

Bargh afshan alborz
Amol
Mazandaran
Iran
Tel: +98 (0)1212229599
Fax: +98 (0)1213239001

WEB : www.AlborzGenerator.com

E – MAIL : ba_alborz@yahoo.com

24MW HFO Power Plant

Further to our recent phone call, I am pleased to send you this indicative offer for the Ex-Works outright sale of our HFO 24MW generating plant consisting of six 4MW 18V28/32S MAN Diesel generator sets with balance of plant as described below within the attached Scope of Supply document.

Added Value - Ready to Go

The 24MW generating plant that we currently have in stock is available for immediate despatch - it comes complete with balance-of-plant equipment and is fully packaged and containerised for ease of site assembly.

Performance

Nominal installed capacity represents the engines alone, while net electrical capacity reflects the generating capacity of the plant as a whole (net of „parasitic“ power consumption by the auxiliary equipment) at an assumed site ambient temperature of 30°C and elevation above sea level of 100m.

Annual generation is calculated on the basis of a plant load factor of 93% (allowing for maintenance outages).

The plant heat rate figures are absolute at the ISO conditions, while the specific fuel oil consumption figures derive from those figures, assuming fuel with a calorific value of 42,700 kJ/kg and other conditions set out in ISO 3046 (the applicable industry standard).

Plant Condition

One of the existing two 12MW power blocks (making up the 24MW plant) was part of a trial assembly plant and has therefore previously been installed and operated for demonstration purposes only (approximately 20 hours only per generator -set unit) . The other 12MW block has never been deployed and the engines/alternators have been in storage in since 2008.

Price & Scope of Supply

Equipment only price: US\$.....

A detailed scope of equipment supply is set out below with the Scope of Supply document.

OEM Inspection and Condition Report: Included within the above price.

The inspection shall be undertaken by MAN Diesel specialist engineers on your behalf The report shall be sent to both yourselves and FW Power in order to confirm that the engines are in good condition.

Warranty Renewal price: .

Twelve months OEM warranty renewal covering the six MAN Diesel engines.

The warranty renewal shall be purchased by FW Power from MAN Diesel and passed on to the client.

Engineering consultancy and site supervision services: estimate

based on the consultancy charge -out rate of a senior engineer. With travel, accommodation and associated expenses charged separately.

Comprehensive Technical/Installation Information

Included within our equipment supply offer are the available detailed component drawings, pipework drawings, pipework assembly drawings, electrical schematics, cable schedules, specification sheets, OEM manuals, and power plant operation manuals.

Delivery & Payment Terms

The Delivery Terms shall be Ex-Works.

A down payment is to be received by FW Power for contract effectiveness and for mobilisation activities to begin. Full payment is to be received by FW Power Limited upon completed plant availability and readiness for pick-up.

Inspection

The goods are available for inspection at the warehouse storage locations.

The identical "sister" plant can be inspected in Mauritania, where the final assembly and commissioning is currently taking place.

www.alborzgenerator.com

24MW HFO Power Plant

| Table of Performance Parameters | |
|---|---------------|
| Parameters | |
| Nominal installed capacity | 24 MW |
| Net electrical capacity at 11 kV switchgear output terminals net of „parasitic loads“ at local site conditions of 30°C and 100m elevation. | 23.22 MW |
| Annual generation plant net output calculated on the basis of a plant load factor of 93% (allowing for maintenance outages) and at 100% load. | 189,145 MWh |
| Assumed calorific value of HFO fuel | 42,700 kJ/kg |
| Plant heat rate net of „parasitic loads“ | 9,289 kJ/kWh |
| Specific HFO fuel oil consumption of plant. | 217.5 g/kWh |
| Annual HFO fuel consumed at 189,145 MWh | 41,139 tonnes |

Nominal installed capacity represents the engines alone, while net electrical capacity reflects the generating capacity of the plant as a whole (net of „parasitic“ power consumption by the auxiliary equipment) at an assumed site ambient temperature of 30°C and an altitude of 100m above sea level.

