



Complete telecommunications for the oil and gas industry

Integrated Communications Oil and gas

ABB is a leading supplier of complete telecommunication solutions to the oil and gas industry, with unique capabilities for large offshore, onshore and pipeline communication projects.



Offshore: Floating and fixed
Customized telecommunication solutions for reliable and flexible communications throughout and around the platform, between platforms and platform-to-shore.



Onshore and LNG: plants and terminals
Turnkey telecommunication solutions covering all needs for onshore plant operations, ensuring reliable communications within the plant, plant-to-platform and plant-to-plant.



Pipelines: transport lines and networks
Robust, cost effective telecommunication solutions providing secure and reliable communications along the pipeline and throughout pipeline networks.

ABB in oil and gas telecommunications ... bringing it all together

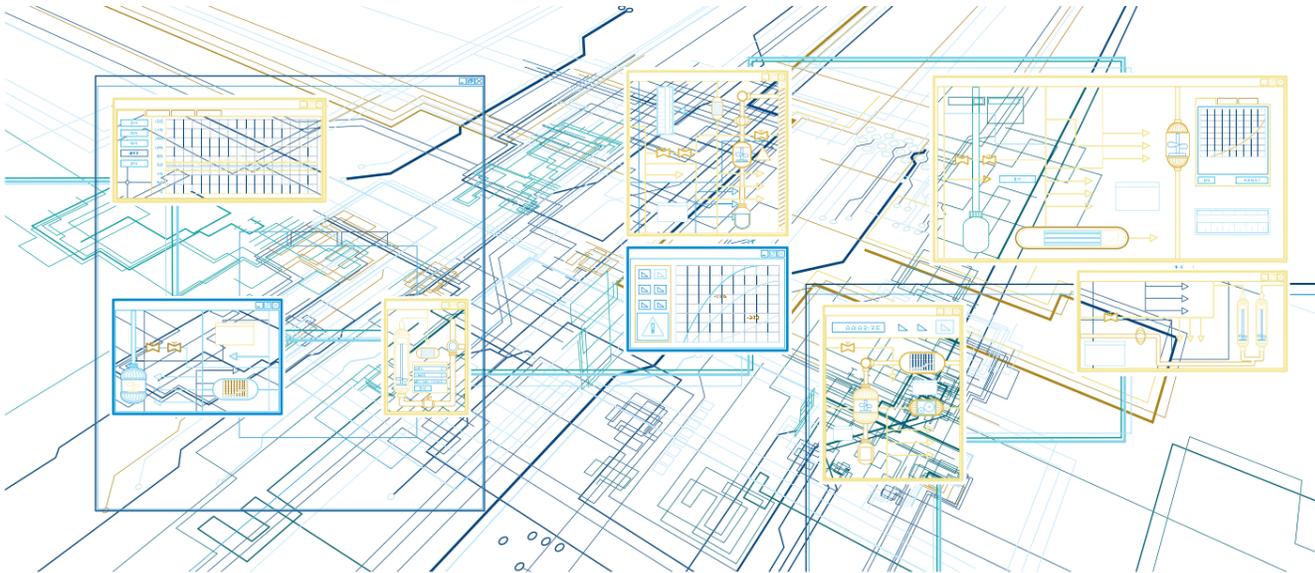


ABB is a highly qualified telecommunication solutions provider with extensive experience and global capabilities, specializing in turnkey telecom projects for the oil and gas industry. For over 30 years we have been in the forefront of developing communication solutions, focusing on efficient, safe and profitable operations for our customers.

Through the years, ABB has built a specialized telecommunications organization dedicated to the needs of the offshore, onshore, LNG and pipeline market segments. We bring a unique level of competence into each new project, and our capabilities within telecom engineering, integration and total project management and execution are proven in some of the most demanding projects in the industry.

Unique multiscope synergies
ABB is the leading supplier of automation, safety, electrification and telecommunication systems in oil and gas. Our multiscope capabilities are unique in the industry, providing our customers synergies of cost, quality and consistency. This combination of specialized expertise enables us to engineer telecommunication systems seamlessly integrated in a common communication and automation solution – with common user interfaces and operating and maintenance routines.

Telecom for your requirements
With oil and gas centers located in more than 40 countries, ABB has over 4,500 dedicated oil and gas engineers and project managers worldwide. We understand the telecommunication needs of the upstream and downstream sectors and use our vast technology resources to meet them.

ABB is a strategic partner with most leading telecom technology suppliers giving us the freedom and flexibility to select the best solutions for your unique application. We migrate ideas between different vendors and technologies to ensure future-proof solutions. We collaborate with our own automation, safety and electrical engineers to build a telecom solution that is fit-for-purpose for effective lifetime operations.

