
Oil, Gas and Chemicals

Solutions portfolio

abb.com/oilandgas
abb.com/chemical



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ABB in the oil, gas and chemicals industry

Providing proven solutions for minimizing costs, optimizing operations and reducing risk

Overview

For more than 50 years, ABB has been at the forefront of helping oil, gas and chemical (OGC) companies with technologies and services to support their projects of any size or complexity.

We offer a proven approach to help OGC businesses analyze data more intelligently, optimize operations, boost productivity and enhance profitability while reducing risks and safety throughout the plant life cycle.



Plan/design

ABB Intelligent Projects improves the speed and quality of project execution through single source integration.



25%
quicker schedule completion

Build



20%
savings from integration


ABB's integrated automation and electrical approach lowers risk and price for projects.

- Electrification
- Instrumentation
- Automation
- Rotating equipment
- Telecommunications
- Services

Operate and maintain

ABB Collaborative Operations transforms existing operations through actionable insights to optimize performance in real time.

Up to **25%** maintenance savings



More than 1,800 service professionals in 28 countries keep plants running and optimize performance.

Intelligent Engineering

Intelligent Infrastructure

Intelligent Applications

Intelligent Services

Intelligent Projects

Collaborative Operations

We created ABB Collaborative Operations because we know how critical it is for the right people to have the right information at the right time. It's our four-faceted approach to cut costs, shorten project schedules and minimize risk. It brings together the solutions you need at every stage of the plant life cycle, from planning and design, through building, to operating and maintaining.

ABB Intelligent Projects

Transforming the speed and quality of project execution through single-source integration of power, automation and telecommunication systems

Benefits

- Improves project outcomes
- Reduces inefficiencies and costs
- Accelerates schedules
- Speeds startups and installations
- Reduces complexities and risks
- Ensures safety of personnel
- Extends life cycle support

Features

Broadest I/O portfolio in the industry

Expedite commissioning and reduce field wiring and signal conditioning modules, as well as dependencies between hardware and software engineering. Solutions include:

- Traditional I/O for expansions or projects with known I/O
- Remote I/O to reduce marshalling
- Smart I/O to significantly reduce hardwiring
- Mixed solutions for cost optimization

Cloud engineering

Make standard designs, methodologies, engineering workflows and support tools accessible to all project execution groups. ABB and EPC contractors can work from a single engineering database and set of common standardized designs.

Automated data management

Eliminate manual steps in project completion. Simplify the design application process by converting data into a common format. And reduce the time needed to transfer data, documents and approvals.

Standardization

Reduce costs and minimize design schedule time with project standardization.

Standard design templates help avoid the cost and time required for technical clarifications, drawing approvals and FAT. Standard designs are globally available for both application software and hardware.

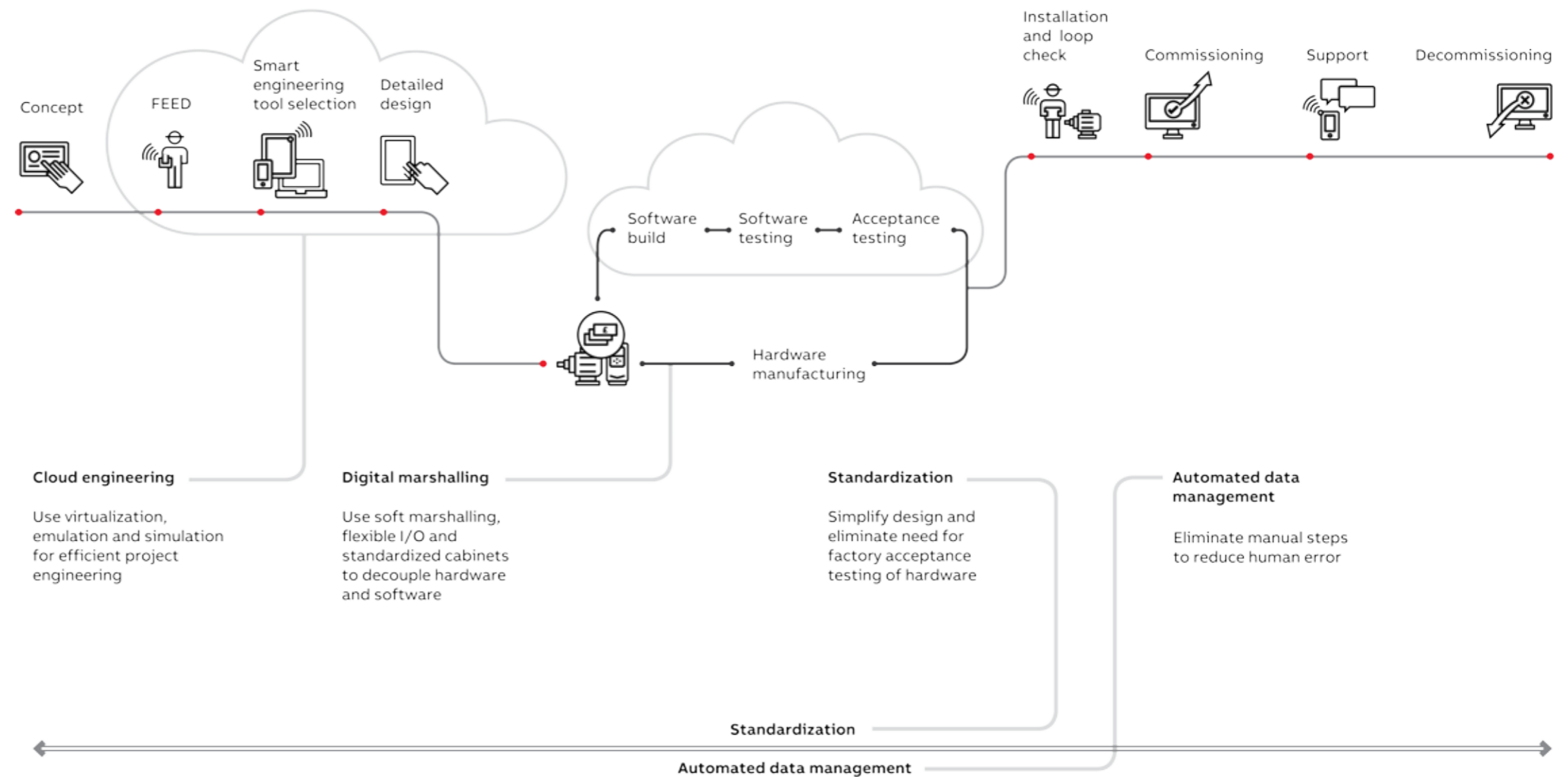


ABB Collaborative Operations

Powered by ABB Ability™

Bringing together people, products, services and applications to operate in a digital world



Overview

Oil, gas and chemicals companies need to move beyond simply integrating solutions and data collection. They need the capabilities to distill data into actionable intelligence to improve operations and move toward predictive maintenance. People, and desired production outcomes, should be the priority.

ABB Collaborative Operations brings together people, products, solutions and services to provide analytic intelligence to improve efficiencies and reduce risk, enabling a digital business transformation. Our approach collects data from integrated solutions, analyzes it and places actionable information into the hands of people who can act on it.

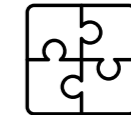
How to realize ABB Collaborative Operations

ABB Collaborative Operations integrates several solutions from the ABB OGC product portfolio – Intelligent Engineering, Intelligent Infrastructure, Intelligent Applications and Intelligent Services – to ensure you have a collaborative approach from project start to completion and throughout the life cycle. We emphasize security at every level of integration, making sure your data, people and assets are protected.



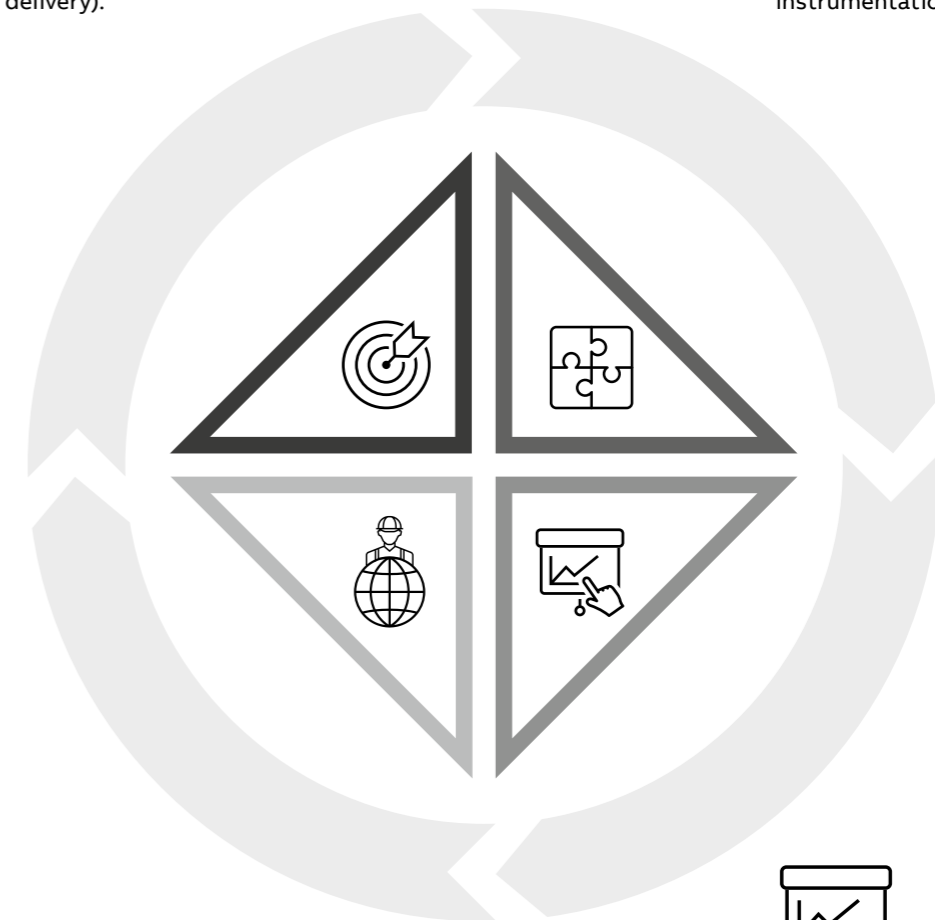
Intelligent Engineering

Begin with Intelligent Engineering on top (design, configuration and delivery).



Intelligent Infrastructure

Next, build Intelligent Infrastructure (control and safety, instrumentation and analytics).



