IndustrialIT for the Oil and Gas Industry

Creating value through integrated solutions.
ABB’s Industrial IT Solutions are even more valuable than the sum of our Products

As the world’s leading supplier to the oil and gas production and processing industries, ABB has provided 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 are all of these things. And all of these 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’s Industrial IT.

Measure

**Field IT**
Devices or software for process-related measurement or actuation, such as pressure, temperature, level and flow

**Meter IT**
Meters to measure usage of energy, gas, water, etc., and related software

**Analyze IT**
Devices or software to measure and analyze product composition

Energize

**Drive IT**
Technologies to supply and improve efficiency of motion, torque or position

**Power IT**
Devices to supply, regulate, convert and distribute electrical power

Produce

**Control IT**
Control and management of operational variables

**Operate IT**
Interaction between automation or plant systems and human operators

**Produce IT**
Planning, scheduling and manufacturing of customers’ end product, including procurement of raw materials

In the range and scope of our technology, products and services, ABB oil and gas is unequalled in the global market place. We can realize your ambitions for field development and facilities management for your project. ABB offers a complete range of services and systems to the global market place, including design and construction of complete land-based and offshore plants. ABB is the global leader for subsea products and systems, and also for wellheads, production trees, and drilling systems for both onshore and offshore facilities.
### Create solutions to optimize your value chain

ABB offers total solutions across the entire value chain, from wellheads through business systems, from your suppliers to your customers. We can create Industrial IT solutions adapted to your specific needs.

### Your Core Processes = the Value Chain

ABB looks at the core processes in your production facility as a value chain. The Operations axis represents all the processes needed to make a successful product; the Asset Management axis represents all the processes needed to keep your production facility ready to produce.

ABB offers information technology solutions that address all processes in this value chain: products that bring value to the day-to-day operations of your business, and services that contribute to the management of your overall production facility.
100 Years of Experience

ABB combines world-class products with unparalleled application expertise and industry knowledge. Our history of innovation, superior performance and technological firsts ensures that you receive the best solutions available today. Our use of fieldbus communications and the development of IndustrialIT field devices ensures that our products are also ready for tomorrow.

The current generation of ABB fieldbus capable devices/systems provides true inter-operability, allowing you the freedom to select not only the most suitable devices available, but also the most appropriate fieldbus for the application.

ABB instrumentation includes:

- Pressure transmitters and remote seals
- Temperature transmitters and sensors
- Controllers, recorders and indicators
- Magnetic, variable area, mass, coriolis, vortex, swirl and wedge flowmeters
- Water and industrial analyzers
- Electrical and pneumatic valve automation products
- Control valves
- HART®, FOUNDATION™ Fieldbus and PROFIBUS compatible instrumentation

Your Business – Our Solutions

ABB supplies remote equipment for hydrocarbon production, transmission and distribution measurement devices and control applications.

ABB solutions also include:

- Flow computers for custody-transfer and quality differential measurement for natural gas
- Flow computers for custody-transfer quality pulse input measurement for gas and liquids
- Remote Telemetry Units (RTU) with a library of field-proven production algorithms
- BTU transmitters provide custody-quality, composition measurement and energy valuation of natural gas
- Advanced control solutions
- Tank level management solutions providing unprecedented accuracy with unsurpassed value
- Wide range of field-proven, scalable communications solutions for a single site or multiple sites
- Host software to manage operations and data site-by-site throughout the entire system
- Call-out maintenance solutions capitalize on every trip to a field production site
Innovation and experience are combined in ABB’s analytical products to offer our customers exceptional functionality, reliability and accuracy in the harshest environments while maintaining a clear display of the process. The comprehensive product range includes analyzers to measure pH, conductivity, oxygen and turbidity, zirconia oxygen analyzers, gas chromatographs, mass spectrometers, FTIR spectrometers, photometers (IR and UV) and physical property analyzers.

ABB offers:
- Gas analyzers/photometers
- Gas chromatographs
- Mass spectrometers
- FTIR/NIR spectrometers
- Zirconia oxygen analyzers
- Water analyzers
- Electrodes

Total Life-Cycle Management
ABB’s AC and DC drives are scalable and designed to be used with both AC and DC motors. Each drive includes all the components needed for total life-cycle asset management:
- Engineering standards and tools
- Tested application standards
- Maintenance tools
- Commissioning
- Training services

Drives can be connected easily to any control system, thanks to flexible communication capabilities. Configuration and diagnostic tools are PC-based.
As the global leader in open control systems, ABB supplies a series of scalable solutions that fit perfectly in today’s dynamic enterprise. From mid-range control systems to enterprise-wide automation, ABB offers a product and solution custom-tailored to fit every need.

