

**KARACHAGANAK / KAZAKHSTAN**

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# KARACHAGANAK / Kazakhstan

KARACHAGANAK PROJECT  
4<sup>TH</sup> STABILISATION & SWEETENING TRAIN  
WASTE MANAGEMENT COMPLEX





## KARACHAGANAK

### The enormous gas field

The Karachaganak field, located onshore in western Kazakhstan (around 150 km to the east of the city of Uralsk), was discovered in 1979 and is one of the largest gas condensate fields in the world.

Covering an area of 280 km<sup>2</sup> and holding over 1.2 billion tonnes of oil and condensate and 1.35 trillion m<sup>3</sup> of gas, the giant Karachaganak field produces an average of 150,000 barrels of condensate and 20 million m<sup>3</sup> of gas per day.

The expansion of the field has involved an investment of over \$ 5.5 billion, making it the biggest internationally funded project in Kazakhstan.

#### END USER

KARACHAGANAK PETROLEUM OPERATING B.V.(KPO),  
A CONSORTIUM OF: BRITISH GAS, ENI, LUKOIL, CHEVRON

The scale and scope of the Karachaganak development project has led to the involvement of numerous companies, both local and international, and a vast workforce. Many of these companies were established as a direct result of the potential offered by the vast field, while other international companies were awarded contracts for specialisms in certain areas. The project has been characterised by the high involvement of local labour resources and services, and has served as a major boost to the area.



- **280 km<sup>2</sup>** is the area of the Karachaganak field
- **1.2 billion t** is the oil reserve
- **1.35 trillion m<sup>3</sup>** is the gas reserve
- **5.5 billion \$** is the total investment involved

# KARACHAGANAK PROJECT

## SOLUTIONS DELIVERED

On behalf of the Bechtel Ltd/Snamprogetti UK joint-venture (which was in charge of engineering and procurement for the Karachaganak project), Skema was responsible for supplying a series of packaged MV/LV substations and electrical switchboards, consisting of both power centers and motor control centers.

## IN DETAIL:

- Nine Packaged Substations, complete with MV switchboards, transformers, 400V switchboards/Motor Control Centers, battery and battery charger, distribution boards, HVAC system, fire and safety and the lighting system.
- LV switchgears and Motor Control Centers. Skema supplied 20 switchboards, more than 250 panels and 1300 motor starters. Key features of Skema's "intelligent" MCC are its withdrawable units and incomers equipped with microprocessor relays. In addition Skema also developed the Electrical Control System for the Karachaganak project in KPC and Unit 2. Each station is equipped with an RTU (Remote Terminal Unit), which collects data from the switchboards and interfaces with DMS and DCS.

The accumulated data is then made available for visualisation on EWS and on plan DMS. Skema has supplied a total of nine packaged substations for Early Works, two 6kV packaged substations for Unit 3, a packaged substation for a Flash gas compressor control room, and a series of seven packaged substations for a Waste Management Complex.

As for the switchboards, Skema supplied the Karachaganak project alone with some 125 MV panels, 670 LV panels, 33 RTUs, 23 110V DC panels, more than 250 relays, and 2500 drawers.

**PROJECT MANAGEMENT CONSULTANT**  
JV BECHTEL LTD AND SNAMPROGETTI UK



"Skema provided an excellent service in assisting with the commissioning of their supplied equipment on site here in Karachaganak. I can say that the work completed was carried out in a timely manner, to high standards, often in arduous conditions. The control and monitoring software package has more than met the design brief providing a user friendly monitoring and control option for the switchboards and electrical networks. The working relationship that developed with Skema personnel was excellent, as they were always prepared to go the extra mile to resolve any anomaly that arose on site and meet the client's expectations".

Electrical Commissioning Engineer, KPO



## 4<sup>TH</sup> STABILISATION & SWEETENING TRAIN

The Karachaganak 4<sup>th</sup> Stabilisation & Sweetening Train Project aims to increase the capacity of the existing Karachaganak Processing Complex (KPC) facilities through the addition of a fourth train.

### SOLUTIONS DELIVERED

Skema was responsible for the design, manufacturing, supply, inspection, testing, export packing and supervision of testing and commissioning of:

- Intelligent LV Switchgear/Motor Control Centers
- Bus Ducts
- RTU
- Integrated Protection and Control System

In total, more than 100 Skema Power Motor Control Center columns were supplied, with more than 300 withdrawable units.

**EPC CONTRACTOR**  
PETROFAC



# WASTE MANAGEMENT COMPLEX

As part of its long-term commitment to health, safety and environmental protection, the KPO consortium has completed construction of a new Eco-Centre (Waste Management Complex), which houses state-of-the-art technology and enables the recycling, treatment and safe disposal of drilling fluids and wastes.

## SOLUTIONS DELIVERED

Skema was awarded the contract for the design, engineering, manufacturing, inspection and testing of:

- 1 Transformer Packaged Substation
- 1 LV Switchgear Packaged Substation

The transformers and substations were housed within a two-hour fire-rated enclosure, and were supplied as complete pre-wired and assembled modular self-contained units, installed on concrete leg foundations 1400 mm above ground, and equipped with bolt-on stairs and access platforms.

The transformers package included 2 off, 6/0.72 kV, 3 MVA each, to allow maintenance of one unit while the other is in service, as well as power and auxiliary cables for interconnection to the packaged LV substation. The LV substation package included a TCC 690V switchboard, 2 off 690/420V, 400kVA each, transformers and a TCC 400V switchboard.