Intelligent Services

Finally, add Intelligent Services (through service agreements, automation migration, maintenance and training).



Intelligent Applications

Layer on Intelligent Applications (for enhanced equipment efficiency and to provide safe, secure production).

Section 1

Intelligent Engineering

Intelligent Engineering offers engineering and consulting services to address your needs throughout the entire life cycle – from project design through decommissioning and end of life.

Using an integrated approach to project execution, we can deliver projects quicker and more cost-effectively.

Our experts offer extensive operational experience and in-depth knowledge of best practices to provide practical solutions for various operational issues.

This is the first step of our Collaborative Operations approach, leading from project initiation to completion.





Project Design

ABB Project Design services ensure expert involvement early in project development to reduce costs by 10 to 15 percent and accelerate time to production. By being involved early, we can reduce project schedules significantly, often by several months.

Benefits

- Shortens overall project schedule
- Standardizes procedures and specification documents for higher consistency and quality
- Improves design constructability and safety
- Enables higher quality system integration
- Provides recommendations for optimum maintenance plans



Design of Control Rooms

ABB designs control rooms that prioritize the human element to ensure operators are empowered to manage and safeguard mission-critical processes. Operations centers designed and equipped by ABB offer the flexibility to adapt to new technologies and feature advanced ergonomic workstations and auxiliary equipment.

Benefits

- Improves operator overall wellbeing – a key factor for safe, productive and reliable operations
- Boosts collaboration and teamwork
- Helps attract next-generation operators and retain skilled operators
- Reduces control room footprint by up to 35 percent
- Improves plant productivity
- Minimizes unscheduled downtime caused by human errors



Front-End Engineering and Design

ABB conducts Front-End Engineering and Design (FEED) studies once feasibility studies are complete. These studies help provide a comprehensive plan for everything that must be accomplished in the project execution phase, including technical requirements, applicable standards to follow, project guidelines, analyses and drawings.

Benefits

- Provides safe, simple and cost-effective plans for implementation
- Ensures faster time to achieve plant startup and turnover
- Reduces costs
- Reduces schedule risk
- Improves risk identification and mitigation



Network Design

ABB builds reliable industrial networks to meet the unique needs of refineries, pipelines, rigs and wells for both offshore and onshore facilities. We have extensive experience in deploying IT systems for industry, control networks, field networks, safety networks, sensor networks and SCADA systems, and are able to design networks fitting any requirement – wired or wireless.

Benefits

- Allows network technologies to combine to reach every part of a site
- Provides reliable network connections with remote operations
- Ensures equipment is resistant to vibration and impact, extreme temperatures and varying electromagnetic fields
- Enables network consistency for all system aspects





Telecom Network Design

ABB builds specialized telecommunications solutions for offshore, onshore, liquid natural gas and pipeline market segments. We strategically partner with leading telecom technology suppliers to gain the freedom and flexibility to select the best solutions for a your unique application or situation. Our experts collaborate with ABB automation, safety and electrical engineers to purpose-build telecom solutions for effective lifetime operations.



REUSE

ABB REUSE is a suite of software products developed for System 800xA and AC 800M Controller families. The suite includes automation solutions commonly required in the OGC industry.

The REUSE product suite includes two categories of solutions: Core Libraries and Add-ons.

Core Libraries include all solutions required for automation projects, while Add-ons include only specialized solutions or features used for specific applications or market segments. Add-ons can integrate with relevant Core Libraries functionalities and use a similar operator interface to enhance the user experience.

Benefits

Feed, engineering and commissioning

- Reduces engineering effort
- Provides a consistent and system-wide way for configuration and implementation
- Lowers application design effort
- Ensures strict version management and compatibility control is in place
- Accelerates delivery cycles

Operations

- Improves user experiences with an intuitive interface
- Provides a standardized “look and feel” for users to reduce risk of human errors under demanding or abnormal operation conditions
- Enhances plant efficiency and safety
- Ensures system-wide operational consistency
- Streamlines operation and maintenance procedures

Maintenance

- Reduces risk with a reliable, long-term life cycle policy that's aligned with the System 800xA life cycle
- Helps ensure forward compatibility or a low-cost migration path
- Includes professional tech support available 24/7
- Provides access to competent expert teams



Commissioning Services

ABB Commissioning Services help improve schedule accuracy, provide you with progress reports in real time and optimize resource utilization during commissioning. Our services include functional test and on-site configuration of electrical, telecommunications and automation components, through full equipment completions, commissioning and startup. Commissioning Services can provide support for new applications, as well as re-commissioning services for ABB and third-party products and systems, regardless of size or complexity.

Benefits

- Improves schedule accuracy and project efficiency
- Optimizes resource allocation and equipment performance
- Ensures smoother installations
- Accelerates plant startup



Process Start-Up Services

ABB Process Start-Up Services help accelerate plant startups to enable the facility to start earning revenue sooner. Our services use specialized tools and applications to tune loops and identify control, mechanical equipment, operational procedure or software issues during the startup process. This enables our experts to recommend and implement changes to help ensure the system behaves in the way the operators and engineers require.

Benefits

- Accelerates plant startup
- Improves process behavior
- Increases control system utilization
- Reduces need for manual operation





Ready for Operations Services

ABB Ready for Operations Services help accelerate inspection and commissioning processes to move projects into the “ready for operation” phase quicker. Our approach is integrated, systemized and sequenced, focusing on each phase of the handover, from construction to the transfer of care. The services include a detailed documentation/audit trail.

Benefits

- Improves accuracy of schedule
- Provides an overview of progress in real time
- Optimizes resource utilization
- Increases project predictability and certainty



Evolution

ABB offers a flexible, cost-efficient and low-risk path for you to evolve to the latest system hardware and software for electrical, telecommunications and automation assets. We can migrate installed ABB equipment, third-party electrical and automation equipment or a combination of equipment from different suppliers at each production site.

No matter when you made your investment – one, five or even 15 years ago – ABB experts can help develop a long-term evolution roadmap.

Benefits

- Identifies upgrade opportunities for most ROI
- Increases efficiency and productivity
- Extends life of system through a planned roadmap for migration
- Lowers maintenance costs
- Protects intellectual investment in current system
- Helps you stay competitive



Decommissioning and End of Life

ABB simplifies end-of-life and decommissioning processes while reducing the overall cost. Once equipment is decommissioned, our experts assist you with disposal and recycling. Or, we can refurbish unused units and find new uses for them.

Benefits

- Closes or mothballs assets safely with no disruption to ongoing operations
- Reduces overall cost through proactive planning and cost-effective techniques
- Minimizes impact on other site operations and lower risks
- Maximizes asset values by planning early and taking advantage of the best resale or scrap prices
- Includes process flexibility to take advantage of market opportunities



Section 2

Intelligent Infrastructure

Intelligent Infrastructure integrates separate systems, such as instrumentation, automation, electrical, telecommunications and information management systems, into one environment.

With everyone and every system working together, projects can be deployed quicker and easier, while saving between 20 to 25 percent in capital and operating expenses.

Intelligent Infrastructure is a critical component in the foundation of our Collaborative Operations approach.



INTELLIGENT INFRASTRUCTURE

Process and power automation, electrical integration, safety, communication and advanced control

ABB is uniquely positioned to support a variety of automation needs. We offer automation solutions for the simplest of projects as well as large-scale, complex projects. We are a proven leader in the oil, gas and petrochemical industry, and we continually invest in and expand our services and solutions.

We provide a world-class control system that works with other systems and equipment – including third-party solutions – to create the foundation for a truly integrated process operation.

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- Distributed control systems
- Networks and communication
- Safety systems
- Process electrification
- Telecommunications systems
- Modular systems
- Motors, drives and generators
- Smart field instruments and analyzers
- Transformers
- Switchgear and motor control centers
- Substation and GIS
- INSUBSEA® power and automation solutions



Distribution control systems

ABB provides control systems for a wide spectrum of solutions and facilities, from concentrated installation to distributed networks that are typical of pipeline transport applications.



ABB System 800xA

ABB System 800xA is a state-of-the-art extended automation system with full integration of process, electrical and safety systems in a modular and scalable way. You can now create an integrated enterprise where programmable logic controllers (PLC), process control systems, fire and gas, emergency shutdown, maintenance, ERP and information systems all work together to improve engineering efficiency, operator performance and asset utilization.

Benefits

- Improves plant availability and reliability with flexible redundancy options
- Reduces life cycle costs with an open architecture that easily integrates third-party plant systems
- Reduces unplanned downtime with comprehensive maintenance features

ABB Symphony Plus

ABB Symphony® Plus is a premier control platform for power generation. It helps maximize plant efficiency and reliability through automation, integration and optimization of the entire plant.

Benefits

- Reduces costs with simple workflow automation to engineer, configure, secure and maintain the entire system
- Simplifies system evolution with scalable and flexible architecture to support small, large and multi-system configurations
- Lowers upgrade costs and risks with seamless and incremental integration of new products, technologies and functionality
- Increases safety and security with a secure and reliable control environment to prevent unauthorized access



ABB Freelance

ABB Freelance DCS combines the small footprint of a PLC and the full functionality of a DCS. ABB Freelance simplifies engineering, commissioning, maintenance and fieldbus management. It features an intuitive operator interface that simplifies operation and diagnosis of the entire system.

Benefits

- Scales from 25 to 25,000 I/Os
- Improves availability with redundancy built in at all hardware levels
- Accelerates startups with only one tool for project engineering and commissioning
- Saves cabinet space with a small footprint

Networks and communication

ABB provides solutions that are resistant to vibration, impact, extreme heat and cold and varying electromagnetic fields to ensure connectivity even in the furthest corner of the most remote facility.

ABB can help networks simultaneously support a range of fixed and mobile oil and gas exploration and production applications, such as:

- **Real-time video and surveillance:** Provide operations with remote situational awareness and information that can facilitate decisions, improve safety and deliver early visibility into unfolding critical situations
- **Security and surveillance systems:** Enhance facility security with electronic access control at entry points or secure locations in the facility; video security at gates or around the site perimeter
- **Drill rig communications and diagnostics:** Monitor drill bit depth and tilt, mud weight, temperatures and pressures; remotely run diagnostics and analyze results
- **Asset tracking:** Track and update the location of fixed and mobile assets in the field to improve operations and contribute to safety and security
- **Mobile field workforce connectivity:** Keep workers in the field connected with access to SCADA data, instant messaging and e-mail if they lack cell service
- **Voice:** Provide IP phones for mobile workers, even in remote areas, to help improve operational efficiency and worker safety

We offer traditional wired solutions and wireless solutions, which are robust in the unlicensed radio spectrum and able to provide blanket wireless coverage for mobile connectivity, as well as the ability to connect sensors and other devices beyond the reach of cables.



