

# Solutions for Onshore Oil and Gas

Creating value through integrated solutions



# ABB Solutions for Onshore Oil & Gas



## Global

responsibility

ABB is a truly global organization with global concerns. With a firm focus on Health, Safety, Security and Environment, we strive to provide the Oil & Gas industry with technology and services that have a positive effect on the world we live in.



## MultiScope

risk management

ABB manages large projects with multiple scopes. We value that skill as a core competence. By combining our multiscope capability with project forecasting, planning and implementation, we reduce risk throughout the project and decrease the total installed cost.



## LifeCycle

enhanced return on capital

ABB's services and products enhance your project from first concept to decommissioning. We operate locally while drawing support from ABB resources around the globe. A partnership with ABB provides world-class expertise and continuity. As the project develops from one phase to the next, we're able to capture lost profit opportunities, to help improve return on capital.



## Enabling Technologies

operational profitability

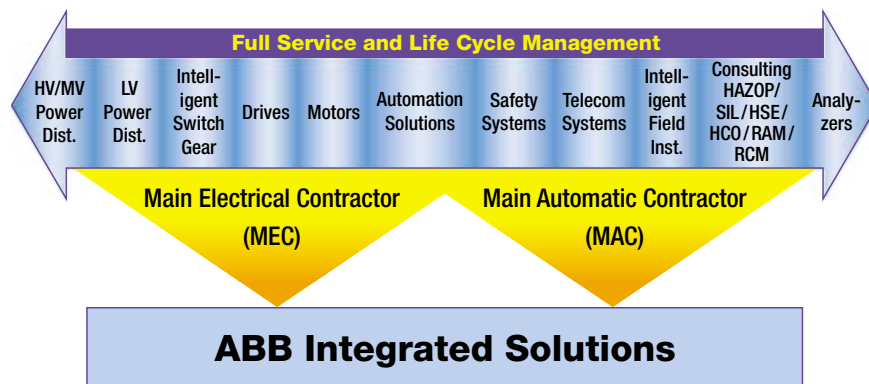
Our Industrial<sup>IT</sup> Enabling Technologies provide fully integrated power, SCADA, automation, telecom and production applications with open connectivity to business systems - a major contribution to safety, profitability and maximized resource utilization.



## A Pioneering Spirit

### Flawless project execution

ABB minimizes your risk by providing integrated products and solutions as the Main Automation Contractor (MAC) and the Main Electrical Contractor (MEC). Solutions for upstream and midstream automation include a full range of instruments and field devices, combined with applications such as pump optimization, field emergency shutdown (ESD), compressor efficiency monitoring, automated well testing, enhanced oil production, abnormal situation management, as well as many other solutions.



Benefits using the ABB integrated approach:

- Risk Management - everything working right the first time
- Schedule Improvement - engineering, commissioning and start-up time reduced
- Cost Reduction - lower engineering, start-up and maintenance costs
- Operational efficiency - a reality that the total plant availability and throughput will improve maximizing the plants profit margin
- Best Use of Technology - truly integrated solution
- Designing it Right - providing best in class and fit for purpose solutions that "build-in" long term benefits
- Project Execution Excellence - a single integrated team with global reach and resources
- Life Cycle Management - from competency development to post-commissioning support to full service.

## Upstream and Midstream

### MAC/MEC benefits

- 20% project cost saving potentials using MAC
- Reduced procurement, spare parts, training, installation and commissioning requirements
- Lower engineering costs – proven interfaces and standard libraries
- Reduced expediting and inspection - single source supplier

*“ ABB provided the efficient way to execute and complete our refined products pipeline SCADA project. ”*

Liu Weiguo  
Operations Manager  
SINOPEC



## Our solutions for onshore oil & gas are more valuable than the sum of our products



As the world's leading supplier to the oil and gas transportation and distribution industries, ABB can provide you with equipment, automation systems, software and services to run your operation productively and profitably. You've thought of us as a measurement company, a controls company and an automation company. We're all of those things. And all of those things combined are Information Technology, or IT. We focus IT on the core processes in your industry, blending the needs of the IT world with the needs of Industrial Automation. That's ABB Industrial IT.

A key feature of ABB IndustrialIT is ABB Aspect Objects™, which integrates information from a variety of applications and makes it available in real-time to any authorized users regardless of their location. Wells, compressors and other components are presented as configurable software objects. Each object carries a range of related information, such as electrical and mechanical capabilities, intellectual properties and identity information that makes the object instantly recognizable to enterprise-wide information networks. With Aspect Objects, information is deployed rapidly and uniformly, so personnel throughout your enterprise view your business through the same real-time "window." Better information means faster and better decision-making and more control over assets.

