Industrial™ for the Refining and Petrochemicals Industries

Creating value through integrated solutions
### ABB’s IndustrialIT Solutions are more valuable than the sum of our Products

ABB is one of the world’s largest suppliers of automation systems, power products, advanced solutions and services to the refining and petrochemicals industries. Our job is to help you increase productivity and profitability while enhancing product quality, maintaining plant safety and protecting the environment. With IndustrialIT, ABB has integrated state-of-the-art technologies for modern refinery and petrochemical facilities. Our solutions meet your needs today and grow with your future.

#### Products

**Energize**
- **DriveIT**: Technologies to supply and improve efficiency of motion, torque or position
- **PowerIT**: Devices to supply, regulate, convert and distribute electrical power

**Measure**
- **FieldIT**: Devices or software for process-related measurement or actuation, such as pressure, temperature, level and flow
- **MeterIT**: Meters to measure usage of energy, gas, water, etc., and related software
- **AnalyzeIT**: Devices or software to measure and analyze product composition
- **MeasureIT**: Technologies for the measurement of physical or electrical variables such as force, torque, proximity, voltage etc.

**Produce**
- **ControlIT**: Control and management of operational variables
- **OperateIT**: Interaction between automation or plant systems and human operators
- **ProduceIT**: Planning, scheduling and manufacturing of customers’ end product, including procurement of raw materials

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“We were pleasantly pleased to see that ABB had not only listened to all we asked for, but had actually acted on a lot of it, and really leap-frogged a lot of their competition in the area of process control and automation.”

Maggi Walker, Director of Process Automation, The Dow Chemical Company

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ABB is now poised to deliver IndustrialIT solutions to the entire spectrum of refining and petrochemicals industries:

- Crude Distillation, Isomerization, Cracking, Olefins, Hydrogen, Gas Processing, Hydrocracking, Dewaxing, Benzene, Polyolefins, Gas to Liquid, Acrylonitrile, Ethylene Benzene, Styrene, Aromatics, Diesel Blending, Crude Blending, Lube Blending, Bitumen Blending, Oil Movement, Terminals, Pipelines
Create solutions to optimize your value chain

When you implement any of these fully integrated ABB Industrial Product Suites, you begin optimizing your business from the device to the enterprise level.

Your Core Processes = the Value Chain

ABB looks at the core processes in your plant as a value chain. The Operations axis represents all the processes needed to make a successful product; the Asset Lifecycle axis represents all the processes required to keep your plant 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 plant.

ABB offers total solutions across the entire value chain, from the production plant through business systems, from your suppliers to your customers. We can create Industrial solutions adapted to your specific needs.
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 ensure 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 solutions include:
- Pressure transmitters and remote seals
- Temperature transmitters and sensors
- Controllers, recorders and indicators
- Advanced control solutions
- 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 is like no other. Your needs are unique. Your requirements are special. You expect instrumentation that is efficient, economical and environmentally sound. You expect solutions that meet your present and future needs.

Wherever you are, you’ll find ABB:
- Delivering high quality IndustrialIT instrumentation solutions that meet your needs – exactly.
- Delivering the levels of customer care that continually enhance your process.

ABB’s ability to satisfy your needs has never been greater. We build upon the leading names in automation: Bailey, Hartmann & Braun, Fischer & Porter, Kent-Taylor, Taylor Instruments, Alfa Laval, Schoppe and Faeser, Bush Beach Engineering, Sensycon and TBI brands.

Helping You Make the Right Choices
Our instrumentation portfolio is unrivalled in its scope. Within IndustrialIT, we’ve integrated an expansive choice of fieldbus-enabled instrumentation that emphasizes compatibility throughout your enterprise, from the device level up.
Advanced Technology
Reliability, safety and profitability: ABB responds to your concerns with advances technologies, systems and services engineered to control and improve production processes in a broad range of industries. As the global leader in open control systems, ABB supplies scalable solutions that are custom-tailored to today’s dynamic enterprise, from mid range control systems to enterprise scale automation.

