

## Evansville Water and Sewer Utility (EWSU) SCADA System Upgrade

### **Overview**

The Evansville Water and Sewer Utility (EWSU) in Evansville, Indiana, supplies 32 million gallons of water per day to 60,000 commercial and residential customers. EWSU also handles all wastewater treatment, sanitary and combined sewer systems for the City of Evansville. Over the past two years, EWSU has been updating its systems for automation and information technology.

InGen Technologies, a Semaphore Authorized Solutions Partner, is the systems integrator for both the SCADA and IT portions of the upgraded system. Scope-of-work for InGen includes the following:

- Monitoring of 22 Combined Sewage Overflow manholes.
- SCADA for 84 lift stations and other remote points.
- New automation systems for three filtration plants.
- Motorola Canopy wireless communications network.
- Central data center.

Following is further information on the T-BOX installations at Combined Sewage Overflow manholes, lift stations and filtration plants.

### **Combined Sewage Overflow Monitoring**

Monitoring of Combined Sewage Overflow (CSO) is used for public notification. Environmental Protection Agency (EPA) regulations require utilities to monitor, generate reports and immediately notify the public about any overflow events. The objective was to automate the data collection process. Before this project, EWSU employees had to travel to each of 22 locations and read the historical data in level/flow meters using low power, “drive-by” wireless technology. This process took an entire day and didn’t meet the real-time notification mandated by the EPA.

At these locations, InGen decided to keep, in place, the existing Teledyne ISCO battery-powered, ultrasonic area-velocity flowmeters. According to Mike Halbig, president of InGen, “The ISCO flow meters were doing a great job under some pretty tough environmental conditions.”

For automated data collection, InGen installed Semaphore’s T-BOX RTU products on nearby 40-foot poles and ran wired, serial Modbus connections to the meters. Halbig added, “T-BOX combines communications and control with onboard data collection, trending, alarming and long-term data storage, all in one, low power consuming package.”



At such remote installations, the IP forwarding capability of T-BOX provides a key advantage. Over a serial connection, T-BOX can collect real-time and historical information from intelligent end devices and forward it on an IP network. Added Halbig, “We equipped each T-BOX with a Motorola 900 MHz ‘subscriber module’ radio that communicates with Motorola Canopy wireless access points installed on top of three water towers throughout the city. The ISCO flow meters indicate how much, if any, combined wastewater is being diverted to the Ohio River, and the T-BOXs upload this information in real time via the wireless umbrella to a secure server in the utility’s central data center. If for any reason, the wireless link is lost, the individual T-BOXs retain the data until it can be uploaded.”

InGen also employed the T-BOX integral webserver in an interesting manner. While the webserver normally provides the HMI functionality in a decentralized SCADA system, EWSU’s system was already in operation with a centralized SCADA architecture. However, InGen found the T-BOX webserver to be ideal for local diagnostic and troubleshooting tools used by EWSU’s technicians.

### ***Lift Station SCADA***

For upgrades at the lift stations, InGen provided panels that include a T-BOX MS RTU, LCD flat screen monitor and indicator panel. The RTU monitors and controls operation of pumps, valves, and wet well level and includes safety/security monitoring functions such as door intrusion and smoke detection.

SCADA communications are via the Motorola Canopy wireless network with 900 MHz subscriber module radios installed in the panels. Over the network, operators have access to alarms, live status for all points at the stations and historical information.

Using Semaphore’s TWinSoft programming environment, InGen developed standard function blocks for pump station operations. Use of the function blocks maximizes commonality among the stations and simplifies operations and maintenance.

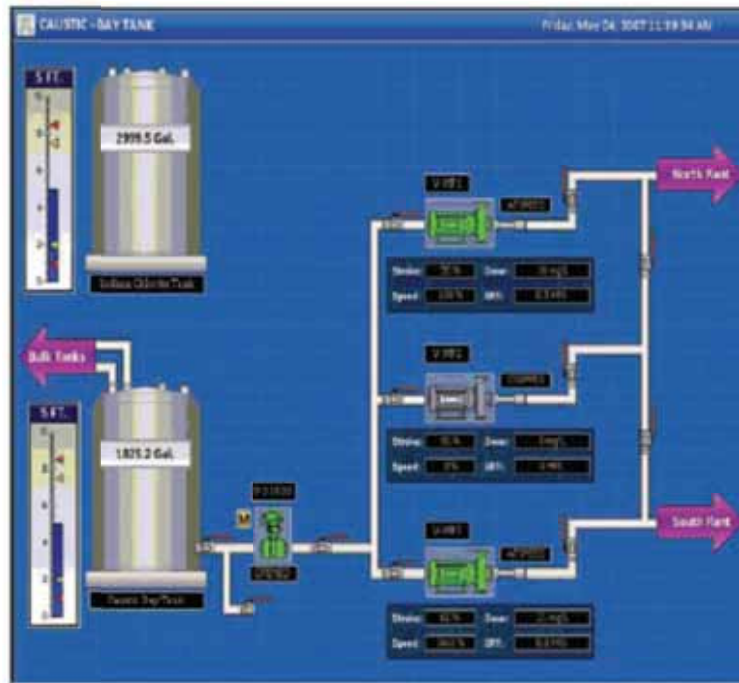


### ***Filtration Plant Automation***

Using T-BOX MS RTUs, InGen implemented monitoring and automation for all filtration plant processes:

- Filter backwash sequencing.
- Low service pumps.
- High service pumps.
- Alum treatment.
- Carbon slurry treatment.
- Caustic soda treatment.
- Flouride treatment.
- Water storage tanks.

Like the lift stations, filter backwash and other processes were suitable for InGen's development of standard function blocks. This significantly decreased process testing and startup and also simplifies operations and maintenance for EWSU.



### **Conclusion**

InGen's implementation for EWSU was able to take full advantage of many of the features offered by Semaphore's T-BOX products:

- Alarm management — All three processes use the T-BOX alarm system for detection and reporting of alarm conditions High service pumps.
- Data logging — the CSO locations use T-BOX data logging capability to process and retain historical information in the event of communications network down-time.
- Push technology and Multi-communications — IP forwarding of live and historical CSO information that is provided via Modbus by manhole-mounted meters.
- Integral webserver — in this case, used for technician's tools, including local diagnostics.
- TWinSoft programming environment — InGen found that TWinSoft expedited development of standard function blocks for a variety of monitoring and control operations.