

OUAGADOUGOU - BURKINA FASO

KOSSODO POWER STATION G8

18 MW DIESEL POWER PLANT
AND 33/90 kV RING CONNECTION



The Largest Diesel
Generator Unit
in West Africa

Built in 2006 for SONABEL



BY



Burmeister & Wain Scandinavian Contractor A/S

Project Background

The project comprised the 18 MW Kossodo G8 diesel power plant and a 33/90 kV ring connection in the capital Ouagadougou. It was initiated by the national utility in Burkina Faso, La Société Nationale d'Electricité du Burkina (SONABEL) in cooperation with the Danish development agency Danida, and was financed by the Danish Mixed Credit facility.

As a result of an open tender issued by SONABEL, the contract was signed with Burmeister & Wain Scandinavian Contractor A/S (BWSC) in June 2005, and became effective in November 2005.

Project Execution

Power Plant

The Kossodo G8 diesel power plant is located on the northern outskirts of the Capital Ouagadougou.

The project included a powerhouse with an engine hall, an annex for electrical switchboards, panels and SCADA system as well as a fuel oil treatment plant, fire fighting systems, service tank farm, radiator cooler and exhaust gas boiler.

The operation of the plant is supervised from the Sonabel control room through a comprehensive SCADA system together with 6 cameras to ensure maximum surveillance of the entire plant.

The full turnkey project was undertaken by BWSC and included the design, engineering, supply of power plant equipment, transport, erection, construction, test and commissioning of the complete plant.



Reinforced bridge

Transmission Lines

To increase the power supply capacity and reliability in the greater Ouagadougou area, a 33/90 kV ring connection was developed, involving the installation of underground cables and overhead lines. This ring enables linking three existing power stations with an existing substation and two future substations, as part of a large development program for the entire electricity system in the Capital Ouagadougou.

The project included the following high voltage transmission lines:

- 20 km 90 kV overhead line with both tubular and lattice towers.
- 27 km 33 kV overhead transmission line.
- 9 km 90 kV underground cable connection. For protection the cables are placed in pre-cast concrete ducts.

Placing the cables was a considerable task. The cables run through the center of Ouagadougou, among others crossing a 300 meter wide lake, where they are placed in pipes encased in concrete at the bottom of the lake. Borings for the cables were made under roads, water channels and railways at 13 different locations.

Included in the project was also the replacement of ground wire on an existing 32 km 90 kV overhead line with an optical ground wire.



Men working on transmission lines

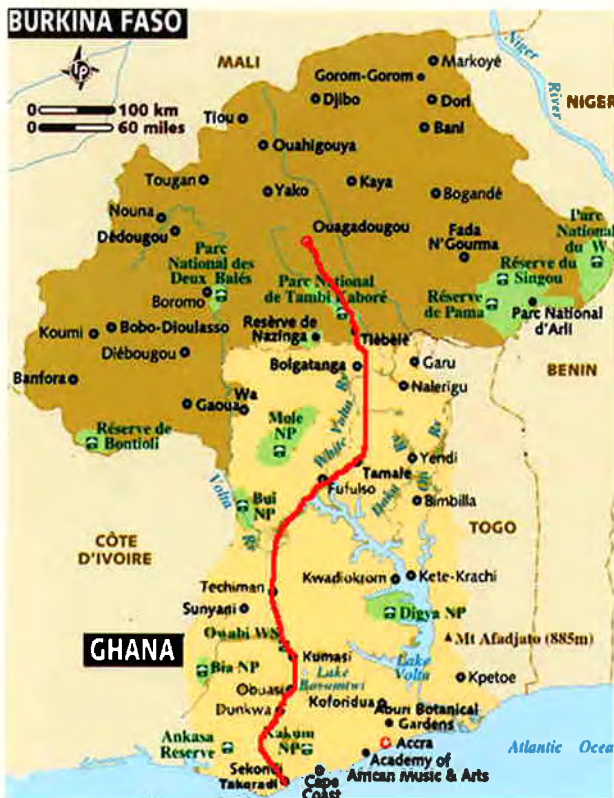
Heavy Lift Transportation of the Biggest Diesel Engine in West Africa

Due to the long inland transportation route, the transportation of the diesel engine presented a major challenge and a complex logistical task.

Upon completion of the work shop test in St. Nazaire, France, the 303 tons engine was stripped to 250 tons, in order to adjust it to the weight restrictions on the transportation route. It was then shipped to the port of Takoradi in Ghana. From there, it was trucked 1000 km through Ghana and Burkina Faso to the site in Ouagadougou on a 16 axle trailer, with a total transport weight of 305 tons.

The roads and bridges in Ghana presented no major obstacles. In Burkina Faso 32 bridges had to be crossed, 7 of which did not have sufficient strength to withstand the load. Steel fly-over bridges were therefore placed above the bridges and supported on the bridge columns to take the full load of the transport. In all, six fly-over bridges were used; some of them were manufactured in Burkina Faso.

The transportation time was 23 days from the unloading of the engine at the port to the offloading of the engine at the site, where it was placed on the concrete foundation and reassembled.



– Transportation route

Summary

Technical Data

Power Station

Diesel Engine

Make..... MAN Diesel SE, Germany
 Type..... 18 V 48/60 B
 Speed..... 500 rpm

Alternator

Make..... ABB, Finland
 Type..... AMG1600UU 12 PSE
 Rating..... 23.1 MVA
 Voltage..... 11 kV
 Frequency..... 50 Hz
 Output at 100% load..... 18.5 MW at P.F. 0.80

Exhaust Gas Boiler

Make..... Danstoker, Denmark
 Type..... EEB-S
 Steam capacity..... 1,000 kg/h

Radiator Coolers

Make..... GEA, France
 Type..... Forced Draft
 Cooling capacity..... HT 6,558 kW
 LT 4,282 kW

Heavy Fuel Oil Separator

Make..... Alfa Laval, Denmark
 Type..... 2 x S871 Single Module
 Rated capacity..... 2 x 10.9 m³/h

Lub Oil Separator

Make..... Alfa Laval, Denmark
 Type..... 1 x S861 Single Module
 Rated capacity..... 7.1 m³/h

33 kV Switchgear

Make..... Merlin Gerin, France
 Type..... Fluair 400
 Voltage..... 33 kV
 Current..... 1,250 A

Step-up Transformer

Make..... Siemens Alkargo, Spain
 Type..... TCA 23000/36
 Voltage..... 11/34.5 kV
 Rated capacity..... 23 MVA

Power House

Length..... 31.2 m
 Width..... 21.3 m
 Height..... 17 m
 Overhead crane..... 30/5 ton

Stack

Make..... VL Staal, Denmark
 Height..... 50 m

Transmission Lines

90 kV cables

Make..... ABB, Sweden
 Type..... XLPE 630 mm²

Lattice towers for 90 kV overhead line

Make..... Europa 2000, Italy
 No. of towers..... 38

Tubular towers for 90 kV overhead line

Make..... PetitJean, France
 No. of towers..... 23

33 kV overhead line

Subcontractor..... Simeeel, Burkina Faso



Offloading engine at site



Engine in power house



Kossodo Power Plant G8, Burkina Faso

BWSC 

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