The Evolution Continues...
IndustrialIT is the latest installment on ABB’s 20-year commitment to Evolution through Enhancement. We pledge that future advances in system technologies will not compromise your current investments. While other vendors may talk about investment protection, ABB’s proven program is truly unique in the industry. StepUp programs can upgrade your existing automation system to IndustrialIT technology in evolutionary steps as part of a 1-3 year plan. Each of the legacy systems we offer has its own path to IndustrialIT. We’ll help you realize the financial benefits of stepping up by assisting you with a return-on-investment analysis.

Process Automation
ABB is a long-time leader in reliable process automation systems and products for the refining and petrochemicals industries, including analysis, blending and the design of intelligent documents and procedures.

ABB has combined process control and optimization with safety, energy and equipment management. Our automation systems aren’t tool kits but full-fledged, robust, flexible, “plug and produce” applications. Each system interfaces with the others and integrates with existing and future plant systems, including MES and intelligent planning and management systems.

ABB Aspect Objects™
A key new 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 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.

“As the advantages of Object Oriented Programming are rapidly becoming recognized in the plant automation business, ABB has taken this concept to the next level with Aspect Objects, making it a powerful tool for engineers, operators and maintenance personnel.”

Todd Billings
Plant Wide Systems
Evaluation Team
Bechtel National, Inc.
As the global leader in the process automation market, ABB is a 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 because redundancy is built into the design.

The key principles behind ABB’s fieldbus initiatives include:
- Full range of fieldbus instrumentation
- FOUNDATION Fieldbus and PROFIBUS integration
- Seamless integration with ABB IndustrialIT and 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

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 some of the largest fieldbus installations in the process industry, both with PROFIBUS and FOUNDATION Fieldbus.

“The decision in favor of PROFIBUS was based not only on the savings in cabling but definitely on the increased information available to the control room team. Within a short time this will be reflected by the reduction of the Lifecycle-Cost of the installation.”

J.M. Brehm
Manager of Technical Engineering,
NIGU Chemie

Analytical

Process Analysis
Innovation and experience are combined in ABB’s analytical products, ensuring you exceptional functionality, reliability and accuracy in the harshest environments while maintaining a clear display of the process. Our comprehensive product range includes:
- Analyzers to measure pH, conductivity, oxygen and turbidity
- Gas analyzers/photometers
- Gas chromatographs
- Mass spectrometers
- FTIR/NIR spectrometers
- Zirconia oxygen analyzers
- Photometers (IR and UV)
- Physical property analyzers
- Liquid analyzers
- Water analyzers
- Electrodes
World’s Leading Drives and Motors
ABB is a pioneer in digital AC and DC motor speed control. We introduced fully digital AC drives in 1983 and the powerful Direct Torque Control principle in 1994. Our dependable single and multidrive systems help to improve your process and reduce the cost of ownership for your plant. Low and high voltage motors and generators, suitable for variable speed drives, match all standards and protection types used in the refining and petrochemicals industries.

Total Lifecycle 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 lifecycle 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.

Composite Plant Solutions
ABB supplies Industrial® products and services on a turnkey basis. Large projects require supply coordination and total integration of products and services. Our equipment and electrification solutions have proven very successful in new plant projects worldwide. These solutions include:
- Transformers
- Switchgear and motor control centers
- Remote services
- Power quality
- Plant design

Industrial® solutions, systems and equipment 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.

As part of ABB’s electrical solution we have ‘Centers of Excellence’ that work with you to identify and provide solutions for your electrical system full life-cycle needs. These capabilities allow ABB to address your full scope of requirements throughout the life-cycle of your electrical system.
ABB offers total solutions for transportation and distribution, to manage the movement of hydrocarbons through pipelines, tankers and terminals, eliminate losses and meet strict government regulations.

With IndustrialIT, you possess the tools to coordinate, integrate and optimize your dispatching operations and give your business a new competitive edge.