Safety systems

ABB provides solutions that help ensure the protection of people, plants and equipment. ABB System 800xA extended automation system was designed to be an integrated control and safety system. Its High Integrity component is a next-generation safety system built in accordance with the requirements of IEC 61508 Edition 2.



System 800xA High Integrity

The System 800xA High Integrity safety system is TÜV certified for SIL3 and was designed with a flexible architecture, in a single configuration.

Not only does this safety system meet the traditional requirements of hardware safety integrity and behavior in the presence of a fault condition, it has been specifically designed to also focus on enhanced diagnostic coverage, diversity and systematic safety integrity.

It can be fully integrated with System 800xA, combined into the same controller, installed on a separate network or installed independently and interfaced with any other DCS or HMI. These options allow you to implement your preferred architecture using the proven System 800xA High Integrity solution.

Benefits

- Reduces system complexity by integrating control and safety systems
- Enables installation of diverse system architectures via certified remote I/O solution
- Increases process availability while reducing risk to overall plant operation
- Ensures safety of personnel and equipment by meeting strict safety standards
- Enables timely response to abnormal conditions
- Consolidates alarms and events
- Increases ease of use with standard interface between DCS, safety, alarm and events, history, asset management and others



Burner Management System

The Burner Management System library is a TÜV-certified safety control system that helps ensure safe operation of all types of boilers, including gas-fired, oil-fired, dual-fuel and coal-fired.

It allows for complete control of the startup and operation of burners, including control and monitoring of the ignition sequence, as well as leak testing of valves and control of air/fuel mixture and fuel supply.

In addition to the TÜV certification to applicable Functional Safety standards (IEC 61508, IEC 61511 and IEC 62061), the library is certified to relevant industry standards applicable to control systems and associated software.

Benefits

- Reduces engineering effort through the use of compliant building blocks
- Increases consistency across applications
- Increases flexibility while minimizing documentation
- Minimizes certification effort required throughout the installation life cycle

Safety Execution Centers

ABB has more than 35 years of experience in the design, manufacturing and implementation of process safety systems. With TÜV-accredited operations on all continents and dedicated safety system teams around the world, we can provide highly qualified SIL 3 systematic capable technical resources during project delivery with the added reassurance of competent local support and service at the operational stage.

Benefits

- Ensure conformity to the local relevant legislation and standards which can be specifically addressed in the Functional Safety Management System (FSMS) as opposed to trying to adopt a 'one size fits all' company centralized FSMS
- Allow local cultural, regulatory and 'good practice' aspects to be addressed in the FSMS, which helps easily accommodate revisions over time
- Enable different FSMS status, progress, activities and life cycle phases to be addressed
- Reduce the audit and evaluation effort required by you based on the local FSMS characteristics
- Provide you peace of mind about function safety competency being available in country
- Help you have a higher degree of confidence and increased functional safety assurance in the local certification processes in contrast to one overriding global certificate
- Demonstrate our focus and commitment to functional safety both globally and locally to processes, projects and personnel
- Support high-level, global commitments to safety certifications and competencies with strategic planning and operational direction



SCADAventure

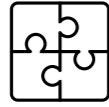


ABB SCADAventure™ is a centralized Supervisory Control and Data Acquisition (SCADA) system for the oil, gas and chemicals industry. It monitors and controls automated systems spread over a large areas.

ABB SCADAventure™ automates workflow and optimizes day-to-day operations by helping apply a standard control methodology across the enterprise instead of creating customized systems that are hard to maintain and to upgrade.

Benefits

- Ensures efficient use of communication bandwidth
- Requires only the purchase of the system license
- Reduces initial system and maintenance costs via templating
- Reduces number of systems the operator needs to work with for real-time or historical data
- Splits database across multiple servers or creates redundancy with disaster recovery without reconfiguring HMI
- Reduces training needs, as software provides a consistent solution between versions and projects
- Reduces effort needed for upgrades with easy-to-migrate database schemes
- Supports open, standards-based interfaces
- Maximizes uptime with a fault-tolerant platform

SCADAventure editions:

Small to enterprise-level companies have four SCADAventure options:

- **SCADAventure HMI** increases the number of interfaces that can access the system.
- **SCADAventure Host** integrates the system's real-time relational database with an application database that includes all of the system's core functions, interfaces and applications.
- **SCADAventure Enterprise** creates a robust platform for core functions such as disaster recovery, interfaces, applications, ABB enterprise applications and those from third parties.
- **SCADAventure Cloud** eliminates the need for proprietary equipment to visualize production data.

These options provide accessibility to the ABB digital offering, which creates a digital ecosystem for companies, project teams and supply chains, enabling them to take advantage of the Industrial Internet of Things (IIoT) as it develops. They also feature enhanced functionalities:

- **Real time:** Analyze database security, access database views and gas measurement
- **Mobile:** Authorize alarm callouts to be texted to smartphones and allow processing of meter histories using the device's scheduler system without SQL servers
- **HMI:** Allow HMIs to capture and store screen images and enable HMI graphics to be customized to attach quality indicators to live values or within data grids

Process electrification

Voltage sags, surges and outages can result in considerable production losses and downtime. ABB process electrification solutions prevent blackouts and disturbances while controlling energy costs, enhancing safety and mitigating health and environmental impacts.



800xA Electrical Control System

800xA Electrical Control System offers detailed, real-time information on power consumption down to the individual loads and secures a reliable and steady electrical power supply.

Benefits

- Reduces unplanned downtime with a complete power management solution
- Enhances safety with remote maintenance and troubleshooting that removes people from electrical danger
- Improves energy efficiency by providing operators an energy distribution overview of the plant

ABB Intelligent Electrification System

ABB Intelligent Electrification System provides electrical solutions, including design, engineering and optimization services, to power your processes throughout the equipment life cycle.

By aligning your specific operational requirements to the electrical system performance, ABB can help you maximize reliability, reduce maintenance costs and avoid production losses.

ABB Intelligent Electrification System includes:

- Broad portfolio of products, applications and services to supply and optimize your entire electrical system
- Power Management software, embedded to prevent potential blackouts
- ABB experts who apply the ABB Intelligent Projects execution model when designing and engineering your electrical system
- Condition monitoring for reduced opex throughout the life cycle





EICT Integrated Project Solutions

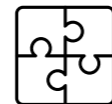


ABB offers complete integrated project solutions for large-scale electrical, instrumentation, control and telecommunications (EICT) contracts. We participate in all phases of the project life cycle, from FEED studies to commissioning and through maintenance and life cycle management.

Our solutions integrate all automation, control, safety and power systems to drastically streamline procurement, accelerate project startups, reduce the need for engineering rework and minimize schedule delays. This integration ultimately helps reduce capex and opex and shortens project delivery times by up to three months.

Project benefits

- Reduces capex by up to 20 percent
- Reduces risk by providing a single point of project responsibility
- Accelerates project startups
- Reduces engineering efforts

Operational benefits

- Reduces total cost of ownership (TCO) by up to 20 percent
- Increases production because of integrated operations and predictive maintenance
- Increases operator safety
- Reduces life cycle costs
- Provides single point of contact for maintenance



Telecommunications systems

ABB integrates specialized telecommunications solutions to meet the needs of the offshore, onshore, liquid natural gas and pipeline market segments. ABB strategically partners with leading telecom technology suppliers so we can select the best solutions for your unique application or situation. We collaborate with our own automation, safety and electrical engineers to purpose-build telecom solutions for effective lifetime operations.

- **Management and utility systems:** Make maintenance and operations simple and easy to help ensure system and personnel health and safety are maintained
- **External communication systems:** Connect installations and link them to the surrounding world. They deliver voice, video, process control and safety system traffic to the right people to ensure uninterrupted safe operation of the facility
- **Internal communication systems:** Allow operators to communicate within the facility. They help ensure reliable and efficient operations and enable workers to communicate and collaborate
- **Safety and security systems:** Safeguard personnel and equipment on and around an installation. All systems are adapted to meet international rules and standards as well as local safety requirements. To ensure the best possible performance and flexibility, safety systems are closely integrated with other internal and external systems

Modular systems

Modular systems are packaged solutions that are delivered pre-commissioned and pre-tested to help reduce site construction schedules, overall project costs and startup time. Modular systems are delivered under one contract, reducing project risk and helping simplify site complexity.



Electrical Modules

ABB Electrical Modules (e-houses) are custom-engineered, walk-in structures/buildings designed and built to protect and accommodate electrical, automation and telecom equipment.

Electrical Modules are ready to operate in the field with minimum installation, commissioning and startup time. They provide a more cost-effective, mobile and less risky alternative to traditional on-site buildings.

Benefits

- Extend life of equipment by safeguarding it in an environment that is properly ventilated and cooled, and over-pressurized and sealed to prevent dust and water contamination
- Accelerate on-site construction schedule with short installation and commissioning periods
- Reduce site complexity with modular and flexible components
- Reduce total equipment footprint with custom engineered building/enclosure
- Lower risks and costs with one provider supplying and delivering all components



Compressor Modules

ABB Gas Compressor Modules help you reduce implementation time and resources by delivering a fully designed, assembled and commissioned solution.

As the world's first digital gas compressor modules, these solutions provide operators with real-time insights about compressor status remotely or from the control room to ensure more precise management and maintenance of equipment.

All modules arrive on-site fully assembled, pre-tested, validated and commissioned. They include ABB motors, switchgear, electrical drives, instrumentation and monitoring systems, control and protection systems and reciprocating gas compressors from Ariel Corporation.

Benefits

- Improve response time to abnormal situations with real-time overview of system performance
- Accelerate installation and save money
- Optimizes performance at lowest possible cost
- Ensure compliance with strict standardization requirements of highly regulated industry
- Reduce risk with fully designed, assembled and commissioned solutions
- Increase efficiency of plant operations

We deliver two types of solutions: Modules for the upstream and midstream markets and modules for the chemical/downstream market (API 618).

Modules for upstream and midstream

ABB designed packages are mounted on skids for easy transportation and installation while ensuring compliance with your specific requirements and standards. We offer designs for up to 7.5 MW @ 750-1,800 rpm.

Applications

- Gas gathering
- Gas injection
- Gas sweetening and processing
- Enhanced oil recovery
- Gas transportation/small pipelines
- Gas storage

Modules for downstream and chemical

ABB designs and customize the packages in order to meet the severe requirements of API 618 by using a moderate-speed gas compressor. We offer designs for up to 4.5 MW @ 600-1,000 rpm.