**Control Applications**
Using IndustrialIT, ABB provides a broad range of oil and gas control applications such as production optimization, oil movements and storage, crude oil blending, alarm and information management systems, dynamic simulation, SCADA for all production and pipeline systems, etc.

**ABB Aspect Objects**
A key feature of this next generation technology is ABB Aspect Objects™, which integrates information from a variety of applications and makes it available in real-time to any authorized user regardless of their location. Plant data and plant components are presented as configurable software objects. Each object carries a range of related information, for example, electrical and mechanical capabilities, intellectual properties and identity information that makes the object instantly recognizable to plant-wide information networks. With Aspect Objects, plant information is deployed rapidly and uniformly, so that personnel throughout your enterprise view your business through the same real-time “window.” Better information means faster decision-making and more control over assets.

**Integrated System**
ABB’s strategy makes it simple and cost-effective to own, operate and maintain our IT solutions. One integrated system handles all aspects of control over the equipment, process, quality functions, electrical systems, regulatory functions, etc.

**Composite Plant Solutions**
ABB supplies IndustrialIT products and services on a turnkey basis. Large projects require supply coordination and total integration of products and services. For new plant projects worldwide, ABB has developed:
- Transformers
- Switchgear and motor control centers
- Remote services
- Power quality
- Plant design

ABB delivers solutions, systems and equipment to efficiently transmit, distribute and control electricity. With our extensive line of hardware expertise in network management, control, protection and monitoring, and our consulting and diagnostics capabilities, we can optimize your asset utilization and contribute to the profitable operation of your business.
ABB’s Power Energy Management Systems (EMS) prevent blackouts and increase the electrical stability of the plant for cost-efficient and reliable power management.

**Power EMS**
- Fast load shedding when power supply sources are lost (response time < 100ms)
- Slow load shedding during overload (peak shaving)
- Active and reactive power control
- Synchronization
- Re-acceleration and re-starting
- Generator and turbine control with integration of excitation and governor controller
- Transformer and tap changer control
- Circuit breaker control with integration of protection relays
- SCADA functionality including:
  - Time tagged events (1 ms accuracy)
  - Intelligent alarm filtering
  - Consistency analysis
  - Disturbance data analysis

Power EMS helps you achieve stable operation and power control by sharing active power (Watt’s) and reactive power (VAr’s) among generators and tie lines. This ensures that the electrical plant as a whole can withstand larger disturbances (from inside or outside the plant) before any motor, generator, transformer, tie line, etc. is tripped.

**Avoid Black-Outs/Load Shedding**
If an instability occurs (because of tie-line(s) and/or generator(s) trip), the load shedding function minimizes the risk of interruption of the production process by switching off the less important loads according to dynamic priority tables.

**Reduce Electric Costs/Peak Shaving**
When in-house generation is maximized and the power demand still violates the contracted maximum value, the system automatically sheds some of the low priority loads.

**Minimize Operator Requirements**
Several generators producing electricity simultaneously normally implies additional control activities for the operators. ABB Power EMS, intelligent alarm filtering, consistency analysis, operator guidance, and a single window concept minimize the need for operator action.

**Optimize Network Design**
The setpoints for the generators, turbines and transformers are calculated to prevent overloading and to keep the electrical network in use to its limits. Over-dimensioning of the network is no longer needed.

**Minimize Cabling and Engineering**
All the signals and information from protection/control relays, governor/excitation controllers and other microprocessor-based equipment can be easily transmitted to the Power EMS via serial communication links. This avoids marshalling cubicles, interposing relays, cable ducts, “spaghetti” wiring and cabling engineering. It also provides extra functionality, such as parameter setting/reading, stored events, disturbance data analysis and a single window to all electrical-related data.
Fieldbus Solutions

As the global leader in the process automation market, ABB is the leading provider of digital fieldbus technology. We offer the widest range of PROFIBUS and FOUNDATION Fieldbus compatible instruments, analytics, drives, and system interface and support products. Our fieldbus offerings guarantee safe, secure and reliable plant operations through unique built-in redundancy design.

