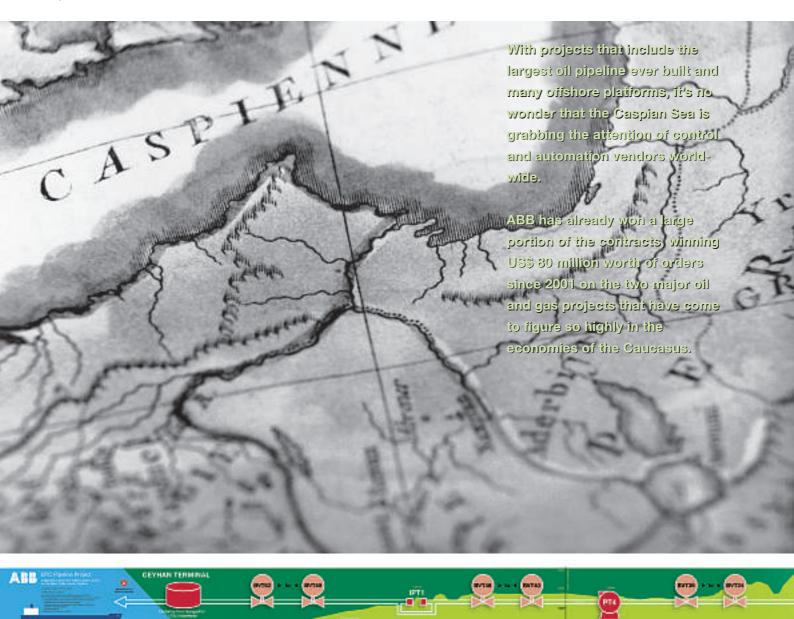
# **Creating Currents**in the Caucasus

ABB and the Caspian Sea projects

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# Innovative engineering

With its competitive price, proven technology and, most importantly, its ability to reuse designs, solutions and operations across all projects, ABB has been able to win further contracts in two of the Caspian Sea projects. For both the oil and gas projects, ABB is supplying equipment for the offshore platforms and the onshore terminals for each as well as equipment to control the two pipelines.

The first order for the projects was secured in December 2001 – deliveries will continue through to 2005, while site work will progress until 2007.

# The oil project

As part of its contract in the oil project, ABB is supplying, installing and commissioning an integrated control and safety system (ICSS) on the Central Azeri compression and water-injection platform, the East Azeri and West Azeri oil platforms as well as at the Sangachal oil terminal.

The ICSS is comprised of a process control system and an integrated safety system. The integrated safety system consists of several self-contained systems comprising a fire and gas sub-system covering process and non-process areas, and a separate emergency shutdown sub-systems for the process area. This will provide process control, emergency shutdown and fire and gas protection on the above mentioned platforms.

As well as the ICSS, a range of other ABB products are being used throughout the oil terminal and platforms, including Operate IT operating stations, AC 450 & AC800M controllers, SG400 Safeguard controllers, along with S800 remote I/O and the use of S900 I/O

1 Assembly and testing of control modules at St Neots before shipping.



mounted in 'Ex-e' rated cabinets for zone one mounting. ABB is also supplying Introl control valves for all the platforms and variable speed drives are delivered for pump control.

### Maximising re-use

The first ABB project to be completed will be for the Central Azeri oil production platform. In fact, the ABB system is already being installed onshore into the control module in the Baku SPS yard 1. West and East platforms are replicas of each other and similar to that of the Central platform and so, for example, the well head panels will be identical in design and supply.

From the Sangachal terminal control room, for example, it will be possible to monitor every aspect of the entire installation. But for this to be successful, every part of the installation needs to be consistent. This has been achieved by writing common functional design specifications for process control, fire and gas, shutdown, graphics, operator interfaces and type circuits with a standard hardware build.