ABB offers total automation solutions to monitor and control operations for upstream and midstream, resulting in lower operational costs and improvements in safety and environmental compliances. From the wellheads to the control room, and on to the boardroom, ABB provides your business a competitive edge, with unsurpassed enterprise connectivity and information access.

ABB's engineering services range from providing electrical equipment, automation equipment and/or instrumentation to delivering a complete system designed to support geographically dispersed assets with "anytime-anywhere" data access. A typical project scope of services includes:

- Project management
- Procurement and logistics
- Site survey and analysis of existing facilities
- Installation and commissioning
- Work statement
- Startup assistance and training
- Basic and detailed design
- Service and maintenance
- Hardware and software engineering

Much of the lifetime return on your investment is determined from the moment you break ground on a new project. ABB can help by providing services, consultation and training as an integral part of the project throughout its life-cycle, including planning, design, production and startup. ABB's support doesn't end with commissioning, however, online and onsite support is also part of our program.



# SCADA Systems

are a core competence of ABB

*Supervisory Control And Data Acquisition (SCADA) systems and ABB's oil and gas experience, enable implementation of the "Field of the Future" concept, resulting in lower operational costs and improvements in safety and environmental compliances.*

Remote operations can be conducted in a safe, thorough, and coordinated manner, through regional and corporate operational centres, allowing remote access for engineering technical experts to implement the right solutions, quickly and in the most cost effective manner.

ABB industry-specific solutions offer scalability and openness, from single-node installations to multi-layered systems. Moreover, the solutions are implemented upon an object-oriented system based on true client/server principles and with redundancy (hot-standby). Security is offered through a highly configurable authority system. Open communication with system components is available through standards such as ODBC, OPC and OLEDB. These state-of-the-art features are offered along with sophisticated front-end communications with redundant configurations and automatic switchover in case of signal loss with remote devices. System features include:

- Open architecture
- Redundancy
- Real-time object-oriented database (SQL compliant)
- Time synchronization
- Real-time calculation engine
- Object library
- Integrated historian server
- Integrated training simulators
- State-of-the-art-process graphics
- Web browser
- Scalability from single-node installations to multi-layered systems
- Peer-to-peer replication for main and backup centers
- Hierarchical replication for multi-layered systems
- Intuitive configuration tools, available across system and application boundaries

ABB's SCADA Vantage™ solutions seamlessly link your business and trading systems in real time, creating a single source for operational, engineering and business information. With this approach, you can coordinate and optimize your dispatching operations, and integrate them with the rest of your business... a true competitive advantage.

***"This rapid increase in production activities might normally mean doubling the number of pumpers/operators. Automation will allow us to keep up without adding pumpers/operators."***

Kevin Kilstrom  
Production Manager  
Marathon Oil Corporation

## Benefits

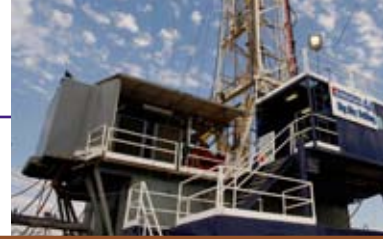
- Simplified user interaction
- Integrated automation, SCADA and telecom user environment
- Enhanced SCADA functionality
- Support for OPC and a wide variety industry-standard communication protocols over a wide range of media
- Simple integration with field automation solutions
- Highly integrated, fast information access and navigation

***"ABB has supported us with SCADA technology for the last ten years, making a continuous expansion and upgrade of the system possible."***

Javier Pellón  
Technical Manager  
ENAGAS



## Project Profiles



### Coalbed Methane Gas Production

As global demand for oil and gas continues to rise, companies are increasingly looking for new innovative alternative sources to supply this demand. In 2001, Marathon Oil Corporation acquired Pennaco Energy Inc., adding a leading coalbed methane asset and expanding its natural gas resources in North America. Today, Marathon has over 2,500 coalbed methane wells in the Powder River Basin located in southeast Montana and northeast Wyoming, USA. Marathon uses ABB solutions for measurement and automation systems. The system includes RTUs, flow computers, pump controllers, SCADA software and communications solutions. Measurement is done at the wellhead, instead of centralized metering buildings, which allow the wells to be operated with fewer operators, contributing to production cost savings. The data is gathered and streamlined via ABB's SCADA Vantage™ system, and interfaces with the customer's production and accounting software. Together, ABB and Marathon developed a coalbed methane system that would support operations and the remote telemetry of their applications.

