Automation System for Wastewater Treatment Plant at Vrbas-Kula, Sludge Line

Location: Vrbas City outskirts (Serbia)
Investor: Delegation of European Commission to the Republic of Serbia
Beneficiary: Vrbas-Kula Municipality (Serbia)

MAIN OBJECTIVES

- Electrical installation and system for Sludge Line at Wastewater Treatment Plant:
  - Complete electrical installation, local and remote automation
  - Control and supervision of: sludge thickening, anaerobic digestion, gas production and sludge dewatering and disposal to landfill)

- SCADA system for local and remote control:
  - Local and remote measurement of multiple processes
  - Distributed control system architecture and management
  - Historical logging of relevant values with trends overview

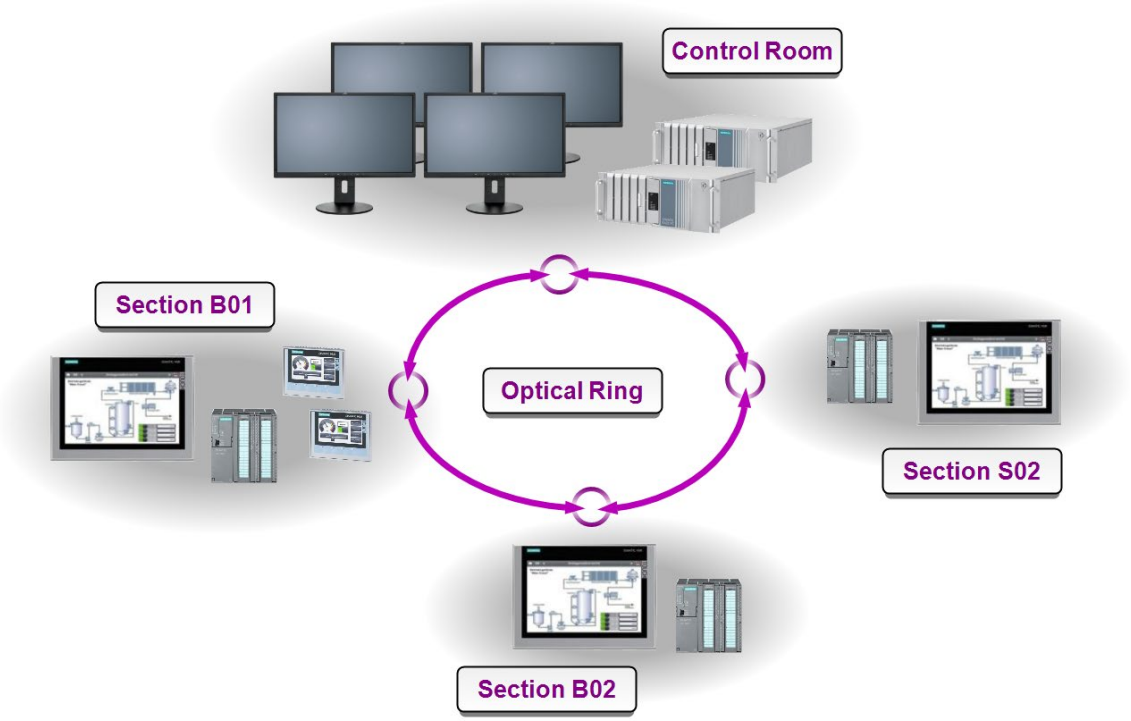
- Connection to existing Water Line at same plant (built in first phase of project)

