Imagine accessing information about your plant’s performance at the click of a mouse. Daily reports, gas well-test results, live and historical data intermingled with lab data, process graphics - all available through your Web browser. This is what the collaborative SOEI team wanted from their Web enabled Process Information Management System (PIMS) and a payback of a few months for their investment! SOEI selected an integrated hardware, software and services solution that provides a framework for the flow of information between the process, plant control and business systems for all the SOEI onshore and offshore facilities. SOEI’s PIMS team decided that operations and other SOEI employees should have instantaneous access to current and historical information to make informed decisions in both their day-to-day activities and their long-term operations. Ultimately, this new technology decision support tool will lead to considerably improved process operations through enhanced process understanding.

SOEI History

From the mid 1960’s to late 1980’s, significant deposits of gas were discovered in the porous sandstone underlying the Sable Island area, 160 to 300 km off the east coast of Nova Scotia. SOEI has constructed the facilities for three natural gas reservoirs. These three reservoirs are Venture, Thebaud, North Triumph, which contain 100 billion cubic metres of recoverable gas reserves.

SOEI has offshore and onshore facilities for production, transmission and processing of natural gas. The Scotian Shelf has the potential to become a major player in the North American natural gas industry.

ABB Automation is a member of the SOEI Facilities Alliance responsible for the design and construction of the project. As a member, ABB Automation is the automation partner and responsible for a number of key integrated packages.

These packages include:

- Fire and gas detection systems
- Open Control System (OCS)
- Safety shutdown systems
- All telecommunications systems
- Simulator and simulator training program
- Process Information Management System (PIMS)

This article focuses on the main functions of the SOEI Web enabled PIMS systems:

- Collecting process data from the onshore at Goldboro and offshore at Thebaud OCS (INFI 90) loops via the Bailey semAPI interface
- Storing process and operational data into the historical PIMS databases both onshore and offshore
- Managing the enormous amount of online stored data (200 GB)
- Serving current and historical data to the IP.21’s Process Explorer/ Web enabled GUI clients and software interfaces
- Serving data to the Internet Information Server (IIS) for use by the Process Information Web Server (PIWS)
- Providing reports, queries and displays on the PIMS system
- Minimizing data collection loss on this complex telecommunication solution
- Allowing other systems (e.g. Mobil Production Reporting System or MPRS) to retrieve data from the PIMS historical database using standard development connectivity tools (SQLplus and ODBC)
- Provide Web based manual data entry capability to store data into PIMS or MPRS
- Integrating PIMS functions with Web Browser technology for easy access onsite or remotely
- Provide access on desktop computers to e-Process Report (Web based classREPORT) reporting system

Overview of SOEI PIMS System

PIMS provides the ability to generate quick adhoc or scheduled emailed reports, perform data analysis and view graphic display mimics and trends. Specific applications (Web based customized reports using e-Process Report, Manual Data Entry, Web Browser access to DCS graphic displays) and development connectivity tools (SQLplus, ODBC) will also provide SOEI with the capability to analyze and report on critical plant data through easy to use standard applications. The development tools also provide data mining capability for SOEI to develop new statistical analysis and reports in the future to meet their changing business needs.

The SOEI PIMS computer hardware consists of three Windows/NT servers installed onshore at Goldboro and offshore on the Thebaud platform. The servers are connected to the SOEI business local area network (LAN) at each location. Satellite communication links connect the offshore into a very large wide area network that includes Halifax, Point Tupper, Dartmouth, the two offshore drilling rigs and all the way to Mobil Calgary. This network connectivity allows access to data onshore or offshore.

The Scanner Computer collects process data from the OCS (INFI 90) loops and sends the data to the PIMS server using a dedicated Ethernet network link or buffers it if the PIMS server is unavailable. The PIMS Server receives data from the Scanner Computer and stores it into the history. It also serves the data to the client workstations, other servers or applications. The server will also backfill data from the other PIMS server if the Scanner Computer is unavailable. The IIS server is the main engine for PIWS’ Single Web Interface. e-Process Report runs on the IIS server and schedules and generates operations reports. This server also accesses data for Web pages requested by users on thin client PC’s using standard Web browsers. PIMS Utilities are used to safeguard historical information and ensure its completeness at both offshore and onshore locations. Back-up and restore procedures on a different medium are used to safeguard process data stored in the PIMS historian in case of accidental loss or corruption of data. Whenever a Scanner computer is unavailable, a backfill utility will transfer process data from one PIMS server to the other in order to keep both servers with identical data.