Applications

- Heavy hydrocarbon processing
- Industrial gas compressions
- Gas turbine fuel boosting
- IGCC gas treatment



Motors, drives and generators

ABB offers a full line of performance-proven, energy-efficient motors and variable speed drives for the oil, gas and chemicals industry.

ABB products are engineered with industry-driven designs and patented technologies that ensure greater uptime with less maintenance.

Our drives and PLC portfolio include low voltage variable speed drives, medium voltage AC drives, motors, scalable PLCs and a selection of HMIs. Our drives also feature integrated safety functions.



Drilling drive system

ABB offers a range of drilling solutions, including low and medium AC voltage frequency drives, DC drives, PLCs, HMIs and motors. All products are designed to enhance your safety, reliability and efficiency. A total solution from ABB helps you gain a proven, functional solution based on unified technology, as well as a single-point supplier that saves time in both the construction and approval processes.

Benefits

- Optimizes drilling performance
- Improves energy savings
- Increases safety and security
- Lowers maintenance costs
- Reduces greenhouse gas emissions

Pumps

Varying operating conditions in the oil, gas and chemicals industry mean pumps may not be operated in the best efficiency area. Variable speed drives can drastically reduce costs and energy consumption. ABB low and medium voltage AC drives provide accurate speed control of motor-driven applications to help you reach the best efficiency point.

Benefits

- Ensure best efficiency point with accurate speed control of the pump motor
- Improve energy savings
- Reduce mechanical stress with soft start and stop
- Avoid mechanical resonances



Artificial lift

The key factor of competitive oil and gas production is maximized production with minimized operational and capital expenditure. That's why the ABB product portfolio includes low voltage AC drives, medium voltage AC drives, motors and PLCs that are designed to help you to get the best profit from your wells.

Benefits

- Reduces stress on equipment with soft start and stop
- Improves possibility for substantial energy savings with VSDs
- Increases safety and security with special shutdown sequence for PCP/ESP with rotor backspin control
- Frees up operator time by using VSDs to change motor speeds instead of changing gearings
- Increases efficiency and reduces risk of pump failure, because the pump does not need to be stopped while the well fills

Drives for compressors

The most effective way to maximize flexibility and optimize capacity of a compressor is to control speed. And the most efficient method to achieve speed control is to use variable speed drives. To enable an efficient process, compressors need to have accurate speed control and to start and stop without causing pressure peaks. This also prolongs the lifetime of the compressor and the compressed air pipes.

Our low and medium voltage variable frequency drives improve process control and reduce wear and tear of process equipment.

Benefits

- Reduces mechanical stress
- Minimizes pressure peaks
- Optimizes system and minimizes waste via accurate air pressure control



Smart field instruments and analyzers

ABB offers an unparalleled portfolio of measurement products and solutions for all stages of upstream and downstream production.

Our solutions range from large EICT projects, where we act as the main instrumentation contractor (MIC), to small projects that require specialized solutions or individual measurement products.

All ABB products offer high performance with a low cost of ownership, enabling you to operate your production assets safely, reliably, productively and profitably.

If there are any gaps in our portfolio, we fill them with third-party products that are rigorously tested to ensure interoperability.

Our portfolio covers the following applications:

- Flow measurement
- Temperature measurement
- Pressure measurement
- Analytical measurement
- Level measurement
- Valve automation
- WirelessHART™ instrumentation and integration solutions



Main Instrumentation

ABB has a proven track record as an MIC to the oil, gas and chemicals industry. Our approach leads to substantial benefits for both you and the EPC contractor, as well as significant savings in capital and operational expenditures.

Product benefits

- Reduces capex by up to 20 percent
- Reduces risk by giving you a single point of contact and single point of responsibility
- Reduces delivery time
- Minimizes fault rate
- Ensures correct specifications are followed
- Integrates with ABB control systems for data collection
- Enables direct contact to the product specialists for the product

Operational benefits

- Reduces opex by up to 20 percent
- Ensures correct specifications are followed
- Reduces spare part stocks with standardized instruments
- Increases uptime with predictive maintenance
- Lowers life cycle costs
- Enables access to the ABB service experts for service and updates

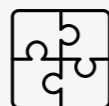


Transformers

ABB is a leading global manufacturer of dry-type and liquid-filled transformers specifically designed to meet the requirements of the oil, gas and chemical industry.

All ABB transformers are designed in accordance with International Electrotechnical Commission (IEC) or American National Standards Institute (ANSI) standards. They are suitable for both onshore and offshore applications and can be installed inside or outside on the production platform.

Our small power and distribution units are tested for extreme environments. In fact, ABB RESIBLOC® dry-type units are suitable for severe low temperature down to -55°C with no insulation fluid. And our largest fleet of subsea transformers has a proven history of operational excellence under the 3,000-meter sea bed environment for applications ranging from shore power distribution to subsea power and localized subsea compression.



Why ABB for transformers?

We are a technology leader with a broad experience with transformers for offshore/subsea applications, onshore hazardous environments or environment-sensitive geo areas.

We have global production facilities for both IEC and ANSI designs.

We provide continuous innovation, research and development with focus on you, our customer.



Switchgear and motor control centers

Our power distribution solutions are all designed to meet IEC, ANSI, CSA, ENA, GB, GOST and other standards.



Medium voltage

ABB is a pioneer and technology leader in the area of medium-voltage products and solutions. Our medium-voltage products are designed for heavy-duty industrial applications and extensively tested to withstand the requirements of the oil, gas and chemicals industry to help ensure maximum safety, reliability and uptime. Our portfolio includes a range of switchgear, e-houses and compact secondary substations suitable for extreme and harsh environments.

ABB medium-voltage primary switchgear offers the ideal combination of flexibility, reliability, availability, safety and economy for industrial and utility applications. Based on leading-edge gas or air-insulated technology and a range of voltages from 1 to 40.5 kV, our switchgear is easy to install, operate and maintain, ensuring reliability and efficiency throughout its service life.

Benefits

- Increases application flexibility with a variety of configurations
- Improves safety with interlocks and shielding
- Simplifies maintenance with window-view components
- Enhances space utilization with ample cable space

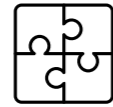
Low-voltage switchgear and motor controls centers

ABB provides market-leading electrification solutions that connect power and automation through the MNS switchgear platform for oil, gas and chemical companies.

We are the world's largest low-voltage switchgear OEM and have unmatched expertise and local support in more than 30 countries. Our team and range of MNS solutions allows us meet any of your project requirements.

The core of ABB electrification portfolio is the MNS® solution platform that's founded on the fundamental principles of safety, reliability and scalability.

MNS Solution Platform



These space-saving switchgear systems help you control costs through ease of installation, operation and maintenance. ABB pioneered this unique, modular design, developing it with the experience gained from more than 40 years of providing customers with low-voltage switchgear solutions. You can scale MNS as your business demands, maximize operation productivity and earn a better return on your switchgear investments.

Benefits

- Enhances safety by going beyond the industry standards IEC 61439-1/-2 and the IEC 61641 optional standard for additional arc flash protection
- Improves availability and reliability with real-time condition monitoring
- Lowers cost of training and spare parts with off-the-shelf hardware that has web-based functionality
- Minimizes maintenance downtime to minutes instead of hours with standard design features such as withdrawable units



Substation and GIS

ABB offers integrated electrification and automation solutions for oil, gas and chemicals industry.

Our portfolio includes a complete range of switchgear solutions and substation components suitable for extreme, harsh environments and special applications within the industry. ABB capacitor and filter solutions contribute to reliable plant operations at minimal cost and facilitate compliance with the strictest of power quality regulations.



Gas-Insulated, High-Voltage Switchgear (GIS)

ABB continues to drive innovation in GIS technology in ratings, operations, switching technology, smart control and supervision and compactness. ABB GIS offers outstanding reliability, operational safety and environmental compatibility. We provide a complete range of products for all ratings and applications from 72.5 kV to 1200 kV matching current and future requirements for modern switchgears.

Benefits

- Increases operational safety
- Ensures high reliability, which helps reduce maintenance costs and increase plant uptime
- Enables switchgear deployment and utilization in otherwise unsuitable or inaccessible environments

The gas used in GIS is a greenhouse gas with high global warming potential. ABB has been developing and deploying alternatives to this greenhouse gas on the path toward greater eco-efficiency and lower environmental impact and is now commissioning the world's first pilot with a new eco-efficient gas mixture.

INSUBSEA power and automation solutions

ABB is a leading provider of subsea power and automation solutions to the oil and gas industry. Our power and automation solutions offer a range of specialized electrical power systems, drives and services for critical subsea production equipment that effectively reduce opex and capex. This is accomplished by decreasing initial product investments and reducing maintenance and operational costs in oil and gas fields of various production sizes. We also help mitigate risk by substantially decreasing human safety threats during operation.



INSUBSEA® Automation

ABB offers System 800xA DCS for subsea applications, which enables remote communication and monitoring and control operations for subsea factories. Our subsea automation solution also integrates subsea and topside equipment to allow engineers to run the total operation from one screen.

Benefits

- Reduces risks that can't be seen from the control room
- Minimizes downtime
- Optimizes plant performance

INSUBSEA Power

ABB offers total subsea power solutions that help operators achieve efficient electric power supply and control at long step-out distances. Our subsea power installations are cost-efficient solutions that may eliminate the need for a fixed or floating topside installation.

Benefits

- Provides reliable long-term, long-distance power supply
- Saves money by reducing or eliminating the need for platforms
- Accelerates production based on quick, easy installation

Long step-out system

ABB INSUBSEA Long step-out system is a cost-effective solution that provides more efficient and flexible power for subsea applications. It includes drive and control seabed compressors and pumps for existing project extensions or new project deployments. It can be used for a variety of applications including upgrades of existing infrastructure, tie-ins of remote pockets of resources, shore-to-subsea development, subsea processing, deep water developments and export applications.

Benefits

- Extends the capacity lifespan of oil and gas fields
- Increases production and flow assurance
- Increases recovery rate
- Improves the safety of the installation and operation
- Lowers risk
- Minimizes capex and opex
- Opens opportunities for longer, deeper and colder production fields

Direct Electrical Heating system

ABB Direct Electrical Heating system is an environmentally friendly solution for preventing the formation of hydrate and wax in flowlines and pipelines. It is customizable, and consists of ABB components including a power transformer, compensation unit, symmetration unit, control and protection products and fiber optical measurement.

