The full plant modernization project would have required a substantial budget increase at a projected cost of \$1.5 million and would have required the San Francisco PUC to replace the controller hardware and software at the core of the control system. This approach would have severely impacted the availability of the system during transition periods.

The San Francisco PUC was already using GE's PLCs in its treatment plants to monitor and control its automated processes. Staying with GE and systematically upgrading the system meant the San Francisco PUC could continue to use its existing code – originally written in the early 90s and still executing in the control system.

The decision to upgrade over time saved the city thousands of dollars in implementation costs and provided a stable path to expanding the longevity of their control system with minimal production interruptions. Staying with GE provided the San Francisco PUC with a number of benefits.

- The project cost to upgrade was only \$200,000. A cost savings of \$1.3 million.
- By standardizing on a common version of GE equipment at the two water treatment plants they were able to decrease the added cost of carrying spare parts from multiple vendors.

- GE products support the PUC's legacy applications. Anything already in place would still be supported going forward.
- The smaller form factor of the PACSystems RX7is allowed the plant to add more capacity in the same amount of rack space.
- The system is set to grow for many years to come and can be added to in a modular fashion.
- Upgrading using in-house engineers helped keep their knowledge base and decreased any costs for re-training over time.

The San Francisco PUC was using GE Series 70-90s in their treatment plants. These PLCs were replaced with the newer PACSystems RX7is. The change over to the newer system was extremely seamless. "While we did some initial preparation to ensure things went smoothly, it came off so well I kept waiting for the other shoe to drop. But it never did," said Travis Hoff.

In preparation for the equipment change over, the San Francisco PUC planned a plant shut down. From the time the plant shut down to being operationally up and running again was 10 hours. "We kept an open window of 10 hours to run, test and ramp up again, but we really could have turned the plant on again in just two hours it worked so well. It was like pulling out a brain and putting in a new one," said Travis Hoff.

The upgrade to the newer RX7is allowed the San Francisco PUC to move data much more effectively. Instead of moving only a small amount of data they are able to move everything. "One of the best outcomes of this project is that we're set for the future too. As our data grows we are able to accommodate it at 4X the speed of the previous system," said Travis Hoff.

Today the San Francisco PUC continues to focus on the Water Treatment Operations and to supply water of world-class quality to its customers.

### GE Intelligent Platforms Contact Information

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Global regional phone numbers are available on our web site.

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