CUC 69 MW DIESEL POWER PLANT GRAND CAYMAN

PHASE IV COMPLETED – A 10 YEAR STRATEGIC ALLIANCE SUCCESS

BUILT IN 1999 - 2010 FOR

CUC
You've got the power

BY

BWSC
Burmeister & Wain Scandinavian Contractor A/S

A 10 Year Proven Strategic Alliance Success

In 1998, Caribbean Utilities Company, Ltd. (CUC), the electric utility in Grand Cayman, Cayman Islands, introduced the concept of a 10 Year 'Strategic Alliance Agreement' (SAA), between an island-based electric utility and a turnkey diesel power plant supplier, into the bidding process for Phase 1 of a new power plant building program.

CUC's aims were to provide commonality of design, equipment, operation and maintenance, to simplify future bidding processes and to establish a long-term, mutually beneficial relationship between customer and supplier, whilst ensuring equipment and services at competitive prices. Of paramount importance were reliable and cost-effective, electricity supplies.

Burmeister & Wain Scandinavian Contractor A/S (BWSC) of Denmark, and MAN Diesel SE (MAN) of Germany became partners with CUC in the 10 Year SAA to build new power generation facilities in 4 phases.

Background

CUC has been the electric utility in Grand Cayman since 1966, responsible for generation, transmission and distribution.

Rapid development and growth of tourism and financial services sectors in Grand Cayman placed demanding requirements for electrical capacity and system stability. CUC met the challenges by capacity increases, upgrading of systems and securing reserve generation capacity.

North Sound Road Generating Station is CUC's single generating facility on Grand Cayman and has been expanded with numerous, different sized generating units and technologies, sourced from different suppliers and contractors; a situation driven by market forces that is common in island-based utilities, producing varying standards for maintenance, training and spare parts needs within a single location.

In 1998, CUC looked for future capacity expansion based on common technology, maintenance, parts and training, ideally with the same contractual partners over a 10 year expansion period.

The solution was an international competitive bid for Phase 1 of a turnkey expansion (2 x 12 MW units) tied to a long-term strategic alliance (SAA) with the contractor. After thorough evaluation of several offers, a contract was signed with BWSC and MAN in 1999.

Strategic Alliance

A Strategic Alliance Agreement is a long-term mutually collaborative business relationship between two or more parties to maximize common benefits.

The key factor being the use of "Principled Negotiations" rather than traditional 'Adversarial Negotiations', where all negotiations in the design-build phases and lifetime of the agreement are conducted on the basis of mutually shared interests, creating a win-win situation for all parties rather than customer-supplier relationships often driven by diverging interests.

The 10 year SAA (1999-2010) between CUC and BWSC /MAN comprised the design and installation on a turnkey basis, of 4 phases of large medium speed diesel generation units, and meeting of specific objectives in the SAA that included:

- High quality 'Design - Build' project phases
- Standardized processes, procedures and engineering
- Commonality of technology, training and maintenance
- Utilization of value engineering to achieve set goals
- Reduced tendering processes and costs in each phase
- Cooperation and trust, facilitating dispute resolution
- Corporate Social Responsibility and local community involvement
- Reduced daily involvement of senior management

MAN supplied the engines and generators and BWSC was responsible for project management, plant design, engineering, balance of plant supply, erection and commissioning of each phase, together with intensive involvement with MAN in the development and implementation of the SAA.

CUC, SAA partners MAN & BWSC and RW Beck. Phase 4 signing.

Completion In 4 Phases

The new CUC generation plant was built in 4 phases over a 10 year period, and designed to allow for future expansion and additional generating units.

The turnkey contract for Phase 1, based on 2 x 12 MW MAN 12V48/60 units, with accommodation for a third 12 MW unit in Phase 2, was signed in February 1999 along with the SAA and was completed in May/July2000.

The power house building was designed and constructed to house three generating units, and equipped with both 30 and 5 ton overhead cranes. The exhaust stack accommodates three flue pipes for three engines. The service tank farm and all mechanical, electrical and control auxiliary systems were designed and constructed for a total of 6 engines.

Provisions within the SAA streamlined negotiations whilst protecting the owner's interests, allowing the Phase 2 contract for 1 x 12 MW installed in the existing power house, to be signed in 2002 without competitive bidding.

The power plant survived Hurricane Ivan in 2004 with minimal damage.

