

Apotex Automates Weighing to Keep Materials Moving

The Canadian manufacturer's "Yield Check" system has made a science out of managing totes and bins.

By Paul Thomas, Managing Editor

Even before it restarted production in 2004, Apotex, Inc.'s Etobicoke, Ontario, facility garnered plenty of attention as a showcase for plant design and automation (*Pharmaceutical Manufacturing*, January 2004, p. 47).

The facility, following a \$238 million expansion, is a multilevel symphony of automated lifts, conveyers and automated guided vehicles (AGVs) that move product from storage to production suites to warehouses at the behest of the plant's execution system. Radio frequency identification tags and barcodes keep track of bins, totes and other assorted containers and relay batch and product weight information to the system.

When he was put in charge of logistics for the new site, project leader Chip Hill knew it was a rare opportunity. "We got the signal from upper management to automate as much as possible, but few details on how," Hill says. "We had to fill in the blanks."

A new "Yield Check" system filled one of these blanks. Hill and Dave Patterson, VP of Grantek Systems Integration, Inc. (Burlington, Ont.), the lead systems integrator on the expansion project, linked a network of calibrated load cells to a database, to monitor and optimize weighing and provide redundant information regarding in-process totes and bins.

Since operators rarely enter the processing suite, the Yield Check system—eight scales for bins, and eight for totes—is really the only way operators have of knowing how much product is in the containers, and thus where they belong at any moment.

CARRYING THE WEIGHT

The key consideration for choosing weighing equipment was its ability to integrate with the Allen-Bradley PLC architecture supporting the plant's operations. Apotex chose equipment from Hardy Instruments (San Diego, Calif.), an AB Encompass partner whose weigh-scale cards fit directly into the buses of PLCs. No wiring was involved.

This was a huge advantage for implementation and maintenance, Hill says. "If we had a load cell or PLC go down in the field, we wanted to

some customization. Hardy's load cells had to be specially designed to accommodate robots that are anything but delicate and that also vibrate bins to remove product. [Dipped in a 1000 pound bin, it's many of the bins that are used in a cell.] [Process Flow: A bin Dave Patterson, CIH Industrial Control, the equipment in the bin.] Shock-absorbing load cells were built with rubber, disc-shaped grommets between cells and mounting plates.

A REAL-TIME LINK TO ERP

Weigh-scale data are event-driven and gathered by the PLCs, which are linked to the company's secure VPN, or virtual private network, using a system designed by Grantek's SAP interface team. Then they are transferred to a Rockwell RS-View database for plant-floor viewing.

Grantek's SAP Interface team also worked with SAP to provide real-time



A self-guided vehicle picks up a tote from a conveyor, which rests on load cells. Photo courtesy of Apotex, Inc.

make sure a technician could replace it without much effort and not interfere with operations," he says.

Hardy's "Integrated Technician" was also a key reason the technology was chosen, says Gene Chae, senior developer at Grantek. This feature allows operators to check scales upon demand—for instance, to check millivolts, excitation or resistance on each load cell at any given time.

The implementation also required

integration of load-cell data with the back end of the Apotex ERP, allowing for constant production monitoring and materials management.

The advanced automation at Etobicoke hasn't replaced operators, but has required them to sharpen their skills. "They've really had to learn to understand what the building is supposed to do," Hill says. "It's a big monster, and its parts all work together." 