Telecommunication technologies are constantly evolving - generating faster, more flexible and more economical information flow. Through ongoing technological and market awareness, ABB ensures optimal telecommunication solutions for today and for the future.

Project profile

Sakhalin II

Project facts:

- Operated by Sakhalin Energy Investment Company (Gazprom 50% + 1%, Shell 25%, Mitsui 12% and Mitsubishi 12%)
- The largest single integrated oil and gas development ever
- The first offshore oil production field in Russia
- The world's largest and Russia's first LNG plant
- The largest oil and gas telecom project ever
- The project was completed in July 2009.

The Sakhalin II telecom project

For the largest oil and gas telecom project ever, Sakhalin II, ABB was contracted for total telecommunication supply. Located onshore and offshore the Sakhalin Island in Far East Russia, the remoteness and size of this project presented many challenges - not least of which were complex logistics with multiple time zones and extensive use of Russian content and sub-suppliers throughout all phases.

ABB supply for the Sakhalin II project includes a complete telecommunication solution for 3 offshore platforms, an onshore processing facility, an LNG plant and oil export terminal, 860 km of pipeline with 104 remote valve stations, all interconnected by an island-wide 10 Gbps DWDM network, 5 pipeline maintenance depot, 2 ports and 6 temporary construction camps. In all, 21 different telecommunication sub-systems were designed and delivered to the facilities to support project operations. ABB was also responsible for installation supervision and commissioning of all systems.



The advantage of a single source telecom solution

... low risk - low cost - high performance

ABB meets the technical and commercial demands of each new telecom project with well-proven solutions that are continually optimized and refined through decades of experience. A single-point telecommunication supply from ABB ensures efficient project execution from concept to commissioning - and a reliable, integrated telecom solution that is easy to operate and maintain.

Telecommunication projects in the oil and gas industry are often large, complex and remote, requiring a wide variety of systems and sub-systems. When multiple suppliers are involved, responsibility becomes fragmented and the risks of complications, delays and cost over-runs are greatly increased.

Low risk, low cost

As a single-source telecom supplier, ABB bears the cost and risk of interfacing with the various disciplines and sub-suppliers. Centralized project administration, engineering, quality assurance, logistics and system supply from ABB assigns clear responsibility and create many synergistic benefits. Project tasks are relegated and monitored from a single point, eliminating overlap and ensuring that nothing is left undone or incomplete. The number of interfaces and potential sources of error are reduced, and consistent engineering and quality

assurance/health, safety and environment (QA/HSE) is implemented from top to bottom, resulting in cost effective and on-time integrated total solutions. Cost advantages continue once the systems are operable. Operational cost benefits are achieved through integrated operations and system management, precise diagnostics, fewer spare parts, less preventive maintenance, common training platforms and simpler up-grades and modifications.

High performance

Today, successful operations of an oil and gas facility are highly dependent on the functionality and reliability of the communication system. Secure, real-time flow of information, voice, data and video, to, from and within the facility is paramount for safe and efficient operations.

Single-source telecom solutions from ABB are based on leading technologies that are applied in a flexible and integrated manner, allowing systems to adapt to evolving needs throughout the various project and operational phases. When project responsibility lies with ABB, we assure that optimal integration is implemented between the systems in the contractual scope, and that external equipment is interfaced in a way that optimizes the overall solution.

