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## Think & Do Featured Applications

### A Waste Water Treatment Application

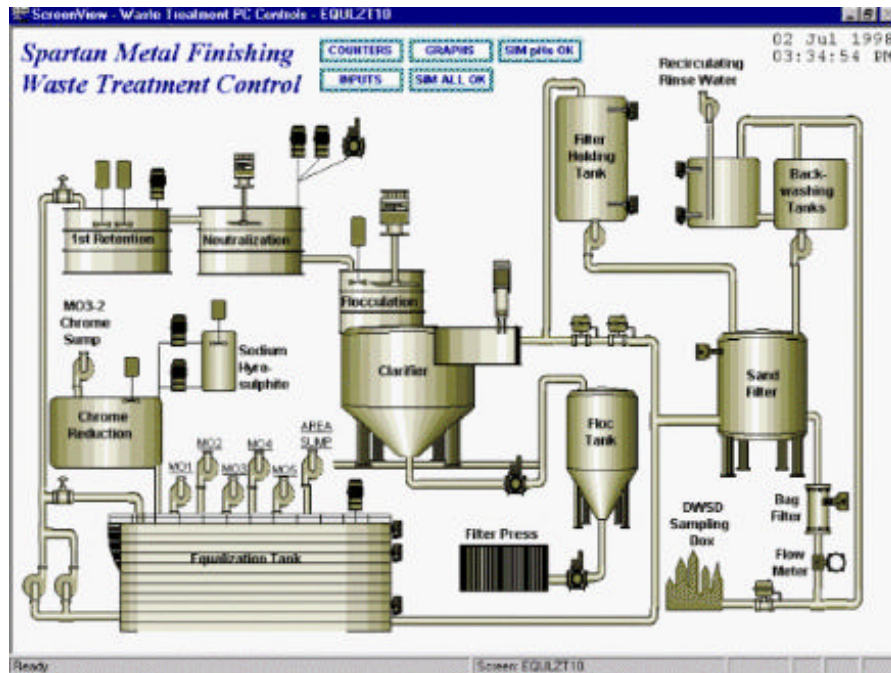
The Spartan Metal Finishing Company provides zinc plating and E-coating of various automotive and consumer products at their Detroit, Michigan plant. Spartan is committed to providing the industry with superior quality and on time service while remaining consistent with its high regard for the environment. Spartan is using **Think & Do** software for process control and HMI on production lines for a waste water treatment and recycling process. Through the use of **Think & Do** software and Ethernet I/O, Spartan has been able to obtain the highest level of dependability in the operation of its wastewater treatment system while lowering cost and reducing implementation times.

Spartan Metal Finishing has been engaged in an ongoing process improvement effort for several years to increase system reliability and efficiency and to reduce costs. As a part of that effort, control system requirements include HMI, process reliability and discrete control, recipe management, alarming and data logging. Chief Engineer, Joe Busutill has been developing the process and monitoring control for Spartan's waste water treatment system. He plans to "completely convert all production line controls to **Think & Do** as they develop new lines and retrofit existing plating lines."

Typically, a waste water treatment system receives liquids pumped from the plating line sumps for processing through an elaborate purification system. The process is monitored and data is logged for internal and external reporting. The particles that are precipitated and removed from the fluid are byproducts of plating chemicals dragged out from the zinc and E-coat lines. Proper pH balances are controlled and monitored at all times to allow the solids to form for removal by clarification and filtration. As the wastewater is treated in each stage it becomes purer, until it is at a level suitable for discharge to the city sewer. Spartan presently discharges treated wastewater at a rate of 40,000 gallons per day. This is a dramatic reduction from the prior discharge rate of up to 135,000 gallons per day. This reduction was accomplished through overall process improvements and by recycling purified water from the wastewater treatment process. Some of this recycled water is used for back flushing and rinsing operations in the plating process. The reuse of the water has been a significant cost saving to Spartan since both water and sewer bills are based on water entering the plant.

The waste water process line utilizes Ethernet based I/O from **Automationdirect.com**. They use multiple 205 racks with a total of 64 digital inputs, 48 digital output, 24 analog inputs, and 6 analog outputs. Many sensors and meters are used to monitor fluid levels, flow, turbidity, conductivity, temperature and pH balances in the system. Maintenance information is logged and stored every time pumps and valves are actuated on or off and flagged on maintenance screens. This information is used for preventative and predictive maintenance of the entire system. They have been able to save other component costs on sensing systems going from intelligent sensors to less costly 4-20mA voltage sensors that can be set and changed from the **Think & Do** HMI screen.

Control logic for the system is implemented in **Think & Do** software logic flowcharts. The HMI is implemented in **Think & Do** as well. One of the system's operator screens is shown below.



Goals for process improvement and lowering overall costs were the objectives in going to a PC based control solution. "Achieving this with PLC's and ladder logic was going to be too complicated and cost prohibitive." They have accomplished these goals with **Think & Do Software** and **Automationdirect.com** Ethernet based I/O. They also have better access to process data and have reduced development time in building a their new waste water treatment system. They are very pleased with the results and will continue to automate other processes with **Think & Do** PC based control software.

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