Benefits

- Extends the life of equipment
- Shortens site construction schedule
- Increases the cost efficiency and reliability of systems
- Ensures flow assurance without the use of chemicals



Section 3

Intelligent Applications

Intelligent Applications comprises software solutions, system components and the people behind them that increase equipment efficiencies, optimize performance and help improve production.

We deliver these through:

Safe, secure production

ABB provides and installs safety systems using highly qualified technical resources during project delivery and then ensures competent local support and service during operation. Our safety applications help you maintain and evolve existing installations to maximize value and ensure safe plant operation.

Enhanced equipment efficiency

ABB offers strategic expertise and control and optimization software solutions to help you improve efficiency of equipment throughout the life cycle – no matter if the goal is long-term operational efficiency, production and asset optimization or lowering equipment end-of-life environmental impact.

Expert guidance, anywhere, anytime

ABB provides intelligent, easy-to-use applications and remote collaboration services to ensure maximum performance of equipment and processes. By offering advanced services and applications remotely, we can improve production while maintaining the safety and security of personnel.

ABB Intelligent Applications provides an important layer of our Collaborative Operations approach, which enhances equipment efficiency and ensures safe, secure production.



ABB Insight Analytics portfolio

The ABB Insight™ Analytics portfolio combines our extensive industry knowledge with digital insights to help you gain more value from your systems and equipment. Our solutions link the key phases of a project — planning and design, build and operate — to reduce waste, improve efficiency, increase uptime and lower maintenance expenses.



ABB SafetyInsight

ABB SafetyInsight™ helps you better manage your safety systems throughout the life of your facilities. It uses early life cycle information to deliver applications that help increase productivity and reduce maintenance costs while also providing health status and decision support to ensure safety systems remain effective.

Benefits

- Minimizes lost production time by enabling faster startup following an unplanned shutdown
- Reduces planned maintenance efforts through the ability to reschedule proof tests using the documented evidence within the automatically generated reports
- Reduces Turn-Around (TAR)/shutdown duration, by using actual performance data to remove TAR activities
- Saves significant time and effort by automatically capturing actual SIF performance data for comparing against SIF design assumptions, as required by IEC 61511
- Helps better manage risk by ensuring safety functions maintain effectiveness throughout the life of the facility and/or safety system
- Reduces implementation costs by leveraging design information captured in the earlier life cycle phases for streamlined delivery of the O&M modules



ABB AlarmInsight

ABB AlarmInsight™ provides scalable software applications that enable operators to effectively respond to process disturbances in high-intensity situations. It helps document, rationalize and maintain appropriate alarm levels, which allows operators to focus on the alarms that truly require attention and respond accordingly.

Benefits

- Improves operator confidence
- Reduces operator stress
- Improves safety and environmental performance
- Enables a smoother startup and shutdown
- Increases production and equipment availability
- Increases operational efficiency
- Helps ensure compliance with industry standards and best practices

ABB AssetInsight

ABB AssetInsight™ gathers operational data into a single web-based tool to enable collaboration across locations, disciplines and organizations. It gives operators access to essential tools in one place, regardless of their location. With AssetInsight, you can see, share and make sense of operational data. It also can provide condition-based data from System 800xA Asset Monitors directly in your dashboard.

Benefits

- Encourages collaboration across disciplines and locations with comment and share capabilities in the dashboard
- Provides an overview of the equipment health status through tailored visualizations of both equipment and process status
- Helps you see how equipment health degradation may affect operation by presenting information in context
- Integrates data from any existing systems and tools, no matter if it's hosted on premises or in the cloud
- Allows you to add functionality as needed, eliminating large, complex and costly roll outs
- Displays statistics and aggregated condition status data for key assets





ABB OperationInsight

ABB OperationInsight™ is an electronic log of activities in the control room and includes two modules: shift report and block log.

Shift Report

An electronic logbook that allows manual information gathering and automatic data extraction. It provides a complete operational activity log that supports handovers to the next shift through special reports and copying of important information. The Block Log view can be integrated into Shift Report.

Bypass/Block Log

A web-based list of all bypassed/blocked and forced Safety Instrument Functions (SIFs), alarms and signals manually suppressed by operators. It features a provision for sign off on each item on the list, and shows both current and historic values.

Benefits

- Improves safety and integrity by acting as the critical point for information transfer
- Improves efficiency and simplifies regulatory compliance by providing historic information and/or reports at operators' fingertips
- Enables better decision making, leading to less downtime and reduced costs



Rotating machines digital solutions

In the oil, gas and chemical business, a slight reduction in performance or unplanned downtime can result in millions of dollars in losses. ABB control and optimization solutions help improve the availability and performance of the most critical plant assets – compressors, pumps and turbines, electrical motors and generators.



Rotating Machine Control

ABB offers a control library for control of turbomachines for 800xA and Symphony Plus platforms. This is a control suite for protection and optimization of critical rotating assets.

Compressor Optimization Solution

The Compressor Optimization solution provides advanced control functions designed to improve the performance of the critical centrifugal compressors.

- SmartSharing function: Calculates best operating point of a group of parallel compressors and reduces fuel/power consumption and carbon emissions without reducing throughput
- ACP: Protects gas compressors driven by ABB MV drives from grid disturbances to achieve continuous operation. It provides advanced diagnostics on the health status of electrical motor drivetrain

Compressor Control Solutions

The compressor control software library provides the fundamental functions for safe and efficient operation of centrifugal and axial compressors.

- Anti-surge control: Protects compressor from instabilities
- Performance control: Regulates capacity
- Load sharing control: Distributes load and avoids unbalanced and inefficient operation between a group of parallel compressors

Turbine Control and Protection Solution

This solution handles speed control and SIL-3 Over-Speed Protection. It provides the fundamental functions for safe and efficient operation of steam and gas turbines.

- Speed governor: Controls turbine speed
- Over-Speed Protection System: Detects high speed and immediately closes trip valves
- Fulfills API 670 Standard requirement
- Integrates with the System 800xA and Symphony Plus platforms

Rotating Machines Analytics Suite

ABB offers condition monitoring solutions as well as analytics platforms for assessment of equipment status. The analysis is based on information from motors, drives, switchgear, control system and instrumentation. Third-party data sources can also be leveraged.

Solutions for large critical assets, such as:

- Gas compressors
- Gas and steam turbines
- High-voltage motors

Solutions for less critical assets, such as:

- Pumps
- Fans
- Low-voltage motors

Benefits

- Provides early detection and notification of upcoming failures and ABB and third-party equipment
- Improves machine reliability because of more predictable downtime
- Reduces energy/fuel costs because of retuning services of machine control systems
- Significantly reduces maintenance costs by influencing maintenance policy changes
 - Full overview of the machine fleet health
 - Clear overview about the residual life time of the fleet's assets
 - Shift from preventative to predictive maintenance



WiMon wireless condition monitoring system

The WiMon wireless condition monitoring system tracks vibration and temperature data to enable condition-based maintenance of motors, fans, pumps and other rotating machines. By transforming traditional equipment into intelligent devices, WiMon virtually eliminates the need for manual retrieval of temperature and vibration data from equipment located in difficult-to-reach or dangerous areas. The system can be quickly installed and easily configured, allowing automated data collection and monitoring to begin almost immediately.

Benefits

- Reduces opex costs by eliminating the need for manual data retrieval
- Reduces capex costs compared to traditional wired solutions
- Reduces maintenance of sensors with extended battery life
- Helps determine the right time for equipment maintenance or pro-active replacement
- Ensures compliance with ISO 10816 guidelines



ABB 800xA Simulator

ABB 800xA Simulator combines System 800xA software with simulator functionality to allow operator training and control system testing to be conducted in a realistic, yet disconnected environment. It helps operators learn how to reduce safety risks, avoid unplanned shutdowns and shorten startup times after plant outages.

Benefits

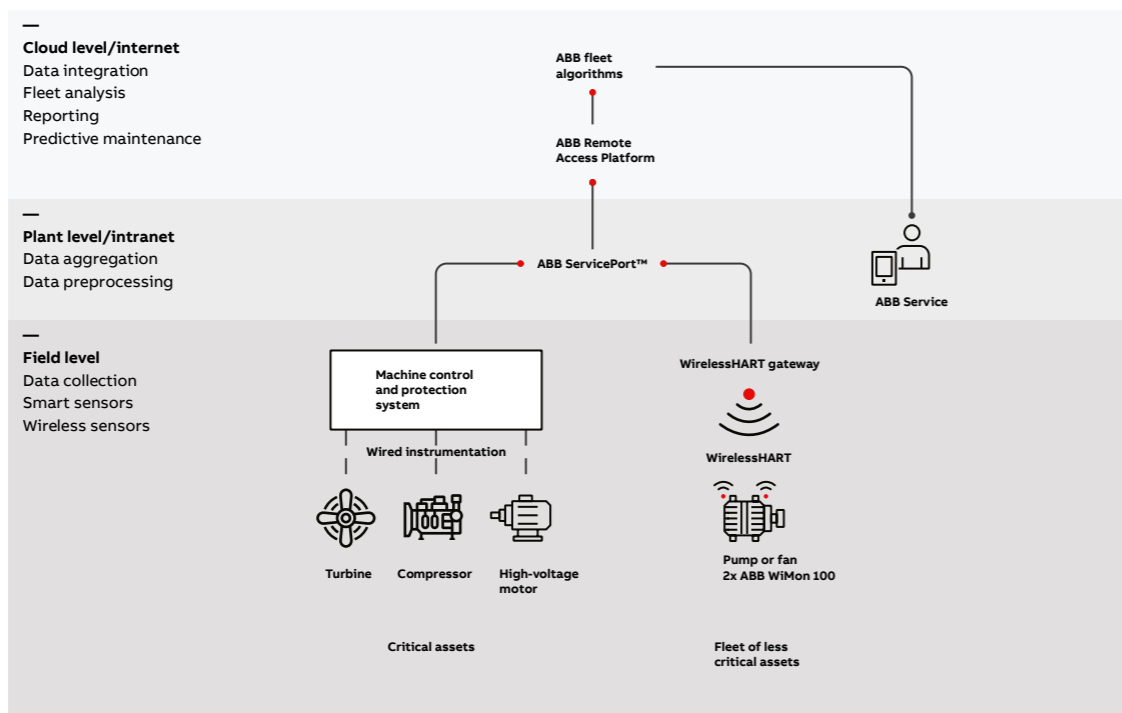
- Improves operator training and education by simulating an environment that is nearly identical to actual plant engineering and operations
- Reduces shutdown time with ability to test proposed operational changes prior to implementation
- Reduces commissioning time at startup with training and testing of new processes, designs and configurations
- Reduces maintenance costs by identifying issues on the simulator instead of in the plant
- Enhances safety by allowing users to gain familiarity and build process and operational competencies before deploying to offshore locations
- Increases computing and storage space savings and cost efficiencies with the option to run on a cloud-based platform
- Provides users access to the system anywhere and at any time with the ability to run in the cloud
- Enhances system security in cloud-based deployments

ABB Process Power Manager

ABB Process Power Manager helps ensure a reliable and stable electricity supply to plants and facilities. It uses System 800xA functions to seamlessly integrate electrical switchgear with the control system based on the IEC 61850 GOOSE standard. This provides the operator with a complete overview, accelerating decision making and allowing for the optimal use of power resources.

