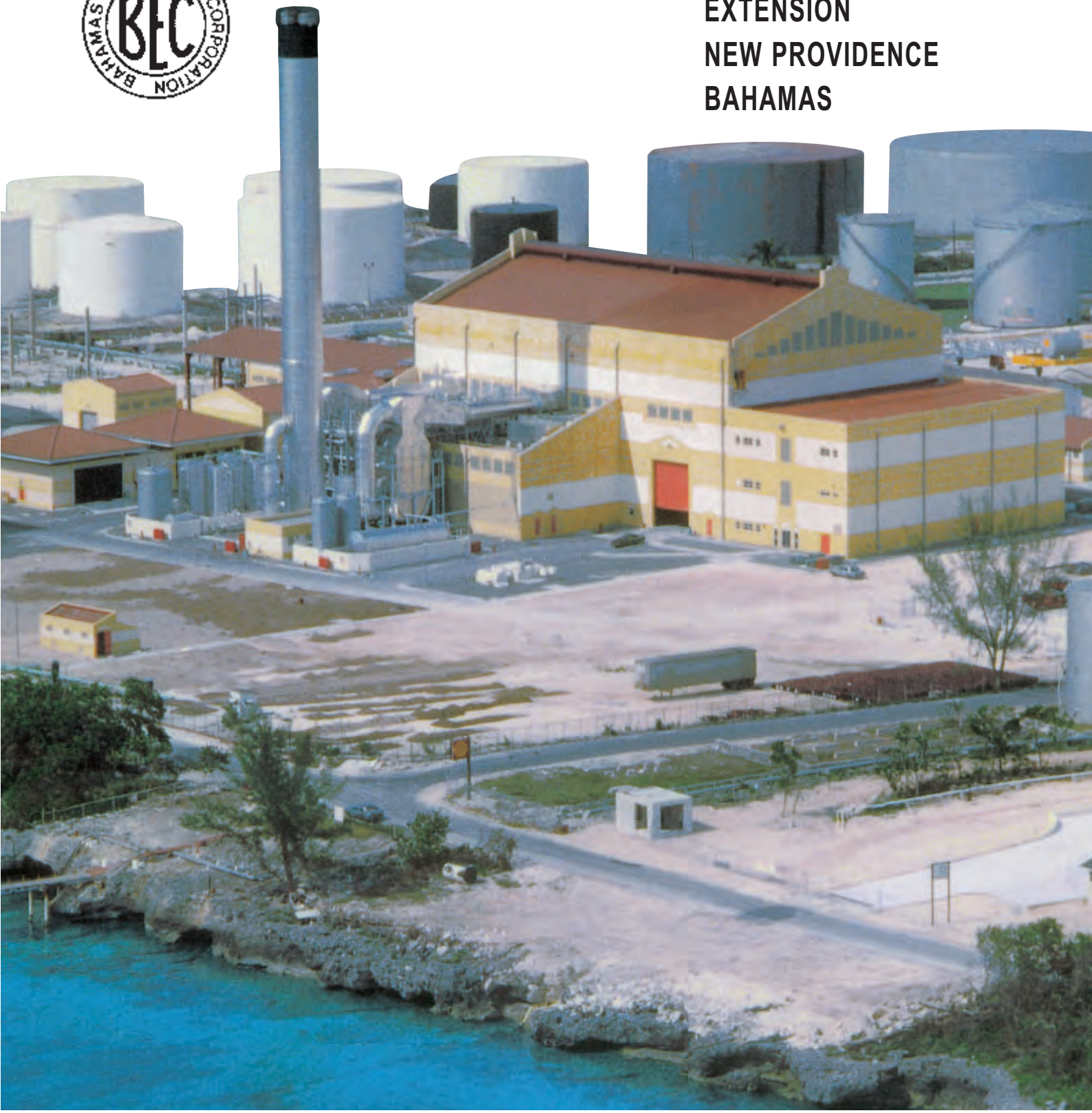
CLIFTON PIER POWER STATION

BAHAMAS ELECTRICITY CORPORATION
BEC

54.8 MW DIESEL POWER EXTENSION
NEW PROVIDENCE
BAHAMAS



BWSC
Burmeister & Wain Scandinavian Contractor A/S

CLIFTON PIER POWER STATION

New Providence, Bahamas, Extension 1992, 2-stroke Low Speed Diesel Generator Units 2 x 27.4 MW

The Employer´s Representative, the Engineers and the Contrator.

The demand for electricity and power in New Providence Island, the Bahamas, is fast growing. Plans for an extension of the base load capacity at the Clifton Pier Power Station were initiated in 1988 and realized in 1992 with 2 diesel, 2-stroke low speed generator units, producing in total 54.8 MW. The units were connected to the grid in July and in August 1992 respectively, and thereby delivered a month ahead of schedule for the extension.