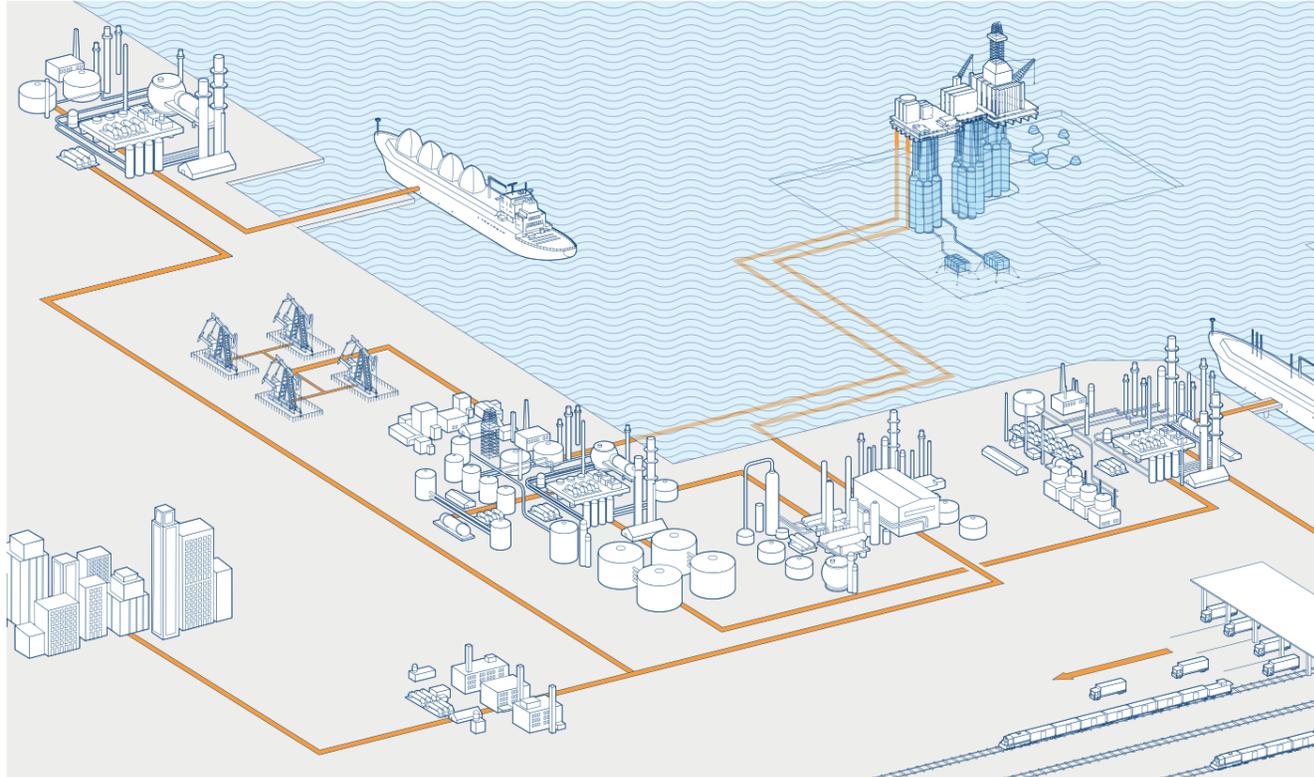




Photo: BP archive

Project profile Valhall

Seamless integration of telecom and automation ... exploiting the synergies

Project facts:

- Operated by British Petroleum, BP
- Major upgrade and redevelopment of the Valhall Field which has been operational since 1982
- A new process and living quarters platform
- Reuse of three existing platforms
- Two satellite platforms
- HVDC supply from onshore
- Onshore operations center
- 290 km power/fibre sub-sea cable from shore

The Valhall Redevelopment (VRD), telecom project

For the VRD project ABB was contracted for telecoms in addition to HVDC light stations, onshore control centre, process control system, electrical systems and drives and integrated operations centre. Telecommunication is a vital part of these systems as the carrier of information and as an information provider. Voice, data and video is carried over the same network with higher speed and bandwidth. Standard, off-the-shelf products and systems are utilized to build customized complete integrated solutions.

On Valhall the solutions include digital trunked radio (TETRA), integration of CCTV and meteorology systems into the ABB 800xA workstations, IP based remote control of wireless (VHF and UHF radios) infrastructure, IP based telephone systems, MPLS data network, IP based entertainment system, digital automatic muster systems and wireless IP data networks.

To enable management of this is the ABB Telecom Management System (TMS) for surveillance of the complete telecom infrastructure, also integrated into the ABB 800xA system. The TMS is an overall umbrella for management and maintenance, integrating all configuration tools into a single software application. Based on industry standard protocols, such as SNMP and OPC, the TMS uses the existing facility network to gather and distribute management information enabling control of all equipment and software applications from a single location, either on-site or remote.

As a world-class multiscope supplier, ABB has pioneered the convergence of automation and telecommunication technologies in the oil and gas industry. Our unique integration solutions empower the operator with a single point of access and common operator environment for all control and communication tasks, providing numerous operational and economical benefits.

Through close in-house cooperation between automation, safety, electrical and telecommunication engineers, ABB has identified commonalities, developed technology and created a powerful system architecture that fully integrates all plant telecommunications into a total OPC-based automation and telecom solution.

Benefits of an integrated solution:

- Uniform operation and user interface
- All information accessible from a single point of access
- Simple installation and configuration
- Automated actions, messages and event logging
- Transmitting equipment removed from operator desk
- Uniform system maintenance and reconfiguration
- Reduced engineering and interface requirements
- Less cabling and spare parts

A complete suite of telecom applications

Combining industry standard off-the-shelf technology with cutting edge developments in telecommunication, ABB provides reliable, high performance integrated communication solutions.

Unlimited telecommunications ... tailored to your requirements

ABB offers a full spectrum of communication systems for onshore and offshore installations - fixed and floating, topside and subsea. Our integrated solutions are based on the best equipment available, selected according to the unique technical and commercial requirements of each project.

We evaluate each delivery for lifetime performance, taking into account current and future integration capabilities and the flexibility to adapt to the evolving needs of the facility. Our customers benefit from our long-standing relations with all leading telecom equipment suppliers and our freedom to always select the best suited technologies.