Benefits

- Reduces downtime by automating reactions based on priority or criticality
- Helps ensure faster recovery of power and production after a failure
- Optimizes electrical network design and minimizes system footprint
- Increases energy efficiency to achieve ROI in less than two years
- Provides a more comprehensive overview when integrated with the process control system
- Enhances safety and mitigates environmental and health impacts
- Reduces shutdown time with ability to test proposed operational changes





Process Power Simulator

ABB Process Power Simulator enables training and electrical control system testing to be conducted in a realistic, yet disconnected environment.

It uses a replica of the plant's electrical control system to create an accurate real-world environment to expose operators to situations and circumstances they may never experience during day-to-day operations.

ABB Process Power Simulator can also help companies ensure compliance with regulatory testing, optimize electrical consumption and lower electricity costs.

Operators can use the simulator to verify and validate new control strategies, equipment, procedures and sequences or to investigate optimization and energy savings opportunities.

Benefits

- Provides realistic operator training
- Boosts operator confidence in handling the electrical distribution and power generation
- Enhances operator performance and understanding
- Reduces duration and costs of Power Management System Factory Acceptance Test and commissioning time
- Lowers safety risks and number of process interruptions and blackouts
- Ensures compliance with regulatory testing
- Lowers electricity costs, reduces emissions and meets new legislative mandates
- Saves time and money by identifying potential problems during design phase
- Accelerates recovery of power after a failure



Batch Management

ABB System 800xA Batch Management is an application for configuring, scheduling and managing batch operations, as well as improving batch production profitability, consistency and traceability. It provides operators the agility and control needed to respond to increasing production demands by modeling, executing and tracking the information associated with material and control flow across the plant.

Benefits

- Increases product consistency, resulting in better quality
- Reduces time to market with easy-to-use recipe management functions
- Maximizes equipment utilization and minimizes operating costs with integrated production management and control
- Ensures regulatory compliance through the use of embedded system technical features



T-MAC Plus

ABB T-MAC Plus is a terminal management system that brings together the control system, subsystems and devices into one platform to automate key monitoring and control modules. It includes advanced functionality, such as automatic bay allocation and optimized loading sequence, to reduce loading times and increase the amount of inventory loaded and tracked. This helps ensure terminal operations are efficient, safe and secure.

Benefits

- Accelerates loading time and increases productivity
- Manages all operations carried out in loading terminal, from product delivery to dispatch, as well as product inventory and balance
- Improves and accelerates decision making by providing the right information at the right time to the right people via remote monitoring, e-mail or SMS
- Reduces opex costs by automating key functions and providing the ability to scale to meet business needs
- Enhances personnel and plant safety to ensure reliable operations in hazardous environments
- Saves engineering time by enabling operators to replicate the application in different installations by simply changing settings



Advanced Process Control

ABB Advanced Process Control (APC) is a software package that enables a higher level of automation and optimization of crude oil separation using deployment of model predictive control (MPC) with System 800xA.

Benefits

- Improves process stability
- Ensures more homogenous quality of components extracted at each step
- Increases profitability by ensuring yield maximization, increasing throughput, reducing quality rejects or minimizing energy consumption



Section 4

Intelligent Services

ABB Intelligent Services help extend the life cycle of your equipment by providing a local partner who's backed by global support. Because we make people our first priority, no matter where projects reside or the scale of support needed, our local partners offer customized support services based on specific needs.

Our service portfolio includes:

- ABB Oil and Gas Care / ABB Chemical Care
- ABB Collaborative Support Network
- ABB Automation Migration
- ABB Analytics Services
- ABB Asset Management and Condition Monitoring services
- Engineering and consulting
- Training
- ABB Parts Programs

ABB Intelligent Services completes our Collaborative Operations approach, providing service agreements, and facilitating automation migration, as well as condition-based maintenance and training.



ABB Oil and Gas Care / Chemical Care

ABB Oil and Gas Care/Chemical Care is our global and standardized service agreement framework that helps improve your operational efficiency. Our standardized framework helps cut service delivery complexity, control costs and maximize your capital investments. We offer a wide selection of services covering the entire life cycle of a facility as well as the entire electrical, instrumentation, control and telecom (EICT) scope.

Benefits

- Reduces contract complexity for routine and emergency maintenance by using a single point of contact between you and ABB
- Ensures consistent service delivery globally with the ABB Collaborative Support Network
- Reduces supplier complexity by requiring fewer contracts with larger scope
- Controls costs with maintenance and support activities that can be planned and offered at fixed, annual prices



ABB Electrical System Services

ABB Electrical System Services help ensure all electrical components and systems are operating cost-effectively and reliably. We take a practical approach to electrical design and guidance with a broad range of engineering, environmental, health and safety and consultancy skills. Our portfolio of services covers all needs, from design to upgrades and replacements. We also offer assessments, system studies, engineering, installation, commissioning, maintenance and troubleshooting services.

Benefits

- Reduces equipment obsolescence risk
- Improves availability by ensuring proper maintenance actions are taken
- Optimizes parts inventories with gap analysis and recommendations
- Enables a clean and stable power supply to reduce disruptions
- Enhances safety and performance by identifying equipment rating and system loading and protection coordination issues
- Provides operators a comprehensive look at how the power system operates in a range of scenarios
- Improves maintenance decision-making through training and assistance



ABB Collaborative Support Network

ABB Collaborative Support Network is our network of local support teams, regional collaboration centers and global core competency centers that connects you with the appropriate support or experts you need. Through on-site visits or remote connection, the ABB Collaborative Support Network helps address issues quickly and proactively to keep production running and enable continuous improvement.

Benefits

- Improves equipment availability and reliability
- Optimizes scheduled downtime
- Accelerates recovery from unscheduled downtime
- Increases Overall Equipment Effectiveness
- Saves time and money during issue discovery
- Drives a proactive-to-preventive-to-predictive maintenance culture



ABB Automation Migration

ABB Automation Migration services help you take a stepwise improvement and modernization approach for electrical, telecommunications and automation assets. ABB experts complete a review of your systems, identify upgrade opportunities with the greatest ROI, and suggest a migration path that will increase the efficiency and productivity of facilities.

Benefits

- Extends life of system
- Lowers maintenance cost
- Enhances value provided from automation system to operations
- Protects intellectual investment in current system
- Helps you stay competitive

ABB Analytics Services

ABB Analytics Services help minimize problems with equipment and processes to ensure efficient operation and a higher return on investment. We apply a three-phase methodology – Diagnose, Implement and Sustain – throughout all stages of the equipment life cycle to minimize process and system issues, ensure efficient operations and increase your return on assets.

The services help identify the root cause of issues that inhibit peak performance in equipment and processes and provide recommendations to resolve issues quickly and systematically. Recommendations are prioritized based on actions that deliver the greatest economic return.



Advanced Services for System 800xA

ABB Advanced Services for System 800xA help uncover issues that limit system performance, implement time- and money-saving improvements, and extend the life of assets. Our services portfolio includes:

- **System 800xA Benchmark:** An overview of actual system status with “traffic light” KPI report
- **System 800xA Core Fingerprint:** A detailed system report with findings, impact and recommendations
- **System 800xA Health Check:** A comprehensive inspection for verifications, troubleshooting or after a major system upgrade
- **Security Update Service:** Provides Microsoft Security patches and McAfee or Symantec .dat files directly after validation by ABB
- **Cyber Security with System 800xA:** Helps identify weaknesses of a system to develop appropriate, risk-based strategies for cyber security improvement



ABB System and Process Analytics Services

ABB System and Process Analytics Services ensure continuous improvement for automation systems and processes through a systematic approach to problem-solving and proactive commitment to service.

Diagnose Phase

System improvement and optimization begins with data collection from ABB Benchmark and Fingerprint services. Thorough data collection ensures a proper diagnosis of system and process health.

• Benchmark services

Benchmark services provide a quick overview of the system status. It is a system check that includes fully automated data collection and KPI status report generation within minutes of data upload.

• Available Benchmarks

- Cyber Security Benchmark
- Freelance Benchmark
- System 800xA Benchmark

• Fingerprint services

Fingerprints are follow-up services to Benchmark services. The data collected in a benchmark is used in a configuration and performance analysis, which is then summarized in a detailed roadmap. This plan simplifies the decision-making process by identifying how to quickly close performance gaps and highlighting high-impact opportunities for improvement.

• Available Fingerprints

- Batch Process Fingerprint
- Boiler Fingerprint
- Cyber Security Fingerprint
- Freelance Fingerprint
- Harmony Performance Fingerprint
- Loop Performance Fingerprint
- LV Drives Fingerprint
- System 800xA Fingerprint



Implementation Phase

This phase is where experts implement the improvement steps identified with the Benchmark and Fingerprint services. Recommendations for improvement can include adjusting, replacing or updating equipment.

Sustain Phase

Benefits realized from improvements made in the Implementation Phase are sustained through a program of continuous monitoring via our Performance Service channels or through regularly scheduled Fingerprint services.



Performance Service channels

Performance Service channels are delivered individually through ABB ServicePort™. Each channel is a bundle of services applied to a particular piece of equipment or production or business process. ABB Service personnel use data collected during scheduled and on-demand analyses to compare against best practices and standards to identify, classify and help prioritize performance improvements. This comparison quickly pinpoints issues, helping to improve system reliability, availability and performance.

Benefits

- Minimizes the risk of system or process upsets through early detection of potential problems
- Decreases the time and cost spent pinpointing problems
- Ensures on-going maintenance, expansions, application or process changes do not negatively affect the system
- Reduces response time and travel expenses by providing remote access to ABB experts for troubleshooting

Available Performance Services

- ABB System 800xA Performance Service
- Harmony Performance Service
- Cyber Security Monitoring Service
- Loop Performance Monitoring Service
- LV Drives Performance Channel
- Rotating Machine Channel



ABB ServicePort

ABB ServicePort is a secure, remote-enabled service delivery platform through which our performance services are delivered. It allows you to view, scan and track Key Performance Indicators (KPIs) to ensure maximum performance of equipment and processes, resulting in higher operational efficiency for a wide variety of industrial applications. It also provides you and ABB service experts local or remote access to views of KPIs and diagnostic data. ABB experts help you identify production and process issues and improvements at any time and any location, anywhere in the world.

