



A Rockwell Automation Company

Interprovincial Pipe Line Inc. SST Simulator Programming for Gen Cube

The Client:

Interprovincial Pipe Line Inc. (IPL) owns and operates a pipeline network spanning from Norman Wells, NWT to Montreal, Quebec. They own the longest petroleum transmission pipeline utility company in the world. IPL's entire system consists of 11540 kilometers of pipeline linking western Canada to refining centers and markets in eastern

Canada and the Midwest United States. IPL transports NGL, refined products, gasoline, diesel, light, heavy and synthetic crude oil. The entire network is controlled from IPL's control center headquarters in Edmonton, Alberta.

The Requirement:

This simulator project was initially developed to allow Inter Provincial Pipelines (IPL) the ability to train site employees on the various pipeline scenarios. Use of the simulator application was intended to be very user friendly and easy in monitoring any characteristic changes in the pipeline flow.

The key requirements involved in the development of the following items:

- Design and lay out various devices for analog and

discrete processes in the field.

- Design a graphical interface that would allow for easy use and observation of different scenarios in the field.
- Link data for the simulation of transient wave characteristics on the pipeline.

The Design Solution:

Hinz was contacted by IPL to provide a simulator design package with which site personnel could learn more about pipeline operations. This design involved the use of the PICs simulator program developed by S & S Technologies. PICs allowed for the ability to design graphical layout screens making the simulation of various field processes easier to implement. For increased flexibility all the generic cubical sites were incorporated into the design of this simulator package.

Preliminary design work on the analog and discrete devices initiated the design process. These devices were graphical in nature and allowed the user the ability to toggle discrete values or preset various analog values. The design of these devices involved using the device template within the PICs program. Devices were then chosen and modified to suit the particular need. In order to modify the various devices, the ladder logic and various graphics associated with the device were revised. The devices were then tested in a number of conditions to ensure the proper operation of that device. Three main devices in all were made. They are a master or resetting of all trips and alarm conditions, a push button for toggling discretely and an analog value entry device.

The design of the layout screens incorporated both the discrete and analog devices that were developed. These

devices were then laid out on the various screens with the discretely on the left and the analogs on the right. Layout screens were made for the Station VFD; Station; Unit 1; Unit 2; Unit 3; and/or Unit 4; Unit 5. All of the layout screens for the units were the same with only variations in values and I/O points wired to. These screens would allow the user easier access to observing and changing different discrete or analog values.

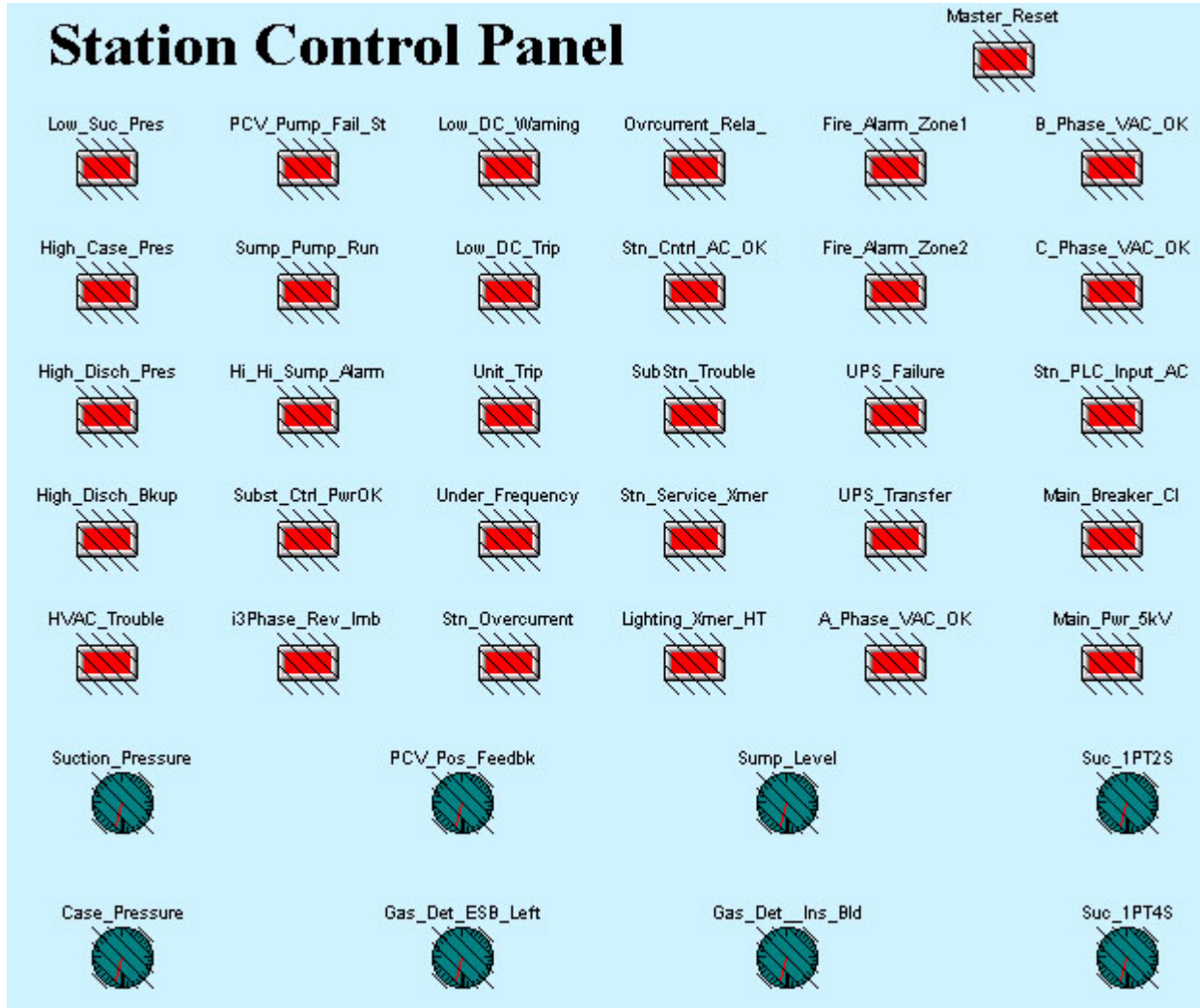
Along with the various PICs device and layout screen designs, the added requirement of having the data to excel was solved. This link was established through a Dynamic Data Exchange (DDE) I/O connection in PICs. A DDE connection between Excel and PICs allowed for data transfer and therefore the ability to simulate transient characteristics modeled in the data tables of Excel.



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Station Control Panel



System Specifications:

- Dynamic Data Exchange

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

www.hinz.com