The key principles behind ABB’s fieldbus initiatives include:

- Full range of fieldbus instrumentation
- FOUNDATION Fieldbus and PROFIBUS integration
- Seamless integration with ABB systems
- Integration with third party packages
- Full conformance to fieldbus standards
- Commitment to full inter-operability
- Design for asset optimization
- Provision for stand-alone engineering tools
- Provision for application-specific packages
- Local and global support

PROFIBUS

ABB provides plant-level digital fieldbus solutions that take advantage of PROFIBUS-compliant products such as pressure and differential pressure transmitters, temperature transmitters, valve positioners, magnetic inductive flow meters and electrical control actuators. Our communication structure intrinsically interfaces safe field networks (PROFIBUS PA) with redundant, high-speed field networks (PROFIBUS DP).

FOUNDATION™ Fieldbus

Also emerging as a dominant digital fieldbus protocol of choice, FOUNDATION Fieldbus provides an intrinsically safe, low-speed field device network (H1) and a high-speed network based on Ethernet/TCP/IP (HSE). While participating in the Foundation’s definition and development activities, we have introduced many FF H1 compliant products, including pressure and temperature transmitters, several flow meters (mass, vortex, electromagnetic) and valve positioners. Using linking devices and a redundant, high speed communication network, these FF H1 compliant devices can be integrated within our system offerings. Our host system interfaces and configuration tools let you easily configure and maintain your digital fieldbus products, as well as other smart devices.

The Preferred Provider

Many of the early adopters of fieldbus technology have identified ABB as the preferred fieldbus solution provider. To date, ABB is leading the way with the largest PROFIBUS installation in the process industry and the largest FOUNDATION Fieldbus solution.
Real-time Production Automation with iVision

IndustrialIT brings real-time production to, and increases responsiveness throughout the enterprise. ABB delivers targeted industry-specific IndustrialIT solutions with features that enable improvements in production, gathering and processing.

ABB’s integrated solutions for oil and gas production automation are flexible and comprehensive. ABB delivers on the promise of IndustrialIT by combining excellence in:

- Field products and end devices
- Remote terminal units
- Flow computers
- BTU Analyzers
- Communications
- SCADA host
- Historian
- Applications
- Project experience
- Support and maintenance

The hub of ABB’s real-time production automation solution is iVision software. iVision is a flexible, high performance, open architecture, real-time SCADA system. iVision is capable of hosting applications that link real-time and transactional business systems and is a single source for operational, engineering and business information. Design goals realized in iVision include:

- Lower operating costs
- Maximized production
- Increased marketing advantage
- Less dependence on specialists
- Lower maintenance costs
- Improved performance and ROI

In addition to providing complete solutions from the wellhead to the control room to the web, ABB can incorporate existing wellhead hardware as well as existing SCADA systems into a single corporate production automation system.
ABB PALS

ABB offers a complete suite of solutions for every aspect of artificial lift. Our Pumping Artificial Lift Solutions (PALS) package combines technology, products and applications that are tightly integrated with ABB’s IndustrialIT suite of solutions.

ABB PALS suite of solutions for onshore artificial lift production equipment consists of:

- Low voltage wellhead equipment for the most common artificial lift methods such as donkey pumps, Progressive Cavity Pumps (PCPs), Electro Submersible Pumps (ESP’s) and water injection pumps. All equipment is suitable for operation in severe production environments.
- Packaged solutions for clustered wells like the Multi-Well System (several oil producing wells locally supervised by one single local panel), the Multi-Phase Pump Smart Power House (MPP SPH), and the PCP Smart Power House (PCP SPH).
- Power network cleanup of harmonics with a geographically distributed approach (cluster wise), using ABB Active Filters (AF), for an onshore oil producing field (a first worldwide).
- Variable Speed Drives (VSD).

In combination with these systems, PCP, MPP, AF and advanced VSD constitute a complete cluster solution, ABB’s Smart Cluster System (SCS). All of these systems are in the low-voltage range and share a common ACS drive technology to improve the maintenance environment, with both standardization and ease of operation in mind.

When these systems are integrated with our Enhanced Oil Production (EOP) suite of solutions, you can enhance production while operating and managing reservoirs much more efficiently and at a lower cost.

ABB is continually improving artificial lift technology. We are always seeking to enhance well site monitoring and increase flexibility in the production cycle. Whether you need advanced automation and control techniques or unique integrated systems, ABB has the right solution for your production requirements.
Protection for Equipment, Fields, Environment

Safety and reliability are critical factors in designing Emergency Shutdown Systems (ESD) and the fire and gas detection and protection systems. ABB offers single, dual or triple redundant safety systems that are also suitable for new fields.

These systems bring production facilities and refinery units to a safe state after an unpredictable hazardous event, and maintain that state until otherwise commanded. Whatever the cause for operating abnormalities, ABB safety systems are designed to consistently and automatically protect personnel, environment and equipment. ABB safety systems do not take false or unnecessary actions, rather the system accelerates the process in which the plant will return to its normal operating state.