The InfoPlus.21 (IP.21) PIMS historian is an NT based three-tiered client/server software platform for automated collection, storage and presentation of real time and historical plant data. IP.21 has been designed with a flexible real time database to fit application needs and a state-of-the-art historical database capable of storing data at true resolution. PIMS provides both a robust, current picture of the process and the ability to access accumulated knowledge using historical information that can be quickly identified, retrieved and deployed in other applications. PIMS can be the platform for simulation and advanced control applications and provides an easy interface to any business information system.

The heart of the system is the IP.21 PIMS server and its 10,000 tags database historian. Other systems and applications communicate with the PIMS server to either retrieve or store data into history. As mentioned, Scanner Computers collect process data from the OCS (INFI 90) loops. The Corrosion System for the offshore platform retrieves process data for its calculations using an ODBC interface via standard protocol (TCP/IP). The MPRS system will retrieve a subset of process data for production allocation calculations and regulatory reporting.

Many applications use the process data stored in the PIMS historical database for analysis, reporting and additional data manipulation. Client PC’s will display process data in graphical trends and graphics using Infoplus.21’s Process Explorer Web enabled GUI application. The Web based Manual Data Entry application enables users to add manually gathered process data or laboratory test data into the PIMS historical database.
from anywhere. This data is then available for historical queries and for use in calculations. A separate facility is also available to enter manual data directly into the MPRS system.

The e-Process Report package enables the configuration, scheduling, and execution of reports that encompass both real-time and historical data. Report layouts are configured using the standard Microsoft’s Excel spreadsheet package but have the benefit of being in a self-contained reporting package with a secure interface.

The Infoplus.21 PIMS historian has the capability to calculate derived data values using any combination of collected process data (raw data), manually entered data, other calculated data and numerical factors within Calc.21. These calculations are embedded within the secure PIMS servers as a trusted calculation source.

**Web based Interface**

PIWS is incorporated in the SOEI PIMS system to serve data to the Intranet located onshore and offshore. From a client computer, a desktop browser can access information served to the IIS from PIMS as well as any other data that SOEI may choose to integrate at a later date.

The beauty of the Web solution is that any person in the company can easily browse live and historical process plant data with a simple Internet browser. Users will be able to access the applications with a single interface. Web users can enter manually captured lab data into PIMS or MPRS, view on-line documents (Bailey CAD and Composer drawings, spreadsheets, process and instrumentation drawings, financial information, maintenance information and instrumentation data), view process data, graphics and trends. The Process Graphic Viewer within PIWS allows graphics from the OCS Operator Interface System consoles to be displayed in view (no control) only mode within Web pages. These OCS graphics are actual graphics viewed by operators and contain animated process values coming from console servers. This package will save SOEI money in not having to engineer another set of process type graphics for the PIMS package. The status of the OCS system nodes can also be monitored within PIWS using the Control Network Viewer.

Well-test batch reports are retrieved from the PIMS database for analysis and results are stored into the PIMS database. Within Web based e-Process Report, users may view and configure reports or issue a request to the MPRS system to generate a report and display it in the web browser.

The single Web user interface consists as a two-frame HTML document. The left frame utilizes the standard Microsoft ActiveX components to provide the user an expandable/collapsible navigational tree so users never get lost in the Web. The contents of this tree control object are:

- Process Graphic Viewer to display Operator Console screens
- e-Process Report to view, configure and manually request reports, execute
- Manual Data Entry into an HTML document
- Aspen Tech InfoPlus.21 @aGlance tools to create static Web pages using provided CGI, ActiveX or Java based components
- Aspen Tech “Process Explorer Web Components” to view IP.21 Process Graphics and Trend Displays
- Online documents and Help allow links to frequently used documents, help and user created files.

The PIMS system at SOEI is essential to assist in increasing productivity, decreasing costs and will lead to better real-time decision making. The expected payback on similar PIMS systems is less than 6 months. Should you want us to review your site needs for process information systems, please give us a call to complete a needs analysis audit.