External communication

External communication systems interconnect installations and link them to the surrounding world - carrying voice, video, process control and safety system traffic necessary to allow uninterrupted safe operations of the facility. With today's solutions and technologies, distance is no longer a limitation and bandwidth is available as needed, either on demand or fixed.

Internal communication

Internal telecommunication systems play a major role in supporting day-to-day operations and enhancing the work environment. They allow any type of system or operator to communicate within the facility, enabling reliable and efficient operations. ABB designs internal operational systems to fit tightly within the external communication infrastructure.

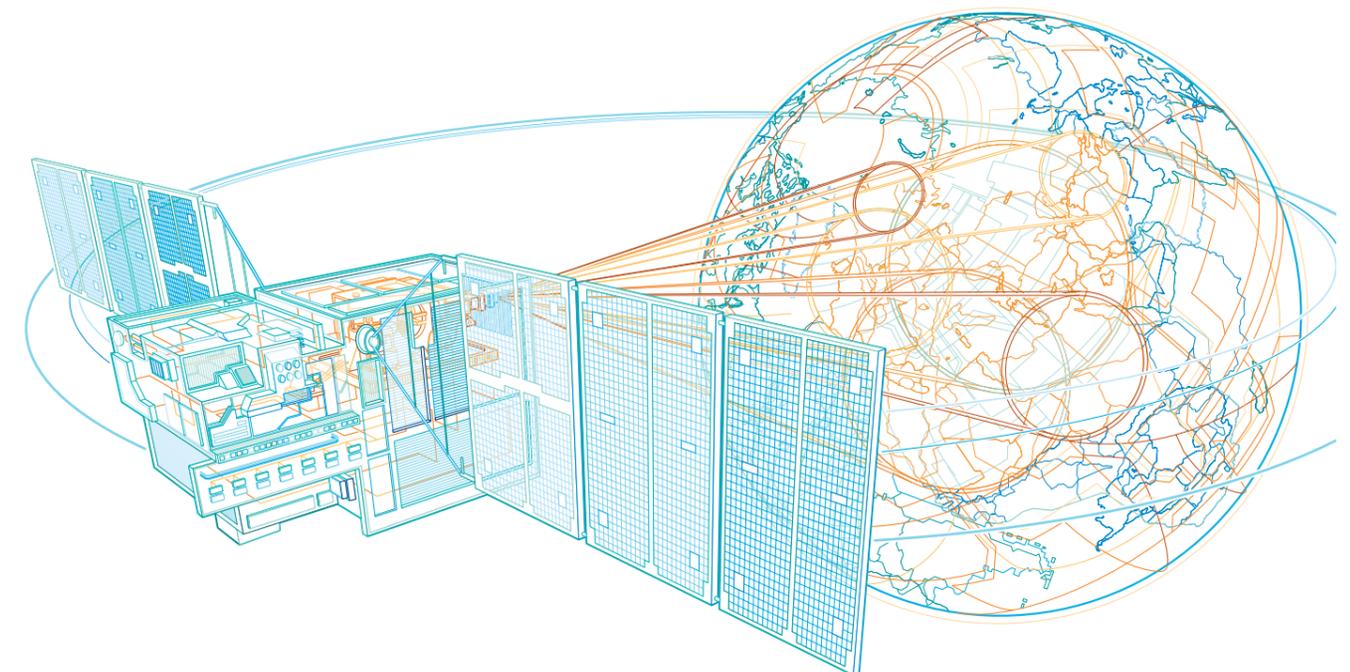
Safety and security systems

ABB has detailed knowledge and extensive experience from applying safety standards and governmental requirements from all parts of the world. We deliver personnel safety systems for tracking and safeguarding of personnel and equipment on and around an installation according to international rules and standards and adapted to meet local safety requirements. For best possible performance and flexibility, safety systems are closely integrated with each other, as well as to other internal and external systems.