ABB conducts a hazard analysis to determine the required level of safety integrity for your plant. The analysis also determines which type of safety protection is required, such as an Emergency Shutdown system. The next task is to decide the appropriate Safety Integrity Level (SIL) the system must meet.

The IEC 61508 and IEC 61511 developing standards define, among many items, four Safety Integrity Levels. Most production facilities in the oil and gas and petrochemical sectors have critical safety applications that range from SIL 1 to SIL 3 (the three levels referenced in the ANSI/ISA S84.01 guidelines).

ABB safety systems are certified by the German certification agency TÜV to SIL 1-3. Single architecture systems are limited to SIL 1-2, whereas dual and triple (TMR) systems are certified for SIL 1-3.

Single Architecture

ABB’s single control branch safety system has many features that make it suitable for use in advanced safety applications, including safety I/O boards, programming elements and highly advanced diagnostics. It is also suitable for use in smaller applications where it can handle both process control and safety.

Dual Architecture

ABB’s dual redundant safety controller is designed to meet any application requirement in safety. It has two control branches that work in parallel, yet independent of each other. Each control branch is able to set field output signals when its extensive diagnostic control gives an active permissive signal.

Triple Modular Redundancy (TMR)

ABB’s TMR safety controller has a fully triplicated architecture, from input modules to output modules. It uses a 2-out-of-3 voting principle, and is designed for maximum safety and availability, maximizing uptime for the plant. The ABB TMR system offers fault-tolerant and fail-safe operation and has the fastest scan time of any TMR system with availabilities exceeding 99.999%.
**Optimizing Processes**
The solutions and services from the ABB Advanced Applications Engineering group are an integral component of the IndustrialIT offering. They work within an existing infrastructure to:
- Increase production
- Enforce production safety and environmental operating constraints
- Improve a production facility’s economic return
- Train operations and maintenance staff

**Advanced Solutions Product Suite**
The suite offers:
- Multivariable control
- Real-time optimization
- Proprietary process model-based control
- Energy management for cogeneration
- Electrical management system for load management
- Blending control and optimization
- Material movements and storage automation
- Dynamic simulation for training and engineering applications
- Plant information management systems
- System integration

**Advanced Application Services**
These services provide:
- Energy management auditing
- Process control performance auditing
- Plant performance benchmarking
- Process evaluation and development
- Safety, legal and environmental compliance consulting

**Resources and Capabilities**
ABB’s Advanced Applications Engineering group possesses the controls expertise and industry experience to deliver results to your plant. ABB knows process technology and plant operating procedures. Our network of ABB professionals worldwide are available to design and commission real-time applications for your site.

**Leading Edge Technology**
ABB delivers world class technology from both ABB R&D and our software partners. ABB utilizes best-in-class tools to build integrated application packages. Our powerful optimization tools solve problems ranging from single process units to small scale plants to large-scale multi-unit facilities. ABB has delivered more operator training simulators to the onshore and offshore production industry than any other company.

**Technology-Based Solutions**
Tapping into the power, automation and process technologies of IndustrialIT, ABB brings about major improvements in the performance of your businesses. Our technology builds upon years of industry experience, state-of-the-art software applications, and a high level of integration within ABB. It draws upon worldwide plant operational design, process engineering and licensing expertise. Whether you require a specialized product movement system, connectivity of a crude oil terminal to business systems, pipeline control or a customized planning and scheduling system, the ABB Advanced Applications Engineering group has the knowledge and know-how to find the correct solution.
ABB eBusiness solutions reduce transaction costs, improve business models and provide structured financing.

ABB Service and maintenance increase uptime and efficiency.

ABB Power Products and Energy Management reduce energy costs.

ABB Enhanced Oil Production Applications increase throughput, increase efficiencies and reduce energy costs.

ABB Instrumentation, Analytics and Measurement Devices increase efficiency and improve quality.

ABB Planning and Scheduling increases savings through achieving faster production, advanced inventory management and improved logistics.

ABB e-SCADA Control and Safety Systems increase efficiencies and reduce costs.

ABB Drives/Motors reduce energy costs, service and maintenance.

Artificial Lift Technology enhances production.
ABB Provides Technology, Products, Applications

Closing the Gap: an integrated approach across the complete life cycle.

Close the gap between plan and reality with ABB’s Industrial Applications.

