



Radio Telemetry & SCADA System Combines Technologies

January 2000 - A new Supervisory Control and Data Acquisition (SCADA) system provided by ESCOR for the City of Jacksonville, North Carolina exhibits ESCOR's engineering expertise by combining a variety of control, communications, and operator interface technologies.

The City of Jacksonville, located on the North Carolina coast, is the gateway to the Camp LeJeune U.S. Marine Base. When the City decided to update their wastewater telemetry and combine it with the water system's SCADA they presented a variety of challenges to potential suppliers. The requirements included a variety of telemetry devices, combining new and existing Input/Output (I/O) equipment, and real time operating data displayed on a dual PC graphic interface. Reliable communications during the area's frequent hurricanes is essential.

The wastewater treatment system includes twenty-eight pumping stations connected to the wastewater administration site by a leased-line telephone telemetry system. Originally connected to an annunciator system, the pump and alarm monitoring points were re-terminated to a new PLC. This PLC also serves as the communications master for a variety of additional devices.

Four new wastewater sites are connected to the administration site PLC by Pacific Crest digital radios. Using a newly licensed UHF frequency, the sites are polled by the master at 4800 bps. Using Modbus RTU protocol each location is updated several times each second. Each of the sites uses a Control Microsystems Remote Telemetry Unit (RTU) for discrete and analog I/O. One site, a land application treatment facility, has 36 discrete inputs. In addition to superior communications capabilities and expandable I/O, these RTUs include ladder logic capabilities. Alarm, data logging, and local logic interlocks are incorporated into the RTU's logic to provide data integrity and reliable control even if communications failures occur.

Twenty-four water locations were consolidated into the ESCOR system. These include wells, pump stations, and elevated tanks. The original RTUs, most installed in 1990, used a proprietary communications protocol and analog radios operating at 300 bps over a VHF licensed frequency.

The original RTUs were replaced with new Control Microsystems units. The original analog radio link and frequency was maintained. New Bell 202 compatible modems were used to connect the RTU's Modbus serial communications to these radios, increasing the communications to 1200 bps. One of the elevated tank sites is configured as a repeater station, connecting the original analog radios with the new digital radio systems.

The old water SCADA system used proprietary operator interface software. Running on a 386 PC with a Concurrent DOS operating system, the interface was slow, was not easily expandable, and was not Y2K compatible.

The screens, trends, and reports from the water system were expanded and incorporated into a new WonderWare graphical interface. State of the art PCs and a Windows NT operating system insure expansion capability. Two fully independent PCs are used. Both PCs display all screens for both the water and wastewater systems. Each PC is connected to a separate communications port on the master PLC. To insure data integrity and consistency critical alarm and data logging functions are programmed into the PLC.

One of the advantages of the ESCOR system was the use of Modbus communications for the entire system. This allows future expansion using RTUs, PLCs, and other control system components from a variety of manufacturers. ■

For additional information contact Ray Holder of the City of Jacksonville at (910) 938-5266. For more information about ESCOR's services contact Tom Jenkins.