



A Rockwell Automation Company

City of Carlsbad, California Encina Effluent Flow Equalization and Water Reclamation Facility

The Client:

The Encina Wastewater Authority is a public agency located north of San Diego in the City of Carlsbad. It was created in 1961 by six local water agencies with a common goal to share the cost and benefit of combined municipal wastewater treatment. It owns one wastewater treatment plant with four pump stations: Buena Creek (34mgd), Buena Vista (23mgd), Agua Hedionda (31mgd), and Raceway (0.7mgd). After its fifth expansion in 2005, wastewater capacity for treatment was increased to 36 mgd liquid phase and

38mgd dry weather solids flow. Most of its secondary effluent flow is disposed into the ocean, while 5mgd are reclaimed back for reuse within the plant. Another 4 mgd are forwarded to a nearby advanced tertiary treatment plant – Carlsbad Water Reclamation Plant. This plant treats secondary effluent with micro filtration (MF) followed by reverse osmosis (RO) and produces high quality reclaimed water for irrigation.

The Requirement:

The goal of this project was to provide engineering design and fabrication of six electrical control cabinets, PLC programming, HMI programming, panel drawings, loop drawings, field instrumentation (58

process measurement devices), pre-commissioning, and instrument training.

The Design Solution:

Three new electric control cabinets were designed – one for PLC (redundant ControlLogix processors) and two for remote I/O racks. The PLC receives data from the secondary equalization pumps and the standby generator via ControlNet. The same PLC receives data for the status of the RO system by gathering data over Ethernet from two new remote I/O racks situated near RO skids, each mounted in separate cabinets. The new PLC, controls four secondary effluent equalization pumps, a sluice gate, and one return flow gate valve. It collects data from over 58 new sensors delivered and commissioned by Hinz. They monitor key water quality or process parameters such as turbidity, pH, flow, level, pressure, temperature and others. Data for the status of reclaimed water pumps, granular media filters pumps, MF feed & backwash pumps and RO feed pumps is collected remotely from remote I/O racks.

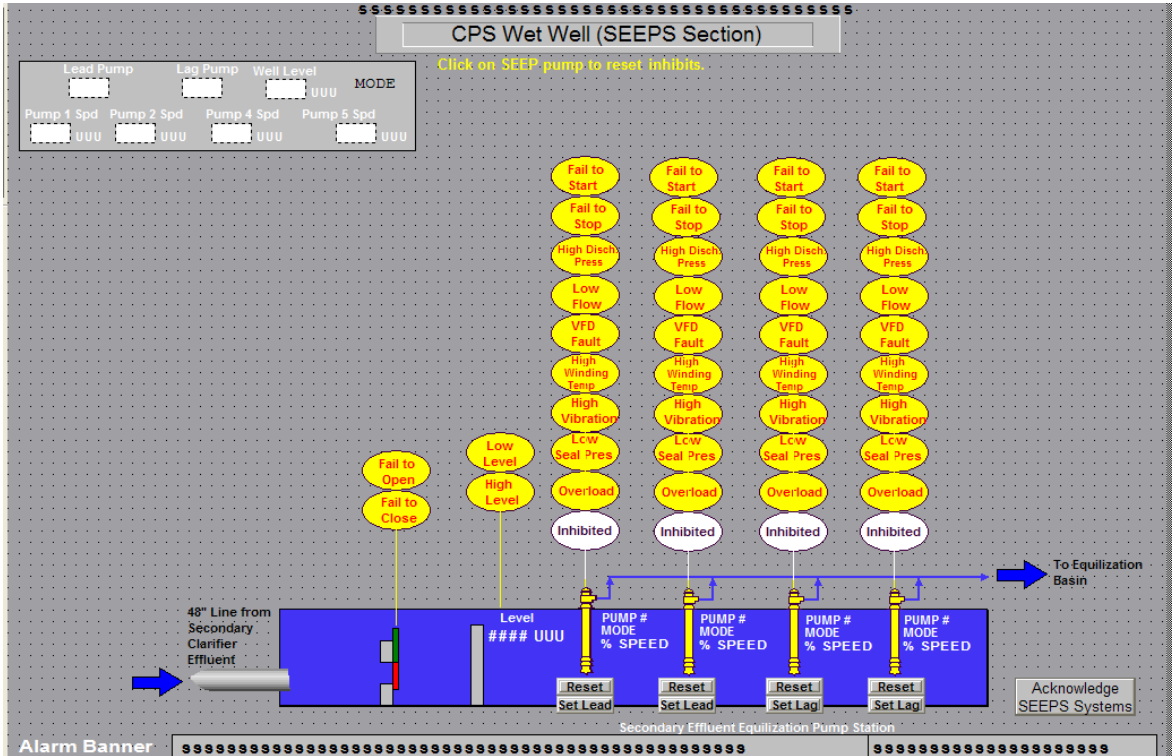
The HMI application displays information about all process related information for the entire group of

devices having contact with the secondary effluent stream. The goal is to provide information for the local operator on every stream of water entering or leaving the secondary and tertiary water reservoirs, thus enabling optimum control of the secondary effluent equalization pump station. In total there are 175 I/O (36 analog and 139 discrete) monitored or controlled by the HINZ system. Backup generators used for alternative energy source in the plant are also monitored by the new PLC. Strict engineering standards were applied across software applications (HMI and PLC). Graphical faceplates, animated symbols, color conventions, screen layout, and PID control strategy was coordinated with the client prior to actual project execution. For length extension and optimum noise suppression, part of the communication link is carried over a fiber optic line.



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System Specifications:

- **HMI Design Platform** – RSView32; Screen count – 35; Analog I/O-39; Discrete I/O – 139
- **PLC** – redundant ControlLogix 5000 processor; Remote I/O – 1756 ControlLogix I/O
- **Communication protocols** – Industrial Ethernet, ControlNet, Historical tags – 20; Total process control loops – 17; Computer stations - 2; Fiber Optic to Copper Transducers – 4;

For further information or to contact a Hinz office near you, please check our website at:

www.hinz.com