Enterprise-Wide Comprehensive Approach to Asset and Supply Chain Optimization

- SCADA Systems
- PALS
- Integrated Safety Systems
- Advanced Solutions
- Enhanced Oil Production
- Subsea Drive System, HVD
- AC Drilling Drives
- Telecommunications
- Service
- eBusiness
Integrate Solutions and Services for the Oil and Gas Industry
to optimize the supply chain from wellhead to distribution.

DC Light™ Integrated Solutions to increase your profits.

- Improved Customer Relations
- Faster Responsiveness
- Improved Vendor/Supplier Management
- Reduced Production Costs
- Reduced Inventory Costs
- Increased Revenue
- Profit Performance
Long established as the premier supplier of industrial equipment, systems and services, ABB Oil and Gas has achieved a unique position in the oil and gas industry for its IndustrialIT solutions.

We build, supply, manage, automate and optimize plants, both onshore and offshore. We are the global leader for subsea products and systems. Our IndustrialIT solutions are already boosting the performance of plants around the globe. And we have formed worldwide research and development partnerships to find even more ways to reduce your operating risks and increase your profits.

With ABB and IndustrialIT, you can be sure that your facilities and assets are working as hard as you do.
Enhanced Oil Production

OptimizeIT Enhanced Oil Production Suite
Part of ABB’s Industrial IT platform, the OptimizeIT Enhanced Oil Production Suite is a family of systems, products and services aimed at increasing oil and gas production. These systems are standardized, modular and capable of full integration with any control system. OptimizeIT applications can be installed as stand-alone solutions to specific problems, or as total asset management solutions.

OptimizeIT Active Flowline Control
The OptimizeIT Active Flowline Control Suite controls and stabilizes multiphase flow in gathering systems, risers and flow lines. It is currently the only active control solution in the market for eliminating terrain-induced slugs. OptimizeIT Active Flowline Control prevents flow and pressure surges and smoothes the flow without increasing line back-pressure.

OptimizeIT Active Well Control
OptimizeIT Active Well Control stabilizes and optimizes gas lift and naturally flowing wells. OptimizeIT Active Well Control prevents flow and pressure surges while maintaining minimal back-pressure and maximizing production. For gas lift wells, OptimizeIT Active Well Control maintains stable production at the optimum lift gas rate.

OptimizeIT Well Monitoring System
OptimizeIT Well Monitoring System is a model-based system for estimating the flow rates of oil, gas and water from all the individual wells in an oil field. The real-time estimation is based on data from available sensors in the wells and flow lines. The OptimizeIT Well Monitoring System may be used as a software multiphase flowmeter, as a reliability tool and as a production allocation system.

Compressor Control Products
ABB provides a complete suite of compressor control products for onshore and offshore installations, with an emphasis on:
- Anti-surge control
- Load sharing

Audit and Tuning
ABB’s process and control system audits help you identify opportunities for increased uptime, increased throughput and reduced emissions. Control system tuning focuses on stability, performance, robustness and the dynamic interaction between process units.
Subsea Drive System

Increased Oil and Gas Production
Subsea processing offers new and significant cost saving possibilities for the field developer. However, subsea processing and transportation of gas and oil over long distances also requires the subsea installation of heavy duty rotating equipment including water injection pumps, oil pumps, multiphase pumps, booster pumps, wet gas compressors and rotating separators. Such equipment demands a large supply of electric power. Together with major customers, ABB has developed solutions to meet these demands. ABB’s Subsea Drive System (SDS) powers up the subsea processing rotating machinery in a safe, reliable and well-documented manner. It is a powerful and scalable system, cost-effective for small as well as large subsea installations. SDS is based on state of the art technology and is ready to be a part of retrofit or grass roots facility.

SDS Technology
Subsea Drive System consists of variable speed drives for subsea pump applications. The drives are based on the successful Voltage Source Converter technology, the dominating technology for drive systems. The SDS comes in two complementary versions: a topside version where the drive system is placed on the shore or platform, and a subsea version where the drive is placed subsea.

