

Sour Natural Gas Pipeline Case Study



Introduction

The Shell Canada Ltd. Caroline Gas Complex is the newest, most technologically advanced of Shell's four sour gas processing facilities in western Canada. The Caroline Complex includes a gas field, 14 wells, three compressor stations, a gas processing plant and a sulphur forming and storage facility.

The processing plant separates raw sour natural gas into natural gas, natural gas liquids, condensate and sulphur. A pipeline from each well forms part of the gathering system, which feeds raw sour natural gas into the plant for processing.

Problem

Shell Canada has a pipeline that transports very sour natural gas to their main processing plant where the poisonous hydrogen sulphide is converted into sulphur products. Because the pipeline is transporting highly poisonous gas, it was necessary to take extraordinary precautions in order to detect pipeline leaks and close the appropriate block valves when a leak is detected.

Solution

Willowglen Systems was selected for this project because of the reputation of the Model 8016 Remote Terminal Unit (RTU) as a gas field RTU. Shell was also confident that Willowglen was capable of making the custom modifications required for this application.

The Model 8016 RTUs were installed with Programmable Acquisition and Control (PAC™) programs that were used to implement the required custom control actions. The Model 8016 RTUs were linked with five VISTA™-II host computers using a 9600 baud full duplex communication line. The VISTA™-II host computers were used as an intermediary system to gather the data to be passed on to the main plant computer system using several Honeywell International Inc. TDC 3000 gateways. Honeywell has formally approved Willowglen's products to be TDC 3000 compliant.

A second communication link was created that allowed one RTU to communicate directly with another RTU even if the host computer communication link does not work. This peer-to-peer network is used for sending emergency shut-in commands from the RTU that detects a pipeline leak to the RTUs located on either side of the leak.