
Over 35 years in safety
An ocean of experience



Both pioneer and world-leader

Over the past 35 years, ABB has successfully delivered and installed safety systems in more than 55 countries worldwide. With operations on all continents and dedicated safety system teams around the world, ABB provides not only highly-qualified technical resources during project delivery, but also ensures competent local support and service in operation. We work hard with end-users to maintain and evolve existing installations, thereby maximizing customer value and ensuring safe plant operation.



1979 First safety system

1983 Safeguard 9000 released

1984 First Integrated Safety System Goes Online

1976 Sevesto, Northern Italy

1984 Mexico City, Mexico | UCC, Bhopal, India

1988 Piper Alpha, North Sea

Generations of safety systems

With our earliest installations going online as far back as 1979, ABB can truly be considered one of the pioneers of safety systems. As a corporation built on innovative products, ABB is an acknowledged development leader. Dedicated and focused teams coupled with a strong corporate culture of responsibility have ensured continuous strong performance in the safety systems market. This long history has witnessed the introduction of several generations of ABB safety systems characterized by a range of technical solutions; from Dual Modular Redundant (DMR) Safeguard systems and Triple Modular Redundant (TMR) Plantguard systems to the most recent modular and scalable 800xA High Integrity system, available in up to and including Quad configuration.

Unrivalled experience of integrated safety systems

The concept of integrated safety systems is nothing new. ABB has over 35 years experience in this field after having installed its first integrated system on the Gullfaks A Platform, a system that went online in 1984. With its latest generation

800xA High Integrity system, ABB takes the integrated approach even further by offering a seamlessly integrated solution without compromising on safety.

Broadest installed base

Throughout ABB's history, several safety system generations have been developed and released, some of which are still active today. And while the vast majority of installations are within Oil & Gas and Chemicals (the main drivers behind safety development), an increasing market diversification is clearly evident. More and more installations are being delivered to non-traditional markets such as Power Generation, Pulp & Paper, Metals & Mining, and the Semiconductor industry, for example.



1993 Safeguard 3000 released

1989 Pasadena



Key projects over the years



Gullfaks A platform

Evolution optimizes safety and control

– Gullfaks A, North Sea

When the Gullfaks A platform went online in 1984, it featured ABB's very first large-scale integrated Process Control and Safety System. Oil company owners StatoilHydro and ABB have since upgraded this solution in several planned steps. The most recent project included live (no shutdown) evolution of the existing advant and master control systems to System 800xA, plus a Fire and Gas (F&G) systems retrofit. In addition, System 800xA and HVAC as well as sequence, subsea and wellhead control were added. Wellhead, process and Emergency Shutdown (ESD) systems, fire and gas instrumentation, an information management system, generator control and a power management system are also now in place.



Sleipner platform (Courtesy of StatoilHydro)

Systems that stand the test of time

– Sleipner, North Sea

North Sea gas platform Sleipner A went online in 1993 for global crude oil and gas supplier StatoilHydro with an original ABB fully-integrated process control and safety system based on Advant and Safeguard 3000. After a series of planned upgrades, the platform's total automation solutions today feature control and safety systems based on System 800xA and Safeguard 3000. Deliveries include HVAC, subsea, choke and compressor control, a utility process system, wellhead control systems, process and emergency shutdowns, fire and gas protection, event recording, instruments, remote control of platforms, and satellite link communication between on and offshore control systems. A training simulator helps speed up system introduction.



Troll A platform

The largest platform on the planet

– Troll A, North Sea

Producing about 75 million scm of natural gas per day plus 10,000 bpd of NGL condensates, Troll A is the largest platform ever built. Its original Infi90-based control and safety system, delivered in 1995, is now being upgraded and expanded. Systems 800xA and 800xA High Integrity will replace Infi90, for example. When the new safety system goes online, it will constitute one of the first SIL3 800xA High Integrity installations in the world. The ABB total automation delivery includes a fully-integrated System 800xA process control and 800xA High Integrity safety system for emergency shutdown and fire and gas systems.



Integration across generations

– Kuwait Oil Company

Gathering Centre-25 is one of the largest oil production facilities of the Kuwait Oil Company, contributing substantial crude and gas production for its owners. Its fully-integrated control and safety system includes Advant open control systems integrated with System 800xA. Gathering Centre-25 utilizes OPC technology for connectivity to third-party systems and historian servers. Dual Safeguard 400 Safety Systems, RTU and SCADAventure are utilized for wellhead monitoring and control, process and emergency shutdown, and fire and gas protection.

Combined process control and safety

– Pemex, Burgos Complex, Mexico

Mexican-owned petroleum company Pemex selected System 800xA and 800xA High Integrity to automate process control and safety in its Burgos Complex (Reynosa, Tamaulipas, Mexico). This cryogenics facility processes eight hundred million cu. ft. of gas per day, plus twenty-four thousand barrels of condensate, and is Pemex's most automated plant, operating with maximum performance and safety. The combined system gives Pemex the advantage of visualizing the processing plant's integrated safety, fire and control systems, which represents an enormous reduction in risk.

