



**CONFIRMATION N. 6700**

**19.02.2008**

**Subject: Slough Data Centre**

**TECHNICAL DESCRIPTION**

**N.4 DIESEL GENERATING SETS MODEL MT.3050**

The generating sets will be powered by MTU diesel engines which will be coupled to Stamford alternators.

**GENERATOR DUTY**

In accordance with the specification requirements the generators are rated to operate at 100% load 2400 kWe which is equal to 3000 KVA at 0.8 pf in accordance with L.T.P in ISO 8528 (BS7698).

The generator nominal frequency will be 50Hz with a nominal engine speed of 1500 rpm, the nominal voltage produced at the alternator will be 11,000 V. Each generator set is governed by a class A1 MTU ADEC electronic governor.

The reference conditions for achieving the stated duty are:

- 40 °C intake air temperature
- 100 m altitude above sea level

**MTU DIESEL ENGINE MODEL 20V4000G63L**

- 4 stroke
- Direct injection
- Turbocharged and inter-cooled
- 20 cylinders 'V' disposal – liquid cooled
- Bore 170 mm
- Stroke 210 mm
- Capacity 95.4 litres
- Compression ratio 16.5:1
- Rotation: anticlockwise viewed from flywheel side
- Piston speed at 1500 RPM: 10.5 m/sec
- LTP rating as per ISO 3046: 2850 KW at 1500 RPM, overload 10% for 1 hour each 12
- Fuel type: EN590: grade n.1d and n.2d according to ASTM D975-00 (with low calorific value of 9.700 Kcal/Kg)
- Fuel consumption at 100% load 221 gr/KWh
- Specific lube oil consumption: 0.82 gr/KWh
- ADEC electronic governor Class A1(injection pump)

**ALTERNATOR – LEROY SOMER LSA 54 VL75**

- Nominal rating for continuous operation 2800 KVA (PRP)
- Nominal rating for standby operation 3080 KVA (PRP)
- Nominal voltage 11kV  $\pm$  5%
- Rated power factor: 0.8
- Frequency: 50 Hz at 1500 RPM
- Rated ambient temperature 40<sup>0</sup> C
- Double bearings construction form, according to IM1001
- Brushless excitation
- 4 Poles
- 6 Wires
- Short circuit current – 3 x full load current for 10 seconds
- Insulation: class F
- Over temperature to Class H
- Self ventilated by internal fan
- IP 23 mechanical protection
- Winding pitch 5/6
- Cooling IC0A1
- AVR
- Current transformers for paralleling facility between alternators
- Current Transformers for restricted earth fault protection (supplied and installed by CTM)
- Anti-condensation heater
- PT100 for bearings (n.1 per each bearing)
- PT100 for windings (n.2 per each phase)
- CT's for paralleling
- PMG

**FUEL SYSTEM**

- Feed pump
- Fuel oil-water separator, static type complete with Racor type connecting parts
- Full flow filters with replaceable elements
- Electrically operated 24V shut down solenoid
- Overspeed devices

**ENGINE COOLING SYSTEM**

- Tropical horizontal radiator with separate electric driven fans for jacket and aftercooler circuits
- Cooling radiators will be skid mounted. Low noise electric driven fans will be installed above the radiator cores pulling air through the radiator
- Engine driven centrifugal pump and water precirculating electric pumps (one for jacket circuit and one for aftercooler circuit)
- Thermostatic valves
- Engine temperature transducers (one for jacket, one for aftercooler)
- High water temperature alarm switch, two steps (high alarm and high high shutdown)
- Water immersion heater (1\*9000W) with thermostat
- All pipe work, connections, valves and supports are included
- Coolant includes for a corrosion inhibitor with a 40% mix of antifreeze and water
- Low water level alarm/shut-down switch (one for jacket and one for AC)
- Low water temperature switch (jacket)

### **LUBRICATING SYSTEM**

- Oil/water pack type heat exchanger
- Centrifugal pump (engine driven)
- Oil pressure transducer
- Oil temperature transducer
- Pressure switch (two step) for low oil pressure alarm and low low oil pressure shut-down
- Manual pump for lube oil drain
- Lube oil top up tank with automatic refilling to allow engine to operate for 48 hours unattended (lube oil tank capacity : 70 lt)
- Min oil level switch
- High oil temperature switch

### **STARTING SYSTEM**

- 24 V electric motor starting
- Single set of starting batteries
- Battery type - Lead acid type, - 24 Volt, 600 A/h (suitable for 3 starting attempts each and 10 seconds rest between attempts)

### **COMPRESSED AIR STARTING SYSTEM**

- electric motor driven compressor
- diesel engine driven compressor
- air starting motor
- air receiver
- safety pressure valves
- connection pipes and accessories

### **ENGINE INTAKE AIR SYSTEM**

- Dry type air filters with replaceable elements
- Visual clogging indicator
- Turbochargers

### **EXHAUST GAS SYSTEM (NOT supplied by CTM)**

- Exhaust gas silencer to reduce noise by absorption and through resonance. The exhaust gas enters an expansion chamber covered with a sound absorbent material. This is protected by perforated metal sheet, and then a sound-proofing absorbent body. The outer casing is made of carbon steel.
- Air cooled exhaust manifold
- Stainless steel flexible bellows
- Exhaust gas temperature transducers
- System designed to achieve the noise criteria of 75 dBA @ 1m in free field

### **ENGINE/ALTERNATOR COUPLING**

- The engine/alternator coupling is a highly flexible plug-in type coupling which creates a torsionally soft connection between an internal combustion engine and the alternator.  
The highly flexible torque transmitting element is designed as a rubber disc which torsional strain twists, absorbing high torsional vibrations and any misalignments.  
The inner diameter of the rubber disc element is vulcanized directly to a taper hub or to a metal sleeve. On its outside diameter the rubber disc is engaged into an internally toothed aluminium ring making a backlash free plug-in connection.  
The flange dimensions of the coupling are according to SAE J 620 and DIN 6281 respectively. A bell housing is provided between engine and alternator.

**GENERATOR MOUNTING**

- The engine and alternator are mounted on a structural steel sub-base sized to support the engine, alternator and the auxiliary systems to form a rigid frame. The sub-base is designed to support the equipment and maintain the correct alignment. The sub-base includes lifting eyes and drip pan fitted under the engine side with drain cock (outside flow).
- The engine/alternator are mounted on anti-vibration mounts fixed to the steel sub-base.

**GENERATOR CONTROL SYSTEM (CONTROL PANELS & SYNC. PANELS)**

**NEUTRAL CONTACTOR & EARTHING RESISTOR**

**UPS FOR CONTROL SYSTEM**