The plant heat rate figures are absolute at these site conditions, while the specific fuel oil consumption figures derive from those figures, assuming fuel with a calorific value of 42,700 kJ/kg and other conditions set out in ISO 3046 (the applicable industry standard).

Half of the plant was part of a trial assembly plant.

(approximately 20 hours only per generator-set unit).

Scope of Equipment Supply

Part A - Included Equipment

The Included Equipment shall comprise the following:

Ex-Works Jebel Ali Free Zone, Dubai

| Module | Quantity | Description |
|--------|----------|---|
| 1 | 3 | Generator set: MAN Diesel 1 8V28/32S engine with an 11 kV Hyundai alternator - including air-starting equipment. |

Ex-Works UK

| Module | Quantity | Description |
|--------|----------|---|
| 1 | 3 | Generator set: MAN Diesel 1 8V28/32S engine with an 11 kV Hyundai alternator - including air-starting equipment. |
| 1a | 6 | Air Intake with oil bath air filters and ductwork. |
| 1g | 6 | Exhaust stack, silencer and ductwork. Includes heat-recovery economizers for heating HFO buffer tanks. |
| 1p | 3 | Set of Interconnecting Pipework: Pipework associated with each genset to be assembled within the acoustic housing. |

| Module | Quantity | Description |
|---------|----------|--|
| 4 | 2 | Switchgear and black-start module: 40ft container unit fitted out by Wardpower of Sheffield with Siemens Simoprime 11kV Switchboards, neutral earthing control panel, Winder Electrical 11 kV/400V 750kVA auxiliary supplies transformer, distribution board and black start generator. |
| 5 | 2 | Control room: 20ft empty container suitable for joining together with the other control room container (via pre-designed openings) with air conditioning unit for the plant operators. Suitable for fitting out with plant control panels and associated Siemens SCADA control systems |
| 5 cont. | 2 | Plant control system & SCADA system: Control system designed by Regulateurs Europa and set of Siemens SCADA control equipment for fitting into the control room. |
| 6 | 2 | Fuel forwarding module: Bulk fuel pumps fitted within 20ft container, located by the fuel buffer storage tanks and site specific bulk fuel farm, housing the duty and standby pumping sets to pump HFO and LFO from the fuel storage facility to the power plant. |
| 7 | 2 | Fire fighting and water treatment module: 20ft fire fighting and water treatment container module fitted with duty fire-fighting water pumping sets (1 electric, 1 diesel) and a jockey pump per module and also duty water treatment facilities to provide potable water for domestic water services and dematerialized reverse osmosis treated water for plant use. |
| 8 | 6 | HFO fuel buffer tank: 40ft container-sized double-skinned, water-heated HFO fuel buffer tank, providing 65,000 litres of fuel storage capacity. |

| Module | Quantity | Description |
|--------|----------|--|
| 8A | 1 | LFO fuel buffer tank: 40ft container-sized double-skinned, LFO fuel buffer tank, providing 65,000 litres of fuel storage capacity. |
| 9 | 1 | Water buffer tank: 40ft container-sized raw water storage tank providing 65,000 litres of storage capacity for the fire fighting and water treatment module. |
| 10 | 1 | Site equipment workshop and storage. |
| 11 | 1 | Site Offices and welfare. |
| 13 | 2 | Local fuel pumps and economiser equipment: Local fuel pumps in 20ft container module containing the local buffer tank, HFO transfer pumps (duty/standby) and economiser heat-recovery circulation pumps (duty/standby). |
| TAP3 | 6 | Acoustic housings: Prefabricated acoustically lined housing for genset, complete with internal walkways and lifting beams for engine maintenance, engine control batteries, electrical power distribution and fit out, building ventilation / engine-radiated heat-dispersal fans and internal lighting. |
| TAP4 | 6 | Radiator: Containerized radiator unit (6-fan, twin-circuit cooling). Each engine is supplied with a 40ft, 6 fan, cooling radiator manufactured by Fincoil of Finland and packaged within a metal frame. The metal frame acts as a protective covering during transit and then as part of the elevation structure during operation. These radiators are integrated into the plant by means of a cold water cooling system found in the modularized pipework and allow for manual or automated engine cooling. |