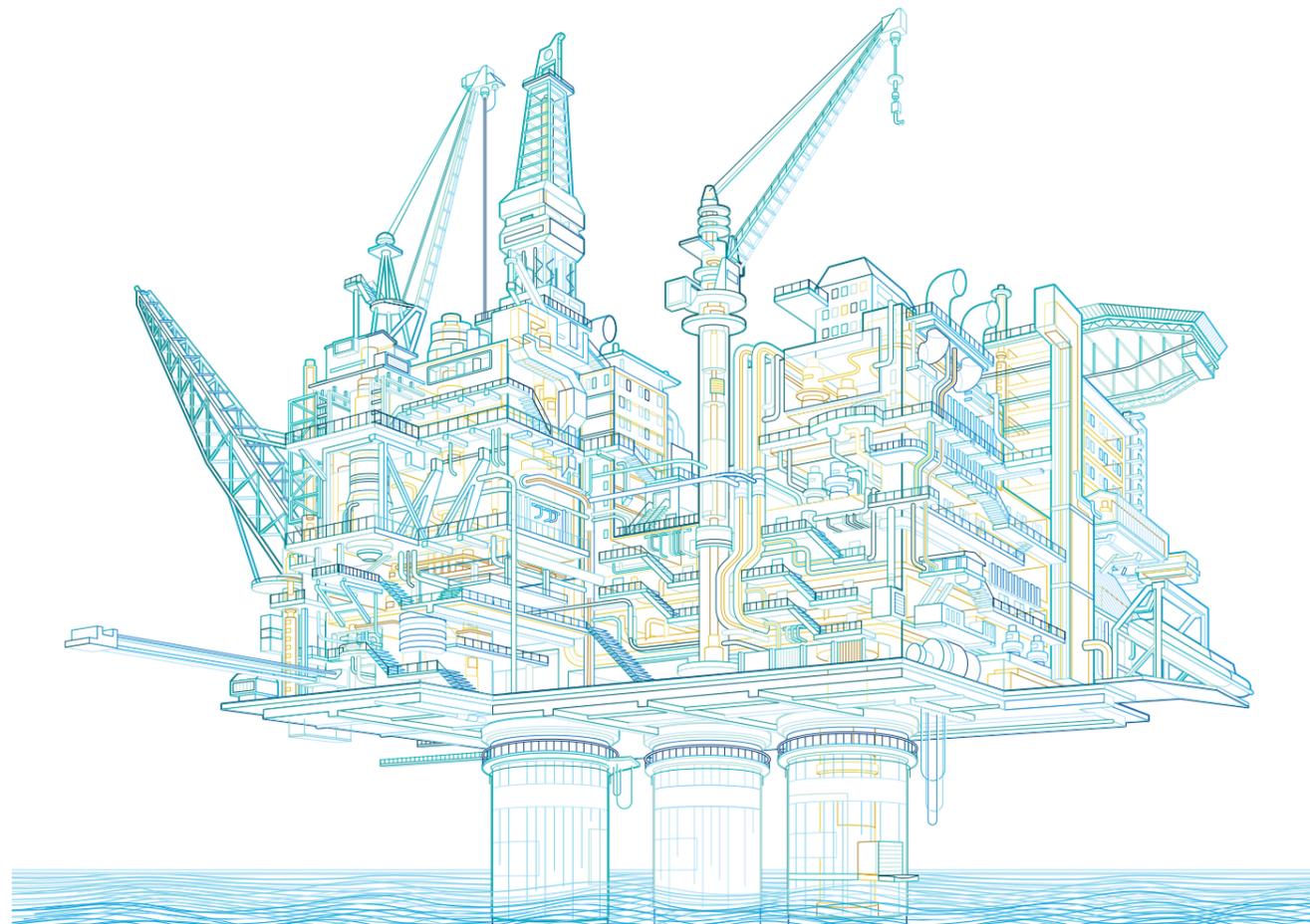
Management and utility systems

System and personnel well-being are supported by a number of management and utility systems, which are intended to ease and simplify telecom maintenance and operations. One such system, ABB's Telecom Management Systems (TMS), is a centralized management and maintenance system which ensures easy and secure access to all telecom systems.

Management and utility systems	External communication	Internal communication	Safety and security
Telecom maintenance system	Transmission/backbone (SHD/DWDM)	PABX and telephone system	Public address and general alarm system
Network management systems	Fibre optic communication	UHF Tetra radio	Sirens
Power supply systems	Microwave radio	LAN/WAN and structured cabling system	CCTV system
	Marine radio and GMDSS	Wireless distribution	Access control
	Aeronautical radio	Paging systems	POB and muster systems
	VSAT and inmarsat	Driller's Talkback	Intrusion detection
	SCADA communication	Crane radio	Meteorological and environmental monitoring systems
	Offloading telemetry	Turret communication (FPSO)	Radars and racon
	Vessel berthing systems	Entertainment	Navigation systems
		Video conferencing	GMDSS
			EPIRB, SART and Beacons
			DGPS
			AIS
			ATIS/MTS



Efficient project execution ... competence and commitment all the way



While each new project has its own risks and rewards, challenges and potential pitfalls, it is still all about lifting the bar and do again what we did successfully the last time - only better every time. Good project management, best-class practices and adaptation to market needs are required in the complex sort of projects we work with, involving multiple operators in multicultural environments.

As a system integrator, it is ABB's responsibility to make sure that our design and engineering fully comply with client requirements and with the needs of all interfacing contractors from all facilities within the project.

Developing an organization that can efficiently deal with large, complex telecom projects on a regular basis takes time. For over 30 years, ABB has continuously built up telecom experience and know-how with each new project, distinguishing us as one of the most qualified telecommunication suppliers in the oil and gas business.

