

Hydro Electric Case Study



Introduction

The New Brunswick Electric Power Commission (NBEPCC) (NB Power) is the electric power utility for the Province of New Brunswick, Canada. The utility supplies power to the provinces of New Brunswick and Prince Edward Island. NBEPCC is responsible for the generation, transmission and distribution of power within the province.



Mactaquac Hydro Electric Dam

Problem

The New Brunswick Electric Power Commission has a requirement to monitor and control from one central location, five hydro electric generating stations on the Saint John River and one remote intake at Grand Falls. A client supplied microwave system is to be used for Master Station to Remote Terminal Unit (RTU) communications. It is required that the customer be provided with a system which can monitor and control: breakers, start/stop generators, raise/lower gates for generator outputs, etc.

Solution

In 1986, a Supervisory Control and Data Acquisition (SCADA) system was designed, manufactured

and installed by Willowglen Systems to perform all of the above monitoring and control functions. The system consisted of two PDP-11/73 host computers configured to operate in a dual redundant standby mode. The system supports three local colour display terminals, one local monochrome display terminal, and one remote colour display terminal. The system also supports two letter quality printers. A Willowglen Changeover Switch is used to share the peripheral devices between the two redundant host computers. Online data storage and archival data storage is achieved using Digital Equipment Corporation (DEC) RD-53 disk drives and DEC TK-50 magnetic tape drives. The SCADA software running on the PDP-11/73 computers stores the data received from the field, alerts the operators when power system abnormalities occur, and displays the status of the system continuously. An intelligent Communication Interface Unit (CIU) with VISTA™-II software is connected to the host computer to communicate with the RTUs.

Six Model 8000 RTUs were installed. These intelligent RTUs were all equipped with the same application software and the same basic hardware configuration. The only difference between the RTUs is that each one has varying amounts of I/O depending on the location. The RTUs perform data acquisition and control functions on: analog inputs, digital inputs, analog outputs, digital outputs, frequency inputs, and 1 millisecond resolution Sequence of Events (SOE) inputs.

Advanced capabilities include:

- Sequence of Events recording with 1 millisecond resolution.
- A copy of every RTU's database is stored in the CIU.
- The CIU operator can edit any RTU's database and then download it to the appropriate RTU.