| Module | Quantity | Description |
|--------|----------|---|
| TAP5 | 2 | <p>Fuel conditioning module:</p> <p>This 40ft container-sized module manufactured by Multipump receives HFO from the HFO buffer tank and heats and treats it to the correct viscosity through Alfa Laval centrifuges and a fuel conditioning module, before pumping it via the modularized pipework to each generating set. The module also houses the LFO ring-main pumps required by the gensets for initial start-up and longer term shut-downs.</p> |
| TAP6M | 2 | <p>Master multifunction skid:</p> <p>Multifunction skid, comprising the interconnection between the external modules and the gensets, with three separate functions all located on one purpose-built 10ft metal frame (skid): lubricating oil treatment centrifuges; HFO/LFO fuel changeover; genset air-starting.</p> <p>(Within each M3 block there are two types of skids, two „slave“ skids and one „master“ skid located in the central housing. Each skid has its own air-receivers, with the master skid also housing the back-up diesel-driven air-compressor and the automatic electric compressor.)</p> |
| TAP6S | 4 | <p>Slave multifunction skids:</p> <p>Multifunction skid, comprising the interconnection between the external modules and the gensets, with three separate functions all located on one purpose-built 10ft metal frame (skid): lubricating oil treatment centrifuges; HFO/LFO fuel changeover; genset air-starting.</p> <p>(Within each M3 block there are two types of skids, two „slave“ skids and one „master“ skid located in the central housing. Each skid has its own air-receivers, with the master skid also housing the back-up diesel-driven air-compressor and the automatic electric compressor.)</p> |
| 120 | 1 | <p>Set of lightning protection and associated earthing system equipment:</p> <p>Generic lightning conductor system. The lightning protection system comes pre-packed in a 40ft ISO container and consists of fibre glass protection masts and catenary wires covering the whole of the plant, leading down to the earthing pits constructed during the civil work.</p> |

Part B - Optional Equipment

The Optional Equipment shall be at an additional price, and shall comprise of the following:

| Item | Quantity | Description |
|-------|----------|---|
| Tx1 | 1 | Transformer: 16MVA 11/33kV step up transformer. Manufacturer: Winder Electrical of the UK. |
| Cable | - | HV and LV Power cable as per "Cable Availability" schedule. |

Part C - Equipment for Direct Procurement

The Equipment for Direct Procurement shall be supported by full drawings and specifications (for direct procurement) and shall comprise of the following:

Module Quantity Description

| | | |
|---------|---|---|
| 14 | 2 | Sets of standardised modular pipework: |
| | | This system comprises a series of pre-fabricated pipework frames that run between the plant modules and engines distributing compressed air and fluids from their source to their required location. The design allows for quick and straightforward connection on site limited to the bolting of flange connections between pipework frames. |
| 16 | 1 | Set of spinal pipework and support frames. |
| 18 & 19 | 2 | Sets of M3 cable and cable tray: |
| | | The M3 system is designed to share central cable runs parallel to the pipework modules. The runs are constructed from cable tray and pre-fabricated supports and comprise of 3 tiers (MV, LV and Control) for ease of construction and interconnection and to provide the necessary segregation. |
| 300 | 1 | Set of spinal cable and cable tray |
| | | |

Part D - Excluded Equipment

The Excluded Equipment shall comprise the following:

| Module / Item | Quantity | Description |
|----------------------|-----------------|---|
| 12 | - | Site security gatehouses and fittings. |
| | - | Site Mess cabins and fittings. |
| 400 | - | Bulk fuel storage facilities (tank farm) for HFO and LFO fuels. |
| 500 | - | All civil works, ground studies & preparation, foundations, internal roads, drainage, sewage, fences, bunding, security gates, site lighting, fire ring mains, etc., etc. |

Please note that generic engineering drawings are available from for items 400 and 500.

www.AlborzGenerator.com