A solid project foundation...

For large, multifaceted projects ABB brings together top expertise from in-house resources and industry leading telecommunication sub-suppliers early on in the project to jointly determine the most effective, flexible communication foundation for the entire project. Through these joint efforts, ABB contributes with increased cost-savings and rationalization for the total installation.

...gives long-term benefits

Project execution by ABB throughout all phases of the project assures continuity from start to finish. Knowledge and experience gained from conceptual studies continue into pre-engineering and FEED. As the project transitions from each phase to the next, feedback is gathered and documentation is adapted accordingly. Reusage and continuous development of project experience and documentation are examples of how a complete ABB solution can save time and errors, and maintain a standard and consistent level of quality throughout all project phases.

Project profile Sable Island

Project facts:

- Operated by Sable Offshore Energy Project (ExxonMobil, Shell, Imperial Oil Resources, Emera Offshore, Mosbacher)
- The first offshore gas field in Canada
- The largest single project ever undertaken in Nova Scotia
- First gas production commenced December 31, 1999
- From start of FEED to completed telecom project in 25 months

The Sable Gas Project telecom solution

The Sable Gas Project was formed from an alliance of 6 companies, each taking responsibility for delivering parts of the project. The project was developed in a Greenfield area with very little telecom infrastructure, and included three offshore platforms and two onshore plants interconnected by pipelines.

Engineering for the offshore and onshore facilities was split between three different companies, each having experience from different areas of the world. ABB's project management was located in Canada, working in an integrated team with other contractors, while telecom design and engineering were done from Norway.

As a system integrator, it is ABB's responsibility to make sure that our design and engineering fully comply with client requirements and with the needs of all interfacing contractors from all facilities within the project.

As telecom contractor, ABB was responsible for developing specifications, engineering the solutions, procuring the equipment, installing and commissioning the telecom systems and ensuring a smooth handover to operations and maintenance. This required much interaction with a variety of parties, such as local telecom authorities, local owners of existing communication infrastructure, providers of satellite services and government organizations.

Telecommunication work for the project started in October, 1997. ABB completed the commissioning work in November, 1999 - delivering the project on schedule and under budget.



Project profile Ekofisk JackTel I

Project facts:

- Developed and built by MasterMarine
- Leased and operated by ConocoPhillips
- Largest jack-up accommodation unit in the North Sea
- 447 cabins

The Ekofisk JackTel telecom project

For the MasterMarine JackTel I, or Heaven project, ABB supplied a complete communication solution including procurement, engineering, installation supervision and commissioning.

System delivery included LAN and structured cabling, entertainment, GMDSS, AIS, helicopter flight information system, emergency communication system (PAGA) and real time clock.

For ease of operation, supervision and maintenance, ABB has also delivered a TMS system which provides a common, intuitive operator interface for management of all delivered sub-systems.



Operations, management and maintenance ... of an integrated telecom solution



A complete telecommunication solution for an oil and gas facility will always consist of a wide range of products and systems from multiple manufacturers - posing numerous functional and operational challenges. In an integrated telecom solution from ABB, key design parameters include full functional interaction and easy, single-point management and maintenance from the very start.

Telecom Management System

ABB's Telecom Management System (TMS) is an overall umbrella for telecommunication management and maintenance, integrating all configuration tools in a single software application. Based on standardized protocols, TMS uses the existing Ethernet for gathering and distributing management information to control all equipment and software applications from a single location, either on site or remote.

All system documentation is available on-line in TMS, supporting diagnostics and maintenance, and only general knowledge of a given telecom system is required to perform maintenance.

TMS may be accessed from dedicated work stations or integrated with other operator stations in the automation system, providing a uniform user interface. OPC (OLE for Process Control) and SNMP (Simple Network Management Protocol) are integrated into the TMS software application, providing a unique flexibility for integrating process-reported alarms and telecom management.

Global service and support

But there is more to successful operations than technology alone. With each delivery, ABB customers gain a qualified telecommunication service partner to provide a broad range of lifecycle services, including training, operational support, service and maintenance, as well as modernization and upgrades. With local ABB presence in more than 100 countries and oil and gas centers in all strategic areas, we are never far away.

