

# PROJECT NARRATIVE



## System Description

**Owner:** Detroit Water and Sewerage Department

**Plant Name:** Wastewater Treatment Plant

**Product Type:** Ovation

**Plant Capacity:** 710 MGD

**Application:** WWT

**Contract Initiation:** 1999

## System Highlights:

- Includes the Wastewater Treatment Plant, 5 water treatment plants, 23 treated water booster pumps, 5 high-lift pump stations, 10 wastewater pump stations, 3 CSO basins, and over 170 remote radio telemetry sites
- 1 Plant Control Center, 6 Area Control Centers, 1 System Control Center
- Ovation network with more than 40 integrated Ovation systems
- Training for more than 700 operators, maintenance technicians, and engineers
- Comprehensive 7-year maintenance program

**DCS I/O Point Count:**

~ 30,000 I/O points

**Number of Graphics:**

3,327 Graphics



This image is the Detroit Water and Sewerage Department's (DWSD) System Control Center (SCC) with Emerson's Ovation® digital control system. The SCC monitors and controls the entire water distribution system and wastewater collection system.

## **DETROIT WATER AND SEWERAGE DEPARTMENT (DWSD) Instrumentation, Control and Computer System (ICCS) Upgrade Located in Detroit, Michigan**

DWSD, a municipally owned utility, provides roughly 4 million residents in southeastern Michigan with an average of 710 million gallons of water per day. Its main Wastewater Treatment Plant (WWTP) – among the largest single-site WWTPs in the United States – collects and treats residential, commercial and industrial wastewater for 78 municipal communities.

To enhance service, process and operational efficiency, and to meet the need for future expansion, DWSD initiated a multi-phase, multi-million-dollar upgrade program encompassing its water distribution system, wastewater collection system and WWTP. The DWSD project is noteworthy for its considerable scope, complexity and anticipated long-term positive impact on operations.

As part of this comprehensive program, Emerson was selected to design, assemble, test and implement a new Department-wide Instrumentation, Control and Computer System (ICCS). The contract also called for Emerson to train more than 700 DWSD operators, maintenance technicians and engineers on the new ICCS, as well as maintain the system for a designated period of time.

October 2009 marked successful completion of the design and construction (Phase One) of a multi-year initiative to modernize the Detroit Water and Sewerage Department's (DWSD) vast water and wastewater treatment complexes with its Ovation® control and SCADA solution.

## Benefits of the Ovation System

- Better management of distributed systems and remote sites
- Streamlined environmental reporting
- Improved water/wastewater process control reliability
- Reduced operations and maintenance costs
- Enhanced ability to detect and isolate system leaks
- Improved ability to react to rapidly changing conditions such as storm water inflow

This comprehensive automation and control solution helps DWSD improve operational efficiency, maintain regulatory and environmental compliance, and accommodate future system expansion. With this major undertaking now complete, Emerson has entered the seven-year comprehensive systems maintenance portion (Phase Two) of the project. During the maintenance phase, Emerson will provide around-the-clock critical maintenance on all control system-related equipment, including software, networking, and communications equipment, new and existing instrumentation and controls, DCS hardware, PLCs, and accessories.

The ICCS upgrade project covers more than 1,000 square miles and includes the WWTP, five water treatment plants, 23 treated water booster pump stations, five high-lift pump stations, 10 wastewater pump stations, three Combined Sewer Overflow (CSO) basins, and more than 170 remote radio telemetry sites monitoring level, pressure and discharge.

Emerson's integrated Ovation control and SCADA solution included installation of a WWTP Plant Control Center (PCC) connected to six new Area Control Centers (ACC), as well as an overall System Control Center (SCC) that monitors and controls the entire water distribution system and wastewater collection system. The SCC features a 43-foot-by-8-foot video display wall that provides geographic images of the entire service area, including all facilities, pump stations and critical sensors. For each facility and monitoring location, system information – including water pressure, valve positions, pump and equipment status, rain data, sewer levels and flows – is collected and broadcast over the network. All the information received or generated by the system is also stored in a high-capacity historian so that it can be used to plot trends, analyze events and project future operational requirements.

Emerson's SCADA solution includes a combination of leased lines, licensed radio and spread spectrum radio interfaces to a redundant SCADA communication server to monitor five high lift pump stations, 40 pump stations, and 353 remote monitoring stations for the treated water and waste water collection systems. A total of 7950 points are monitored and available from the SCADA system to the SCC.

In all, the Ovation network architecture features more than 40 integrated Ovation systems monitoring and controlling approximately 30,000 I/O points.