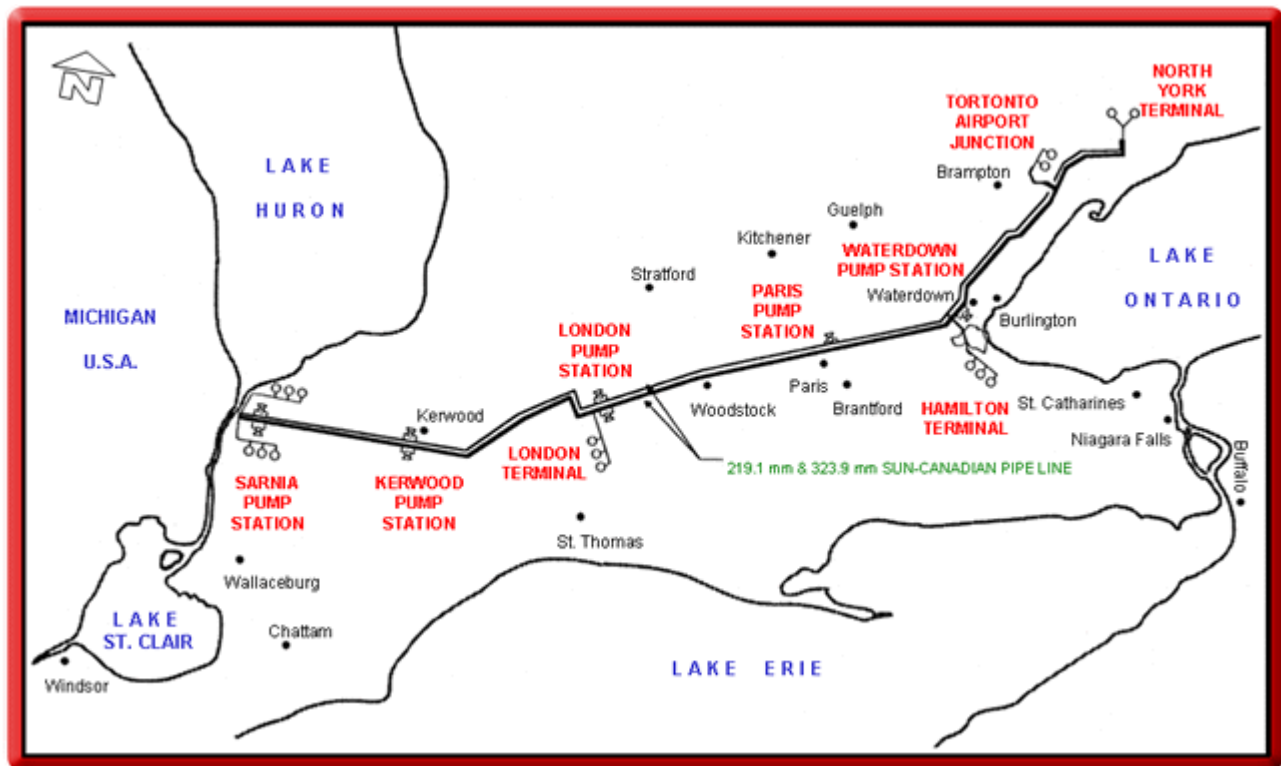


Small Diameter Pipeline Case Study



Introduction

Sun-Canadian Pipe Line Company Limited (SCPL) owns and operates two pipelines referred to as the Toronto Line and Hamilton Line. The prime purpose of the pipeline system is to move refined petroleum products from refineries in the Sarnia area to bulk storage terminals. The products transported by SCPL include gasoline, distillates and fuel oils.



The 290 km long, 300 mm diameter Toronto Line delivers refined products from three refineries to three pipeline delivery terminals. The 235 km long, 200 mm diameter Hamilton Line delivers refined products from two Sarnia refineries to the Hamilton Delivery Terminal. These two pipelines have a number of pumping stations, valve sites and delivery stations and are controlled from SCPL's Supervisory Control and Data Acquisition (SCADA) system in Waterdown, Ontario. All stations are unattended.

In order to prevent any loss, continuously running leak detection software is used so that any pipeline leak is quickly detected and isolated so that personal injury and property damage is prevented.

Problem

A new dual redundant SCADA master station was required at the Waterdown facility to monitor and control the electrically powered centrifugal pumps, booster pumps, motor operated valves, tank volume transmitters, pressure transmitters, and density potentiometers. Two dual monitored dispatching consoles, one single monitored dispatching workstation, a technologist workstation and a scheduling

workstation were required to present overview and detailed information of the pipeline system and other real-time displays to the operators. Leak detection and batch tracking capabilities were to be implemented and the billing and ticketing process was also to be automated. The new host system needs to interface to the 21 existing Siemens (TI) Programmable Logic Controllers (PLC) using the TIWAY 1 Communication Protocol.

Solution

In a competitive bid, Sun-Canadian Pipe Line Company Limited selected Willowglen Systems Inc. to provide a state-of-the-art SCADA system for their pipeline system. Willowglen's advanced SCADACOM® master station software provides SCPL with a true multi-tasking, open systems, solution with many years of field experience. SCADACOM® has one of the most advanced Man Machine Interfaces available in the SCADA industry. Highly reliable UNIX based multiprocessor capable servers integrate a powerful object oriented real-time database and the industry standard Sybase® relational database. Each of the servers is equipped with dual high resolution monitors and simultaneously provides user interface capabilities to the dispatchers.

Personal Computers (PCs) are used for the dispatching and scheduling workstations and a powerful UNIX based workstation is used for the technologist workstation. Each of these user interfaces can access any of the SCADA system displays, reports, trend displays, alarm displays, etc. The SCADACOM® software uses a unique parallel real-time database design that ensures optimum system response and optimum communication bandwidth usage. X Window System support is also provided for the PCs connected to the Local Area Network (LAN). A laser printer and a colour inkjet printer are attached to the dual redundant LAN and allow any user to print reports or colour trend displays.

Redundant Digi International Inc. PortServers® are connected to the redundant LAN and provide serial communication ports for the field RTUs. Pipeline application software from VECO Engineering is used to provide leak detection and batch tracking capabilities so that a fully integrated package is available to the customer.