Project profile

Khursaniyah Permanent Communications

Project facts:

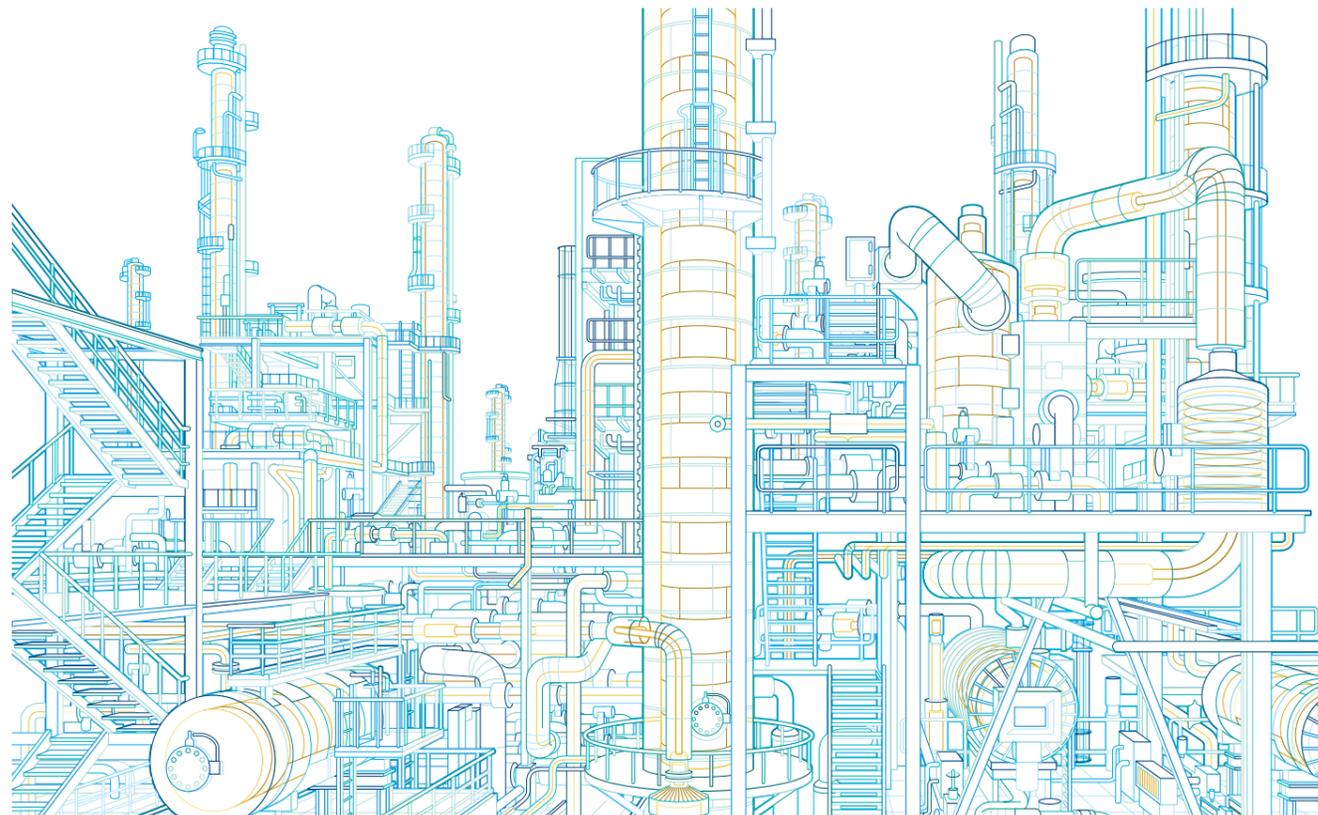
- Developed and operated by Saudi Aramco
- First integrated oil and gas facilities in Saudi Arabia
- Processes 500 MBCD of oil and 700 MMSCFD of gas
- Oil processing facility, gas plant, industrial support facility, interconnecting pipelines and tie-ins to Saudi Aramco network
- Work completed in September 2010

The Khursaniyah telecom project

For the development of these first integrated oil and gas facilities ABB was contracted for the complete design, engineering, delivery, installation and commissioning of the complete communication infrastructure including all the telecommunication systems. Together with our partner, Sumitomo of Japan, this turn-key project also delivered 80 facility buildings, 5 remote RTU buildings, plant fibre and copper distribution, 170 km of outside plant fibre optic cable and antenna towers.

The backbone network infrastructure includes switches, routers and firewalls and is built using STM-64 nodes and interfaces to the existing northern area Saudi Aramco STM-64 network. Services provided include fixed telephone services, wired and wireless corporate data network, mobile radio services, GSM enhancements, solar powered SCADA communications, site access control and intrusion detection and assessment.

Execution of the project was out of the ABB office in Saudi and involved several local contractors for detailed engineering, civil works and on-site installation and commissioning.



Looking ahead with ABB

... towards an integrated future

ABB is in the forefront of telecommunication technology for the oil and gas industry. We keep updated on industry trends and long-term strategies and stay abreast of the latest advancements in telecom technology to ensure futureproof solutions that are engineered for the full lifecycle of your facility.

As we look towards the future we see a continued convergence of technologies and applications - where the network is everything. Voice, data and video are carried over the same network, with higher speed and bandwidth. To assure reliability and serviceability, standard, off-the-shelf products and systems will be increasingly utilized to build customized complete solutions.