ABB offers complete pipeline automation. We deliver on the promise of IndustrialIT by combining excellence in:

- Field products, interfaces, transmitters and end devices
- Remote terminal units
- Flow computers
- Drives and power technology
- Station automation solutions including:
  - Field controllers
  - Field communicators
  - Hybrid control systems
  - Distributed control systems
- Communication solutions
- SCADA systems
- Advanced pipeline specific applications
- Interfaces to business and trading systems
- Project experience
- Support and maintenance

**Fully integrated solutions**

From the wellhead, to the SCADA control room, to the boardroom, ABB's IndustrialIT pipeline solutions seamlessly link real-time, business and trading systems. We serve as your single source for operational, engineering and business information, for facility upgrades, or for installation of equipment, systems and solutions:

- Feed-through construction capability
- All required field instrumentation, electrical and telecommunication supplies
- Project financing – even pay-for-performance contracting
Clariant and ABB have built up a success story in the technical support offered to the refining industries. Our mutual approach combines a unique way to manage CFPP constraints by using high performance MDFI additives coupled with a strong, innovative approach provided by the ABB refining expert team. This combination of core competences provides very high added value in terms of optimization of blend formulations and production programs for the customer.

TOPNIR

On-Line, On-Time Modeling
As a leading supplier of advanced technology solutions, ABB offers Topological Modeling Technology (TOPNIR4), a patented multi-dimensional modeling tool that was developed by BP for use in the refining and petrochemicals industries.

TOPNIR4 enables operators and managers to make the best choices. It characterizes feedstocks and products “on-line” and “at-line”, providing real-time data to identify control and optimization opportunities:

- Closed loop blend optimization (Mogas, Diesel)
- Crude oil validation, both live and stabilized (70+ properties)
- Product characterization (crude oil, reformat, platformate, FCCU feed, CDU side-draws)
- Laboratory validation
- Refinery optimization
- Olefin plant optimization
- Web enabled support and development
- Pipeline management and accounting

ABB’s expertise in the development and implementation of advanced technologies ensures that you extract maximum benefit from tools like TOPNIR4, throughout the value chain. We’re committed to providing our customers with long-term service and technology support.

Optimal Blending

ABB provides a complete solution allowing the intuitive management and optimization of your blending operations. This includes:

- Multi period planning
- Optimal control of raw materials, product quality and environmental specifications

All are window based and may be integrated into ABB Industrial® Regulatory Blend Control (RBC) or third party DCS installations.

Two options are available depending on your requirements and specifications:

- Advanced Blend Control (ABC) using proven nonlinear optimization with dynamic data reconciliation option if required
- Embedded topological functionality with an unique access to the full set of patented spectral blending laws based on the hydrocarbons chemistry. This is:
  - far more accurate for properties prediction with nonlinear effects
  - allows the visual checking of robustness of the solution to component variations
  - enables the total control in real time of the optimal calculated solution.

Both options may be integrated with TOPNIR4 on line analysis to offer total closed loop blending control.

The result is a unique offer that totally integrates all of the spectral models along all the blending operations chain (LP, MPLP, MVPC, off line blending, on line blending, Laboratory) of a Refinery and Petrochemicals operation.
Plant Performance Improvement

ABB delivers improved variable cost performance by helping customers to control their processes, to optimize raw material and utilities usage and to reduce waste from their manufacturing processes. This is built on experience in all phases of plant design and operations. We provide our clients with technology updates, training, plant optimization pressure relief, process safety, environmental solutions and energy & utilities usage advice, operations troubleshooting and access to models to enhance plant performance. Our starting point is our proven benchmarking service that accesses the largest database of process industry benchmarks in the world. This is often supported by ABB’s commercial software suite, Process Engineering Library (PEL), which was designed by process engineers for process engineers.

Full-scope services for the hydrocarbon processing industry

We’ve established a long and successful track record in Planning and feasibility studies, Technology licensing, Process design, Detailed engineering, Project management and controls, Estimating and scheduling, Project financing, Procurement, Construction, Operator training Commissioning and start-up services and Technical services.

 Competitive Process Technology

Advanced Process Technologies

Our proprietary refining and petrochemical process technologies bring you significant capital and operating advantages, and are world-renowned for their reliability and integrity. We are committed to ongoing research and development, and have an unparalleled network of alliances and partnerships with major refining, chemical and catalyst manufacturers to continually improve every aspect of our process technologies.

Refining

We can provide a fully integrated refinery at low cost, with high efficiency and reliability, optimized for local site conditions. Our portfolio of refining technologies provides solutions for bottoms upgrading, hydroprocessing, reformulated fuels and high octane blending components. Via our joint venture with Chevron we include hydrocracking, residual hydrotreating, residual hydrocracking and lubricants. Our CDTECH partnership supplies catalytic distillation processes that combine reaction and fractionation in a single unit operation. These processes are applied in selective hydrogenation, hydrodesulfurization, alkylations and etherification.