The Employer

The Bahamas Electricity Corporation (BEC) is responsible for the supply of electricity in the Bahamas (with a few exceptions). During the 1980's the annual growth has been increasing from approximately 7% to 10/11% as recorded in 1989.

The Project

Realizing the growth it was decided to increase the production capacity considerably to cover the requirements up to the second half of the 1990's. With funds raised from the Inter American Development Bank, BEC made project plans with assistance from the consultants, Ewbank Preece in Dublin, Ireland.

Tenders were issued and quotations for 4-stroke as well as 2-stroke diesel units were studied. The final decision was for 2 units of each 27.4 MW capacity. The contract for the mechanical and electrical project was signed on 2nd April, 1990.

The Contractor

The Danish contractor Burmeister & Wain Scandinavian Contractor A/S was selected for the project, BWSC are specialists in the design and construction of diesel driven power plants. Worldwide the company is a leader within the field of large 2-stroke low speed diesel power plants and has made more than a dozen 2-stroke diesel driven installations.

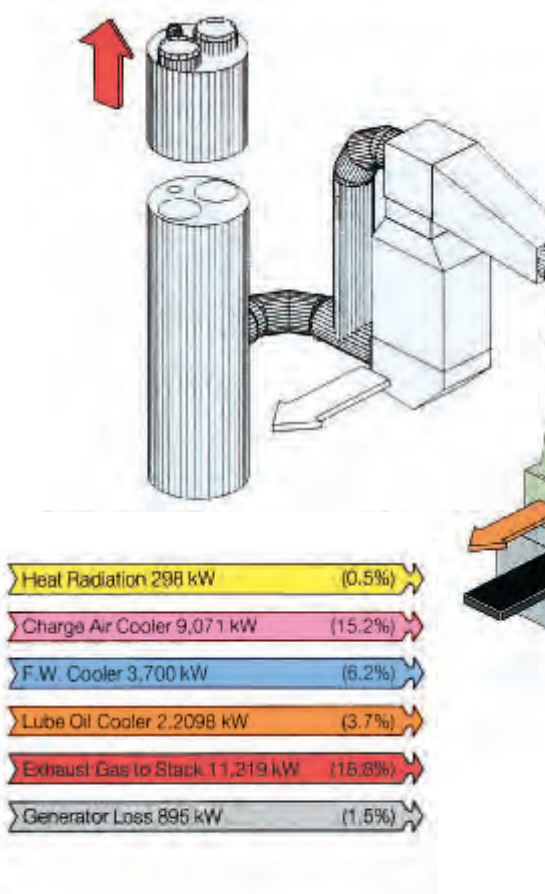
The Engine Builder

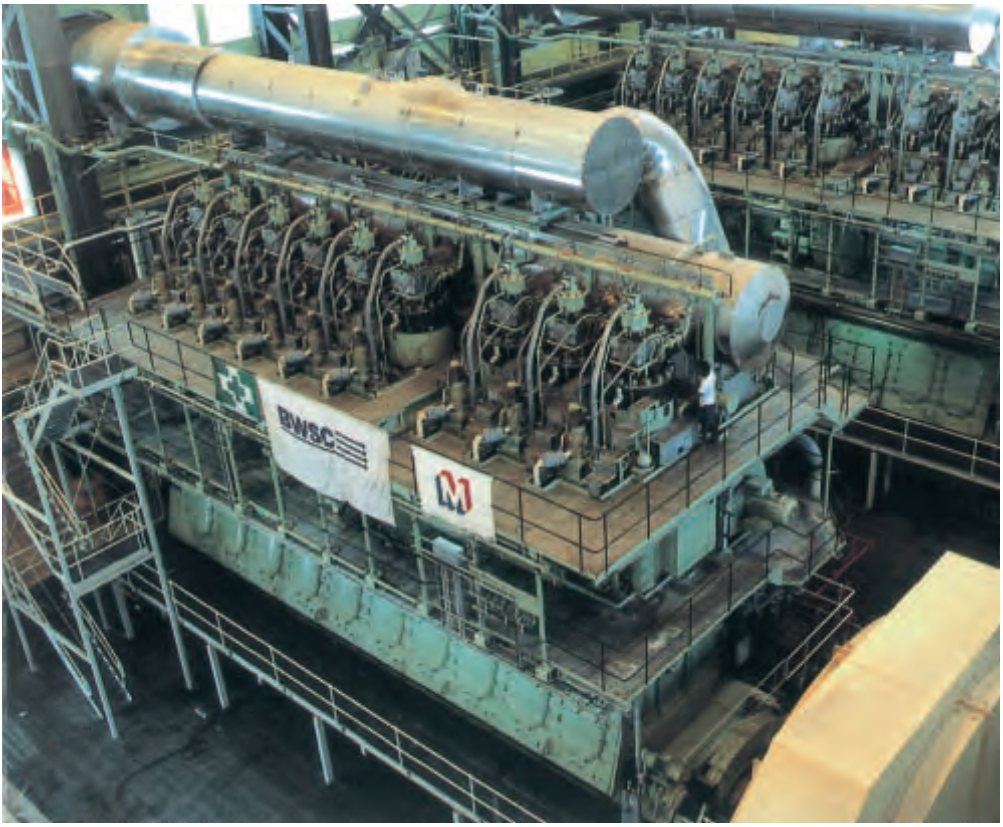
The diesel engines, 9 cylinder MAN B&W 9K80MC-S, have been manufactured by Mitsui Engineering and Shipbuilding Co., Ltd., Japan. This company is the senior licensee of MAN B&W Diesel A/S.