Benefits

- Identifies trends to mitigate equipment and process issues
- Reduces response time and travel expenses
- Decreases the cost of identifying issues
- Minimizes risk of system upsets

Asset Management and Condition Monitoring services

ABB Asset Management and Condition Monitoring services are enabled by the ABB Asset Management System. The system provides a platform for remote services to be implemented and allows for advanced analysis services that focus on improving equipment and process conditions. Services can either be applied in the form of studies, which do an overall evaluation of equipment health at one time, or they can be applied more regularly to enable condition-based maintenance and more informed decision making by operators.

Benefits

- Improve efficiency and safety while minimizing environmental impact
- Enable predictive maintenance thereby reducing operational expenditures
- Increase plant uptime
- Increase lifetime of equipment
- Reduce need for on-site spare part storage as fewer spare parts need to be kept in stock
- Ensure plant operates closer to the design limit

ABB Asset Management and Condition Monitoring services also follow the Diagnose, Implement, and Sustain methodology.

Diagnose

During an on-site assessment, ABB's experts, together with site maintenance specialists, evaluate the precise maintenance needs. A long-term solution is then designed based on business goals and technologies available.

Implement

The ABB team deploys the ABB Asset Management System.

Sustain

ABB remotely measures and optimizes maintenance performance and presents results in periodic reports. Under a service agreement, ABB ensures the application is always up to date so that your maintenance teams can focus on their daily maintenance work.





Safety Life Cycle Management

ABB Process Safety Life Cycle Management helps you manage safety risk in all phases of the life cycle—from the initial hazard and risk assessment, to the design of safety barriers, to ensuring barriers remain effective in avoiding catastrophic accidents. With insight into the health of safety systems, coupled with focus on keeping production running, we help organizations achieve safe and reliable operations. You benefit by reducing associated capex and opex costs and increasing plant availability – with quicker start-up if an unplanned shutdown occurs.

Process Safety

ABB Process Safety Life Cycle Management services with supporting applications, helps you identify and manage your safety risk in all phases of the life cycle – from the initial hazard and risk assessment, through to the design of safety barriers and to ensuring barriers remain effective in avoiding catastrophic accidents.

With insight into the health of safety systems and a focus on keeping production running, we can help you achieve safe and reliable operations. ABB's life cycle approach ensures you benefit by reducing associated capex and opex costs, as well as increasing plant availability.

Benefits

- Provides management of all safety-related activities throughout the life of a facility
- Offers you access to industry leaders for practical advice and solutions based on operational heritage and for gaining regulator approval
- Demonstrates and ensures that risks are under control, while focusing resources to areas of highest risk
- Includes structured methods embedded into our services and applications, which reduce engineering effort through an efficient and intuitive approach to complying with international standards
- Streamlines project delivery, reducing capex and risks of project delays and ensuring safety system meets defined requirements
- Provides a digital platform to enable contextualization of the vast amount of data generated during operation and maintenance, achieved through the SafetyInsight applications
- Integrates SafetyInsight to help increase plant availability, reduce opex costs and reduce the maintenance burden, while providing an efficient solution to capture actual performance data and compare against the assumptions made in the earlier life cycle phases



Proof Test Fingerprint

The Proof Test Fingerprint review is a structured risk-based approach that makes use of existing organizational functional safety and operations and maintenance management systems, industry and regulatory research reports and extensive plant operational experience to determine the status of existing functional safety processes. A site review program is planned in advance using the ABB Proof Testing Assessment Database Tool so that evidence is collated your staff's time is used in the most optimal way possible.

Benefits

- Demonstrates a proactive attitude which is expected by the authorities, public and workforce
- Supports company risk management arguments and demonstrates traceability to industry good practices
- Enables you to know in advance any changes that will have to be made
- Helps avoid surprises regarding the on-going sustainability of the operation
- Provides information on how to maintain the level of safety designed into the SIS
- Reduces the plant spurious trip rate and cost of its consequences
- Uses a risk-based approach that highlights the areas in most need of improvement to relieve the demands on other resources





Cyber Security Life Cycle Management

Cyber Security Life Cycle Management helps protect your control systems against security threats by ensuring that the system is operated according to best practices based on international standards and ABB experience.

Diagnose services collect data to identify strengths and weaknesses for defending against an attack. Implementation services help with the installation of cyber security solutions that fill the gaps identified in the Diagnose Phase. Sustain services are scheduled maintenance or continuous services that can be offered as part of a larger care agreement.

Benefits

- Identifies areas of a control system that are vulnerable to security breaches
- Determines strengths and weaknesses for defending against a cyber attack
- Improves control system reliability with installation of solutions built on years of experience
- Reduces costs by implementing standard solutions based on proven technology
- Ensures continued and stable performance of cyber security system
- Provides peace of mind with ABB experts who are available 24/7
- Increases production with best possible system uptime



Alarm Life Cycle Management

ABB Alarm Life Cycle Management services enable safe, efficient and effective operations by reducing alarm rates and prioritizing alarms. Our services help operators clearly see which alarms to act on first to avoid interruptions in production.

Diagnose services determine where to start by pinpointing alarm problem areas. Implementation services help enable confident operators with training and consulting services that help reduce alarm rates and prioritize alarms. Once alarms are under control, Sustain services help ensure they stay that way with ongoing or periodic support services.

Benefits

- Empowers operators to confidently make decisions in high-anxiety conditions
- Helps ensure plant uptime by focusing attention on only the alarms that require action
- Fosters effective responses to process disturbances
- Ensures the plant is compliant with health and safety standards





Rotating Machines - Analytics Services

ABB Rotating Equipment – Analytics Services are a suite of services that provide consistent improvements to rotating machine operation, leveraging ABB leading-edge technologies and seasoned experts' support and guidance.

Our experts apply the three-step Advanced Services methodology – Diagnose, Implement, and Sustain – to optimize equipment performance and ensure high availability.

Benefits

- Helps predict failures via pervasive information analysis to minimize negative impact on people, equipment and environment
- Enables more predictable operation so operators know when machines might fail and can adjust maintenance according to failure forecasts
- Reduces operating costs via real-time optimization:
 - Reduces costs related to unscheduled maintenance
 - Increases fuel and power savings – up to 50 percent
- Reduces CO₂/NO_x emissions penalty costs



Engineering and consulting

ABB engineering and consulting services for the oil, gas and chemicals industry help identify potential improvements in industrial asset management, production processes and operational infrastructure. Maintaining large in-house engineering capability is increasingly difficult to justify in today's business environment. However, operators still want access to a full range of experienced engineers when needed, including mechanical, control and electrical, civil and structural, materials and process specialists. ABB has an extensive range of engineering specialists with operational experience and in-depth knowledge of best practices, allowing them to provide pragmatic solutions to operational issues.



Tailored Software Solutions

ABB offers services to design and implement tailored software solutions for operations management. Tailored Software Solutions manage production, warehousing and connectivity to integrate process control systems, batch control systems and Enterprise Resources Planning (ERP) systems, as well as all field equipment and systems related to production and logistics.

ABB starts with a consultancy service to determine the scope of work, the sources of information to be integrated, your operations pattern and the kind of software products to be customized and put into operation. The Tailored Software Solution is based on your specific needs and operation. Three solutions comprise this suite: Systems Connectivity, Production Management System and Warehouse Management System. These can be deployed together or independently, depending upon your need or project scope.

Systems Connectivity is designed to connect interfaces of disparate systems, integrating data generated by all process and logistic equipment and systems present in the production chain, so this data may be used to feed other higher-level software applications.

This applies to the following systems:

- System 800xA process control systems
- Third-party process control systems
- ABB and third-party PLCs
- ERP systems such as JD Edwards or SAP
- PIMs and MES systems
- Peripheral devices, like bar code readers and printers, scales, handhelds, conveyors, cranes, tans elevators, and picking and palletizing robots
- ABB Production Management Systems
- ABB Warehouse Management Systems

Production Management System is a System 800xA-based software package that permits the interoperation of field devices, process control systems, batch control systems, Manufacturing Execution Systems (MES) and ERP systems to manage and supervise the entire production chain. This allows producers to react more flexibly and quicker to market requirements and handle complex work processes more efficiently.

Warehouse Management System (WMS) is a System 800xA-based solution that administers a wide range of operations within a warehouse and provides utilities with inventory control and resources optimization.

WMS helps optimize performance and space utilization and controls and tracks the entry and egress of units to the warehouse.

WMS integrates information coming from different sources, such as field equipment, control systems and other management systems, to provide a detailed overview of all materials that are being stored and moved within the warehouse and their elements.

Benefits

- Reduces costs with better management of the capacity of plant assets
- Increases supply chain efficiency
- Boosts production efficiency with configuration of workflows with optimal paths and dynamic flows (routing)
- Lowers TCO for integration of ERP and plant systems by using a standard product for all vertical integrations





Integrity Management

ABB helps process industry companies improve the integrity of their operations and assets. ABB's risk-based approach reduces safety and business risks cost effectively. ABB brings a well-respected and independent approach to any stage of the improvement process. Our program combines leading methodologies and tools with expert technical judgment to initially identify and then deliver integrity improvements. We prioritize the key areas to address, rather than unnecessarily assessing areas with no scope for beneficial improvement.

Benefits

- Improves the management of safety in production, whether related to people, systems or hardware
- Focuses effort on reliability and sustainability, while supporting the development of asset life cycle strategies
- Enables you to comply to legislation and regulations in an optimized way
- Provides benchmark competencies for both the organization and people, identifying areas for and assisting with improvements

Our integrity offerings include:

Asset Health Checks and Audits

Asset Health Checks and Audit Service is the starting point for improving integrity. ABB assesses manufacturing operations across the key areas of integrity and compares against best practices to identify any gaps. The output is a prioritized list of improvements.

Benefits

- Helps you maintain HSE compliance
- Extends the life of assets
- Provides a proactive approach to managing ageing assets

Civil and Structural Inspection

ABB Civil Structural and Inspection Service determines the strategy for maintaining integrity of civil and structural assets. Our engineers develop and deliver a cost-effective inspection regime. ABB inspection procedures define the requirements for the examination of structures, bunds and drainage to ensure resources are focused in the right areas. They can be used to form the basis of a maintenance regime or asset life study. ABB engineers also assist in prioritizing and specifying any required remedial works.

