

Palmyra, Missouri

Job Information

End User:

Board of Public Works - Palmyra MO

Consulting Engineer:

Poepping, Stone, Bach & Associates
– Quincy, IL

Local Sales and Service:

Hydro-Kinetics – Saint Louis, MO

Existing Water Distribution System:

2 High Service Pumps at Water Plant
4 Storage Tanks (3 elevated, 1 ground)

Healy-Ruff Controls Provided:

- 1 Master V-PAC (CTU) at Water Plant providing touch-screen graphical interface for entire system and High Service Pump control
- 3 Micro-V-PAC (RTUs) providing valve control and monitoring at each Elevated Tank and 1 Micro V-PAC providing booster pump and tank valve control at the Ground Storage Tank site
- System Communication via VHF Radio

Benefits Summary

Improved Customer Satisfaction and System Performance

- Increased system pressure by 25%
- Added capacity by 150,000 gallons
- Refreshed water in ground storage tank

Reduced Operating Expenses

- Reduced average daily water production (plant run time) by over 30%
- Reduced overtime expenses
- Reduced energy consumption
- Reduced maintenance and “wear and tear” on equipment

Healy-Ruff Technology Improves Efficiency of Water Distribution in Palmyra, Missouri



Palmyra is a community of about 3,500 people near the Mississippi River in northeastern Missouri. A water treatment plant and elevated tank were built in the early 1970s to serve the community’s growing needs. This expanded a system that already had an existing elevated tank (Dickerson Street) and ground storage tank (GST). (Interesting note – the Healy-Ruff control system installed in 1973 is still running the plant.)

In the early 1990s, an additional water tower was added to support the growth of an Industrial Park on the edge of town. The water distribution system now comprises two high service pumps at the plant, 3 elevated tanks and a ground storage tank.

In 2003, a major project was initiated by Don Lloyd, the superintendent of utilities and Jeff Schneider, plant supervisor to better utilize the capacity and improve the overall efficiency of the system.

Added Capacity Creates Added Problems

The addition of the Industrial Park elevated tank, while it added capacity to the system, also created a few problems. The entire distribution system and levels in each tank were driven from the high service pumps at the plant. In order to maintain levels at the Industrial Park tank, the plant had to produce and pump enough water to fill the Plant Tank, Ground Storage Tank, and the Dickerson Street Tank.

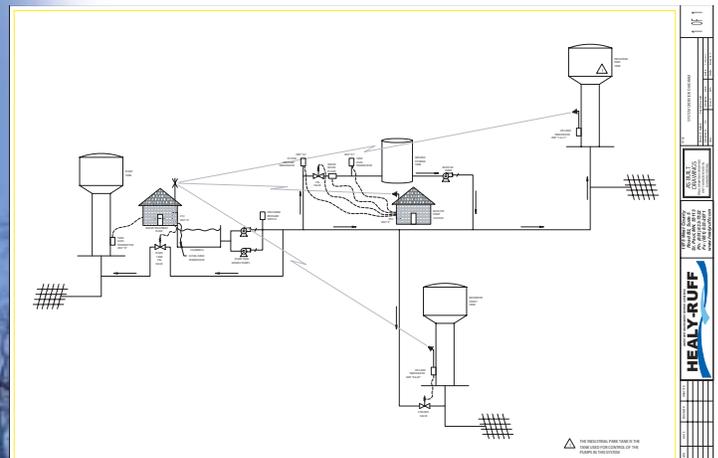


The elevations of the various tanks also caused several problems. Because of its distance from the rest of the system, it was impossible to completely fill the Industrial Park tank. In addition to the unused capacity, this also caused the water pressure to be lower in that part of town. Because the Ground Storage Tank was the low point of the system, the water from this tank did not “turnover” as new water passed over it on the way to the industrial park.

- Overproduction of water needed to maintain overall system levels
- Unused capacity
- Poor water pressure
- Poor “turnover” of water in ground storage tank

Healy-Ruff V-PAC Technology is the Solution

To address these challenges, Palmyra turned to the engineering firm of Poepping, Stone, Bach & Associates (PSBA). PSBA came up with a plan that called for adding control valves at each individual tank and a booster pump station at



the Ground Storage tank. PSBA then turned to Hydro-Kinetics of Saint Louis to provide the valves, pumps and the Healy-Ruff control system.



“Healy-Ruff really helped us on the front-end of this project,” said Charlie Bach of PSBA, “They did a site visit, developed a design concept for the control system and coordinated all the radio communication issues. Because of their expertise in water and wastewater applications, they were easily able to apply the right control algorithms as well as design a user-friendly system that was very easy for the operators to use and understand. The fact that a Healy-Ruff control system has been helping run the plant for 30 years also made it an easy sell to the town that they could have confidence in a Healy-Ruff solution. Healy-Ruff dramatically reduced both our engineering time and our risks associated with the project.”

The new control system consists of a Micro V-PAC RTU and a level transducer at each tank, which regulates the valve to control the tank levels. Each RTU communicates back to the water plant. A Micro V-PAC also controlled the new booster pump station. At the plant, a Master V-PAC with a graphical, touch-screen interface provided control of the high service pumps as well as serving as a CTU providing supervisory control and an interface to the entire system.

The new system also gives Palmyra an infrastructure that would make it easy to expand and upgrade as they add new sites or add a PC-based SCADA system.



Improved Performance Earns Skeptics' Approval

The project was subject to some skepticism—around town and in the plant. “There were many people who told us it would never work,” said Superintendent Lloyd. Also, although the plant staff was interested in improving their operations, they were somewhat concerned about adapting to the new technology.

“We were used to running the system by using the pressure gauge on the original Healy-Ruff control panel as a stopping point. The mark on the gauge (61 PSI) was the maximum pressure we could achieve at the plant,” said Schneider. “When they told us about the new system, we were a little intimidated by the technology and were not sure how accurate it would be. However, when Healy-Ruff and Hydro-Kinetics came to commission the system, everything went smoothly. They really explained everything and took a lot the mystery out of the system.



The Master V-PAC gives us a lot of important information in a very easy-to-use format. With the touch screen, it is very simple to both access information and make changes to the system.”

“Once we switched over the new system, we went out and physically measured the tank levels to check on the accuracy of the level readings – they were within inches. Also, it took just a few hours to fill the Industrial Park tank – which had never been completely filled before.”

In addition to improving the system operations, there were many benefits to the people of Palmyra through improved water service, quality and capacity and many cost savings. There was an overall average improvement in water pressure from 61 to 74 PSI in the system. It also gave the town 150,000 gallons of additional capacity for future growth.

There are also areas of dramatic cost savings. In order to keep the system “fully charged” the water plant needed to produce/pump water an average of 9.5 hours a day. With the new ability to individually control each tank, only 6.5 hours a day of production are required. This nearly one-third reduction in production requirements has dramatically reduced the need for overtime, while increasing the time available for other projects. It has also reduced energy consumption dramatically. Additional benefits include reduced equipment maintenance and extended equipment life due to the reduction in daily run-time.

And what about the skeptics? “I never thought I’d see the day when we could get water out of the overflow pipe at the Industrial Park tank,” said Schneider with a smile.

“The morning after we switched over to the new system, I got several calls from around town telling me how much better the water pressure was in their showers that morning. That makes us feel pretty good,” added Lloyd.



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