



A Rockwell Automation Company

Johns Manville Corporation Etowah Batch House Upgrade

The Client:

Johns Manville Corporation (Johns Manville) is a world wide leading manufacturer of building materials, commercial/industrial roofing, reinforcements, and filtration media.

Johns Manville's Etowah Tennessee plant manufactures T-Glass and E-Glass fiberglass for use in commercial/industrial roofing and reinforcements. In 1979 the batch house control system was installed to feed raw materials to the plant's two glass furnaces. The initial system consisted of a DEC computer and a Modicon 384 PLC. In 1986 the control

system was upgraded to a Modicon 584 PLC controlling both E and T Glass furnaces and driving two RS-232 Televideo "dumb" displays with ASCII characters. In 1988 the controls for E and T Glass furnaces were partially separated and a Microtie host computer was added. Since 1988 the batch house control system remained essentially intact. In 1995 Johns Manville was facing the problem that its glass furnaces' batch house control system components were failing and required replacing if the system was to remain operational..

The Requirement:

The basic requirement was to replace the existing batch house control system with a new control system. The changeover must be accomplished while the system is running, with a total daily downtime of no more than four hours allowed.

The objectives of the batch house control system modification were as follows:

- Replace the Modicon PLC with three Allen Bradley PLCs using structured programming for logical areas and functions. The system should allow for independent operation of the three areas of functionality.

- Replace the old Toledo scale indicators with new Mettler Toledo Jaguar interfaces.
- Replace the Micro host computer to a modern Windows NT based HMI, Intellution FIX32.

Provide long term data archiving and reporting with Microsoft Access database integrated into the HMI. Reports include monthly and on demand batch, material inventory, and EPA monitoring.

The Design Solution:

Hinz was initially contracted to prepare a Control System Specification Document that was to be used to obtain quotations for upgrading the control system. This document defined the functional requirements of the system, including control and interlocking, operator displays, report contents, etc.

Hinz was then awarded the execution phase of the batch house upgrade project. Hinz worked closely with Johns Manville personnel to develop structured design documents for PLC and HMI software design; using CASE tools. Hinz assisted Johns Manville in HMI software evaluation and selection. Hinz then developed all PLC, HMI, and Microsoft Access programs. All software underwent one hundred percent system testing prior to commissioning, using SST's PICS simulator package.

Hinz also prepared complete electrical installation drawings necessary to replace the existing Modicon 584 PLC with three Allen Bradley PLCs.

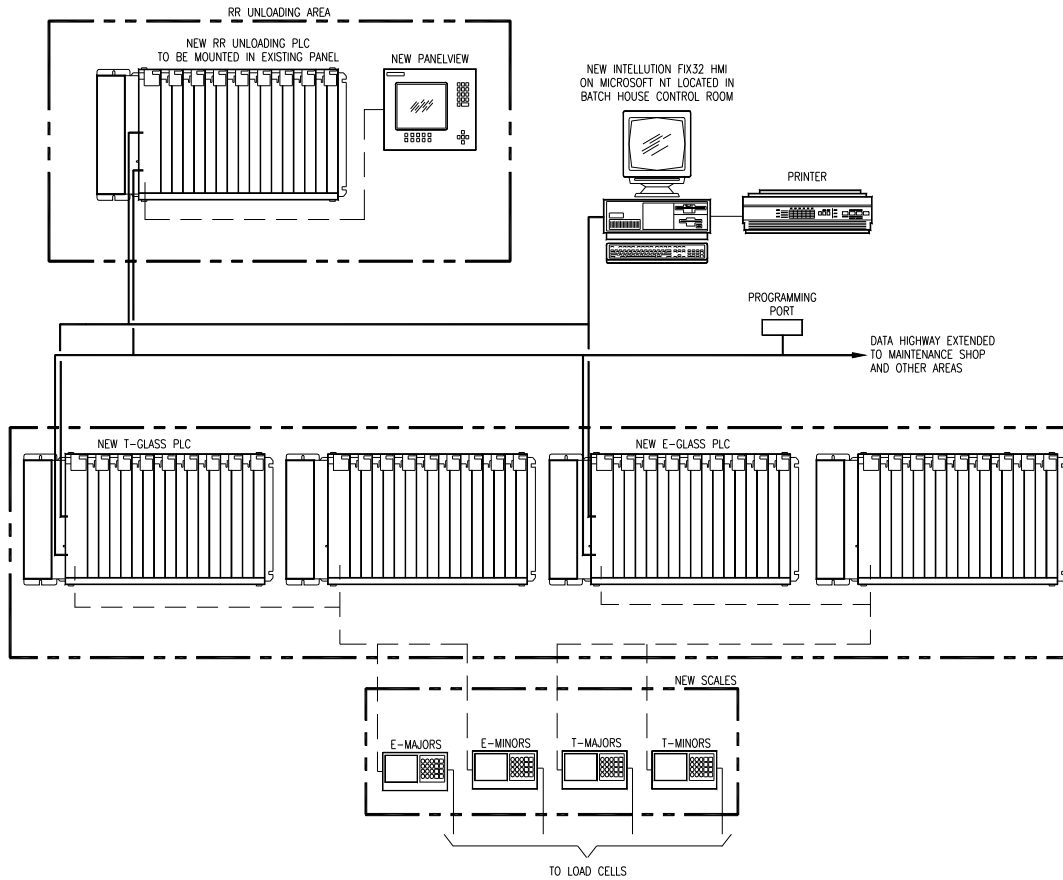
During commissioning the key requirement was that the changeover could not interfere with the furnace operation. Only one furnace could be down at a time, and only for a three hour period. Hinz worked with the plant personnel and the electrical contractor to develop a plan to work within these constraints. Each PLC was commissioned within four days without any distribution to the plant's production.

The FIX32 HMI communicated to the PLC via Data Highway (DH+). HMI displays were used to set and monitor batch weight formulas. Security was used to prevent indiscriminate changes to batch or system operating parameters. Completed batch, inventory, and EPA information were stored in Microsoft Access via an ODBC connection. Reports and database update queries were written in Access macros. These Access macros also included troubleshooting and diagnostic tools to allow technicians to monitor system performance.



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System Specifications:

- Railcar and Truck Unloading PLC (AB PLC 5/20)
- T-Glass Batch Control PLC (AB PLC 5/40)
- E-Glass Batch Control PLC (AB PLC 5/40)
- Mettler Toledo Jaguar Scale Interface (RIO connection to PLCs)
- PanelView HMI for Railcar Unloading Control
- Intellution FIX32 HMI for Batch Recipe Control and Monitoring (DH+ connection to PLCs)
- Microsoft Access for Data Archiving and Reporting
- Connection to Plant LAN and Corporate WAN for Data Reporting

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

www.hinz.com