Snøhvit is the first offshore development in the Barents Sea and the first development on the Norwegian continental shelf with no topside facilities. The complete project is grand in size and scope, encompassing the Snøhvit, Albatross and Askeladd fields, remote-controlled subsea production installations with pipeline transport, subsea carbon dioxide storage and shore-to-sea pipelines. Onshore, Snøhvit includes a receiving and processing plant, a tank farm and facilities for LNG export.

Meeting the challenges of the Barents Sea

Within the oil and gas industry, the Snøhvit project in northern Norway is synonymous with technological challenges and breakthroughs. Severe climatic conditions, remote location, stringent environmental demands and high development costs are just some of the issues that Statoil has overcome to make the Snøhvit project a reality.

Developing the field has required creative thinking, thorough planning and innovative technological solutions from Statoil and their suppliers. For Snøhvit, ABB has supplied extensive turnkey solutions for integrated automation and electrification, including:

- Integrated Safety and Automation System (SAS)
- Subsea Control System
- Electric Equipment, LV Motors and Drive Systems
- Power Distribution Control System
- Power Management System
- Field Instrumentation and Analyzers
- SAS Simulator

A “single window” for plant- and field-wide monitoring and control

The complete ABB scope of supply enables seamless control and monitoring of three subsea fields, the sea-to-shore multiphase pipeline, the LNG processing plant and ship loading. To achieve this, the ABB SAS system handles over 100,000 signals from a wide range of independent processes performed throughout the Snøhvit development. Under normal production conditions, the entire facility is controlled by just 3 or 4 operators situated in the central control room.
Environmental innovation
In developing Snøhvit, Statoil incorporated several innovative strategies for achieving maximum safety and production efficiency with minimal environmental impact. For example, by combining the refrigeration process with the natural cold Arctic climate, Statoil has succeeded in building the most energy-efficient gas liquefaction plant in the world. Other factors such as over-trawlable seabed structures and underground injection and storage of carbon dioxide byproduct will help to ensure that Snøhvit maintains sustainable and successful petroleum activities throughout the field lifecycle.

Process Control and Data Acquisition
Since ABB first began working with the Melkøya LNG project in 2002, we have delivered a wide range of automation solutions to the plant, but perhaps none as critical as the Process Control and Data Acquisition (PCDA) system. As a part of the overall combined Safety and Automation System (SAS), the PCDA system handles as many as 30,000 signals simultaneously from control and monitoring processes throughout the plant. To ensure maximum system performance and uptime, the complete system underwent extensive testing in Bergen prior to shipment to Melkøya in 2005.

The total PCDA delivery was substantial, comprising:
- 307 cabinets
- 40+ 800xA operator stations, 22 Melody Composer engineering stations, 15 remote clients
- Large projection screen, 9 projectors and work desks for Control Room
- IMS applications
- OPC interfaces to Asset optimization, IMS applications, C&E applications, Alarm Management applications and CCTV integration
- 31 Melody CMC70 controllers
- 40+ ABB specialists involved in project, including ongoing commissioning, changes and upgrades

Electrical Control and Supervisory System
The size and scope of the Melkøya facility is enormous, placing high demands on power generation and distribution to ensure stable ongoing operations. To meet these demands, Melkøya utilizes two separate power sources; the national power grid and its own dedicated electric power plant with emergency and back-up power readily available.

For the Melkøya facility, ABB has provided a wide range of HV, MV and LV equipment. An integral part of the total electrical delivery is a complete Electrical Control and Supervisory System (ECSS) with dedicated subsystems such as a Power Distribution and Control System (PDCS) and a Power Management System (PMS) for data collection, processing, presentation and storage of electrical data and parameters.

The ECSS delivery includes:
- 48 Controllers (single and redundant AC 800M with S800 I/O)
- 19 servers and workstations
- 10 MB/s redundant control networks
- 100 MB/s redundant client/server networks
- System baseline (ControlIT AC 800M, OperateIT PPA)
- Approximately 8,500 hard-wired I/Os and 22,000 Bus I/Os

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Oil, Gas and Petrochemicals
ABB AS
Process Automation Division
Ole Deviks vei 10
P.O. Box 6359 Etterstad
NO-0603 Oslo
Norway
Phone: +47 22 87 20 00
E-mail: eit@no.abb.com

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