### CO<sub>2</sub> Injection and Storage

Apart from giving new life to an old oilfield, the use of CO<sub>2</sub> injection makes EnCana's Weyburn site the world's largest greenhouse gas sequestration project. In one oilfield alone, the Weyburn CO<sub>2</sub> flood will store 30 million tonnes of CO<sub>2</sub>, which is the equivalent to removing 6.8 million cars off the road for a year. ABB has been involved from the beginning of the project, providing the following SCADA Vantage™ solutions for monitoring and control:

- Well monitoring and control
- Plant Processing
- CO<sub>2</sub> Compression Plant
- Tank Farm
- CO<sub>2</sub> Pipeline Monitoring
- CO<sub>2</sub> Nomination
- Dynamometer Cards
- Field Emergency Shut Down (ESD)
- Automatic Well Testing
- Miscible Flood

Currently, ABB's solutions are helping EnCana Weyburn achieve 60% increase in oil production, and 12,000 incremental barrels of oil per day as a direct result of the CO<sub>2</sub> injection project.

### Field of the Future

Today, real-time data plays a major role in a manager's business decisions. Keeping this as an imperative, ONGC (India's Oil and Natural Gas Corporation Limited) aims to take maximum advantage of ABB's state of the art technology (SCADA Vantage™) to increase their productivity and thereby profits.

ABB recently provided its supervisory control and data acquisition (SCADA) technology to monitor and manage vital production and business information for ONGC. This project covers 157 offshore platforms, 10 offshore rigs, 247 onshore installations, pipelines, two processing plants, 65 onshore rigs and several thousand oil and gas wells. This is the single largest automation project in India with some unique features such as: the largest three tiered network of real time process data monitoring; India's largest Foundation Fieldbus based project; the largest Oil and Gas SCADA installation with 179 control rooms, 16 data centers and 75 mobile control rooms.

The system is designed to support ONGC's geographically dispersed assets both onshore and offshore with "anytime-anywhere" data access to enable faster decision-making and response for increased efficiency.



## A Full Range of Solutions from control room to field installation

**Remote Terminal Units** family includes smart RTUs, which combine a high performance RTU with a library of field-proven algorithms (for example, flow computer applications, multi-tube flow calculations, and well optimization) in one controller.

**Instrumentation and Fieldbus Solutions** ABB combines world-class products with unparalleled application expertise and industry knowledge. The current generation of ABB fieldbus-capable devices and systems provide true inter-operability, allowing you the freedom to select the most appropriate devices and fieldbus for your application. Our instrumentation product range includes transmitters, recorders, indicators, flow meters, analyzers, and valves. Our fieldbus offerings guarantee safe, secure and reliable operations through their unique built-in redundancy.

**Analytical Instruments** ABB also helps you maintain correct quality control. Our products include sampling systems and analyzers to measure pH, density, conductivity and turbidity; gas chromatographs; mass spectrometers; FTIR spectrometers; photometers (IR and UV); and physical property analyzers.

**Drives and Motors** ABB is the pioneer in digital AC and DC motor speed control for transportation and distribution industries. ABB's dependable single-drive and multi-drive systems provide a simple and clear solution for fluctuating flow rates.

**Telecommunication Solutions** ABB's solutions are based on the leading industrial telecom technologies and allow for simple, reliable and secure operation throughout your facility's lifetime. These systems can adapt to your changing needs, protecting your investments. ABB designs each telecom system for integration with other telecom, SCADA and automation systems.

**Power Technology** ABB is the world's leading supplier of power technology products. ABB delivers solutions, systems and equipment to efficiently transmit, distribute and control electricity. We combine an extensive line of hardware with expertise in network management, control, protection and monitoring, and with consulting and diagnostic capabilities. Our solutions include High, Medium and Low Voltage technologies, power transformers and distribution transformers.



## Asset Information operational gains

- Centralized management and low cost maintenance
- Increased safety and environmental control
- Reduced cost of ownership
- More reliable production and more efficient operation

*“ We’ve chosen ABB because they offer state-of-the-art technical solutions at competitive prices within short delivery times.”*

Liu Xiang Dong,  
PetroChina Project Manager





For further information please contact  
your local ABB office, or visit us at:  
[www.abb.com/oilandgas](http://www.abb.com/oilandgas)

© ABB