



## **GLACIER SERVICES, INC. OPERATIONS AND MAINTENANCE**

Glacier Services has been providing operations and maintenance (O & M) within Alaska's oil and gas industry for over a decade. Our support and maintenance for British Petroleum, ConocoPhillips, Eni and Pioneer has included their DCS, PLC, SCADA and engineering systems. These service and support activities are numerous and the following represents a sample of our O & M capabilities.

### **1. Operations Reporting Data**

Client: British Petroleum (BPXA)  
Location: Alaska (Anchorage and North Slope)  
Length: Ongoing

#### **Activity Overview:**

Develop and modify reports for BPXA internal operations, BPXA co-owners and issuance to both federal and state authorities. This includes operations, compliance, royalties and tax reporting. The reporting system provides BPXA with vital information to include:

- Production and allocation reporting
- Royalties
- Taxes
- Well monitoring
- Well configuration
- Well event tracking
- Turbine runtime and fuel usage reporting
- AOGCC monthly reporting
- Freeze protect logging
- Diesel usage logging
- Gas venting logging
- MPFM (Multiple Flow Meter) compliance
- Annual bleed logging
- Lab data entry
- Reporting and run ticket monitoring

GSI's activities with this effort involved both design and engineering knowledge utilizing Aspentech IP.21 database and a graphic control system (GCS) HMI. Coding languages include SQL, Visual Basic.Net and Excel. A variety of operating systems are also involved including UNIX, VMS and Windows.

### **2. SCADA Implementation**

Client: British Petroleum (BPXA)  
Location: Alaska (Anchorage and North Slope)  
Length: Two years

#### **Activity Overview:**

System upgrades to replace aging supervisory control and data acquisition (SCADA) systems with new SCADA systems at various petroleum processing plants on the North Slope.

This effort involved detailed analysis of the older SCADA systems, existing programs and reports. The replacement systems are Windows based servers and include Aspentech IP.21 database and a graphic user interface (GUI) HMI. The transition included the generation of custom code, programs and reports with the new systems. Detailed knowledge of SQL and Visual Basic.Net coding languages were employed during the implementation. The operating system environment included UNIX, VMS and Windows. Most of the upgrade work performed by GSI was completed in remote sites under field conditions.

### **3. Production Optimization**

Client: British Petroleum (BPXA)  
Location: Alaska (Anchorage and North Slope)  
Length: Two months

**Activity Overview:**

Develop a new Aspentech IP.21 sub-system to discover more efficient practices to increase petroleum production.

This effort involved strong working design knowledge of all production facilities and operation practices at Alaska's North Slope. Development of the sub-system included reports on existing systems and generation of custom programs by GSI. Coding languages utilized during the effort were SQL, Visual Basic.Net and Excel. Most of the development was completed on the North Slope in remote areas under field conditions.

### **4. Operator Training**

Client: British Petroleum (BPXA)  
Location: Alaska (Anchorage and North Slope)  
Length: Various

**Activity Overview:**

User interface training on Aspentech GCS and Honeywell PHD systems. Attendees for the training include both Engineers and Control Room Operators in Anchorage and Prudhoe Bay Alaska.

A strong knowledge of the underlying systems, user practices, BPXA company practices and North Slope operations were required for this effort. GSI developed the training program by configuring the classroom environment to include consoles, servers, networks and printers. GSI trained both end users and instructors.

### **5. SCADA System Upgrade**

Client: ConocoPhillips (CPAI)  
Location: Alaska (Anchorage and North Slope)  
Length: Two years

**Activity Overview:**

Replace obsolete VAX / VMS supervisory control and data acquisition (SCADA) systems with new Microsoft Windows based systems to include integrating the database / historian at all five ConocoPhillips petroleum and water processing plants on the North Slope.

The replacement systems are Windows based servers that were deployed utilizing Aspentech InfoPlus.21 (IP.21) real-time databases and graphic user interfaces. Each site was upgraded to a primary server with dual hot backup servers and redundant NetApp storage systems. All critical historical data was converted from obsolete systems to the new servers. The cutover was performed without interruption to ongoing oil and gas production at all five facilities. Almost 1,900 graphic displays and over 650 custom programs (SQL, C / C++ and Visual Basic) were converted and methodically tested. Secure file transfer methods were implemented for transferring regulatory and accounting data to other corporate users and the state of Alaska. These upgrades were completed under budget and ahead of schedule.

### **6. DCS I / O Driver Development**

Client: ConocoPhillips (CPAI)  
Location: Alaska (Anchorage and North Slope)  
Length: Twenty months

**Activity Overview:**

Develop and maintain real-time Windows multi-threaded input / output driver programs to continually transfer high speed process data between plant devices. These devices included logic controllers, wireless remote sensors and distributed control systems (DCS) used by Plant Operators to control oil, water and gas production / injection at both Kuparuk and Alpine oil fields.

High speed drivers for multiple protocols (Modbus, Allen-Bradley and ControlLogix) were developed using structured programming in C / C++ languages. The protocols were developed utilizing Microsoft Visual Studio development tools to meet industry standards. Full design, configuration and programming documentation was provided to the client both during and at the completion of development.