

**KASHAGAN / KAZAKHSTAN**



In Charge of Your Energy.



# KASHAGAN / Kazakhstan

KASHAGAN FIELD DEVELOPMENT EXPERIMENTAL PROGRAMME

FRAME AGREEMENT

MV/LV PACKAGED SUBSTATIONS

LOCAL EQUIPMENT ROOMS

PROCESS AND UTILITIES BUILDINGS





## THE GIANT KASHAGAN

Kashagan, 80km south-east of Atyrau, in the North Caspian Sea, is the largest oil field discovered over the last thirty years worldwide and extends over a surface area of approximately 75km by 45km.

Its development represents one of the greatest challenges faced by the petroleum industry, given the deep, high-pressure reservoir, the high sulphur content, the shallow waters that freeze in winter and the marked shifts in temperature (from -30°C to +40°C).

The potential daily average production amounts to 1.2 million barrels, with estimated reserves of 38 billion barrels.

The Kashagan Project consists of two developments: Offshore Complex (artificial islands in the Caspian Sea) and Onshore Complex (Bolashak onshore processing facility).

Skema supplied Local Equipment Rooms, MV/LV complete Packaged Substations, all LV Switchgears/Intelligent Power Motor Control Centers, RTUs, LMS/DMS (onshore) and the IPCS System.

Skema, through its in-country subsidiary Skema LLP, is also working in joint-venture with one of the major local industrial group, Isker Consortium, on the EPC contract for the fabrication of 20 process and utilities buildings.

The fabrication yard is located on the Ural River in Atyrau.

### END USER

AGIP KCO

### A CONSORTIUM OF

CONOCOPHILLIPS - ENI - EXXONMOBIL - INPEX  
KAZMUNAIGAS - SHELL - TOTAL



- **190 km<sup>2</sup>** total area of onshore operations = the size of Amsterdam
- **120,000 tons** total weight of steel items and structures used = 1.5 times the weight of the Golden Gate Bridge in San Francisco
- **510 km** total length of pipelines = almost the distance between New York and Montreal
- **5,000 km** total length of electric and instrumentation cables = about the distance between Almaty and Rome
- **50,000 m<sup>3</sup>** volume of concrete structures used = the size of the landmark 88-floor building of Petronas Towers in Kuala Lumpur, Malaysia



**FRAME AGREEMENT**  
Onshore / Offshore

Skema was awarded the frame agreement for the provision of all intelligent LV Switchgear / Intelligent Power Motor Control Centers, RTUs, the Integrated Protection and Control System for both offshore and onshore facilities and LMS / DMS (onshore).

**5.1 km** = the total length of columns supplied by Skema  
( the length of 340 trailer trucks )

**EPC CONTRACTORS**  
ABB PS&S - AKERKVAERNER - BATEMAN - CONSAFE - FORES - GE OIL & GAS NP  
GUSTOMSC - KAZSTROYSERVICE - LITWIN - MSS - PUNJI LLOYD - SAIPEM  
SBM - SIEMENS TURBOMACHINERY - ROSETTI MARINO - RENCO - TEKFEN  
- ZAFER



# MV/LV PACKAGED SUBSTATIONS

Onshore

Skema was in charge of the engineering, manufacturing, testing and commissioning of 6 MV/LV Packaged Substations. The Substations feed the infrastructure utilities for the Kashagan field and are part of the Early Works of the Kashagan Experimental Programme.

Each Substation was equipped with:

- 10 kV Switchboards
- PMCC LV Switchboards
- Distribution boards
- Distribution transformers
- AC and DC UPS batteries
- Alarm and communication RTUs
- HVAC system
- Electrical Control System



“The products supplied by Skema were able to meet the strict technical standards of the job. Skema’s project team showed competent technical skills and the ability to work and support us at all stages of the project from engineering to commissioning”.

Project Electrical and Instrumentation Engineer



## LOCAL EQUIPMENT ROOMS

### Offshore

Skema was awarded in joint venture the EPC Contract for the provision of 20 Local Equipment Rooms (LERs).

The scope of work includes the coordination and monitoring of every aspect of the project, from feasibility studies and cost/performance optimization to the design of structural, electrical, HVAC and safety systems, procurement, construction, assembly, commissioning, final inspection and supervision of on-site installation.

The LERs are pre-fabricated steel-structure modules (measuring on average 8.3m in height, 15.3m in width and 44m in length), which have the following systems installed: medium and low voltage switchboards, transformers, distribution switchboards, UPSs and relevant batteries, supervision and control equipment, HVAC with provisions for explosive/dangerous gas injections, electrical networks, fire-detection and fire-fighting systems and telecoms equipment.

Each LER has an average length of 50 m and weight of 1000 tonnes. The LERs are being built in Ravenna, are shipped to the Caspian Sea on barges and will be located on artificial islands in the Caspian Sea.





## PROCUREMENT AND FABRICATION OF OFFSHORE BUILDINGS - IN COUNTRY

Skema has been highly committed to developing the local content of its operations in Kazakhstan since the early stages of its presence in the country. Having already founded Skema LLP in Atyrau, Kazakhstan, a year earlier, in 2009, Skema and Isker Consortium established a 100% Local Joint Venture Company called Ozen Port Production Base LLP (OPPB LLP) with the intention of becoming one of the major EPC Contractors in the Oil & Gas Industry in the Republic of Kazakhstan.

The OPPB LLP's operations can leverage major pre-fabrication facilities, including: the AZTU workshop, with a total area of 22,500 m<sup>2</sup>; and the Ozen Port Yard, located in Atyrau on the Ural River and covering a total surface area of 100,000 m<sup>2</sup>, which plays host to a workshop for sub-assembly, an indoor assembly area of 40,000 m<sup>2</sup>, a quay measuring 215 m in length (including the 110 m Ro-Ro quay), controlled-atmosphere storage warehouses and a series of offices that are fully equipped for use by managers and supervisors.

By making the most of the perfect mix of skilled local personnel and expatriates to ensure local development and top-quality solutions, OPPB LLP handles the design, engineering, construction, pre-commissioning, commissioning, installation, start-up and maintenance of modules, local equipment rooms, process and utilities buildings, temporary refuges, manifolds and piping fabrication for both offshore and onshore applications.

**FIRST MILESTONE ACHIEVED BY OPPB LLP**  
**Winning an EPC Contract for 13 Offshore Utilities Buildings for the Kashagan Experimental Programme, Island D.**





## KEY SUCCESS FACTORS

- Maximum local content achievable for modules, temporary refuges, local equipment rooms, process and utilities buildings
- First local Contractor to be awarded a multidisciplinary EPC Contract for offshore applications (highest quality standard required in the Oil & Gas Industry)
- Project delivered on time and without any punch list
- The complete project cycle is managed by internal resources (from feasibility studies and cost/performance optimization to the design of structures, electrical HVAC and safety systems, procurement, construction, assembly pre-commissioning, start-up, commissioning, load out activities and on site supervision/installation)
- Facilities located in a strategic position (Atyrau) and designed for all modular solutions



“Company congratulates Contractor with the big achievement of meeting the requested delivery date, and thanks for its good work and cooperation, and wishes to Contractor to maintain its place for the future achievements”.

AKCO Contract Holder