



Custom solutions for process automation.

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Cleaning and Conditioning Process Line

Industry:

Defense

Design Task:

The US Marine Corp's Fleet Readiness Center contracted KDY to perform a turnkey retrofit and upgrade their Automated Cleaning & Conditioning Process Line. The system consisted of several tanks lines with corresponding overhead cranes to move batches of parts to required tanks for a programmed duration.

The design task encompassed multiple software & hardware elements:

- Update the legacy Allen Bradley PLC-5 System hardware & control program
- Replace the crane positioning system
- Develop a User Interface for the configuration & operational management of the cleaning line
- Provide a new rooftop scrubber control system
- Provide new air handling controls

The Solution:

KDY delivered a comprehensive system update that included:

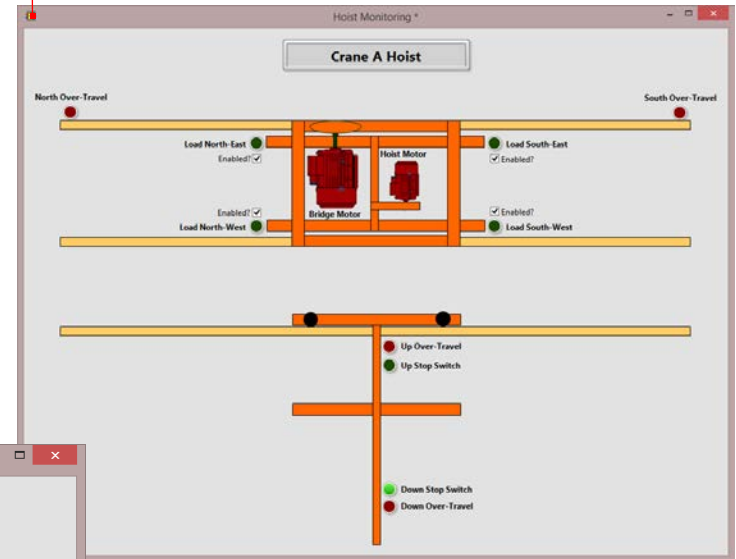
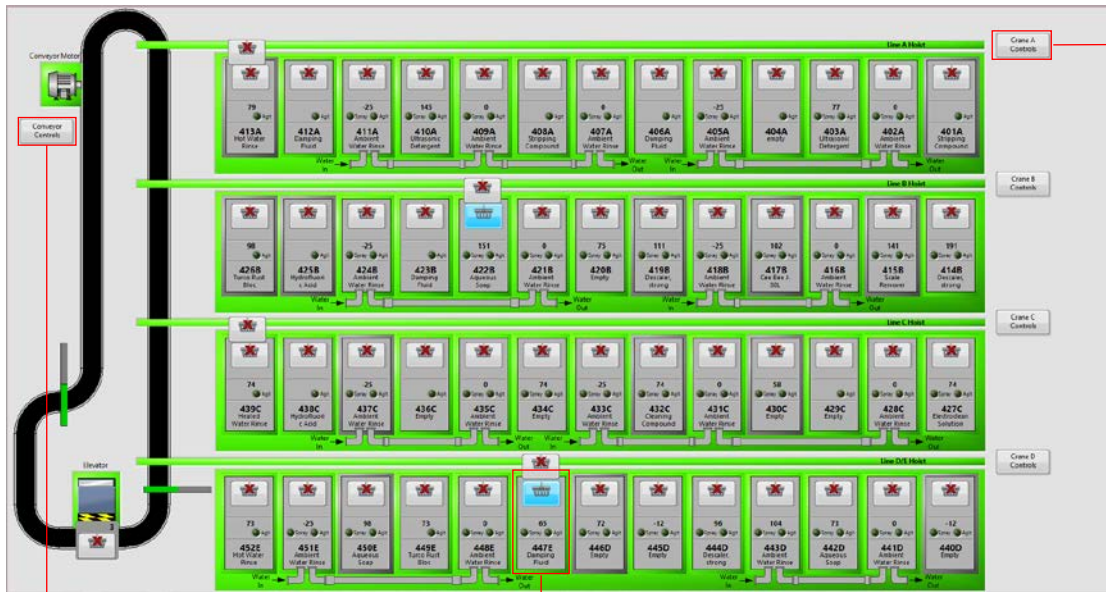
I/O Hardware & Firmware Overhaul

KDY seamlessly modernized the client's existing PLC-5 system to the faster & more versatile AB ControlLogix series. Using the Allen Bradley I/O Wiring and Conversion System, KDY was able to update the existing hardware without the inconvenience of the traditional requiring process. With LabVIEW-based firmware developed in-house, KDY completed the transition with minimal system downtime.

