

## PHARMACEUTICAL RESEARCH & MANUFACTURING FACILITY

This case study represents an AS/RS multi-project, multi-year effort resulting in a complete facility modernization and resolving a variety of business issues, including performance, reliability, and space.

### **The Facility:**

Large lot-size production quantities and small shipment quantities require a large buffer facility, with a quick, pick and ship order turnaround capability. The **Schering-Plough Corporation's** New Jersey site is this type of facility. They are a niche market pharmaceutical company receiving, processing, and storing high value “work-in-process” raw materials and producing refined prescription drugs. The product is stored on captive pallet boards and orders are filled through the pull, pick and ship method.

### **At Issue:**

- The market had expanded and changed.
- The system design needed to grow to keep up.
- The seven-aisle AS/RS facility contained obsolete and economically unsupportable AS/RS controls equipment.
- It had become more difficult and expensive to support the AS/RS equipment.
- The site had become severely space limited.
- Required system changes and solutions were being driven by their implementation issues.

Schering-Plough needed a supplier who could execute a major conveyor and controls retrofit and redesign, to improve the system reliability and performance, without causing downtime. Retrotech was chosen to perform the complex conveyor controls upgrade and redesign work.

### **Implementing a Flexible Solution:**

Retrotech met the numerous challenges that this project presented exceeding their customer's expectations. This kept Retrotech in the forefront of other Schering-Plough projects.

### **Conveyor Upgrade and Redesign – 3 Phases**

The first project was divided into 3 phases. All were part of the massive conveyor upgrade and redesign effort. Retrotech, working in partnership with Tensar Inc., performed the complete controls upgrade (phase 1) and the layout redesign (phase 3) while Tensar Inc., the original computer installer, handled phase 2, (the HOST/VAX upgrades).



*Schering Plough, NJ – More than ½ of the conveyor pictured here, was removed.*

### **Project 1.1 Conveyor Controls Upgrade**

Retrotech replaced all the obsolete and proprietary IBM RTC (Real Time Controller) conveyor controls tied to the proprietary control system with standard non-proprietary off-the-shelf Allen Bradley control view (GUI) interface to PLC 540 control components. Retrotech installed a control switchover option to allow the conveyor operation to be controlled by either the new, or old, control system. This allowed onsite installation and test effort scheduled during the facilities off-hours (nights and weekends), to utilize the new control equipment. In this way Retrotech was able to accomplish the upgrade objectives without interrupting the facilities normal operations.

### **Project 1.2 HOST (VAX) Upgrade**

Tensar Inc., the original installer of the Host (VAX) system handled the Host upgrades.

### **Project 1.3 Conveyor Reconfiguration, Consolidation Redesign**

This phase of the project involved a massive reconfiguration effort for the conveyor. In effect, ~40% of the original conveyor was disassembled, completely reconfigured, then reassembled. Approximately 100 feet of the system's original conveyor were permanently removed. In addition to re-engineering the pallet accumulator this redesign effort included the upstream relocation of all 6-pick service stations and the reject station. These redesign efforts increased the system performance and significantly opened up the system floor space.

As a result of this precisely planned, well-executed project, and the weekend implementation effort, Schering-Plough enjoyed a smooth “interruption free” transition to their new conveyor configuration and controls upgrade. Retrotech enjoyed considerable repeat business.

**Project 2 Install Stretch Wrap Equipment**

As the business continued to change it became necessary to add load stability. Retrotech proposed that Stretch Wrap equipment be added to the system by a 3rd party provider. Schering-Plough, having previously worked with Retrotech, requested that we instead lead this enhancement effort and install the equipment. The installation effort occurred over 2 weekends and resulted in no loss of floor space or system downtime.

**Project 3 Crane Upgrade & Rail Replacement**

The final system upgrade involved the proprietary AS/RS stacker cranes, which were obsolete, unreliable, and beginning to pose a safety concern. At the recommendation of the crane manufacturer, Schering-Plough was preparing to replace them. Retrotech was asked to evaluate the system and proposed a solution that provided Schering-Plough a multi-million dollar cost savings. Retrotech proposed the following upgrades for each stacker:

1. *Replace the Kenway proprietary KE-8/8 controller with Allen-Bradley SLC-5/03 controller with 1746 series input/output modules to interface with existing sensors and drive controls.*
2. *Replace the horizontal and vertical-positioning systems with a modern photo-scanner based system using standard Banner SM502 units mounted in NEMA 12 enclosures.*
3. *Replace the obsolete Randtronics DC horizontal drive controllers with SCR based Control Techniques Quantum III model 9500-8605 DC drive controllers.*
4. *Provide an aisle power shut-off pushbutton at the end of each aisle.*
5. *Replace the Kenway current loop converters used for stacker communications with a SICK ISD 220 infrared communications system.*
6. *Provide a new TCP QuickPanel Jr. color operator interface for off-board stacker semi-automatic operation and diagnostics.*
7. *Provide software modifications on existing computer to interface with new stacker Allen-Bradley SLC-5/03 controllers.*
8. *Replace the Stacker Floor Rail and realign the wheels.*

These multiple project efforts occurred, (at the customer's request), over a 3-year period, 2 stackers

were upgraded the 1<sup>st</sup> and 3<sup>rd</sup> years and 3 stackers were upgraded in the 2<sup>nd</sup> year. Retrotech performed pre-work on each stacker the weekend prior to the controls installation commencing. The first stacker controls installation occurred over a 4-day weekend. The second installation occurred over a 3-day weekend. After each stacker was retrofitted acceptance testing commenced to confirm its proper operation. Once the testing was completed the stacker was placed back in service using the new upgraded system and stacker controls. This allowed the facility to remain in service while the system upgrades commenced.

**The RETROTECH Advantage**

RETROTECH's state-of-the-art, non-proprietary designs, innovative "Live Switchover" approach, and efficient conveyor system redesign have dramatically improved the Schering-Plough AS/RS system performance, reliability, serviceability and space utilization.

- The new conveyor layout and designs utilize less floor space with no sacrifice to the AS/RS capacity, floor space is a commodity of significant concern in the New Jersey marketplace. The layout and design changes also enhanced the system performance and tracking capabilities, while efficiently meeting the customer business needs. Implementation efforts were scheduled to occur during periods of system inactivity and resulted in no system/facility downtime being experienced as a result of the conveyor redesign and/or implementation efforts.
- The new, non-proprietary, conveyor and stacker control software has given Schering-Plough a system that is more reliable, provides substantially unrestricted flexibility in all system repairs and future flexibility for system modifications system enhancements and redesigns, as required.
- RETROTECH's innovative "Live Switchover" approach allowed the daily facility operations to run with the existing control functionality during periods of normal system operation. During "off-hours" the system was switched to the new control system and the implementation and test process proceeded.

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