Load growth projections and additional power from the MAN 48/60B engine range, facilitated installation of a 16 MW MAN 14V48/60 generation unit in the Phase 3 power house in 2006.

Phase 4, signed in 2008 included the expansion of the Phase 3 power house with an additional 16 MW MAN 14 V48/60 generation unit and an additional 5 ton overhead maintenance crane.

The power plant today is a borehole cooled 69 MW plant, equipped with five MAN 48/60 diesel generating units, two overhead cranes, fully automatic electrical systems, common local control room connected to CUC's external control center and is fuelled from CUC's main diesel storage system. The engines are capable of operating on HFO in the future, if required.

A 10 Year Strategic Alliance Experience Shared With The Community

A partnership between power plant owners, equipment suppliers and turnkey contractors, enforced by a 10 year Strategic Alliance Agreement including default penalties, is an unusual and initially challenging prospect. But in a high growth location there is great value in standardization and streamlining for the utility, and for the supplier it is long-term business.

Once the objectives of the SAA were understood by all parties, innovative and clear lines of communication were established to avoid conflicts, disputes, and constant involvement of senior management.

Serious commitments were incorporated for open-book full technical disclosures, continuity of personnel, training, local employment and local community support. Future pricing mechanisms were agreed with safety nets and performance bonds, eliminating the need for future competitive bidding and associated costs.

BWSC and MAN joined CUC in cleaning up public beaches, sponsoring awareness exhibitions, providing scholarships for local students, vocational work for high school students and restoring historical artifacts. BWSC has provided engineers to assist CUC in restoring power production after Hurricanes.

Meeting the mandate for local involvement, major subcontracts were placed with Caymanian companies, such as Hadsphaltic for civil work and building erection, and, Hay Electric for lighting and small power systems. Working together under the umbrella of an SAA has facilitated a highly successful long-term project, with stress-free day-today work, amicable problem solving and excellent cooperation between all parties.

CUC now have a modern, efficient, world class 69 MW generation plant, constructed in 4 phases, based on common design and equipment, with options for alternative fuels, efficiency improvements by additional steam generation and an ideal layout for future expansion to meet local needs.

Project Summary

CUC's latest Power House built under a Strategic Alliance in 4 phases during the past 10 years with five diesel generating units:

Phase	Contract Scope	Contract Signed	Contractual Take-over
1	2 x 12V48/60 (2 x 12.25 MW) • Civil work, building and stack for 3 units • Mechanical-, electrical and control systems prepared for 6 units • Service tank farm for 6 units	February, 1999	May & July, 2000
2	1 x 12V48/60 (1 x 12.25 MW) • Installed in the building already built	August, 2002	July, 2003
3	1 x 14V48/60 (1 x 16.0 MW) • Extension of building for the unit • One stack for the unit	April, 2006	May, 2007
4	1 x 14V48/60 (1 x 16.0 MW) • Extension of building for the unit • One stack for the unit	April, 2008	August, 2009

Technical Data

Diesel Engines
Make ..... MAN Diesel, Germany
Type ..... 3 x 12 V48/60 and 2 x 14V48/60
Speed ..... 514 rpm

Alternators
Make ..... ABB, Finland
Voltage / Frequency ..... 13 kV/60 Hz
Output at 100% load ..... 3 x 12.25 MW and
..... 2 x 16.0 MW at p.f. 0.8

Fuel
Fuel ..... Diesel oil

Borehole Cooling Water Pumps
Make ..... ABS, Sweden
Cooling flow ..... 3 x 370 m3/h + 2 x 450 m3/h

Cooling Water Heat Exchanger
Make ..... APV and Sondex, Denmark
Cooling capacity ..... 3 x 8.5 MW + 2 x 10.2 MW

Power House Building
Supplier ..... ATCO Noise Management, Canada and
..... Rambøll, Denmark
Height ..... 17.1 m.
Length ..... 61 m.
Width ..... 28.5 m.
Overhead cranes. ..... 30 tons + 5 tons

Exhaust Stack
Height ..... 42.4 m

Civil Works
Subcontractor ..... Hadsphaltic, Grand Cayman

Lube Oil Treatment
Make ..... Alfa Laval, Italy
Type ..... LOPX 709, SU 835 and SU 836

13 kV Switchgear
Make ..... General Electric and Cutter Hammer, USA
Current ..... 1,200 A

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