The Generator Builder

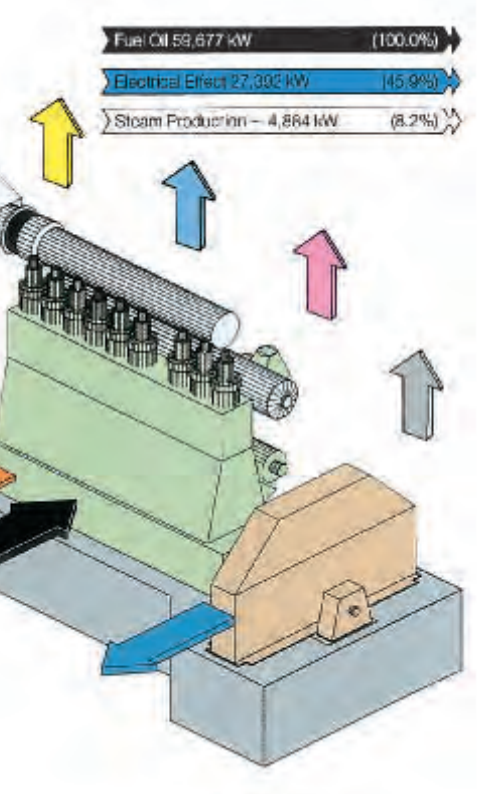
The generators, each 34 MVA were manufactured by Meidensha Ltd., Japan. The company is among the most experienced designers and manufacturers of low speed generators for diesel generator sets.

The waste heat from the exhaust gas is recovered through boilers installed in the exhaust gas systems. The produced steam is partly utilized for heating of the heavy fuel oil for the engines in the power station and will provide necessary heating capacity for a future desalination plant in connection with the power plant.





The diesel engines and generators.



Technical Features and Main Data

This power plant represents "the State of the Art" within 2-stroke low speed diesel driven plants for electricity production including waste heat recovery for use in a future desalination plant. The plant's technical features are:

The Diesel Engine

2 units type Mitsui/MAN B&W 9K80MC-S, 9 cylinders

Bore/stroke	800/1,960 mm
Nominal output	28,080 kW
Revolutions	100/min.
Weight	1,272 tons

The Generators

2 units type Meidensha TCB-AF

Output	34,240 kVA
Voltage/Hz	11kV/60 Hz
Weight	566 tons

The Operations and Control System

The SCADA control system is the most modern of its kind with more than 1000 measuring/controlling points per unit. It facilitates and supports BEC operators in their daily work for economical operation of the plant. The 4 operator colour screen displays provide an easy overview and instant status of the plant condition and performance. Further, the system keeps track of all the important data for performance, monitoring, and maintenance purposes.

The Plant Efficiency

The prime movers, 2-stroke low speed Mitsui/MAN B&W Diesel engines are the most efficient and reliable on the market. The efficiency of the plant, guaranteed site measurements – corrected to ISO conditions – is 54.1%, of which 45.9% is the produced electricity while 8.2% represents steam production for heating purposes such as heating of fuel oil for the engines and as heating medium for a future desalination plant.

The Training, Service and Maintenance

It has been a very important part of the contractor's duties to train and educate the BEC operators and maintenance staff to secure the optimal performance and stability of the plant. The parties also concluded a 5-year maintenance and service agreement. The contractor will during that period follow up on the training and give advice and support the operation.
Furthermore, the agreement covers the supply of the spares needed for the planned maintenance program and unforeseen outages.

The control room.

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Burmeister & Wain Scandinavian Contractor A/S (BWSC) is a world-leading turnkey contractor for medium and large diesel engine based power systems. The company's experience and expertise range from every aspect of plant design to rehabilitation, operation, maintenance, and financing.

Within two decades, BWSC has supplied more than 143 diesel power plants to 46 countries with a total generating capacity in excess of 1,950 MW. In addition to turnkey power plants, BWSC's product range includes transmission lines, distribution systems, generation services, and power plant rehabilitation. Furthermore, BWSC has entered into long-term technical support agreements (TSA) and operation and maintenance (O&M) agreements covering a total plant capacity in excess of 920 MW.