

# Natural Gas Production and Gathering Facility Case Study



## Introduction

The Bahrain Petroleum Company (BAPCO), wholly owned by the Government of Bahrain, is engaged in the oil industry including exploration and prospecting for oil, drilling, production, refining, distribution of petroleum products and natural gas, sales and exports of crude oil and refined products. Bahrain is an island nation located in the Persian / Arabian Gulf situated between Qatar and Dhahran, Saudi Arabia.



BAPCO has oil and gas production facilities that supply natural gas to Bahrain for power generation, industrial feedstock, and household use. The gas is also injected for reservoir pressure maintenance and gas lift. Well production fluids are separated into an oil fraction, a gas fraction, and a water fraction. The field production facilities include approximately 30 gas wells and 300 oil wells. Average production from these facilities is 38 MBOPD and 880 MMCFD.

## Problem

Supervision and control of the Khuff Gas production and gathering facilities was controlled by outdated equipment with semigraphic operator display consoles. Performance of the existing system was constrained by inadequate disk storage space for historical data, inadequate processing power for new application programs, and the inability to support local area networks. The gas dehydration units connected to natural gas wells needed state-of-the-art Remote Terminal Units (RTU) for monitoring and control.

## **Solution**

In 1991, in a decision based on technical ability and competitive pricing, BAPCO selected Willowglen to supply a Supervisory Control and Data Acquisition (SCADA) system for the Khuff Gas Production and Gathering Facilities. The project included an upgrade of the existing control system by replacing the main computer and operator terminals with a completely fault tolerant SCADACOM® central host computer system.

In 2001, the system was upgraded with new hardware and updated SCADACOM® software. The SCADA host system is used to monitor and control the Willowglen RTUs as well as other Programmable Logic Controllers (PLC) and RTUs. In addition, serial communication ports are used to communicate with an external SCADA system.

The Willowglen Model 8016 RTUs are equipped with 9600 baud modems to communicate with the host computer. Full AGA-3, NX-19 and AGA-8 calculations are performed in the Model 8016 RTUs.

The SCADACOM® master system is made up of powerful host computer hardware, SCADACOM® baseline software, and project specific application software. By selecting the SCADACOM® solution, BAPCO benefits from the ease of system configuration, the commitment to open systems, and the ease of future system expansion with additional low cost but high performance workstations. In addition, the operators interact with the control system using the SCADACOM® high resolution graphic display screens, user configurable reports, and variable scaling trending displays.