

COMPLETION OF AN ERA

EAST POWER STATION EXTENSION BERMUDA



BUILT IN 2005 FOR



BERMUDA ELECTRIC LIGHT COMPANY LIMITED

BY



Burmeister & Wain Scandinavian Contractor A/S

Project Background

In the fall of 2003, Bermuda Electric Light Company Limited (BELCO) contracted Burmeister & Wain Scandinavian Contractor A/S (BWSC) as turnkey contractor to extend their East Power Station in Pembroke with two large four-stroke diesel generating sets, E7 and E8. This latest extension to the power station completes a series of extensions made by BELCO between October 1984 and April 2005.

Project Description

The extension project is a fully integrated continuation of the existing East Power Station containing units E1 to E6 and it is based on an improved version of the E5 and E6 diesel engines, the MAN B&W 14V48/60 four-stroke engine. The engines operate on either Heavy Fuel Oil or Cetane. The extension consists of a new engine hall for E7 and E8 with mechanical and electrical annexes, however using the existing common facilities.

The selected MAN B&W 14V48/60 version diesel engines are based on the new generation of energy efficient four-stroke engines, achieving not only a significant reduction in running costs, but also a reduced environmental impact because of their low fuel and lubricating oil consumption.

Reliable operation of the complete power plant is achieved using a state-of-the-art computer control system supervising the entire power station.

In 2003, Bermuda was hit by the powerful hurricane Fabian. Although the hurricane caused severe damage to buildings and installations in Bermuda, the power plant and related building structures withstood the hurricane without any damage. Thus the reliability of power plant designs applied was proved and tested at full scale.

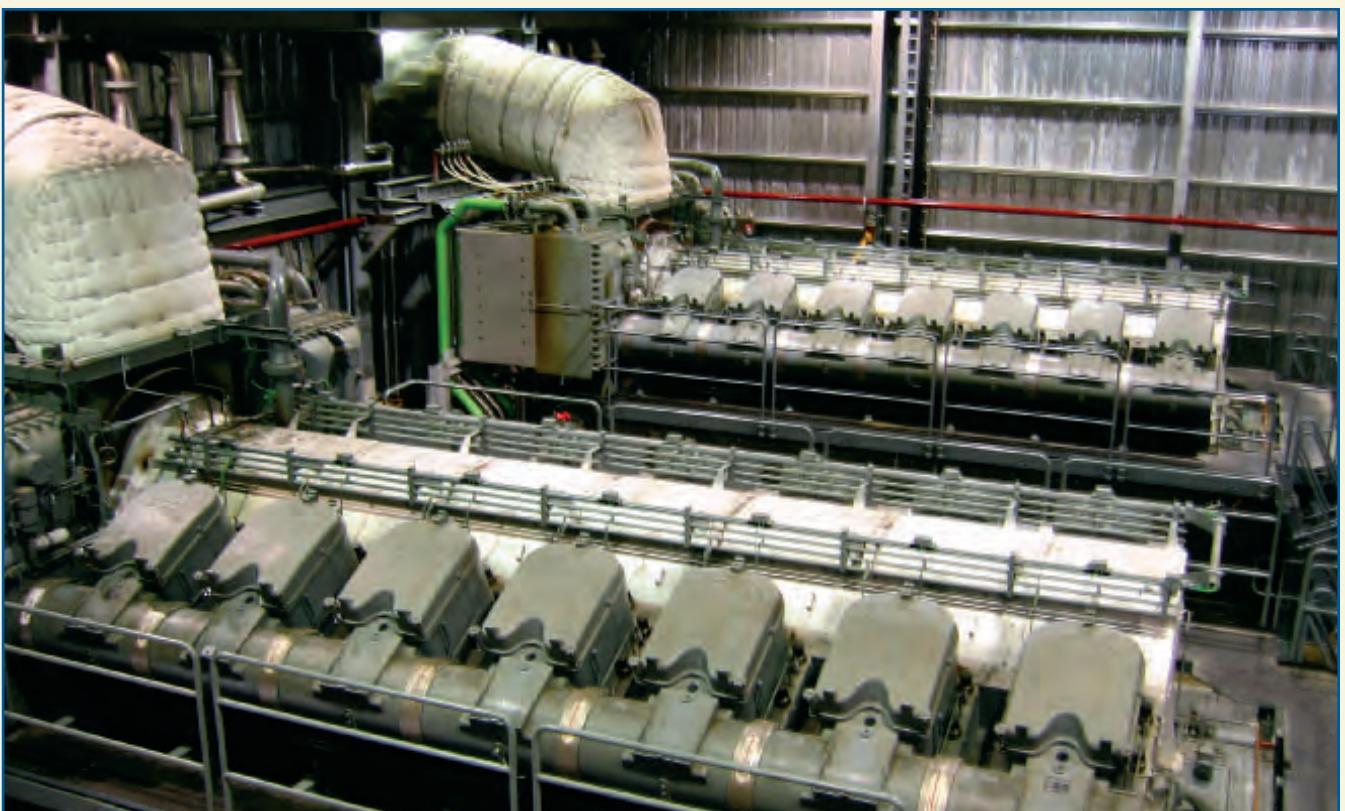
Project Implementation

BWSC undertook the turnkey contract with MAN B&W, Germany, as nominated subcontractor for the diesel generating sets.

The confined site layout offered multiple challenges during the construction phase of the project. Material storage and handling required thorough planning and close coordination between BELCO, BWSC, and its Bermudian and international contractors.