Benefits of SDS:
- Subsea booster pumps increase production without increasing costs
- New marginal fields may be developed with a minimum of topside processing equipment
- Subsea separation with re-injection of produced water increases the oil production with less power consumption
- Subsea removal of water reduces the need for water treatment equipment topside

HVDC Light™

Environmentally Friendly, Cost Effective Power Transmission
An environmentally friendly and cost effective power transmission system for offshore installations, HVDC Light is a fundamentally new power technology developed by ABB. HVDC Light is based on Voltage Source Converter technology - the same technology that has come to completely dominate the electrical drives market. Because it is considerably more compact and lightweight than classic HVDC, HVDC Light enables transmission of electrical power to, from and between offshore installations where distances prohibit AC transmissions. HVDC Light can be used to drive large electrical motors with variable speed operation - e.g., compressor drivers - as well as to supply power to electrical systems on offshore installations. Transmission of electrical power offshore installations replaces gas or diesel driven local generators. It decreases maintenance, increases lifetime and improves availability, thereby enhancing project economy. A typical offshore power station is far less efficient than a land-based station so fuel consumption and greenhouse gas emissions are greatly reduced by replacing electrical power transmission. By interconnecting offshore installations, generating capacity can be coordinated and optimized.

Benefits of HVDC Light:
- Higher availability of electrical power, i.e., increased production
- Reduced maintenance costs
- Longer lifetime of power supply equipment
- Reduced life cycle costs
- Reduced fuel consumption
- Reduced greenhouse gas emissions
- Optimized and coordinated generating capacity on interconnected installations
- Enhanced installation economy
Offshore and Onshore Drilling Applications

ABB has successfully served drilling drive system customers since the early 1970’s. The breakthrough for AC drilling drives came in 1994 when Shell/Statoil installed ABB’s (and the world’s first) AC drilling drive at the Troll A Platform. This installation quickly revealed the advantages of AC drilling drives. ABB’s drilling drives offer responsive, extremely accurate speed and torque control. They have excellent dynamic characteristics in the entire range from zero to maximum speed. The specially designed AC drilling drive and motor can hold the drillstring stationary at full torque. In draw-work applications, the motors attain zero speed with full torque. For the operator, this means full control using a single joystick.

Benefits of onshore and offshore drilling applications:
- Optimize drilling operations
- Minimum operating cost
- Increased safety and security
- Increased system availability
- Considerable energy savings due to high overall efficiency
- Low maintenance costs
- Ability to interface to all major suppliers

Reliable, compact and flexible ABB AC drilling drive systems consist of robust and virtually maintenance-free induction motors controlled by a modular, solid state water-cooled frequency converter. The Exe proof AC motors need no pressurizing. Air-cooling eliminates pipe systems and heat exchangers. The motors can operate without an eddy current brake system, reducing weight and saving space. Because the converter system is based on common DC bus principles, only one supply section is necessary, reducing cabling costs and space requirements. Expansion is accomplished by connecting new inverters to the DC bus.

ABB AC Drilling

A major advantage of an AC drive is the use of an induction motor. This is the most versatile, reliable and economical type of motor. Our induction Exe motors are standard, frame-size motors specially designed for frequency control and adapted to drilling applications.

Benefits of ABB AC drilling drives:
- High efficiency, low noise/vibration
- Simple construction, less maintenance
- Constant torque in the full speed range
- Available in 350, 400, 450, 500 and 560 frame sizes
- Output up to 4300kW (600, 660, 690V)
- Separate mounted, air cooled ventilator fan (no water cooling or air purging system required)
- Water and air cooling, Exe motors also available

Complete Deliveries

ABB offers the following complete deliveries:
- AC/DC drives, switchgear, power generation and management
- Cabins, chairs, consoles and panels
- Instrumentation and control systems
- Communication systems
- Studies and engineering
- Installation, commissioning, service and training
- 24/7 worldwide service and logistics
**Integrated Approach to Communication**

A common infrastructure of automation systems, SCADA systems, voice and data networks, and video seamlessly link users, regardless of their geographic location.

- Simplified user interaction
- Integrated automation and telecom user environment
- Centralized management and maintenance
- Reduced cost of ownership

**Wireless Technologies**

Wireless technologies support the activities within the wireless communication infrastructure, such as mobile phone networks and wireless networks. ABB provides end-to-end value added services to help construct and implement these networks. Our services encompass planning, acquisition, financing, design, configuration, engineering, construction and final commissioning.

**Fixed Networks**

ABB handles every task from consulting to operation, from analysis and design to implementation of fixed telecommunications and data networks in the oil and gas industry. We base our operations on product neutrality and are therefore able to design, install, maintain and support most types of networks for most users. Our services include voice communication, data networks and cabling, and various other services.

