

Samawah Power Plant 60 MW, Iraq



Completed in 2009
for

The Japan International Cooperation System (JICS)

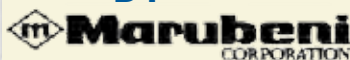


Ministry of Electricity, Republic of Iraq

And



BY



Project Background

Under the Japanese Ministry of Foreign Affairs grant program for the reconstruction of Iraq the Japan International Cooperation System (JICS) issued in 2005 a tender for the construction of a 60 MW Diesel power plant in Samawah, the southern Iraqi city where Japanese Self Defense Forces were deployed until the summer of 2006. The end user would be the Iraqi Ministry of Electricity.

The contract was won by Marubeni Corporation in consortium with Mitsui Engineering and Shipbuilding with BWSC as sub-contractor and was signed on 3 February 2006.

BWSC has delivered design, engineering, supply of equipment, transport, construction, installation, test and commissioning on a full turnkey basis.



Ground Breaking Ceremony, February 2006.



Project Description

Located near Samawah the power plant's 4 generation sets have a production capacity of 60MW in 55°C ambient temperature. To operate in these extreme conditions the plant's 32 radiator coolers feature water spray cooling. Designed to be primarily operated on heavy fuel the engines can also run on diesel oil.

A power house with an electrical annex and a control room fitted with SCADA (Supervisory Control And Data Acquisition) control system, a diesel and heavy fuel storage tank farm, a fuel purifier station which houses the heavy fuel separator units, a water treatment building, auxiliary and exhaust gas boilers, an incinerator, a switchyard where the two 11kV-132kV step up transformers are located, as well as a 900 sqm administration building and a two-story crew lodge complete the works inside the site.

Outside works include, relocation of a 132kV line, construction of a 6.5 km long fuel oil pipeline linking the station to a refinery and connection to the Iraqi national grid by refurbishing an existing switchyard.



Water treatment building, fuel oil purifier station and tank farm.

The complicated security situation at the time of contract signing advised against dispatching expatriate supervisors to Samawah; instead the civil work phase of the project would be supervised from an office in Kuwait where occasional coordination meetings could be held.

Initial civil works included a concrete wall around the site's perimeter, watch towers, bomb shelters and other security structures to protect the workers and the works.

Inland Transportation and Security Contract

In the summer of 2006, with civil works, engineering and procurement well underway, the province of Al Muthanna, whose capital is Samawah, was transferred to the Iraqi government. Coalition forces withdrew and their bases were closed down invalidating the original plan to lodge expatriate supervisors in Camp Smitty.



Transport of engines through Al Khidr village

To solve this issue the Inland Transportation and Security Contract was signed on 14 December 2007 to complement the original contract under a "Remote Supervision Concept".

The scope included:

- Transport of equipment, including the 320 ton engines and 250 containers, from Kuwait to Samawah, a journey of 350 km, in 45 escorted convoys.
- Provision of up to 175 security guards for round the clock site protection.
- Training of Iraqi engineers.
- Remote supervision of installation, test and commissioning.
- Project management of the above tasks and coordination with JICS.



BWSC's staff at the virtual site office arranged at BWSC's head office.

Remote Supervision Concept

The Samawah Power Plant has been built, tested and commissioned entirely via remote supervision by BWSC in Denmark without the presence of a single expatriate on site.

The remote supervision concept rests on five pillars:

1. Development by BWSC of an advanced 3D model which, upon clicking on each element, provided:
 - Layout drawings showing the element's location
 - Technical data (i.e. manufacturer's manual)
 - Number of the container in which it was shipped to site
 - Related mechanical and electrical documents
 - Shipment documents
 - Detailed step by step installation instruction
 - Unit drawing
 - P&I Diagram
 - Plot plan
 - Area and room number definition
2. Satellite connection providing both live video feed from several fixed and mobile cameras on site and control system data.
3. Three month long training of ten Iraqi engineers, later to work as supervisors on site, in suppliers' workshops in Europe (i.e. engine manufacturer) and Japan (generator and transformer) as well as visits to power stations built by BWSC .
4. Establishing a virtual site office at BWSC's head office, fully staffed with Site Manager and Supervisors.
5. Regular meetings between BWSC and Iraqi supervisors in Amman (Jordan) and Istanbul (Turkey).

Despite the many challenges on 16 January 2009 the Iraqi Ministry of Electricity issued the Taking Over Certificate for the last unit of the station which now contributes to improving living conditions for the inhabitants of Samawah.



Training of Iraqi engineers in Japan.

Summary

Contract

Type..... EPC, Turnkey
Contract award February 2006
Handing over October 2008 - January 2009

Plant generation 60 MW

Technical Data

Diesel Engines

Make..... MAN Diesel SE, Germany and France
Type..... 4 x 18V48/60, 4 stroke
Speed 500 rpm

Synchronous Alternators

Make..... Meidensha Corporation, Japan
Type..... 4 x EGK-AF
Voltage/frequency..... 11kV/50Hz
Rated output 18750 kVA
Output at 100% load 4 x 14,998 kWe
..... at Pf 0,8 at 50C

Main Unit Supplier

Builder..... Pipecon, Denmark

Lube Oil Treatment

Make..... Alfa Laval, Denmark
Type..... 4 x SU846
Rated capacity:..... 4 x 4,9 m3/s

Radiator Coolers

Make..... GEA, France
Type..... Induced draught
Cooling capacity HT+LT: 4 x 9100 kW
..... + spray cooling

Fuel Oil Treatment

Make..... Alfa Laval, Denmark
Type..... 3 x SU876
Rated capacity 3 x 15,6 m3/s

Power House Building and Stack

Supplier..... Rambøll, Denmark
Area 1500 sqm
Height 18,6 m
Overhead crane Kone, 5 ton
Stack..... Promecon, 1 x 40 m

11kV Switchgear

Make..... Siemens
Type..... Simoprime
Rated voltage/frequency..... 12kV/50Hz
Current..... 3150 A



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