Olefins/Polyolefins

ABB licenses about 40% of worldwide ethylene capacity. Olefins Conversion Technology optimizes the balance of ethylene, propylene and butylene depending on current market demand and pricing. Through a joint venture with Equistar Chemicals we offer the Novolen gas phase polypropylene process for the production of a full range of polypropylene products.

Petrochemicals

Our diverse chemical technologies run along product lines, such as styrenics (ethyl benzene, styrene and polystyrenes), light hydrocarbons (C3-C5) dehydrogenation and other assorted specialty chemicals (cumene, maleic anhydride and aromatic nitriles).
Advanced Solutions

**Advanced Solution Product Suite**
The suite encompasses:
- Multivariable control
- Real-time optimization
- Proprietary process model-based control
- Process modeling
- Dynamic data reconciliation
- Dynamic simulation for training and engineering applications
- Plant information management systems
- System integration

**Advanced Application Services**
These services include:
- Plant performance benchmarking
- Process control performance auditing
- Process evaluation and development

**Leading Edge Technology**
ABB delivers world class technology from both our own research and development and our software partners. We utilize 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. We’ve delivered more operator training simulators to the refining and petrochemicals industries 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 worldwide plant operational design, process engineering and licensing expertise. Whether you require specialized reporting, connectivity to business systems, composition control or a customized planning and scheduling system, ABB has the knowledge and know-how to find the correct solution.

**Optimizing Processes**
The solutions and services from ABB's Advanced Applications Engineering group are an integral component of the IndustrialIT offering. This group works within an existing infrastructure to:
- Increase plant production
- Enforce plant safety and environmental operating constraints
- Optimize a plant’s economic return
- Train operations and maintenance staff

They possess both controls expertise and chemical industry experience. These ABB professionals are available world-wide for consulting, development, design and commission real-time applications for your site.

“Through the teamwork and alliance approach, the whole package has been delivered with all project targets being met in the first full month of commissioning.”

Tony Knapton
Wilton Site Manager
Huntsman Polyurethanes
ABB Discovery team effort has yielded a measurable improvement in our process overall. When we look to do this type of work in the future we will look to ABB for the expertise that we need.”

Stephen McKernan
Nova Chemicals

Enhanced Polyolefin Operations

You’ll improve the productivity, profitability and agility of your polyolefin operations when you rely on ABB’s intelligent use of domain knowledge, focused applications and efficient software. ABB offers applications, products and services that support your operations from plant floor to business system, and from production to supply chain optimization.

Improved Control and Operation
Built upon rigorous, first principles models of the process, ABB improves operations through on-line data reconciliation and through fit and forget multivariable control. The result? Higher throughputs and yields and quicker changeovers. ABB’s model-based solution eliminates costly and disruptive step testing, making polymerization control and optimization easier to implement and maintain throughout the lifecycle of the production plant.

Discovering the Hidden Assets in Your Plant
Using benchmarking and statistical methods, ABB can determine the potential of your assets and identify how to achieve it. ABB’s expertise in regulatory control, advanced control and optimization means guaranteed process improvement with a team you can work with.

Getting the Most Out of Available Information
ABB offer a set of polymer specific applications that take raw plant data and turn it into valuable information. These applications include yield accounting, performance monitoring, quality and material tracking, and an assessment of plant profitability by grade, shift or customer order.

Integration into the Supply Chain
Your customers stay loyal when they get the right quality material for the right price and at the right time. ABB smoothly integrates your plant into the planning and supply chain processes so that you can track quality, production and profitability, and match them with your customer’s orders. We integrate validated data into your existing ERP systems to put you in complete control of all the information you need for great service.

