

# *Case Study* Use of Control System to Maximize Efficiency and Reduce Costs



North Shore Sanitary District  
Gurnee, IL

**DONOHUE**<sup>®</sup>  
& ASSOCIATES

# North Shore Sanitary District

- ▶ 3 municipal sewage treatment plants
  - Clavey Road (17.8 mgd average design flow)
  - Gurnee (23.6 mgd average design flow)
  - Waukegan (22 mgd average design flow)
- ▶ Treatment processes
  - Primary clarification
  - Two-stage nitrification
  - Sand filtration
  - Excess flow treatment
  - Sludge GBT and belt press dewatering



## **NSSD Objectives Were to Improve Performance and Control Costs**

- ▶ Automate process to permit single shift operations and eliminate off-shift coverage
- ▶ Reduce electrical and chemical costs
- ▶ Implement automated data gathering and management
- ▶ Reduce emergency responses

# Automation Objectives

- ▶ Address all process operations
- ▶ Increase operational flexibility with multiple control modes
- ▶ Provide response to alarm and failure conditions
- ▶ Minimize routine maintenance with automate lead/lag sequencing of equipment & exercising of standby equipment
- ▶ Automate response to power outage
- ▶ Provide remote access to control system

# Automation Hardware & Software Solution

- ▶ Distributed Allen Bradley PLCs – total of 10,200 I/O
- ▶ Redundant in-plant fiber optic network
- ▶ PC-based operator interface (ICONICS)
- ▶ Remote modem access
- ▶ WAN connection to District headquarters



# Project Impact

- ▶ Since 1994, Waukegan STP has operated automatically
- ▶ Based on success of Waukegan, Clavey Road and Gurnee STPs have also been automated
- ▶ Operator coverage at 40 hours per week per plant
- ▶ Unmanned operation for holiday weekends (Up to 72 hours)
- ▶ Off-shift call-ins average 1 to 2 calls per month
- ▶ Plant effluent quality has not been impacted
- ▶ Electrical power has been reduced

UNITED STATES  
ENVIRONMENTAL  
PROTECTION AGENCY



FIRST PLACE

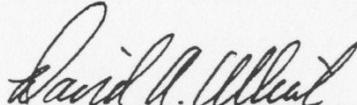
AWARD OF EXCELLENCE

Presented to  
North Shore Sanitary District  
Waukegan Treatment Plant, Waukegan, Illinois

Eugene Lukasik

GENERAL MANAGER

FOR OUTSTANDING OPERATION  
AND MAINTENANCE OF THE WATER  
POLLUTION CONTROL FACILITY  
LARGE ADVANCED

  
Regional Administrator  
(Acting)

1998

Region 5 • Chicago, Illinois

## NORTH SHORE SEWER DISTRICT TO CUT FEES 5 PERCENT

**By Casey Bukro**  
Tribune Staff Writer  
*October 9, 1999*

The North Shore Sanitary District Friday announced a 5 percent cut in user fees, the fourth such cut in three years, totaling 20 percent.

Its operations and maintenance budget has dropped from \$25 million to \$16 million through automation and savings in labor, utility and chemical costs, Jensen said.

# NSSD Automation Keys To Success

- ▶ Began with high expectations
- ▶ Major Owner involvement from concept to implementation
- ▶ Understand unique nature of operations
- ▶ Flawless startup
- ▶ Continuous improvement