



A Rockwell Automation Company

## PCS Rocanville Mill Control Upgrade

### The Client:

The Potash Corporation of Saskatchewan owns a number of potash mines across Saskatchewan, and has operating interest in a number of others. The Rocanville mine is located in the southeast corner of the province. The

Rocanville mine has a long standing reputation for being an efficient mine, and a leader in the application of the latest technology.

### The Requirement:

The original potash mill (Circuit 1) had been built in the 1950's, with controls implemented by large push-button panels, wall mimics, relay interlocks, and single loop PID controllers. In the early 1980's the capacity of this original mill was effectively doubled by a major expansion (Circuit 2) of the mill. Circuit 2 control was implemented using Allen-Bradley (1774) PLCs and Honeywell TDC 2000 instrumentation.

The control system was running well, but two major problems existed with the configuration. The plant control room was located in side the plant where it was susceptible to leaks of process fluids. Previous attempts

to seal the control room roof had been expensive, and had met with limited long term success. It thus was concluded that the best long term solution would be to relocate the control room to a better environment. However, relocating the existing relay control panels and push-button consoles would require an enormous rewiring task, not to mention a huge new control room location. The second problem was that the PLC controllers and operator colorgraphic units installed for Circuit 2 were obsolete. Problems were anticipated with downtime as the Circuit 2 control equipment began to fail more frequently and repair turn-around times increased.

### The Design Solution:

Circuit 2 had operated for nearly ten years with a colorgraphic MMI, detailed alarming, keyboard control functions, and group start functions. Thus the plant personnel were comfortable with automated systems, and had a relatively clear vision of the control functions and alarming that they would like to see on the new system.

An on-site PCS project manager was established to supervise and coordinate consultant design functions, procurement of equipment by PCS, and installation by PCS electrical crews. Hinz first of all prepared a study to define the scope of the project and to establish budget figures for approval. Once the project was approved, Hinz was engaged as the controls/electrical consultant.

Approximately 750 motors and devices were to be controlled by the PLC system, with very detailed status and alarm annunciation. Thus it was decided that the capacity and response time of the MMI system were to be given careful scrutiny during both the configuration and design. The communication network had to be very high speed. Allen-Bradley PLC 5/250 processors, c/w (MicroVax) Information Managers were chosen for the main PLCs. A number of smaller PLC 5 processors would be integrated into the system via fiber optic, modem, and conventional data highway links. The MMI

system selected was CSI VXL on Vaxstation 3100 workstations. As the additions to the instrumentation system was less extensive than the PLC system the existing Honeywell system was upgraded to handle the additional instrumentation.

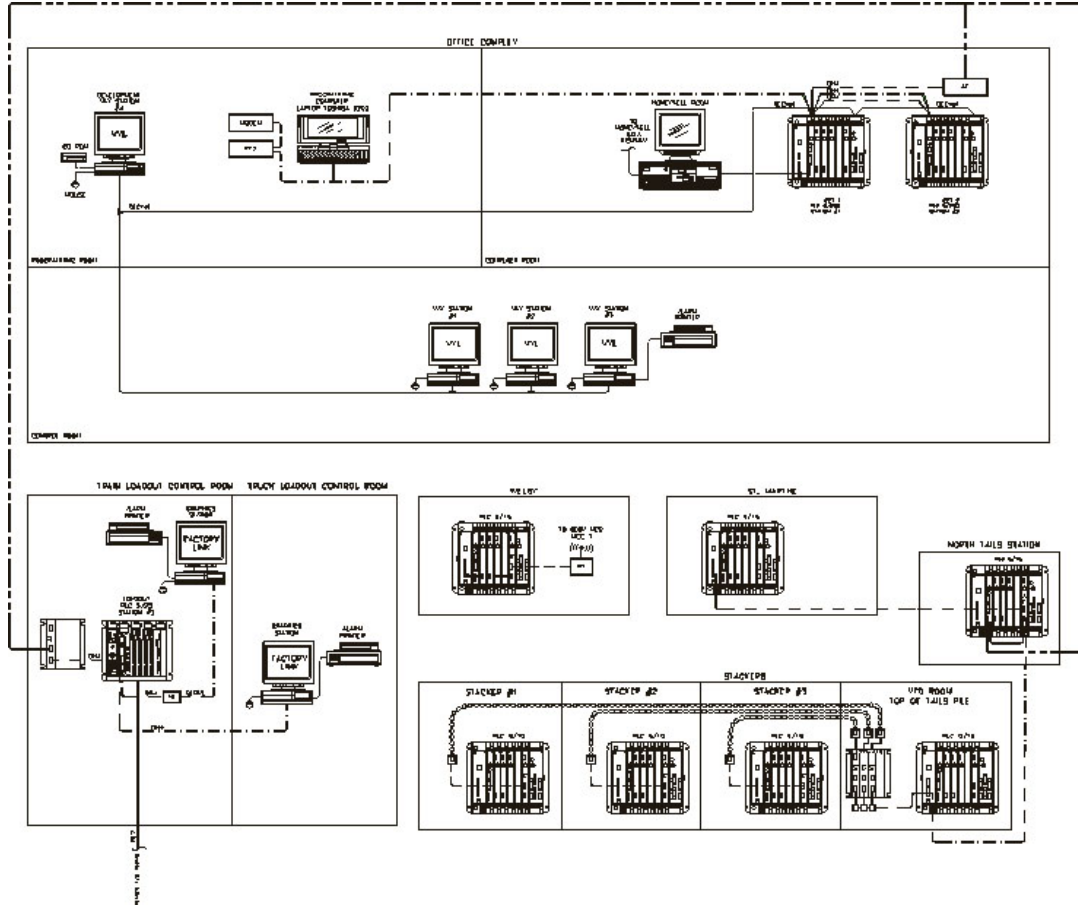
The new control room was located in the office building, with an adjoining CPU room and a program development room. The control room is air conditioned, with cooling air fed into the oak control console via the removable floor panels. The completed system is both aesthetically pleasing and extremely functional. All operator control actions will be confirmed by equipment status changes or by alarm indications. The operator has very detailed information of the status of all equipment, including items such as on/off, alarm, detailed listings of interlocks made, auto/manual, normal/maintenance, etc. The high resolution screens display very high density graphics, with response times in the 1 to 2 second range.

The complete system, including extensive Loadout system controls was commissioned comfortably during a one month shutdown. The plant start-up was extremely smooth, with very few problems.



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## System Specifications:

- 2 AB PLC 5/250s c/w MicroVax Info. Manager
- 8 AB PLC 5's for remote sites
- 3 Vax Workstations running CSI VXL Graphics
- FactoryLink MMI at train and truck loadouts.
- Multi Fiber optics for Data highways
- Radio Link on Data highway
- 26,000 Database tags in CSI system
- 51 Graphics screens on CSI System
- 21 Graphics screens on Factorylink
- 4500 Digital PLC I/O
- 800 Analog PLC inputs

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

[www.hinz.com](http://www.hinz.com)