Integrated Production

– FPSO Peregrino

Completed in April 2011, FPSO Peregrino is permanently docked at the Peregrino oil field, 85 kilometers off the coast of Brazil. ABB was involved in the design, engineering and conversion from the beginning as the main automation and main electrical contractor (MAC/MEC). Peregrino has a fully integrated multi-system solution including process control, power management, condition monitoring, fire and gas (F&G) and emergency shutdown (ESD) all fully integrated within the same System 800xA Extended Automation platform and operating environment. Peregrino has 10 System 800xA PM866 controllers and 14 PM865 high integrity safety controllers controlling the processes and protecting production, people and the environment during its 24/7 operations.

2005 SIL2 certified 800xA High Integrity controller released

2005 Texas City, US

2005 Buncefield, UK

2007 Bay of Campeche, Mexico



2008 SIL3 certified 800xA High Integrity controller released

2010 IEC 61508 Edition 2 released

Spanning a whole region – the Caspian Sea Project

Spanning an entire region with a major pipeline, one of the world's largest oil/gas terminals, and seven oil-related platforms projected to peak at over 1 million bpd production – that's the Caspian Sea Project! The pipeline crosses three countries and is the most complex pipeline project in the world to date. Nine pumping stations, up to 100 block valve and manifold stations and a complete green-field marine oil terminal also make up the infrastructure. ABB's total supply includes automation, safety systems, instrumentation, motors and drives. Both Safeguard and 800xA High Integrity systems were delivered for ESD and F&G applications.

World's largest chemical production complex – Sadara Chemical Company Complex

When fully operational in 2016, the Sadara joint venture between Saudi Aramco and The Dow Chemical Company will be the largest plastics and chemical production complex ever build in a single phase. ABB was selected as the Main Automation Contractor (MAC) and supplied System 800xA Extended Automation integrated control and safety systems as well as project services and engineering for the 26 different process units and supporting facilities that make up the chemical complex. With over 170 redundant PM 891 process controllers and 104 redundant PM 865 safety controllers, Sadara is one of the largest installations of integrated control and safety systems (ICSS) in the world.

First Coal Seam Gas Project – Queensland Curtis LNG

First shipments started from the Queensland Curtis LNG near Gladstone, Australia in late 2014. ABB was appointed the Main Automation Contractor (MAC) and provided the integrated automation, safety and telecommunication systems for the project. Approximately 60 redundant 800xA High Integrity controllers were provided on Emergency Shutdown and Fire & Gas applications at the compressor stations as well as for gas gathering and pipeline transportation. The integrated solution was based on the System 800xA solution, using multi-system integration to consolidate data and control into the Central and Emergency Control rooms utilizing the Extended Operator Workplaces (EOW) as the main HMI for all integrated systems.

2010 Deepwater Horizon

Taking safety system development forward



ABB's latest generation safety system – SIL3 -certified 800xA High Integrity – constitutes an integral part of ABB's flagship automation offering – System 800xA. Modular and scalable, 800xA High Integrity system features a market-leading level of integration with the 800xA process control system, ensuring significant savings across all lifecycle stages.

800xA High Integrity clearly takes safety systems development one important step forward in terms of integration. In addition, several less obvious design features further augment its safety integrity. For example, the system utilizes embedded software and hardware diversity in the logic solver and I/O subsystem respectively. Diverse execution paths ensure that it is virtually impossible for random failures to avoid detection.

800xA High Integrity is available up to Quad configurations, allowing end-users to optimize costs and tailor their solutions to the specific requirements of each installation. Safety integrity is achieved regardless of configuration. In Quad configuration, 800xA High Integrity enables continuous process availability of up to 99.9999%, which ensures minimum production upsets or interruptions.

Benefiting from ABB's Experience

During the over 35 years since ABB began working on our first safety system, we have been on the forefront of technology from the first integrated safety system with Advant Safeguard in the 1980's to our flagship System 800xA integrated control and safety system, now entering its 10th year. Our experience and innovations in technology, have led to a modern, reliable and highly available solution for many industry and utility safety applications, including:

- Emergency Shutdown Systems (ESD)
- Fire & Gas Systems (F&G)
- Burner Management Systems (BMS)
- High Integrity Pressure Protection Systems (HIPPS)
- Remote Terminal Units (RTU)
- Machinery Safety Applications
- Relay Interlock Replacements
- Combined control and safety applications (same controller)
- High availability and high reliability applications
- Integrated or stand-alone applications

With almost 3,000 systems installed worldwide, ten years of run time and applications that vary from 50 I/O to over 10,000, System 800xA High Integrity will provide the safety, security and protection for people, equipment and the environment required for almost any project.

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abb.com/highintegritysafety

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