

MARSA ALAM - EGYPT POWER GENERATION PLANT

PHASE 1 YEAR 2001



BUILT FOR



Emak

FOR UTILITIES & SERVICES S.A.E., EGYPT

By

BWSC 

Burmeister & Wain Scandinavian Contractor A/S

**MAN
B&W**
HOLEBY
GENERATING SETS



PROJECT BACKGROUND

The Egyptian Marsa Alam tourist resort is located on the southern part of the Red Sea Coast. The tourist resort is being developed in a green field area, and therefore all essential infrastructure facilities must be constructed before hotels and amusement conveniences can be established. The infrastructure facilities include an international airport, a water desalination plant, a sewage plant, road construction, a service village, a marina, and a power plant to service the entire area, since power supply from the national grid is not available. The Kuwaiti M. A. Kharafi Group, the project developer for the entire project, has established the company Emak for Utilities and Services Ltd. in Egypt to place contracts for the utility components of the project. Parameters such as high quality equipment, fast delivery time, and reliable technology enabled Emak to select BWSC and MAN B&W Holeby, acting in a consortium, as turnkey contractors for the power plant. BWSC was the consortium leader. The contract with Emak for one of the first Heavy Fuel Oil (HFO) plants in Egypt was signed in July 2000.

PROJECT EXECUTION

The power plant project is divided into 3 phases. In phase 1, the installed capacity is 13 MW. In phases 2 and 3, the plant will be extended to a total capacity of 60 MW concurrently with the development of the tourist resort.

The first phase of the power plant was constructed within the guaranteed period of 14 months. This was achieved as a result of a professional cooperation between Emak, BWSC and its partners.

BWSC was the overall turnkey contractor for the power plant, with MAN B&W Holeby providing the diesel generating sets. Civil works and mechanical and electrical erection works were carried out by BWSC's subcontractor Hideleco, Cairo, under BWSC's management and supervision.

Phase 1 of the project includes the powerhouse and electrical annex, an oil storage tank farm, a fuel oil treatment building, a fire fighting and water treatment building, and a 2-storey administration and storage/workshop building.

Four MAN B&W Holeby diesel generators including mechanical and electrical auxiliaries are located in the engine hall. An overhead travelling crane covers the entire hall, including the unloading area, in order to facilitate the maintenance of the plant. Adjacent to the engine hall, the electrical annex accommodates both the control system and the switchgear. The elevated floor provides easy access during maintenance and will simplify additional installation when the plant is extended in the future.

Close to the powerhouse, other auxiliary components are located such as ventilation units, oil bath intake filters, boilers for pre-heating fuel oil, exhaust stacks, radiator coolers, and transformers.

The power plant is designed for continuous operation on HFO and includes HFO storage, transfer pumps, HFO purifiers, and various service tanks. The engines can also be operated on diesel oil.

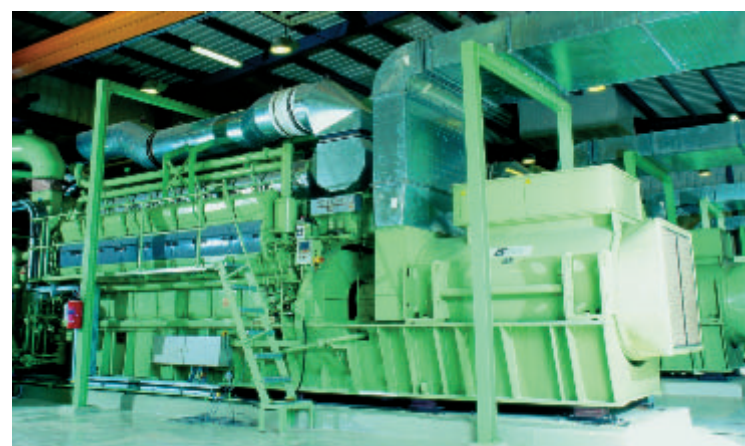
The generation voltage as well as the voltage of the underground cable distribution system is 11 kV.

Straightforward and reliable operation of the power station takes place in the control room using a comprehensive SCADA (Supervisory, Control And Data Acquisition) system controlling the entire power plant. The system has been prepared for the remote operation from a main control room, to be established at a later stage, which will control all of the utility services within the resort.

The power plant is equipped with a fire fighting and fire detection system designed in accordance with international standards.

Upon completion of the construction process, the BWSC commissioning team carried out testing and commissioning to the client's full satisfaction.

Engine hall





ENVIRONMENTAL IMPACT ASSESSMENT

As the Marsa Alam power plant is one of the first plants in Egypt to operate on HFO, the environmental impacts were scrutinized. Consequently, a comprehensive Environmental Impact Assessment (EIA) was performed by independent consultants so as to demonstrate that the power plant was built and will operate within the guidelines established by the Egyptian Environmental Affairs Agency (EEAA).

EEAA issued the environmental permit upon completion of the EIA, concluding that the power plant complies with all environmental regulations, and that it was designed well within the approved limits for base load operation utilizing HFO.

Fuel storage area



Summary

Contract Particulars

Type Turnkey
 Contract signing..... July 2000
 Effective Contract..... October 2000
 Handing Over December 2001

Technical Data

Diesel Engines

Make MAN B&W, Holeby, Denmark
 Type 4 x 16V 28/32 4-Stroke
 Speed 750 rpm

Alternators

Make Leroy-Somer, France
 Type LSA 56 BZL 11-8p
 Rating 4,250 kVA
 Voltage 11 kV
 Frequency..... 50 Hz
 Output..... 4 x 3,400 kW at Pf 0.8

Fuel Type

Operation Heavy fuel oil

Exhaust Gas Boiler

Make Danstoker, Denmark
 Type 2 x EEB-S
 Steam capacity..... 2 x 780 kg/h

Auxiliary Boiler

Make Danstoker, Denmark
 Type 1 x DRG-H
 Steam Capacity..... 1 x 800 kg/h

Radiator Coolers

Make GEA, France
 Type..... 4 x 8V1 1250-H 2.1
 Cooling capacity HT 4 x 2,070 kW
 LT 4 x 840 kW

Fuel Oil Treatment

Make Westphalia, Germany
 Type OCS 15-0136-067/15
 Rated capacity 2 x 2,400 l/h

Lub Oil Treatment

Make Westphalia, Germany
 Type OSC 15-0196-067/15
 Rated capacity..... 2 x 2,650 l/h

Civil Works

Subcontractor Hideleco, Cairo
 Powerhouse..... Length 39 m
 Width 18 m
 Height 7.6 m
 Overhead crane 2 ton
 Stack 4 x 23.5 m

11 kV Switchgear

Make ABB, Denmark
 Type ZS1
 Voltage/Frequency 12 kV/50 Hz
 Current..... 3,150 A

THE FUTURE

The contract with Emak for phase 1 of the power plant includes options for phases 2 and 3, which, according to the planned establishment of hotels and facilities, will have installed capacities of 24 and 16 MW, respectively. The second and third phases are based on the installation of larger diesel generator units supplied by MAN B&W Diesel.

Since many of the essential services and equipment, including the SCADA and electrical systems, have been prepared for the extension of the power plant, the construction of the extensions will be carried out without affecting the existing operations.



Power station



New Marsa Alam International Airport.



The future Port Ghalib International Marina



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