

## BEEF PROCESSING WAREHOUSE



### EXCEL CORPORATION - DODGE CITY, KS

Excel Corporation, a division of Cargill, Inc., specializes in beef processing for the consumer market. They provide various grades of boxed beef products to both wholesale and retail distributors as well as to high-volume end users. The Dodge City facility has operated since the mid 1980s as Excel's only *fully automated* warehouse.

#### Background

The warehouse operations use an elaborate series of box and unit load conveyors to move boxed product from the fabrication floor through the system to the shipping dock. Several lines of case conveyors from production feed a merge system, which in turn feeds a 4-level sortation system.

Boxes in the sortation lanes dump to palletizers and the palletized boxes in turn are conveyed to Excel's 5-aisle Demag AS/RS for storage. When product is requested for shipping it is pulled from storage and conveyed to depalletizers. From here, the cases are conveyed to shipping sortation lanes for manual loading onto over-the-road carriers.

The software and controls architecture of the original design employed extremely responsive IBM Series/1 interrupt-driven hardware along with the now defunct Integrated Automation Corporation's proprietary high-speed micro-processor technology. As throughput demands increasingly exceeded the original system's capability, Excel used "Band-Aid" solutions to continue to meet its throughput requirements.

By the early 90s, however, the controls were no longer supportable and long-term solutions

needed to be investigated. Excel's goal was to maximize the number of cattle that could be processed and shipped daily from the Dodge City site. At the same time, they needed to safeguard against the ever-increasing high probability of system downtime.

In 1994, Excel began a partnership with *RETROTECH* to modernize its box handling operations. As part of Phase One, *RETROTECH* updated Excel's AS/RS Crane Room. For Phase Two, Excel and *RETROTECH* teamed to modernize and improve the functionality and capacity of Excel's automated distribution operations. Excel updated the box handling and releasing control; *RETROTECH* was responsible for the Series/1 replacement, pallet handling control, and system interface.

#### Phase One

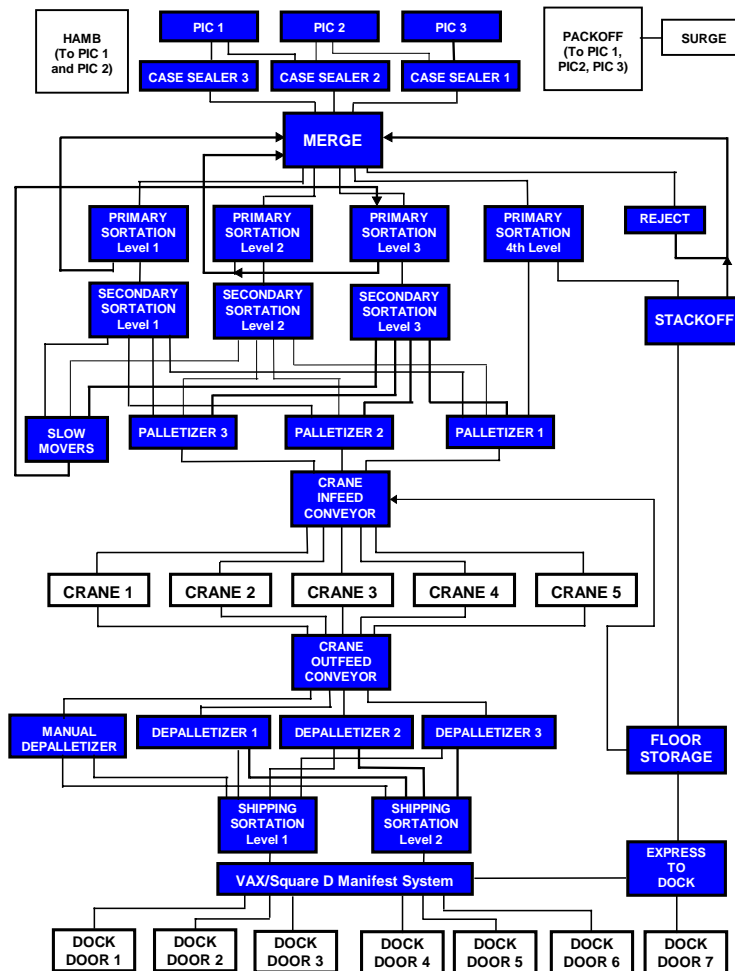
**Problem:** Vintage 5-aisle Demag unit load AS/RS had proprietary control system with limited support capabilities and no flexibility. Drive systems were obsolete and system performance needed to be improved.

#### RETROTECH Solution:

- Use Allen-Bradley SLC 5/03s to replace the proprietary control system for the cranes.
- Provide UNIX-based DEC PC-486 Equipment Control Computer (ECC) system interfaced to the existing IBM Series/1 Warehouse Control System (WCS).
- Provide horizontal and vertical A-B 1395 DC drive controllers, horizontal and vertical DC motors, Pacific Scientific intelligent servo-controller and motor for shuttle operation, and new positioning systems. Provide modify the system so that it could new NEMA 12 enclosure assemblies.
- Replace existing buss bar communications system with a new infrared communications system.

#### Phase Two

**Problem:** IBM system contained obsolete hardware and proprietary software that was difficult to support.



### RETROTECH Solution:

- Replace IBM Series/1 computer with redundant Hewlett-Packard HP9000 computer systems and the HP-UX (HP's UNIX) operating system.
- Use Oracle Relational Management System Database.
- Provide new A-B SLC-5/04 for pallet conveyor, palletizer and depalletizer control. (New sortation and case conveyor control system supplied by others.)
- Interface HP9000 with all PLCs and the sortation controller. (HP directs flow of cases from production and determines what sortation lanes to use. It also directs the dump of lanes to the palletizers and determines where to store the pallets in the AS/RS. In addition, it controls the shipping

operation deciding what pallets to pull from storage to fill orders and directing cases to the proper shipping lanes.) Provide HP9000 system with multiple screens for performing all necessary functions by all warehouse operators. (Screens incorporated X-Windows and Motif standards for highly graphical and user friendly interfacing.)

### *The RETROTECH Advantage*

RETROTECH provided Excel Corporation with solutions that met and in certain areas exceeded their goals. GUI screens were tailored so that operators could view system data on a realtime basis and make adjustments to optimize performance in an environment where performance criteria changes rapidly. This upgrade not only supports Excel's current business, it allows for future business growth

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