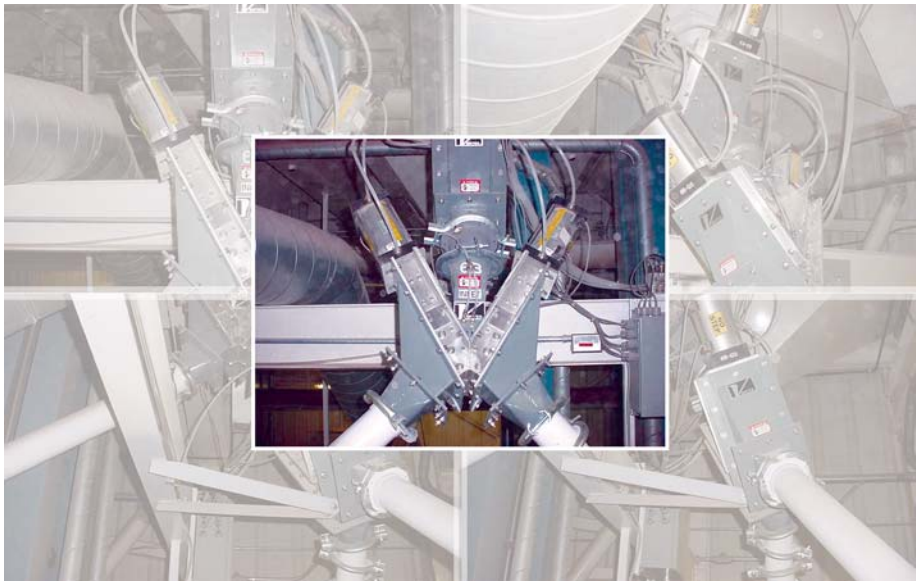
Beyond 'Kernel Clean'

An automation upgrade reduces safety concerns and improves seed quality



In some applications, Salina Vortex gravity "Vee" dual gate diverter valves were installed in a series to provide four or five routes for seed flowing from a single source bin.

In 2001, Pioneer Hi-Bred International, Inc. began an automation upgrade of its Constantine, MI seed corn conditioning facility constructed in 1997. During the next three years, a computerized system was installed to control and monitor the flow of seed corn from receiving through packaging.

As a result of new biotech traits and more hybrids targeted to specific customer needs, the number of lots being conditioned was increasing while the average size of lots was decreasing each year.

"Twenty years ago, we had 8-10 hybrids a year with each lot running two to three weeks," says Conditioning Leader Les Heeringa. "Now we were running 25-30 hybrids every season with multiple runs of each. We are changing lots two to three times a week. Not only do change-overs take time, they become a safety issue as workers rush to get the system back into production."

The upgrade, designed by Pioneer engineers and production staff, included installation of computer-controlled gates, sensors, bin level monitors and controllers to start and stop equipment throughout the entire conditioning process.

Automated Diverter Gates

In making lot change-overs with the old equipment, it was necessary for employees to climb ladders and maneuver around pipes in awkward positions to manually adjust the gates directing the flow of seed through the facility.

"Setting and checking some of the manual gates and valves required real effort," Heeringa says. "We needed components that could be reliably operated and verified by the automated system."

Sixteen (16) new **Salina Vortex Gravity "Vee" Diverters**, Salina Vortex® Corp, Salina, KS (785-825-7177/ www. salinavortex.com) were installed throughout the facility duringthe 2001 upgrade. They provide a dust tight material seal in gravity flow applications. The dual gate design permits material flow to be open or shut to each outlet.

The Gravity Vee allows diversion of flowing material. With traditional diverters, the flow of material needed to be shut off before it can be redirected.

CASE STUDY

In some applications, valves were installed in a series to provide four or five routes for seed flowing from a single source bin. "The linked diverter gates were easily controlled by the PLC which essentially eliminated the possibility of any product being misdirected by an employee's error," says Heeringa.

As a final safeguard against cross-contamination between lots, Pioneer employees installed an air blast system to remove any remaining "bees wings" or chaff.

Modified grease zerks connected to plastic tubing are used as air jets to blow chaff. A solenoid activated by the PLC controls the pulsing air cleaning sequence. According to Heeringa, it is a simple solution that has worked very well.

"The tolerances for GM quality have moved beyond cleaning to the last kernel," concludes Heeringa. "The new system with automated diverter gates and our air blast cleaning have enabled us to be clean to the last bit of chaff."

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Key Personnel

- Alan Spice, Location Manager
- Les Heerringa, Conditioning Leader

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