An additional achievement of the careful planning of the construction activities included that the existing generating sets E1 to E6 were fully available for power production during the entire construction period. The successful execution of the project is a result of the great enthusiasm, skills and cooperative spirit displayed by all the parties involved.

Engine hall



Civil Work Partnering

In order to maximize the use of BELCO's knowledge and experience of local contractors as well as BWSC's knowledge of engineering, procurement and turnkey power station construction, a civil partnering agreement was established. The partnering arrangement with open book accounting has resulted in close and successful cooperation to the benefit of both parties.



Control room operation

Service Support

Throughout more than two decades, BWSC has provided services to BELCO, amongst others:

- Maintenance assistance for more than 20 years, ever since the installation of the E1 and E2 generating sets. These generators have over two decades been true workhorses in the BELCO generation system.
- Upgrading and rehabilitation for the second phase E3 and E4.
- Provision of training and a resident engineer for the third phase including the E5 and E6 generating sets.
- Provision of a resident engineer for the E7 and E8 generating sets.

The cornerstone of BWSC's comprehensive service to BELCO is long lasting cooperation developed between the staff of both companies, thus ensuring reliable and efficient electric power production for Bermuda.

Summary

Contract

Type Turnkey
Contract award November 2003
Handing over April 2005

Technical Data

Diesel Engines

Make MAN B&W
Type 2 x 14V48/60, 4-stroke
Speed 514 rpm

Alternators

Make ALSTOM
Type AK 275, brushless excitation
Rating 2 x 18,000 kVA
Voltage / frequency 13.8 kV/60Hz
Output at 100% load ... 2 x 14,325 kW at pf 0.8

Radiator Coolers

Make GEA ERGÉ-SPIRALE
Type Horizontal, forced draft
Cooling capacity 2 x 12,220 kW

Fuel Treatment

Make Alfa-Laval
Type SU 855
Capacity 2 x 7.5 m³ / h at 120 cSt / 90°C

Step-up Transformers

Make BRUSH
Type ONAN, double wound core
Ratio 34.5 kV & 23 kV / 13.8 kV
Rated power 2 x 18 MVA

Power Building

Height 14.6 meters
Length 29.0 meters
Width 22.5 meters
Overhead crane 1 x 5 tons

History of East Power Station

In the early 1980s, the Board and Management of BELCO decided to initiate a program to develop a new power plant area in Pembroke named East Power Station.

The first contracts for the East Power Station were signed between BELCO and BWSC in January 1982 and September 1983 respectively for the supply of the E1 and E2 diesel generating sets.

Through further contracts between BELCO and BWSC, BWSC has supplied 4 more diesel generating sets E5, E6, E7 and E8, which now complete BELCO's development of the East Power Station complex.

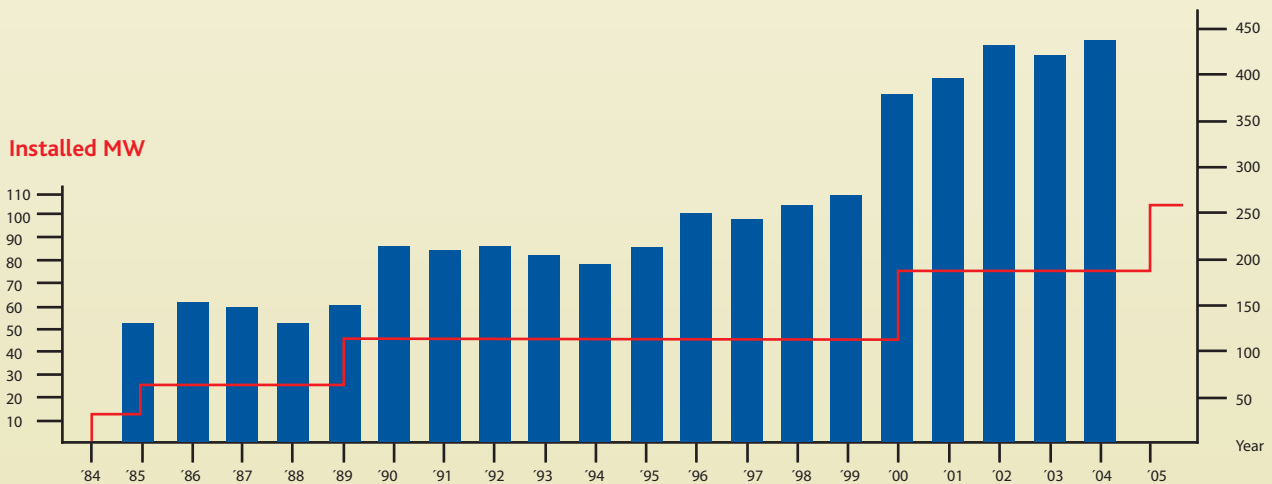
This has been achieved through a long-term and extensive cooperation developed between all levels of the BELCO and BWSC organizations.



Radiator coolers on roof

Summary of installed capacity and production

Generated GWh



Summary of diesel engines

	E1 / E2	E3 / E4	E5 / E6	E7 / E8
Year	1984/85	1989	2000	2005
Make	Gotaverken - MAN B&W	Sulzer	MAN B&W	MAN B&W
Type	2 x 8K67GSCA 2-S	2 x 16ZB40/48 4-S	2 x 14V48/60 4-S	2 x 14V48/60 4-S
MW	2 x 12.5	2 x 10.5	2 x 14.3	2 x 14.3



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