- Implementation of modern equipment, functionalities and industry standards

SCOPE OF WORK

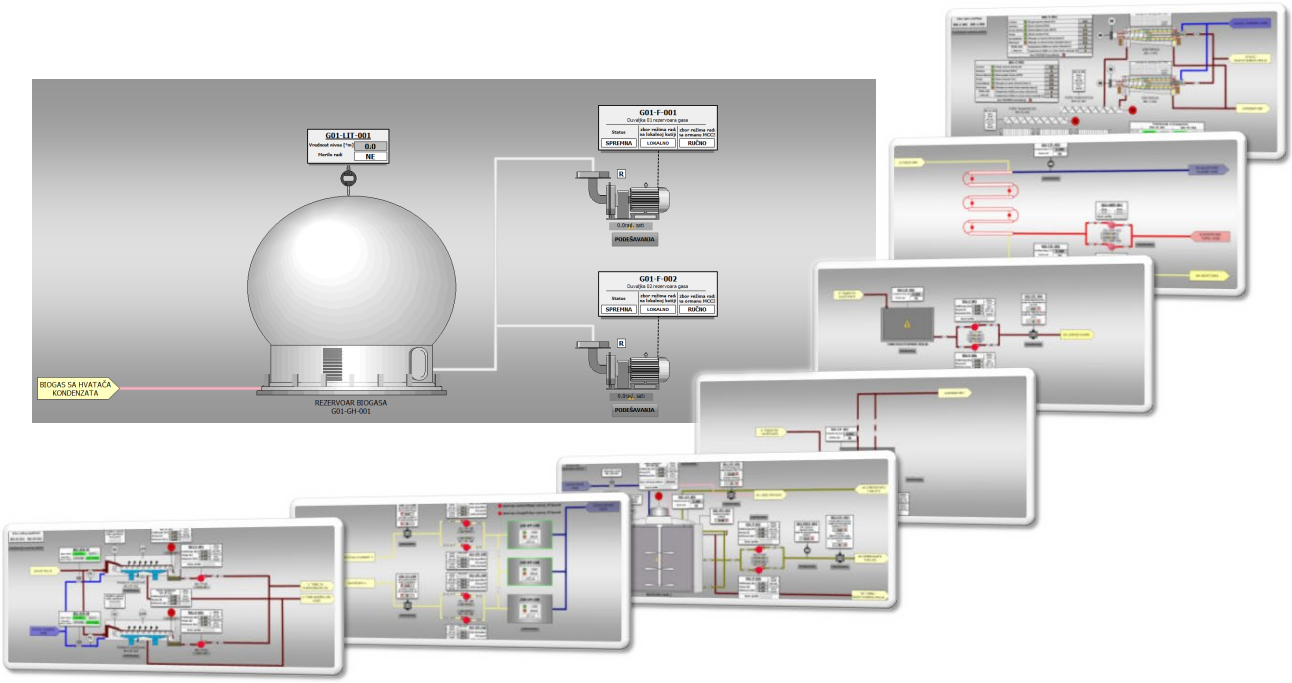
- Wastewater Treatment Plant is divided into three sections (B01, B02, and S02) with regards to control automation. Each section has its own MCC, PLC and local HMI display. Section B01 is equipped with additional smaller local HMI display, located next to belt thickeners. Both PLCs and (section) HMI displays are located within their respective automation cabinets.

In addition to these three sections, plant is equipped with control room, which supervises all plant operations. Inside this control room, two computer stations are used for control and supervision of entire Wastewater Treatment Plant. Computer station and section control cabinets are connected in ring architecture, with optical links between control room and sections, and ethernet and siemens profibus links within each location.



SCADA System

- All control access points (scada, local displays) can be used independently, within their operational parameters. For example, belt thickener can be operated from its local display, from main HMI display in Section B01, or from either scada station in Control Room. However, only scada stations in Control Room can operate the whole Wastewater Treatment Plant. Main HMI display on Section B01 is not equipped to operate with processes on Sections B02 and S02, and vice versa.



In addition to complete operational access, scada stations are equipped with comprehensive trends and history. Local HMI displays have access to alarm lists, but not to process history and trends. Scada stations can operate on one or two monitors, and they are equal in operational hierarchy. Even so, stations are configured as server and client. For client station to be fully operational, server station must be online and running.

Equipment and Instrumentation

- Control of Sluge Line requires precise measuring of multiple process values. Most common are: flow, pressure, temperature, and PH values. Krohne equipment is used for most of these measurements. Some of the installed instruments are: **Optiflux 4000F**, **Optisense 8300** (+ Mac 100), **Optitemp TRA-S11** (+ TT30C), **Optisonic 7000** (+GFC300C), **Optibar 5060C**.