**Data Centers**

Internet Data Centers (IDCs) and Points of Presence (POPs) provide the technical infrastructure to keep communication equipment secure and reliable 24 hours a day, 7 days a week. Data Centers designed, built and maintained by ABB provide an optimal solution for Internet Service Providers, Application Service Providers and Network Operators. Our customers profit from our international experience in complying with local standards and regulations.
ABB Asset Performance Improvement

ABB offers a complete range of asset performance improvement services to the oil and gas industry. We build upon a highly competent staff, advanced technology and domain know how, as well as significant operational experience in the petrochemical and oil and gas industries. This combination of world-class professional services, consulting and industrial partnerships and operational excellence makes ABB your most trusted asset life cycle partner.

ABB helps you optimize the performance of your assets throughout their life cycle:
- After sales support
- Education and training
- Total Equipment Management (TEM)

ABB helps you to reduce your total maintenance costs by:
- Optimization of the direct costs
- Minimization of the indirect costs - e.g., increasing output by improving the Overall Equipment Effectiveness (OEE)

In doing so, we address Return on Capital Equipment (ROCE) and Economic Value Added (EVA) which is impacted by two factors:
- Additional contribution, i.e. the profit from being able to produce more goods due to available equipment, increased speed and acceptable quality
- The optimal use of resources, i.e. the cash gain and profit from not having to pay for excess equipment, material and people

Product and System Services

ABB offers complete professional services ranging from providing electrical rotating equipment or switchgear to delivering the most sophisticated ABB products and systems. These services also include education and training, parts and customer support.

After-Sales Services

ABB handles the repair, migration and modification of ABB products and systems, including drives, motors, switchgears, transformers, DCS, instrumentation and control systems.
- Parts
- Field service
- Remote customer support

Education and Training

ABB offers a comprehensive portfolio of customizable education and training programs covering:
- Product
- Process
- Technology

These programs can be delivered:
- On site
- At ABB University
- As self-study on the Web

Total Motor Management

ABB’s Total Motor Management (TMM) or System Services cover automation systems, instrumentation and control systems to:
- Reduce administration costs
  - Decrease the number of suppliers
  - Simplify the purchasing process
- Reduce capital employed
  - Decrease the amount of equipment in stock
  - Pool stocked necessary equipment
- Reduce risks
  - Provide turnkey solutions
  - Guarantee prices
- Increase output
  - Increase the availability of equipment through preventive maintenance
  - Reduce equipment failures, thanks to condition-based monitoring
Full Service Partnerships deliver customer benefits on the basis of an agreed minimum target level of plant performance in terms of production output and total maintenance costs in line with customer's business strategy. Shared benefits and risks are part of the Full Service partnership offered by ABB.

Full Service partnerships go much further than either fee-based management contracts or availability-based contracts, and are fundamentally different from contract maintenance (break and fix) and the various forms of field services, all of which do not cover the total plant performance as Full Service partnerships do.

ABB Full Service partnerships are long term win/win agreements whereby ABB takes over the design, execution, and management of the customer's industrial asset management function. Practically, this means that ABB manages the customer's entire asset base including plant equipment, maintenance, personnel, maintenance-related activities, spare parts, engineering functions, and non-production activities.

Our Consulting Services encompass:
- Global and specific performance benchmarking
- Asset management
- Safety and environment
- Legal compliance
- Process engineering
- Plant support
- Project consulting and support
- Organization and competency development

ABB helps Full Service partners achieve increased profitability by focusing on:
- Higher asset effectiveness and reduced maintenance costs (increased profitability)
- Increased availability, increased output and reduced quality losses (Overall Equipment Effectiveness or OEE)
- Improved coordination of asset availability and production strategy
- Reduced conversion costs
- Higher Return on Investment (ROI)
- Increased Return on Assets/Capital (RONA/ROCE)

ABB Full Service partnerships lead to improved customer satisfaction and loyalty gained by more reliable deliveries, reduced lead times and improved quality.

ABB has significant experience in the successful implementation of Full Service partnerships whether it be in petrochemical complexes or in remote locations. Several dozens of Full Service partnerships are currently delivering results for customers around the world.
Value Chain Convergence

ABB's eBusiness and Supply Chain Solutions increase shareholder value. ABB's flexible business process models, proven industry experience, expertise in real time information processing and IndustrialIT solutions allow us to accelerate and optimize your entire value chain. We offer:

- Business consulting and planning
- Business process automation, optimization and modeling
- Production planning and scheduling
- Production management
- Energy management
- Shipping and logistics
- Data analysis
- Web collaboration
- Continuing services

The Challenge

Success in today's environment of increasing international competition requires companies to adopt a new approach to business processes - an approach that lets you react quickly to market demands and thereby opens-up new market segments. The oil and gas industry has a unique and complex supply chain driven by supply, demand and pricing dynamics.