Process Line Hardware Redesign

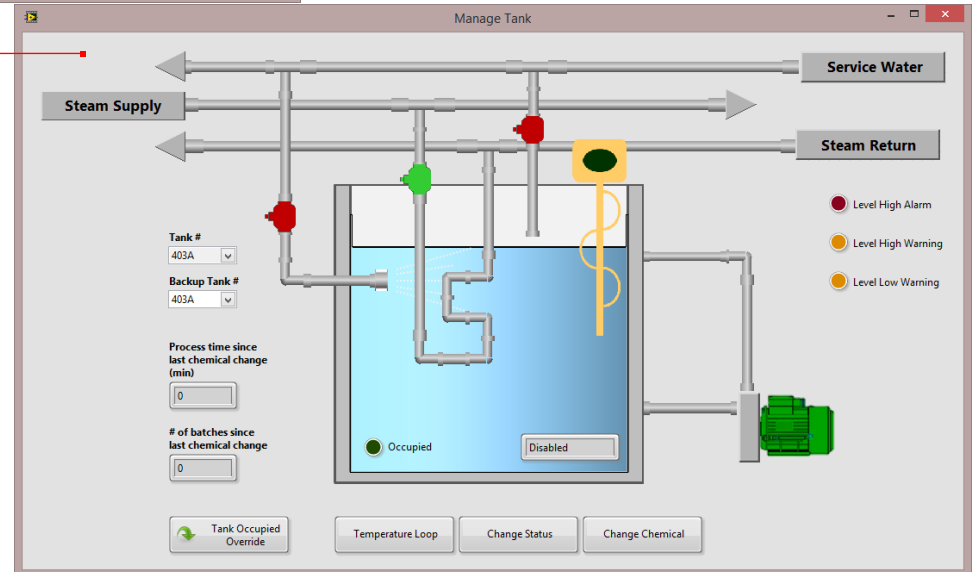
In addition to updating the software & wiring elements of the Cleaning and Conditioning Process Line, KDY improved multiple hardware elements of the system as well:

- Improved Sensing, including:
 - Rosemount 3100 Series Ultrasonic Liquid Level Transmitters
 - Allen Bradley RightSight Photoelectric Sensors
- Upgraded Crane Positioning: KDY replaced the existing diffused light sensor with higher accuracy laser position sensors & designed logic software for the updated PLC system
- Scrubber System: KDY designed the hardware and PLC firmware for a scrubber & neutralizer system to safely strip chemical byproducts of the cleaning process from the system's exhaust vapor. The system featured:
 - A Signet 8900 multi-controller to manage the acidity, ORP & conductivity of the water sump
 - UL-Listed Industrial Control Panel
 - Pulsatron Electronic Metering Pumps
 - Custom user interface panel in the overall software suite



The Conveyor Control interface includes a table for pallet management and various control buttons. The table shows Pallet #, Batch #, and Batch Dest. The control buttons include Empty Pallet Requested, Request Empty Pallet, Clear Empty Pallet, Pallet from Elevator To, Change Dest., Clear Dest., and Clear All Pallet Information.

Pallet #	Batch #	Batch Dest.
1	0	---
2	0	---
3	0	---
4	0	---
5	0	---
6	0	---



Cleaning and Conditioning Line Control & Management Suite:

KDY delivered a robust UI equipped with powerful & intuitive tools:

- Batch management: Manual operation or automated scheduling, computer generated reports,
- System alarm supervision
- Individual tank management: Tank health, temperature, batch state
- Recipe manager & editor
- Conveyor & Crane manual control capabilities
- I/O & Alarm Configuration Tools

All of these features & more combined for a holistic, visually-driven, user-friendly software suite.