Production and Engineering Management
We bring the right information to your fingertips. With the unique Aspects Objects technology of IndustrialIT, all the process and production information created by various applications is available precisely where, when and how you need it. IndustrialIT lets users individualize their own screens, showing the information that’s valuable to them, in the format that makes sense to them. The plant manager sees information about production rates per shift and per month, views calculated information such as catalyst yield, and tracks the quality of material sent to customers, using the same system and information that keeps operators in touch with production and in control, moment by moment.
ABB Provides Technology, Products for the Refining and Gas Industry

Close the Gap between plan and reality

With IndustrialIT you are fully Web enabled

- ABB provides a Total Management capability of your feed stock supplies
  - Pipeline management
  - TOPNIR4 On-line and At-line analysis of all your hydrocarbon feed stock in the pipeline or the ship
  - Blending of all your feed stocks
  - Full terminal management
  - Total electrical and telecommunication supply
  - Total instrumentation and control supply
  - A full service capability
Products, Applications and Petrochemicals Industry

Collaboratively and Operative in Real-Time with ABB’s IndustrialIT based Solutions to improve, Collaborative and Operative in Real-Time.

ABB provides total management and optimization of your Refinery

- Full energy supply, management and optimization
- Leading edge process technology
- Unique dynamic data reconciliation of all your data
- Advanced control of your unit operations through domain rich dynamic models
- TOPNIR4 on-line analysis to improve your control
- Real time management information for planning of business and maintenance
- Direct links to your supply chain management
- Total electrical and telecommunication supply
- Total instrumentation and control supply
- A full service capability
Services

tries

Increase your Profit.

ome across all Levels and Systems.

ABB provides total management and optimization of your Petrochemical plant

- Full energy supply, management and optimization
- Leading edge process and catalyst technology
- Unique dynamic data reconciliation of all your data
- Advanced control of your unit operations through domain rich dynamic models
- TOPNIR4 and other on-line analysis to improve your control
- Real time management information for planning of business and maintenance
- Direct links to your supply chain management
- Total electrical and telecommunication supply
- Total instrumentation and control supply
- A full service capability

ABB provides total management and optimization of your product distribution

- TOPNIR4 On-line and At-line analysis of hydrocarbon feed stock in the process
- Blending of all your feed stocks
- Full terminal management
- Total electrical and telecommunication supply
- Total instrumentation and control supply
- A full service capability
Expertise/Experience in the following Areas:

- Crude Distillation
- Isomerization
- Cracking
- Olefins
- Hydrogen
- Gas Processing
- Hydrocracking
- Dewaxing
- Benzene
- Polyolefins
- Gas to Liquid
- Acrylonitrile
- Ethylene Benzene
- Styrene
- Aromatics
- Diesel Blending
- Crude Blending
- Lube Blending
- Bitumen Blending
- Oil Movement
- Terminals
- Pipelines
Integrated Electrical Supply

ABB offers turn-key integrated electrical solutions, including automation systems and complete electrical equipment, as a single source supplier for major projects. A typical electrical and control system comprises the following key elements:

- Generation
- Medium and low voltage switchgear
- Distribution power transformers
- Motors and motor control centers
- Variable speed drives
- Power and load management
- Integration with DCS/PLC/SCADA and instrumentation
- Cabling

Our electrical engineering group provides expertise at all stages of project involvement from initial interpretation of customer requirements to on-site commissioning. The selection and dimensioning of the equipment is based on customer specifications, BS/IEC standards and the requirements of the application. We source equipment of the highest quality from the most competitive major suppliers both within and outside ABB, worldwide.

We begin by pre-engineering the electrical system and dimensioning the equipment. Then we produce a technical specification and invite quotations from sub-suppliers. The quotations we receive are fully evaluated, and a supplier is selected based on competitive costs and compliance to technical and commercial requirements.

We’re able to offer a truly integrated response to your electrical and control system enquiry, including:

- Complete project management
- System design
- System studies – fault level calculations, load flow calculations, etc.
- Protection studies
- Plant engineering
- Interface engineering
- PLC/SCADA software
- Supply of equipment
- Installation engineering – cable calculations
- Installation and commissioning
- Complete lifecycle support

You’ll find that an integrated system from a single source reduces project demarcations, encourages standardization of methods, optimizes equipment and secures the following benefits:

- Total project responsibility with one supplier – reduces procurement costs, client administration, expediting and inspection
- Reduced project risk
- Shorter project cycle time
- Common hardware, operating philosophy and documentation
- Increased plant reliability and availability
- Single point of contact for service
- Lower operational costs

You can rely upon ABB to manage the project risk and all interface issues that may arise.
Optimal, Safe Control of your Operations