Everything has a common look and feel because of ABB's ability to reuse designs and solutions across all projects. Re-use of technology and solutions are critical if this major installation is to be completed on time and within budget. ABB employees from some five different countries are all heavily involved with the various stages. Re-use means that everyone is working to the same specifications, drawings, even down to using common software codes.

### Controlling the world's biggest pipeline

After leaving the Sangachal terminal, the oil will flow through a US\$ 2.9 billion, 1,755 km oil pipeline, the most advanced part of the entire oil project. When commissioned, this pipeline is expected to carry one million barrels of crude oil a day from Sangachal Terminal on Azerbaijan's Caspian coast, near Baku through Georgia to a new marine terminal at Ceyhan on Turkey's southern Mediterranean coast.

ABB is supplying similar systems for the numerous pump and block valve stations along the pipeline route from Baku to



the Ceyhan marine terminal. Here ABB's AC 800M controllers are used for all of the block valves along the pipeline.

The work includes remote-controlled subsystems to isolate sections of the pipeline for regular inspection and maintenance. The pipeline will be linked over its entire length by a fibre optic telecommunications backbone. Associated field instrumentation includes transmitters and ultrasonic flow metering for the terminal, valve and pumping stations.

'A cross-border technology solution is needed to make sure this extremely complex oil pipeline runs efficiently,' says Nick Laming, Oil and Gas Division. 'Our Industrial IT platform is unique in that it handles both process and safety control in one system, rather than with separate systems, as is done traditionally. This is important to ensure pipeline efficiency, as well as environmental and personal safety.'

Eventually the operators will be able to control the processes from either end of the pipeline. Along the pipeline route will be intermediate pumping stations, intermediate pigging stations, fiscal/custody transfer metering, pressure reduction stations and block valve stations. The crude oil is collected and stored in tanks before being dispatched to tankers via a loading jetty located at Ceyhan. At each location, ABB's Industrial IT technology provides control and monitoring of the plant from both ends of the pipeline and at the various major stations along the pipe.

## Turning on the gas

The other Caspian Sea development is a major gas project for the Shah Deniz

Training expatriate and local engineers at the ABB Training School in Baku.



field, and this also includes an offshore platform, onshore terminal and pipeline. The Shah Deniz condensate field lies in the Caspian Sea, about 100km south of Baku in water depths ranging from 50 m to 500 m. From here a pipeline is being constructed to supply gas to Turkey.

Like the oil project, ABB is supplying an ICSS for the new onshore gas terminal and offshore platform and the associated South Caucasus Pipeline (SCP). The system architecture for both the terminal and the platform installations, while very similar to the ones being delivered for the oil processing facilities, does incorporate some added-value features. The longer timescale for this part of the project has allowed the use of the latest AC800 technology with the introduction of the AC800 HI safety controller and the latest 800×A (extended Automation) software.

# Picking the team

The international nature of the projects is mirrored by the global efforts and resources that ABB has harnessed in order to meet their control and automation needs. The ABB project team, based at St. Neots in the UK, has drawn on skills from ABB companies as far afield as India, Poland and the United States, as

well as training locals in both Turkey and Azerbaijan.

The very size and nature of the Caspian Sea project meant that ABB needed to build up its resources to meet the challenge. Initially, the project team was composed of some 190 engineers and this number was later increased with engineers from Poland and India.

### Local presence

ABB is committed to maintaining supplied equipment for up to 10 years, and crucial to supporting the projects is an ABB office in Baku, the capital of Azerbaijan. Even though ABB has been present in Azerbaijan since 1995 with a representative office, ABB Ltd, UK, registered a branch office in Azerbaijan in June 2003 to comply with the legal requirements of the Caspian Sea project. The team moved to new premises in Baku during March 2004 and its main role is to facilitate and manage the installation and commissioning of ABB's ICSS equipment. The office is also the base for the development of local engineers to support the contract in the future 2.

ABB believes few other automation vendors could marshal resources on this scale and is rightly proud of all the group has achieved in managing such large and complex projects.

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