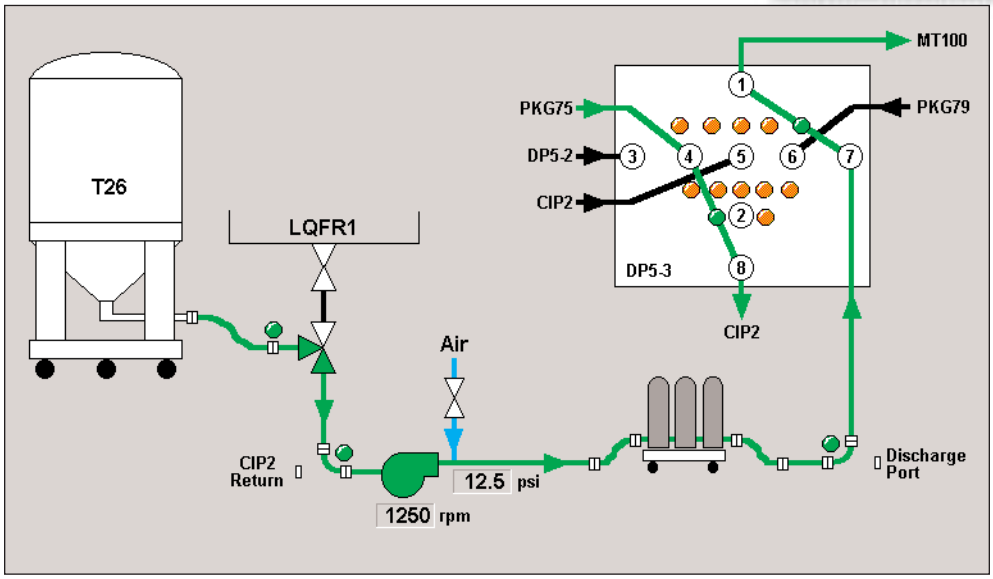
CQS Innovation, Inc.

Flexible Batch Reduces Cost!

Automated batch system provides:

- Equipment-independent master recipes.
- Step-by-step setup checklists on-line for operators.
- Batch scheduling and coordination of similar batches on-line.



Errors and inefficiencies occur in batch manufacturing because of the complexity of recipes, procedures and equipment.

PROBLEM — *With over 60 products in one facility, using nearly 100 processing units, produced to cGMP regulations-this company needed an efficient and flexible batch system. Now they have it!*

BACKGROUND

Batch variety means more labor and equipment-tracking errors.

Small quantities of specialty chemicals and pharmaceuticals are manufactured in batches from pre-weighed, bulk ingredients processed in "portable" equipment trains (temporarily inter-connected pumps, tanks, mixers, reactors, filters, etc.). Because each equipment train was temporary and would not accept permanent instrument and actuator wiring, operators had to manually initiate, monitor and terminate processing steps.

Production equipment also had to be disassembled (and at times moved) to be cleaned thoroughly between uses. The connections and cleaning solutions processing duplicated the manufacturing effort, and keeping a record of equipment status and location added more tasks.

In the pharmaceutical industry, the additional need to keep step-by-step detailed production records increased the operator's labor, and produced a paper workload that increased costs and created processing and data error rates that exceeded acceptance limits.

The efficient scheduling of various pieces of equipment, pre-weighed ingredients, and qualified staff resources required trained, innovative people with easily accessed, accurate information. Without computers to collect and provide the data, buying extra tanks and other spare equipment was the only way to manage scheduling problems.