The refining and petrochemicals industries continually strive to improve performance and profitability while maintaining and improving safety and meeting both regulatory and social requirements for safety and reliability. The international safety standard IEC 61508 and its process sector variant, IEC 61511 are setting global ‘good practice’ benchmarks in functional safety throughout the industry. ABB offers a unique ‘one stop shop’ solution to the process operator’s concern for safety. We have the tools and techniques to help you manage the Health Safety and Environment issues throughout the life of your Assets. These includes:

- Quantifying HS&E risks
- Audit procedures
- Organizational programs which enhance the safety culture
- Validated software tools
- Blend safety technologies (instrumentation, logic solvers and valves)

Safety and reliability are critical factors in designing both Emergency Shutdown Systems (ESD), fire and gas detection and protection systems. ABB offers single, dual or triple redundant safety system architectures suitable for new and existing plants. These are certified by the German certification agency TUV 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.

Managing Your Risk

ABB conducts hazard and risk assessments to determine the levels of risk reduction required for your plant. Two specific state-of-the-art software tools support this:

- Trip Requirement and Availability Calculator (TRAC) determines the most appropriate architecture and safety integrity level.
- Trip and Alarm Management System (TRAMS) enables you to maintain safety performance and optimize the management and testing of safety critical loops.

These cost effective software tools achieve full traceability and documentation for compliance with regulatory requirements as well as with IEC 61508.

“One major benefit of TRAMS is the 80% reduction in time required to process data and schedule.”

Jon De Main
I/E Engineer
Huntsman North Tees Site
## Complete Energy Solutions

### Energy Management Systems

ABB is involved in every aspect of energy management to minimize your energy costs. We focus on:

- Optimal purchase of electricity and fuel using ABB’s e-purchase capability
- Optimal generation of steam and electricity to match varying production demands, using ABB Energy Management Optimization software
- Advanced real time control of all electrical supply, including:
  - Avoidance of black-outs and the resulting major energy costs
  - 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 and disturbance data analysis

The electrical plant as a whole withstands larger disturbances (from inside or outside) before any motor, generator, transformer, tie line, etc., is tripped. If an instability occurs, the load shedding function minimizes the risk of interrupting production by switching off the less important loads according to dynamic priority tables.

Reduction of energy consumption through detailed domain knowledge. This starts with benchmarking to quantify the opportunities, followed by detailed practical steps that build on ABB’s domain knowledge, experience and technology.

Total energy management, including implementation, is an added value service from ABB.

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"ABB appears to have found the solution. We have not had any problems with the modification and we have every intention of proceeding with the same upgrade on the two reactors due in next year’s overhaul."

Paul Carter, Cereclor Plant Engineer, Ineos Chemicals Ltd.
Refinery and Petrochemical Business Optimization

In all refinery and petrochemical operations significant time passes between the purchase of the raw materials and the delivery of the finished products. Any disturbances in the external environment or internal processing increase the risk that the business will not deliver the expected financial return.

ABB reduces this risk by:

- Speeding up the supply chain’s responsiveness, to reduce the time when cash is at risk and increase confidence in Just in Time delivery of quality products
- Providing “on line” and “at line” analysis of the key hydrocarbon streams, to improve control of processes and blending
- Using selective dynamic modeling of the key process operations, to continuously provide dynamically reconciled data. Accurate data is the basis of improved control of both variable costs (through improved process control of the raw material and energy conversions) and fixed costs (though predictive maintenance and safety)
- Making terminal operations more efficient, with minimum shrinkage
- Providing a topological analysis of operations data to identify trends early and to optimize all purchasing and scheduling decisions by matching key decisions with market requirements
- Using IndustrialIT, Aspects Objects and smart instrumentation/electrical systems to minimize the cost of document management, process changes and product management.

This integrated IndustrialIT approach is unique to ABB. It significantly reduces the financial risks of management decisions.
“Through alliances with companies like ABB, we’re helping to create global supply chain manufacturing processes that are not only efficient, but support new product development and accelerate the introduction of new business models.”

Joe Forehand, Chairman and CEO, Accenture

**eBusiness**

**The Challenge**
Success in today’s environment of increasing international competition requires companies to adopt a new approach to business processes - an approach that allows them to react quickly to market demands and thereby open up new market segments. Concepts like collaborative planning - planning carried out within logistics networks - characterize the competitive advantages of the future.

