

- A Strategic Alliance -

Phase 1 - Year 2000 Expansion



Built for



Caribbean Utilities Company, Ltd.
Grand Cayman



Year 2000 Expansion

Project Background

Caribbean Utilities Company, Ltd. (CUC) operates the only public electrical utility in Grand Cayman and is required to be an extremely reliable supplier of electricity and maintain adequate reserve generating capacity. With the continued development of tourism and the financial service industry in Grand Cayman, CUC has been faced with the challenge of rapid growth in electricity demand. This growth is estimated at 8.5% per annum over the coming years.

To meet these challenges, CUC has developed a long-term expansion program and entered into a long-term strategic business relationship with a leading Diesel engine manufacturer and reputable turnkey contractor, for the addition of Diesel generating capacity.

Engine Hall

Following a competitive tender process, CUC signed a 10-year Strategic Alliance Agreement (SAA) on 5th February, 1999 to design and install Diesel generating units on a turnkey basis with MAN B&W Diesel AG (MBD) of Augsburg, Germany. Burmeister & Wain Scandinavian Contractor A/S (BWSC) of Copenhagen, Denmark, played a significant role in the formation of the SAA and was selected as principal subcontractor responsible for project management, plant design, and supply of balance of plant. At the same time, CUC and MBD also signed the project agreement for the first phase of the Year 2000 Expansion Program, involving the turnkey installation of 2 x 12.25 MW medium speed Diesel generating units and auxiliary systems.

CUC selected R.W. Beck as consulting engineer for these projects.

Project Execution

The total project was completed in only 16 months, which was 1 month in advance of the contractual completion date.

The new powerhouse is located on the existing North Sound Road Generating Station compound and consists of a ground floor and an operating floor. An annex in three levels on the side of the powerhouse contains auxiliary equipment, a local control room, offices, and small spare parts storage. 30 and 5-ton overhead cranes are provided for maintenance purposes. The powerhouse includes a third bay and foundation to accommodate a future Diesel generating set and is also designed for further expansion to accommodate a total of 6 Diesel generating units with exhaust gas boilers and a steam turbine.

The plant is designed to operate on Diesel fuel oil using the existing facilities for storage, treatment and removal of sludge.

The electrical systems are all fully automatic, enabling the plant to be controlled from the existing station's new central control room.

Although the Island of Grand Cayman is a relatively small community with approximately 40,000 inhabitants, contractors from Grand Cayman carried out the majority of the site activities. Hadsphaltic was responsible for the civil works and electrical and mechanical erection. Hay Electric was responsible for all the lighting and small power systems. Only specialist assistance was brought in from abroad.





Control Room

Operation and Maintenance

Operation and maintenance (O&M) for the new plant will be undertaken by CUC staff who have participated in a number of specialized training sessions provided as part of the turnkey contract, under the Strategic Alliance Agreement, such as:

Project management training at the European offices of MBD and BWSC.

Training in operation, maintenance and repair on engine, turbochargers and related equipment at MBD's factory.

On site operator training carried out prior to the commissioning of the plant.

In addition to the above, site training will continue during the warranty period conducted by the Maintenance and Operation Specialist provided by MBD/BWSC.

Summary

Contract

Particulars

Type	Turnkey
Contract signing	February 1999
Hand-over	August 2000

Technical Data

Diesel Engines

Make	MAN B&W Germany
Type	2 x 12V 48/60 4-Stroke
Speed	514 rpm

Alternators

Make	ABB Finland
Type	AMG 1600QP14
Rating	15,300 kVA
Voltage/frequency	13 kV / 60 Hz
Output at 100% load	2 x 12,600 kW at Pf 0.8

Borehole Cooling Water Pumps

Make	ABS Sweden
Type	NB 200/150 - 32C
Flow	2 x 370 m ³ /h

Borehole Cooling Water Heat Exchangers

Make	APV Denmark
Type	2107 MGS-16
Cooling capacity	2 x 8,500 kW each

Lube Oil Treatment

Make	Alfa Laval Denmark
Type	LOPX 709
Capacity	2 x 3.9 m ³ /h

Civil Work

Subcontractor	Hadsphaltic Grand Cayman
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Power Building

Supplier	ATCO Noise Management Canada
Height	17.1 meters
Length	34.5 meters
Width	28.5 meters
Overhead crane	1 x 30 tons, 1 x 5 tons

Project Challenges

Strategic Alliance Agreement

Unlike traditional contracting, the "Strategic Alliance Agreement" is a co-operative business relationship in which both parties recognize and maximize mutually beneficial needs over the longer term. The parties enter into a process with the common objective of achieving the substantial benefit of increased productivity, improved efficiency, reduced costs and mitigation of risks. A key factor of this process is the use of "principled negotiations" rather than traditional adversarial customer-supplier relationships creating a win-win environment.

If growth continues as anticipated, CUC will require at least 52 MW of additional capacity over the next ten years. Under the Strategic Alliance Agreement, MBD/BWSC will provide CUC with this additional Diesel generating capacity on an "as required" basis. In return, CUC will be given "most preferred customer" pricing and delivery times, to-

gether with other advantages associated with standardization, improved design features, technology advances, spare parts and training.

Borehole Water Cooling System

As opposed to most conventional Diesel operated power stations, which normally use seawater cool-

ing systems or a closed radiator cooling system, the CUC plant utilizes an innovative borehole water cooling system.

The Diesel engines are cooled with water drawn from the deep underground. The water is pumped through titanium plate heat exchangers and returned back into the underground structure, at a level separated horizontally and vertically from the abstraction zone.



Borehole Water Cooling System



Caribbean Utilities Company, Ltd.

P.O. Box 38 GT, Grand Cayman,
Cayman Islands
Phone : +1 345 949 5200
Fax: +1 345 949 4621
Website: www.cuc-cayman.com

R.W.Beck, Framingham, US

Phone : +1 508 935 1600
Fax: +1 508 935 1666
Website: www.rwbeck.com



**MAN B&W Diesel AG,
Power Plant Division**
Stadtbachstr. 1, P.O. Box 100080
D-86135 Augsburg, Germany
Phone : +49 821 3220
Fax: +49 821 1460
e-mail: powerplants@manbw.de
Website: www.manbw.de

MAN B&W Diesel Inc., Houston

Phone : +1 713 355 2777
Fax: +1 713 355 4863
e-mail: cwalker@manbwhou.com



**Burmeister & Wain
Scandinavian Contractor A/S**
Gydevang 35, P.O. Box 235,
DK-3450 Allerød, Denmark
Phone: +45 48 14 00 22
Fax: +45 48 14 01 50
e-mail: sales@bwsc.dk
Website: www.bwsc.dk

BWSC U.S. Rep. Office, Inc.

Phone: +1 202 261 2170
Fax: +1 301 263 9581
e-mail: csg901@aol.com