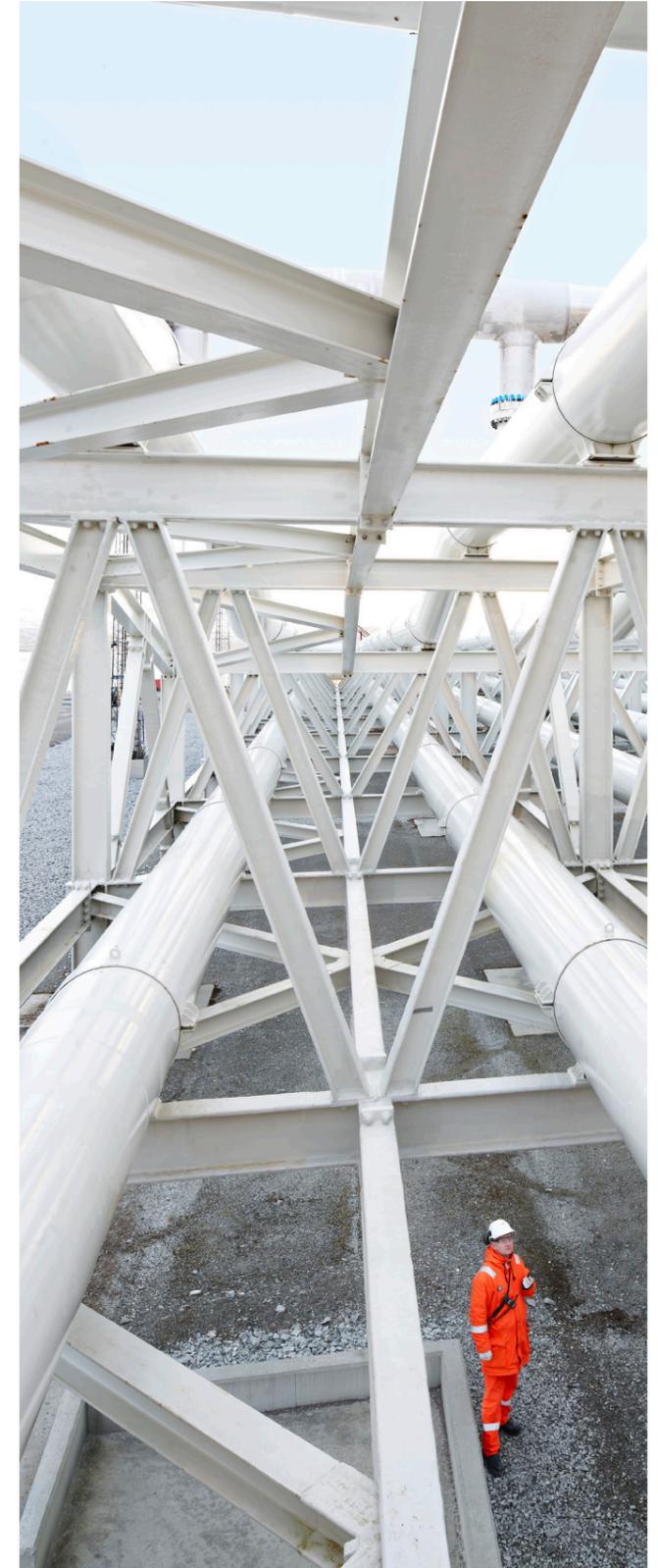
Telecommunications will play an increasingly important role in the industry's efforts to reduce CAPEX and OPEX. As more remote and less accessible reservoirs are developed, high-speed, reliable telecommunications - both fibre and radio - allow for increased off-site monitoring and control. Land-based operation of offshore facilities is one example of how advanced telecommunication creates opportunities for more efficient and cost-effective operations.

Technology has taken great strides forward in developing mobile telecommunication solutions in the last few years, and mobility will continue to evolve in the future. Stationary operator stations will give way to more flexible wireless solutions, providing operators and maintenance personnel access to their facilities regardless of location.

Streamlining technology through integration

Modern telecommunications are all about streamlining technology through integration, and this trend will certainly continue into the future. Duplication of hardware, software and cabling can have a strong impact on the bottom line due to higher costs, more spare parts, increased training and less efficiency. To rationalize operations and control costs, tomorrow's oil and gas industry will take advantage of common user interfaces for all applications and systems, common network infrastructures, common technologies and common maintenance systems.

As a global leader in telecommunications for the oil and gas industry, ABB will continue to ensure that communication technology keeps pace with the changing needs of the industry, and implement innovative solutions for increased efficiency in the future.



Contact us

ABB AS
Process Automation division
Krokatjønneveien 11 C
N-5147 Fyllingsdalen
Norway
Phone: 03500/+47 22 87 20 00

www.abb.no