**On-line Collaboration and Relationship Management**
As part of ABB’s eBusiness applications, CollaborateIT lets you conduct business with ABB in an on-line, Web enabled environment that drastically cuts the time and cost associated with doing business.

**Collaborative Production Management (CPM)**
Cut costs through better production scheduling and management. Increase revenues through improved customer service and product quality.

CPM reconciles strategic production requirements with tactical execution:
- Break down projected plans from enterprise (ERP, SCM, SCP) systems into production schedules
- Monitor production for improved processes, quality, and customer service
- Deliver timely, accurate information to offset uncertainties in demand, production capability, supplies and costs

ABB’s solutions are built on our decades of experience in delivering world-leading MES and automation systems built specifically for the refining and petrochemicals industries.

**Process Information Management Systems (PIMS)**
PIMS is an integrated hardware, software and services solution that provides a framework for the flow of information between the process, plant control and business systems. It provides instantaneous access to current and historical information, allowing you to make informed decisions. PIMS includes a Front End Engineering Design Study, data historians, web enabled applications and interfaces to other systems.

**Accenture Alliance**
ABB and Accenture have recently joined forces to offer consulting, technology and business transformation solutions based on our complementary skills and common understanding of customer needs. Together, ABB and Accenture will provide you with a fully integrated solution covering important aspects of your business.

ABB offers:
- Product and program management capabilities
- Technical knowledge of equipment and systems
- Technology development capabilities
- Experience running turnkey capital contracts

Accenture offers:
- Process redesign and rationalization capabilities
- Integration and rationalization of ERP and project management systems
- Experience creating value-enhancing outsourcing deals
- Knowledge of capital-efficient strategies under various regulatory regimes

ABB’s IndustrialIT, real-time business planning and management solutions, added to Accenture’s supply chain expertise, business transformation outsourcing skills and network of alliances, creates a powerful new combination to help your enterprise achieve a higher level of competitive performance.
Managing the Performance of Industrial Assets

ABB's asset performance improvement services combine experienced staff, advanced technology, deep industry knowledge and operational experience making ABB your most trusted asset lifecycle partner.

ABB helps you optimize the performance of your assets throughout their lifecycle with Product and System Services and Asset Management Services.

We reduce your total maintenance costs by:

- Reducing direct costs; for example, labor, spare parts, subcontracting
- Minimizing indirect costs; for example, by increasing productivity through improvements in Overall Equipment Effectiveness (OEE)

Product & System Services

Using the latest technological tools, ABB supports everything from electrical rotating equipment or switchgears to the most sophisticated products and systems. Our value-added services improve your productivity through maximum use of your installed equipment.

Customer Support Services

After-sales support provided in a non-traditional manner is the trademark of ABB Customer Support Services. Our focus is on improving the overall asset performance through creative approaches to technical support.

Training & Education Services

As technology continues to change, we help customers maximize their most important asset, their people, through continuing education programs. ABB stimulates learning with a variety of programs, from full eLearning to one-on-one instructional courses. We'll conduct these programs at your plant site, at one of our worldwide ABB University locations, or as a self-study program on the Web.

Logistics & Repair Services

Having critical parts when and where you need them is fundamental in achieving your business goals. ABB's Logistics & Repair Services enable you to maintain a highly consistent level of responsiveness, with defined processes, advanced delivery tools and support structures. Our value-added services increase productivity through inventory planning and management.

Application Services

ABB offers service packages that improve the application of your products and systems. We analyze and correct problems that interfere with the optimum use of your assets, while paying attention to both process and environmental issues. We maximize the value and efficiency of your existing installations, systems and processes, and we reduce the costs of ownership.

Asset Management Services

Asset Management Services take into account the total lifecycle and performance of the assets we service. We improve your plant’s performance through specific maintenance changes and through performance-based risk/reward asset management partnerships.

Consulting Services

ABB identifies opportunities for improvement in your industrial asset management, production processes and operations infrastructure. Our experts consider both your needs and the best practices of the industry, applying their in-depth knowledge to:

- Plant performance benchmarking
- Performance improvement delivery
- Change management and sustainable maintenance excellence
- Turnaround excellence
- Safety, health and environmental excellence

Our plant performance-based consulting shows our dedication to “making things happen”.