With the cost of crude and refined products largely fixed by the market, with perfect competition at retail, supply chain optimization represents one of the best profit enhancement opportunities for oil and gas companies. Modern IT solutions supplied by ABB provide the tools you need to take advantage of these opportunities.

Online Collaboration and Relationship Management

As part of ABB's eBusiness applications, CollaborateIT lets you conduct business with ABB in an online, web enabled environment that drastically cuts the time and the cost associated with doing business. Many applications are now a mouse click away:

- Project collaboration workrooms
- Content management systems for commercial, technical and project documentation
- Online meetings and information sharing
- Purchasing parts and service
- Customer services: troubleshooting support, on-site service issues, repair and logistics, software updates, etc.
- Operations tools
- Deployment of customer specific applications
- Training services

CollaborateIT operates within a high security extranet environment that is easily maintained by both ABB and our customers.
ABB Financial Services create value for our customers with innovative financial solutions in structured finance, leasing, project development, financial consulting, insurance and treasury activities. With operations in every major market of the world, ABB Financial Services offers an unequalled breadth and depth of both financial and industrial expertise.

- **Structured Finance**
  ABB Structured Finance provides ABB and third-party customers financial advisory services and financing in the form of leasing and lending. It services a wide range of our customer needs from small-ticket vendor financing in established markets to big-ticket infrastructure projects in emerging markets. We also provide specialized financing for energy-related projects in the US.

- **Equity Ventures**
  Equity Ventures initiates, develops, and finances infrastructure projects. This business area invests equity in the projects and manages the portfolio of equity investments. It will continue to base its business on the skills and expertise it has gathered through its power generation activities; those of creating, closing and managing complex projects that demand commercial, technical, financial and legal know-how.

- **Treasury Centers**
  Treasury centers provide professional cash management and risk management solutions through a wide array of financial instruments.

- **Insurance**
  Business area Insurance is active in international reinsurance and insurance underwriting through Sirius International, financial reinsurance and insurance through Scandinavian Re and Sirius International, and US insurance through Sirius America.

- **Financial Consulting**
  Financial consulting delivers results through professional financial consulting services covering a broad range of industries. ABB Financial consulting is a specialized management consulting company with experienced consultants operating globally.

ABB Financial consulting creates shareholder value by combining our expertise in financial, treasury, commodity and energy management with an understanding of your core businesses. We take you all the way from strategy decisions to implementation.
Common Global Processes for Consistent Customer Results

ABB institutes worldwide process improvement programs that aggressively seek to identify best practices - whether inside or outside ABB. Once identified and adopted, these best practices are quickly integrated into every ABB division.

Four areas affect the customer:

- Continuous improvement - Lessons learned in one part of the world quickly enrich every customer.
- Consistency and accountability - Standardizing on a single best practice delivers the same predictable products and services to every customer.
- Cost efficiency - Optimizing supply chains across all ABB manufacturing and engineering centers ensures consistent product, reliable suppliers and controlled costs.
- Risk reduction - Your solution is proven before it’s applied, meaning less experimentation and uncertainty.
Compliance with International Standards

By continually improving ABB, we keep our entire organization at the forefront of the world’s most demanding standards.

Six Sigma

ABB’s belief in “Six Sigma is quality in everything that we do” is the best opportunity for our company to set itself apart from our competitors. All customer-critical processes are subjected to this rigorous and systematic approach to achieve 100% customer satisfaction.

ISO

All ABB plants are ISO 9000 certified, and 97% are ISO 14000 certified for continuous improvement in reducing environmental impact.

Recognized Performance

ABB has earned awards throughout the world. Control Magazine listed ABB as the top automation supplier worldwide. Industry Week named ABB one of the “100 Best-Managed Companies”, and Goldman Sachs designated ABB as the No. 1 process automation company.

Customer-Driven Research and Development

No one can predict the future. But we’ve worked so closely with so many plants that we’ve developed an excellent picture of emerging issues.

Accordingly, we direct our research and development toward creating customer-focused responses, using strategic core competencies and skills.

In 2000, ABB spent nearly US$2.5 billion on research and development - 8% of the company’s total revenues - and far more than anyone else in our field.

Intensity of Innovation:
% of Business Based on Products Developed in the Past Five Years

![Intensity of Innovation Chart]

Factory Automation
Power Systems
Distribution Products & Systems
Industrial Service
High Voltage Switchgear

65% 75% 75% 85% 85%
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IndustrialIT solutions from ABB blend the industry’s broadest portfolio of compatible knowledge components with a proven architecture for real-time enterprise automation and information.

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