Benefits

- Ensures resources are distributed correctly
- Provides a foundation for a maintenance regime or asset life study
- Creates a cost-effective inspection regime

Reliability

ABB Reliability Services offers risk-based equipment maintenance policies to maximize reliability and integrity. ABB can assist you with your reliability practices, by helping to prevent failure and manage maintenance work.

Services include

- Criticality analysis
- Risk-based maintenance and Failure Modes and Effects Analysis



- Preventive maintenance planning and scheduling
- Spare parts management

Benefits

- Maximizes production of quality products
- Increases return on investment by a minimum 3:1 margin
- Provides a path to permanent plant reliability and improvement
- Optimizes plant productivity and flexibility

Risk-Based Inspection

The ABB Risk-Based Inspection (RBI) Services use qualitative and semi-quantitative methods to optimize inspection schemes and intervals. ABB RBI Services can be applied to a broad range of equipment, including pressure systems and rotating equipment and structures.

RBI Services include:

- RBI studies using our proprietary methodology and tools
- Inspection schemes updates to reflect the outcomes of RBI studies
- Screening studies that provide a rapid assessment of equipment to prioritize items for full RBI studies

Benefits

- Improves equipment integrity
- Reduces inspection cost by specifying appropriate inspection techniques and extending inspection interval where appropriate
- Improves reliability and plant availability
- Ensures you are compliant with regulations

Shutdowns and Turnaround Management

ABB Shutdowns and Turnaround Management Services help minimize the effect of current and future planned outages. Our approach follows a proven model of excellence to deliver successful turnarounds.

Benefits

- Improves the safety performance, integrity and efficiency of operations
- Reduces the costs associated with poorly managed turnarounds or outages
- Minimizes startup issues
- Improves reliability between events

Technical Due Diligence

ABB Technical Due Diligence Service assesses the condition of manufacturing facilities and the supporting systems prior to a potential acquisition.

Benefits

- Identifies issues with legislative compliance
- Uncovers imminent safety or reliability issues
- Allows for capex investments to be planned in advance





Maintenance and Reliability Management

ABB Maintenance and Reliability Management services aim to improve the cost-effectiveness of maintenance and maximize the reliability and integrity of equipment.

Services include

- Successful Outages/Shutdowns
- Maintenance and Reliability Improvement
- Successful Turnarounds
- Operational Plant Engineering Support
- Criticality Analysis
- Risk-Based Maintenance and Failure Modes and Effects Analysis
- Preventive Maintenance Planning and Scheduling
- Spares Parts Management



Asset Life and Closure

ABB Asset Life and Closure assessment identifies the investments required in an asset to achieve its desired performance throughout a defined lifetime, typically 10 to 20 years.

The assessment provides:

- An overview of deterioration modes and equipment status
- Detailed life assessments and required action plans for key equipment
- Overall asset investment profile over the study period
- Improvement plans for the asset supporting processes

ABB Operational Excellence

ABB Operational Excellence services help improve performance in the areas of compliance, operations and engineering.

ABB consultants work with you to transfer knowledge and ensure performance improvements are sustained. Our services range from identifying potential issues, to implementing actions, to ensuring identified benefits are realized.

Training

ABB offers custom-tailored product, system, process and technology training services designed for engineering, operation and maintenance personnel. You can learn online in our web sessions or attend classroom trainings at ABB or on your premises.

Benefits

- Improves your skills
- Ensures you are up to date on latest technology
- Helps you get more value from your systems

ABB Parts Programs

ABB Parts Programs provide original, high-quality spares and consumables for ABB products. You get the spare part you need in full working order quickly and within the agreed timeframe. Spares are available throughout the life cycles of the plant and the control system.

Benefits

- Minimizes plant and equipment downtime
- Provides cost-efficient spare parts and services to ensure best possible accessibility and continuous trouble-free operation
- Extends lifetime of equipment



Spart Parts Service

Our Spare Parts Service provides you with genuine, certified ABB spare parts when and where you need them, helping to increase system reliability and extend the life of systems. You can order spare parts through our 24/7 web-based ordering process, and new and unused parts are shipped within a day. Our services vary depending on the product's life cycle state and are available for all process automation systems.

	Active	Classic	Limited	Obsolete
Spare Parts Service	✓	✓	As available	On request

01 ABB Spare Parts Services by life cycle status





Emergency Parts Service

ABB Emergency Parts Service provides immediate response to your part needs 24/7. You can contact ABB experts by phone, through your local center or online at www.online.abb.com. Our services are available on all ABB equipment and provide new, refurbished and pre-owned parts based on stock availability.

Benefits

- Offers immediate access to available parts
- Allows you to contact ABB in the way that works best for you
- Provides the quickest possible delivery method through the ABB global parts network
- Enables better spare parts management



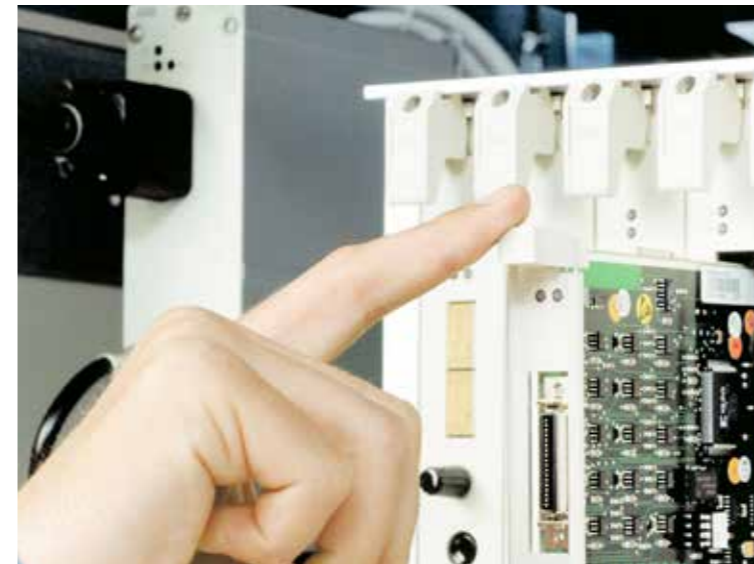
Refurbished Parts Service

ABB Refurbished Parts Service offers an alternative for buying spare parts if you're price sensitive. All parts offered have been recovered and updated by ABB to meet the original equipment specifications and the current component standards. Service availability depends on the product life cycle state. Parts that are repairable are always offered as refurbished in the active and classic life cycle phases and often in the limited and obsolete phases.

Parts Repair Service

Our Parts Repair Service helps you prolong the life of your unique equipment. Our service provides repairs that meet original equipment specifications with a turnaround time of typically less than two weeks. A repair report is included in every return shipment.

You should be aware that our Parts Repair Service availability depends on the repairability of the part. As products go through the life cycle phases, component availability can become more difficult. As long as component parts are available, ABB will always attempt to offer repair services.



Parts Exchange Service

The ABB Parts Exchange Service allows you to purchase fully functional spares in return for your broken ones. This service is available for refurbished or new parts based on availability. Depending on the product, core credits are also available for the return of the failed unit, once the replacement part has shipped.

Benefits

- Keeps lead times to a minimum
- Offers a cost-effective alternative to purchasing new parts



Parts Test Service

The ABB Parts Test Service determines if parts that you have stored for a longer period of time are still operational and meet the original manufacturing specifications. Units that pass testing are sealed with recertification labels, enabling you to keep known good spares on hand. For any items found to be non-functional, a repair quote is provided.

Benefits

- Verifies whether parts used or stored for a longer period are still operational
- Protects systems by verifying the quality of critical spares



Preventive Maintenance Kits

ABB Preventive Maintenance Kits service helps secure continuous operation. It helps ensure that calculation of parts maintenance costs is more accurate and that equipment is serviced before a breakdown actually occurs. Preventive maintenance is carried out during planned production shutdowns for which the required parts and resources should be reserved in advance. Our pre-specified, easy-to-order kits consist of genuine ABB spare parts that are necessary for a specific scheduled maintenance. These kits have a lower price compared to the price of individual spare parts and are delivered within a lead time, unlike normal spare parts.





Inventory Access Program

Our Inventory Access™ Program (iAP) is a cost-effective alternative if you're purchasing parts inventories. It provides a customized spare parts inventory at or near your location, owned and maintained by ABB. It helps you shift many of the costs related to obsolescence, depreciation, administration and inventory ownership to ABB, while only purchasing the items you need. You pay a fixed monthly fee for the security of on-site parts availability, while reducing the initial capital expenditures of a spare parts inventory. Actual purchase does not take place until the part is taken out from the Inventory Access part stock and placed into service. It helps reduce costs by converting the warranty from a static time period to an open-box warranty that begins when the item is placed into service.

Benefits

- Increases uptime with quick access to ABB-owned spare parts located at or near your site
- Reduces initial capital expenditures of a spare parts inventory
- Controls costs with a fixed monthly fee



Parts Root Cause Analysis Service

The ABB Parts Root Cause Analysis Service helps you gain valuable knowledge and understanding through analyzing the root cause of a hardware failure. Our hardware design experts analyze your failed item by using state-of-the-art laboratory equipment and original design and test documentation. After the analysis has been performed, an extensive report is created and issued, providing valuable knowledge and understanding of what caused a hardware failure. It's important to remember that the repair of the failed unit is not included in the Parts Root Cause Analysis Service and, depending on the failure mode, repair of the item may not always be possible.



ABB Parts Fingerprint

The ABB Parts Fingerprint service reviews the effectiveness of your parts management processes to identify cost reduction opportunities and potential risk associated with the spares inventory. The Parts Fingerprint service analyzes inventory documentation and validation, and includes a historical review of parts use and purchasing patterns. In addition, inventory risks are assessed and a gap analysis is performed, then recommendations are made for cost savings. ABB provides an evaluation report of the parts management program, including existing processes and conditions, compared with ABB established best practices for ABB products.

Benefits

- Maximizes system parts availability
- Reduces short- and long-term parts expenditures



Storeroom Management Consulting

ABB Storeroom Management Consulting service helps you develop a comprehensive storeroom management process that ensures that all plant equipment continues to operate at its maximum design capacity. ABB works with you to identify the current process and areas for improvement, develop a plan to implement recommended changes and execute the new process.

Benefits

- Increases reliability of system with improved spare part management
- Reduces waste and save costs

