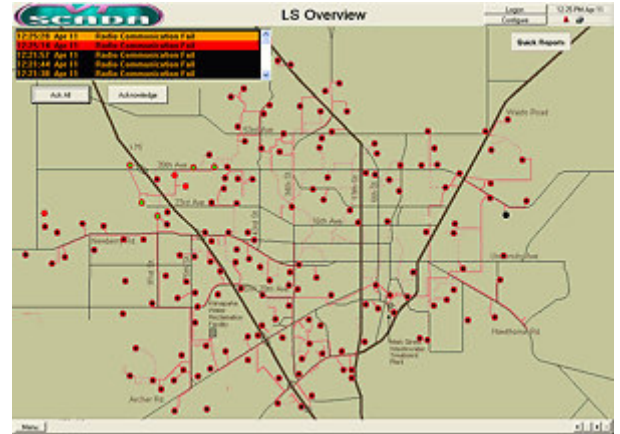




How a Unified SCADA Solution Increased Reliability & Reduced Costs

The story of Gainesville, Florida

By Christopher Little, Trihedral Engineering Ltd.



VTS lift station network at GRU

In 1999, Gainesville Regional Utilities began utilizing VTScada™ to control and monitor its lift station network. When staff compared this to what they were using in their treatment plants, they saw an opportunity to unify their system and open up their proprietary SCADA central.

The historic city of Gainesville Florida is best known to the world for the academic and athletic accomplishments of its University of Florida founded in 1905. Yet, the third largest University in the US might easily have ended up somewhere else if city planners had not had the foresight to construct modern water and sewer systems, and then offer them to the university for free.

Today, Gainesville Regional Utilities (GRU) is the fifth largest municipal utility in Florida and serves just over one hundred thousand people. The utility operates two wastewater treatment plants (the Kanapaha Water Reclamation Facility and the Main Street Wastewater Treatment Plant) as well as 165 lift stations. Together, these facilities process approximately 20 million gallons of wastewater a day.

GRU employs a variety of monitoring hardware including Programmable Logic Circuits (PLCs) from TI, Moore and Siemens in its plants, and Remote Telemetry Units (RTUs) from Data Flow Systems at its lift stations. The plants used a legacy HMI, while the lift station central was a proprietary system.

Two Major Problems:

1. The HMI they were using in their treatment plants was not Y2K compliant.
2. The supplier for their lift station central software was unable to provide the level of support required.

A Divided Approach:

It was decided that the HMI in the plants would be replaced with SCADA software from Wonderware. Although this met the basic requirements for the plants, it lacked features required for use in the lift station system. The challenge then became to find a different software package that included a driver for the proprietary RTUs used in the lift stations.



Typical lift station display

Trihedral Engineering Limited had recently created this proprietary driver for use with its VTS software. Digital Control Corporation (DCC), a systems integrator working with GRU at the time, knew of this driver and contracted Trihedral to provide the solution for GRU's lift station system.

Using their Data Flow driver, Trihedral installed a VTS application that not only tied together all the lift stations but also included the VTS Alarm Dialer, integrated reporting tools and seamless failover from primary server to backup server. It was this application that became the prototype for Trihedral's water and wastewater software tools layer, VTScada.

For the next several years these two systems operated in tandem with Wonderware in the plants and VTS in the lift stations. This required that extra time and money be spent training staff on two different systems. Additionally, the successful lift station implementation illuminated several issues with the treatment plant HMI.

The issues at the plants included:

1. **Expense:** The Wonderware installation required separate server computers for each SCADA service (e.g. – polling, historical data logging) Besides the initial cost of the servers themselves, each required an expensive Wonderware license with annual support fees.
2. **Configuration time:** Changes made to application displays and databases had to be manually updated on each networked computer.
3. **Reliable failover:** When a server failed, or was manually taken offline in one part of the plant, an operator had to run to another part to activate the backup server.
4. **Organization of information:** Some operators required real-time information from both the plants and lift stations to do their jobs effectively. This required access to two different HMIs.
5. **Alarm options:** If an operator was unable to react to a critical alarm there was no way to escalate the alarm to notify other operators or supervisors.

This last point hit home in 2001 when an expensive spill occurred due to an operator being unable to respond in time. In the days that followed, another operator noted that the accident could have been prevented with VTS.

The VTS Alarm Dialer automatically contacts critical personnel from a roster if alarms go unacknowledged. Recipients hear auto-generated voice messages that detail the nature of the alarm and offer an opportunity to acknowledge the alarm over the phone.

A Unified Solution:

At this point, Gainesville Regional Utilities decided to remove the Wonderware HMIs and incorporate the plant and lift station system functionality into a single, unified VTS application. Three major factors influenced this decision.

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1. The extensive library of device drivers Trihedral had developed meant VTS could interface with all existing hardware and incorporate new devices as needed.
2. Trihedral's ability to convert the existing HMI database rather than rebuilding it from scratch. This saved time and reduced the likelihood of costly errors.
3. The high quality of Trihedral's technical support team.

Benefits:

To best meet the needs of the utility, Trihedral provided GRU with a fixed price contract to be completed at the utility's convenience. The single, unified system immediately began saving the Utility time and money.

- Training costs were drastically reduced. The consistent look and feel of the interface meant operators could be transferred to any location without requiring additional HMI training.
- Operators could see both plant and lift station data displayed on the same displays.
- The number of dedicated servers was reduced due to the ability of VTS to run all services (e.g. polling reporting, historical data logging) on a single server.
- Concurrent VTS Internet Client licenses replaced per seat client licenses, significantly reducing licensing fees.
- Operators could make configuration changes on one computer and automatically push those changes out to all networked VTS computers (including VTS Internet Clients) within seconds.
- The system could be controlled remotely in the event of a toxic chemical leak at one of the plants.
- Automatic server failover was set up such that the primary and backup servers for each part of the system (e.g. plants, lift stations) were located in separate buildings, improving the reliability of the system as a whole.
- Trihedral's technical support ensured the burn-in period continued smoothly.

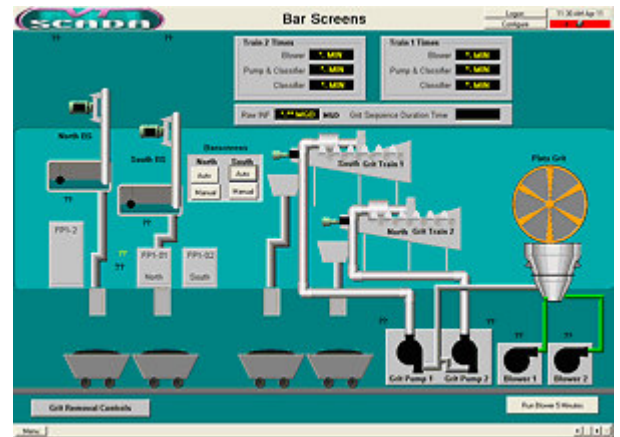
Technical Support:

As with the implementation of any large-scale project, there were the usual growing pains that required regular communication between Gainesville staff and Trihedral's technical support team.

It was in this area that Trihedral set themselves apart from their peers and was a major factor in expanding the VTS system to include the plants.

In the words of GRU Instrument Technician, Thomas Wallace, "As long as Trihedral keeps offering this level of customer support, there will always be VTScada at Gainesville."

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Bar Screen display from the Kanapaha Plant