

DUAL FUEL MODIFICATION & INSTALLATION OF 80 TONNE WARTSILA 18V46GD BLOCK DIESEL AND IN-SITU MACHINING SERVICES COUPLED TOGETHER FOR MAJOR PROJECT

The 120-MW barge-mounted power plant in Haripur, Bangladesh, owned and operated by power generation providers NEPC and Covanta Energy, has been in operation since 1999. One of its eight Wärtsilä 18V46GD engines required significant repair work, including the supply of a fully reconditioned engine block.

Goltens was contracted to replace it and to overhaul and modify the replacement block to run on Gas as well as MDO and HFO.

Goltens is not new to undertaking the most demanding repairs in the industry. Goltens located and inspected a similar engine block in a power plant in the Philippines and sent it to Goltens' workshop in Singapore for a full overhaul and machining modifications. All modifications were completed utilizing Goltens' In-Situ machining tools.

The full scope of work was carried out in three locations, culminating in the rebuilding of the engine and commissioning on-site in Haripur, near Dhaka, Bangladesh. This was an extremely challenging project that required complicated logistical arrangements and operations between the Philippines, Singapore and Bangladesh.

Goltens' specialists started the work by dismantling and extracting the 80-tonne engine block from an existing power plant in a rural location in the Philippines. At this stage, visual inspection and nondestructive testing were performed to confirm suitability of the block for the project. Once ready for land transportation, the engine block was transported 50 kilometers to the port by multi-wheeler trailer. The engine block was then loaded onto a heavy lift vessel for onward transportation to Singapore.

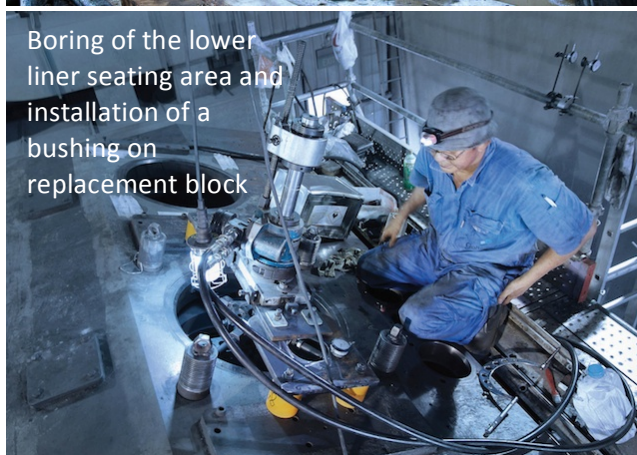
Upon arrival at the Port of Singapore, the engine block was unloaded and moved overnight to the Goltens workshop, accompanied by a police escort for increased safety. Goltens Singapore in-situ machining experts carried out the modification and conversion of the used diesel engine block into a gas-diesel engine block using specialized In-Situ Machining equipment.

PROJECT FACTS: COVANTA ENERGY

Engine Type:	Wartsila 18V46
Bore and Stroke:	460 / 580 mm
Length and weight of block:	12.3 M / 82 MT
Max Power and RPM:	18,900 KW / 514 RPM



Laser alignment inspection of the main bearing pockets on replacement block



Boring of the lower liner seating area and installation of a bushing on replacement block



Removal of the damaged block in Bangladesh

Following reconditioning in Singapore, the engine block was shipped to the Port of Mongla in Bangladesh by a heavy lift vessel, that Goltens had coincidentally just completed a major main engine overhaul on. It was then loaded onto a barge for onward river towage to the final location.

Goltens' specialists dismantled the existing engine, jacked up the damaged engine block from its original position and shifted the crankshaft aside. A full inspection of the existing crankshaft was carried out on-site, resulting in honing of the crankpins and main journals, as well as milling counterweight contact landings.

A delicate skidding operation was then performed whereby the existing engine block was removed and replaced by the reconditioned block. Goltens' diesel team then rebuilt the engine culminating in successful commissioning and handover to the customer.

IN-SITU MACHINING REPAIRS CONSISTED OF:

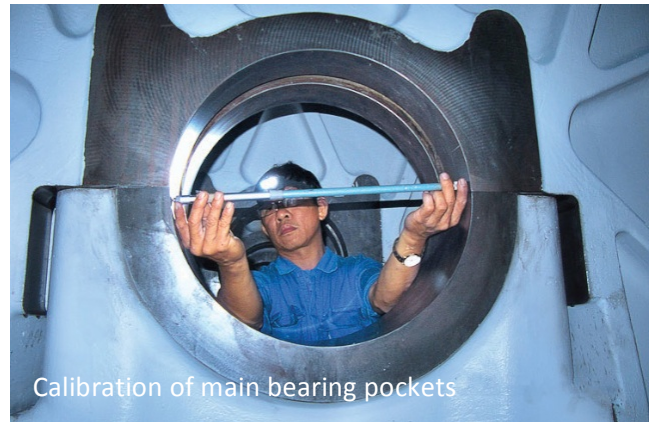
- Laser alignment and full calibration on all main bearing pockets.
- In-Situ grinding of all liner landing surfaces.
- In-Situ machining of 3 lower liner landing surfaces
- Fabrication of new bushes, shrink fitting and securing of new bushes for the lower liner landings.
- In-situ machining of all fuel pump bores to accommodate the gas fuel pump body design.
- Honing of all crankpins and main journals
- Milling counterweight contact landings
- In-Situ milling of locating key way and in-situ drilling of location pinhole for new fuel pump design.
- Full blasting and painting, under paint manufacturer supervision and procedures.

DIESEL ENGINE SERVICES PERFORMED:

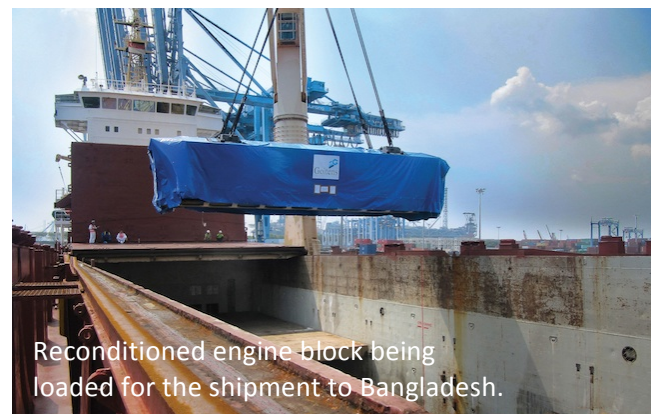
- Calibration and NDT performed on all liner, fuel pump and main bearing landing surfaces.
- Disassembly and relocation of replacement block to Singapore
- Disassembly of damaged engine in Bangladesh
- Reassembly of engine with reconditioned block in Bangladesh
- Final inspection and Engine commissioning

RESULTS:

Although the diesel and machining work performed was largely routine for Goltens, the complex logistics surrounding the project in 3 countries made it a very challenging assignment. All operational tests were successful and the engine was turned over to Covanta.



Calibration of main bearing pockets



Reconditioned engine block being loaded for the shipment to Bangladesh.



Damaged Block being removed by skid alongside reconditioned block ready for installation



Successful operational testing of the rebuilt engine