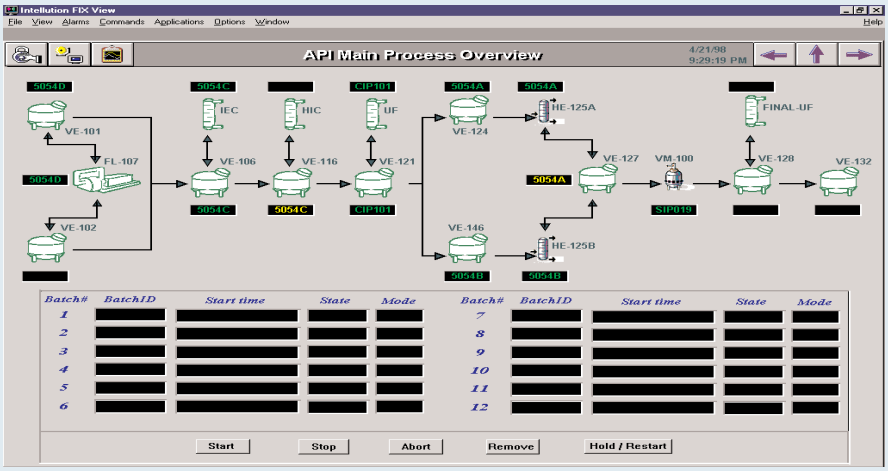
CHALLENGE

Integrate PCs with PLCs to improve accuracy and efficiency.

The Instrument Society of America (ISA) standard S88.01 defines data and operation structures which provide a common view and new system architecture. It integrates control and information elements seamlessly to receive high-level production plans, execute recipes and produce complete product genealogy records.

Historically, Distributed Control Systems (DCS) proprietary hardware and software products have been the system foundations, with custom code interfaces to receive production plans from, and send results to, information system networks. Today, powerful personal computers (PCs) can act as the information system server for programmable logic controllers (PLCs) networked into a control system-at significantly lower cost.

The challenge is to integrate available PC packages with PLC controller logic product over an open network. The technology is new. There are few experienced appliers or users, the first systems are being defined by users, vendors, and (in pharmaceutical companies) FDA regulations. A true solution must integrate the entire system to provide all the promise of the S88.01 structure. Computer-based decision support systems are the answer.



SOLUTION

Nearly one hundred different units for any batch.

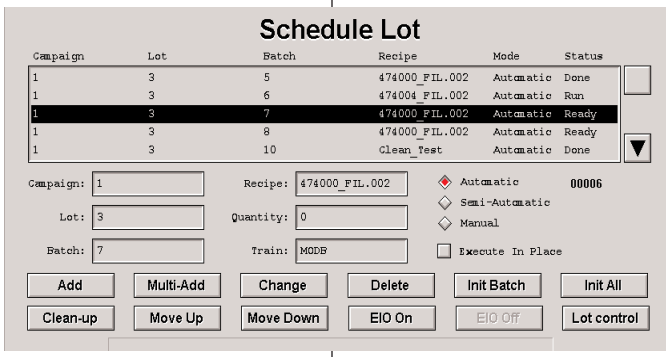
SOLUTION

Flexible modular system.

CQS Innovation, Inc. installed and commissioned a single integrated system that automatically executes recipes made up of:

- 6 Trains (made up of 91 units with 18 connections)
- 22 Process Classes
- 10 Transfer Classes
- 143 Phases

The system consists of a Batch Server, which communicates with the operator workstations over Ethernet. This station directs the sequencing of the phase logic and records the results. The actual execution of the phase logic takes place at the operator workstation or PLC level.



The Supervisory Control and Data Acquisition (SCADA) node communicates directly to the PLC. Two SCADA nodes are included to eliminate a single point of failure in the critical component of the control system. In addition, the SCADA node logs alarms and historical trend information to disk.

Each operator workstation includes a touch-screen color monitor, keyboard, mouse and hand-held bar-code reader. These workstations are used for operator interface to enable the operator to view information about current lots, unit status, etc and to enter bar coded data. They are portable workstations that connect to the process and networks when in use. Each operator station has access to all data in the system and can be focused on a specific train or batch.

RESULTS

Reliable performance and increased quality control.

The new system provides:

- equipment-indpendent recipes according to S88.01 definitions;
- total batch scheduling and coordination of batches on-line;
- on-line equipment status evaluation allocation and release;
- operator step-by-step setup checklists on-line;
- tracking of done-by/checked-by events with secure data;
- reusable, model-based, modular phase logic in the PLCs;
- automatically produced batch journal, complete and detailed; and
- equipment-cleaning requirements determined by rule-based logic.

Making your manufacturing world-class.

From plant-wide systems to customized solutions for specific needs, CQS Innovation, Inc. has the experience in automation systems to meet your project's goals.

For more information on how our integration of computer systems, controllers, networks and software systems can improve your manufacturing site's product quality, production flexibility and quality-control tracking, call (800)860-1968, ext. 385.

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