HINZ
A Rockwell Automation Company

Luscar - Gregg River Mines
Coal Loadout Automation Upgrade

The Client:

Luscar Coal Ltd. is a major Canadian coal producer. Luscar Coal operates the Gregg River Mine that is located south of Hinton, near Cadomin. The metallurgical coal is mined, and prepared for shipment to domestic and international customers.

The Requirement:

The train loading system for the mine was designed for 90 ton steel railway cars. When Canadian National Railways began using the 110 ton aluminum cars the original auto system could no longer be used due to the fact that the weigh bins can only hold approximately 90 tons each, and the system was designed to fill a car from a single weigh bin. Since the new cars have been in use, Luscar has been loading in manual, and an accurate value for the coal that is put in each car was not available.

The existing train loading PLC was obsolete and did not meet with current plant standards. The control console consisted of hard wired push buttons, selector switches, indicator lights and analog displays. The majority of the hardwired devices were to be replaced by a PC based HMI. The HMI uses a database to store car identification numbers, tare weights, and loaded weights, and generates a report at the end of the loading of each cut of the train. To avoid paying shipping cost twice for carry back coal, it was required that the system compensates for the carry back coal. For example, if a 110 ton car has 50 tons of carry back, the target load weight would then be 60 tons. This ensures that Luscar is shipping its train cars full, but not overloaded.

To accommodate the larger cars and receive more accurate reporting on the amount of coal that was put in each car, it was necessary to upgrade the system.

The Design Solution:

Hinz planned and implemented the replacement of a Modicon PLC with an Allen-Bradley 5/40E PLC, following the site's current standardization of Allen-Bradley. Hinz also designed and implemented a PC based HMI program using RSView32 with a touch screen for an operator interface.

A scale equipped with a car reader weighs the cars of the train and records their ID in a database. From the database, the tare weight of the car is known, and therefore from the scale weight, we can determine how much carry back coal is left in the car. The target weight is then calculated from the maximum tonnage for the car, minus the carry back. This target weight is the amount of coal that is put into the car by the automatic system. The new system uses both weigh bins, splitting the load between each, to allow automatic filling of all sizes of train cars. Half of the load is put into weigh bin #2, and the other half of the load is put into weigh bin #1. Both of the bins are dumped into the train car giving the total target weight for the car. The system automatically detects which car is being filled, and puts the proper target weight into the proper car.

Photo eyes are used to ensure that the weigh bins do not open between cars. This allows accurate filling of the train cars, and reporting on the actual an amount of coal put into each car. When the system has finished loading the second last car, the target set point for last car is known. From this set point, we calculate how long the feeders have to run to deliver enough coal for the car. Once the feeders have run long enough, the feeders are shut down and the car is filled. This ensures that no coal is left in the system when loading is finished.

Once the train is fully loaded, a report is generated with the car IDs and the amount of coal that was put into each car.

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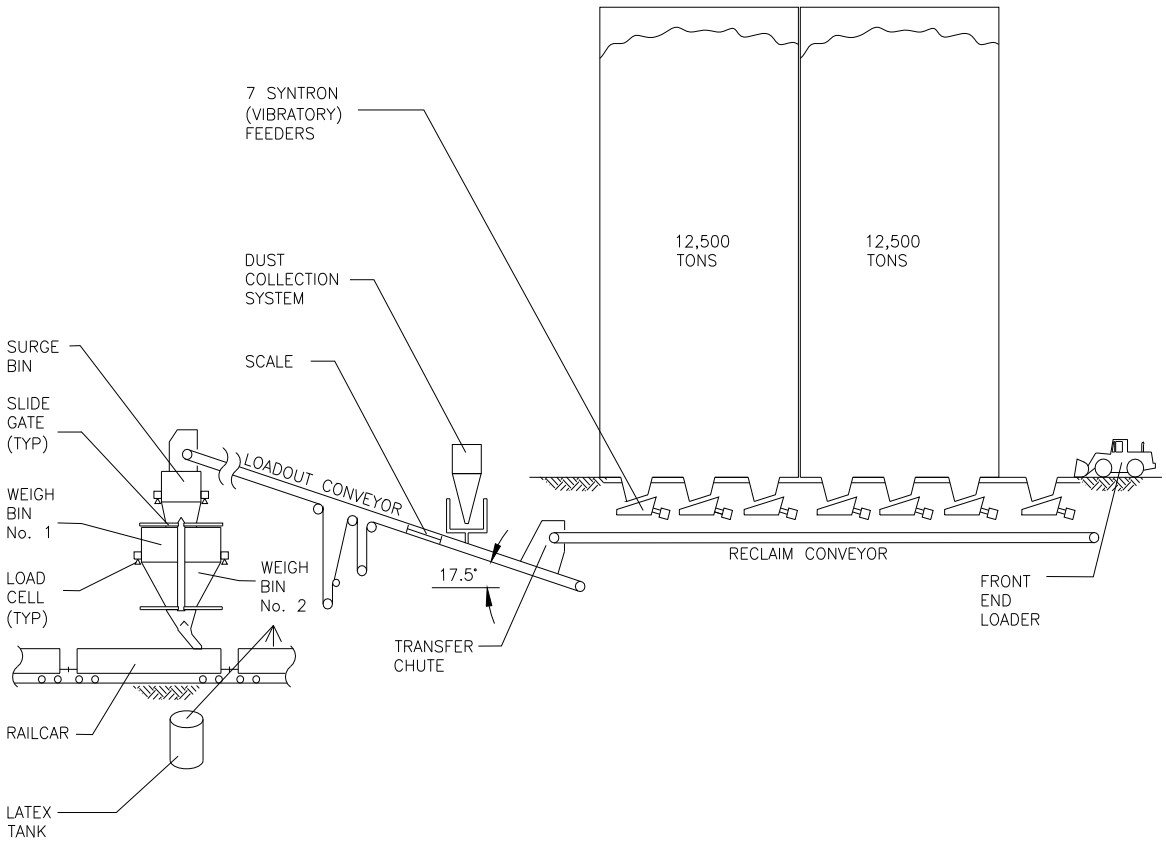

System Specifications:

- Rockwell Software RSView32 software.
- Rockwell Software RSLinx Gateway software.
- Pentium II 266MHZ Computer
- TCP/IP Local Area Network
- Windows NT Operating System
- Allen-Bradley PLC-5/40E with Remote I/O
- Mettler-Toledo 9411E In-Motion Scale Controller
- Amtech RFID Car Reader System

For further information or to contact a Hinz office near you, please check our website at:

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