Shuttle Train Loading System

COMPUWEIGH GMS PACKAGE TO MAKE IT POSSIBLE TO LOAD 100 CARS IN UNDER 15 HOURS

Like many farmer-owned cooperatives across the High Plains, St. Edward, NE-based **Tri-Valley Cooperative** has sought the grain merchandising advantages that come with the ability to load shuttle trains. To that end, in 2002, the cooperative added enough trackage at its Monroe, NE elevator (402-495-4645) to boost its railcar capacity from 75 to 100, in order to ship on the Union Pacific (UP).

The UP requires shippers to load trains in 15 hours or less, so it was necessary to upgrade the facility's loadout capabilities, says Location Manager Dave Wagner.

For a loadout system designed to meet those demurrage rules, as well as loading grain to specification on the go, Tri-Valley turned to **CompuWeigh Corp.**, Cheshire, CT (203-699-9000). "We did about three years worth of comparison shopping," Wagner says. "After we met with CompuWeigh's people and looked at what they had to offer, we settled on their GMS 4000 package."

Along with a 60,000-bph CompuWeigh bulk weigh loadout scale trackside, the project, which was nearly complete at the end of February 2003, included two legs, three conveyors, a scalper, and new actuator gates connected to five concrete storage tanks at the 800,000-bushel elevator.

Contractor and millwright on the project was **Nebraska Grain Systems Inc.**, York, NE (800-788-4658). **Marley's Electric**, Columbus, NE (402-564-8614), wired the electrical systems. Construction began in the fall of 2002.

GMS Package

The entire loadout system is fully automated and controlled from the loadout workstation running Compu-Weigh's Grain Management System (GMS). The GMS package includes Compu-Weigh's CD-4000 to control the 60,000-bph bulk weigh scale and automation for controlling all the components from the actuator gates on the storage tanks to the cross conveyor, legs,

New 60,000-bph bulk weigh loadout scale is under the control of a CompuWeigh GMS 4000 package, which interfaces with a PC controller in a loadout shed shown below right of the scale.

Tri-Valley Cooperative's rail terminal elevator at Monroe, NE, with two new York legs at right. Overhead 60,000-bph Hi Roller enclosed belt conveyor takes grain to a new 60,000-bph CompuWeigh bulk weigh loadout scale at left. Photos by Ed Zdrojewski.

Control boxes for SmartWatch software package, which provides hazard monitoring for legs and conveyors, and SmartGate software, which controls the operation of 10 actuator gates for on-the-go blending during loadout.
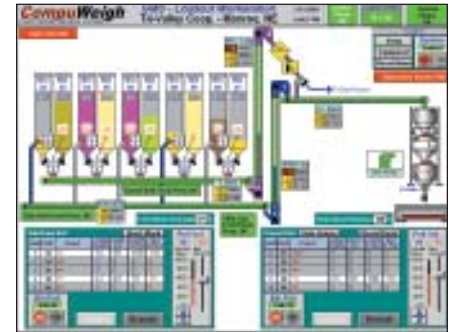
Full-color GMS 4000 display allows the operator to monitor and control every aspect of loadout operations. Image courtesy of CompuWeigh Corp.

and scale.

The new **SmartGate** actuators are used for the five automated gates feeding the 30,000-bph sidedraw Hi Roller enclosed belt conveyor and the five automated gates feeding the 15,000-bph Hi Roller enclosed belt conveyor in the tunnel. The system controls the percentage each gate is open, with an accuracy of 1%, and allows the operator to control the gates for each group with common controls. This allows the operator to easily make "on-the-go" blending changes.

The new **SmartWatch** digital hazard monitoring system examines the data from bearing temperature, alignment, and speed sensors on all the belt conveyors and legs in the loadout process. The system uses both limit and differential temperature monitoring routines to alert the operator of any problems. SmartWatch directly integrates to the PLC/HMI automation system and displays the temperatures, speeds, and any alarms on the loadout workstation.

The **SmartTech** Opto box provides the interface between the CD-4000 controller and the bulk weigh scale. Continuous scale diagnostics built into the controller ensure proper operation of the scale. It informs the operator of any problem and then shows on the screen what the problem is, where it's located, and how to fix it.

The **SmartRead** system automatically identifies the railcars to be loaded via RF tags mounted on each car, eliminating the need to walk the track. As the cars are scanned, the car ID is sent to the GMS-4000, where the car is found in the **SmartCar** database. The optimum load limit is calculated based on weight, volume of the car, and track limitations.

Ed Zdrojewski, editor

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