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Service

- Advise
- Collaborate
- Consult
- Control
- Field
- Inform
- Measure
- Meter
- Optimize
- Plan
- Simulate
- Support
- Sustain
Service

Total Equipment Management
With Total Equipment Management (TEM), ABB takes over the management of your electrical equipment (such as motors, breakers, drives, instrumentation and control systems). Using world class and proven Condition Monitoring techniques and methodologies, we:
- Reduce risks by providing turnkey solutions and guaranteeing prices
- Reduce administration/purchasing costs by decreasing the number of suppliers
- Reduce capital employed by decreasing/pooling the amount of equipment in stock
- Increase output by increasing the availability of equipment

ABB Full Service® Partnerships
Full Service Partnerships are long-term performance-based win/win asset management agreements whereby ABB takes over the design, execution and management of the customer's maintenance function. Practically, this means that ABB manages the customer's entire asset base including plant equipment, maintenance personnel, spare parts, subcontractors and maintenance related engineering functions/activities. You benefit from:
- Higher asset performance at a lower maintenance cost
- Additional contribution through increased availability, output and reduced quality losses
- Optimal use of resources, which means you no longer pay for excess equipment
- Higher Return-on-Investment, which includes higher return on net assets, capital employed and economic value added (RONA/ROCE/EVA)

Turnaround Management Partnerships
ABB offers expertise and operational experience in managing plant turnarounds. We reduce the duration and cost of your required turnaround to accelerate your return to production and increase your company revenues.

Customer Service Portfolio

Product and System Services:
Customer Support Services:
- Hardware/Software, Contract and Demand, Web, On-Line and Remote Services, Telephone Services, Upgrades, Expansions, and Modification

Training and Education Services:
- ABB Product Training, Process and Application Training, General Technology Training, Management Training, Training Contracts, Training Assessment Programs

Logistics and Repair Services:
- Spare Parts, Reconditioning and Repair, Version Management, Legacy Product Support, Parts Management

Application Services:
- Installation and Commissioning, Product Application Services, Product Environmental Adaptation, Process Application, Product Migration Services

Asset Management Services:
Consulting Services:

Total Equipment Management Services:
- Motor Condition Monitoring Contracts, Total Motor Management Contracts, Total Drive Management Contracts, Total Rotating Machine Management Contracts, Total Instrumentation Management, Total Control Systems Management, Total Electrical Systems Management, Total Equipment Management

ABB Full Service®
ABB Full Service® Partnership Agreements

Turnaround Services:
Single Turnaround Management Contracts, Multiple Turnaround Partnership Agreements

“The work accomplished by ABB reduces the cost... by improvements in the plant and by collaborating in a significant way for the maintenance of our Core Business.”

Mr. Francisco de Assis
Manager
Petroflex Company
Wireless Technologies
Wireless technologies support activities within the wireless communication infrastructure such as mobile phone networks and wireless networks. ABB provides end-to-end value-added services for operators and industry in the construction and implementation of networks. Our services include planning, acquisition, financing, design and configuration of total solutions with 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 refinery and petrochemical industries. We base our operations on product neutrality and are therefore able to design, install, maintain and support most types of networks and users. These services include voice communication, data networks and cabling.

Data Centers
Internet Data Centers (IDCs) and Points of Presence (POPs) provide the technical infrastructure to ensure security, reliability and availability so that communication equipment is up and running 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 or network operators. As a result, our customers profit from our international experience in complying with local standards and regulations.

“...It was the balance of an integrated team that added to the success and has now resulted in ABB engaging in further development projects with Rhodia Chirex...”

Nick Lindop,
Engineering Project Manager
Rhodia Chirex
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 centers ensures consistent product, reliable suppliers and controlled costs

- Risk reduction – Your solution is proven before it’s applied, meaning less experimentation and uncertainty
Customer-focused with **strategic core competencies and skills**

**Customer-Driven Research and Development**
No one can predict the future. However, we’ve worked closely with so many plants that we have 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 total company revenues, and far more than anyone else in our field.

**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.

**Recognizing 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 estimated ABB as the No. 1 process automation company.

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2000 Worldwide Process Control Sales Figures (US$ Millions)

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The next Way of Thinking

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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