

WINDOWS NT BATCH OPERATING SYSTEM

THE GOAL

A **chemical manufacturer** decided to expand and upgrade their facilities. The ultimate goal of the upgrade was to increase production capacity by 75% while keeping the same labor costs.

Through the automation of various steps in the targeted batching process, it was also expected to increase the yield of material usage. Prior to the upgrade, the yield was 97%. After the upgrade yield is expected to increase by 1% which correlates to an expected annual savings of \$300,000.00.

In addition, the increased level of automation was expected to decrease the overall batch time since raw materials could be added more quickly and efficiently.

THE SITUATION

The process is divided into four (4) process areas, each operating in a similar processing manner. Each area differs only in material bases and the type of product refinement equipment.

The plant manufactures in excess of 500 recipes. Production scheduling is based on overall company inventories and customer demands. All of the products utilize a subset of twelve (12) liquid bulk raw materials. These products are maintained in large quantities in bulk storage tanks. The bulk raw materials were previously added to the process using manual totalizing meters and a weighing tank.

This was a labor and time intensive operation. Other small quantity liquid raw materials and dry raw materials were added by hand.

THE SOLUTION

TransAmerican Automation Inc. (TAI) performed an analysis of the existing plant control equipment. Based on the requirements to provide greater operator integration and improve the productivity of the facility, **TAI** decided to replace the existing MMI interface with a full Level 2 process optimization system using **Moore Products Process Suite Batch (Wonderware's Factory Suite Plus)**. This software combined with the Level 1 Moore Products APACS controller forms the basis of a highly functional and flexible batch control system.

Due to the **Class 1 Div 2 area** classification, a purged computer enclosure has been implemented to provide the necessary protection for the operator's station. From this centrally located station, the operator can access the system and perform all of the batching and monitoring functions. A second batch system station is located in the QC lab. This station enables the lab technicians direct access to the batch process. The technicians approve or reject product samples and can direct process steps and adjustment actions required to finish a batch. The third station is located in the Production Supervisor's office so that, he can monitor the plant floor activities. The fourth station is the Batch System Server, which resides with the plant engineer who will be responsible for modifications and upgrades to the system.

The four (4) computers that constitute the batch system are **Pentium II, 266 MHz, 64 MB RAM PCs**. The computers are networked utilizing standard **Ethernet TCP/IP 10-BaseT** topology. The PC operating system is **Windows NT 4.0 Workstation**. The Batch server communicates with the Level 1 system via a hardware data bridge also connected to the Ethernet network. The Level 1 control system is comprised of redundant CPU

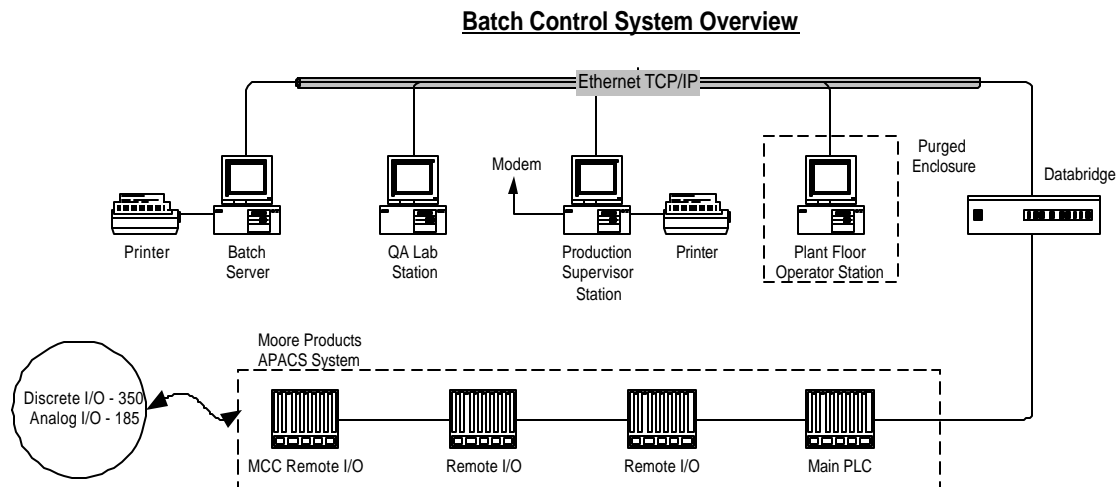


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controllers, providing automatic switching in the event of a CPU controller failure. The DCS I/O is distributed into three (3) locations, providing for more efficient connections of the field devices to the control system I/O. With this system the plant engineers and QC lab technicians have the ability to modify, add, and delete recipes without the need of a systems programmer to modify controller code.

Operator training began prior to startup of the system, using the simulation mode of the program. The simulation mode is inherent with the batch software. This allowed the operators to get comfortable with the look and feel of the new system before the first batch was run.



THE BENEFITS

Automated the bulk liquid additions to improve accuracy and minimize operator errors.

Developed a cleaning cycle routine to help reduce wash water consumption.

Implemented a bulk liquid inventory control system.

Established the foundation for a future electronic batch ticket.

Designed a better operator interface with the DCS providing the operator with a more complete view into the process activities.

Expanded and improved the number of variables monitored in the process.

PLANT PERSPECTIVE

The plant went from a strictly manual operation to a plant of the future, operating today. By utilizing the latest technology, **Microsoft Windows NT**, **Moore Products APACS DCS** and **Wonderware's Batch Software** a small manufacturing facility (~ 50 people) was able to progress from a manual operation to an efficient and automated plant with relative ease, realizing a significant return on investment.

CSWinBatch 1/7/99



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