PetroSA

SCOPE OF WORK:

TZANEEN DEPOT

SUPPLY AND INSTALLATION

OF A STANDBY GENERATOR

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1. SCOPE OF SUPPLY

1.1. General

PetroSA is seeking to appoint a sufficiently experienced service provider for the project management for the supply, transportation, rigging, installation, testing and commissioning of a standby generator, inclusive of all civil, structural, electrical and mechanical works required at the PetroSA Fuel Depot located in Tzaneen.

The minimum equipment requirements are outlined, but do not cover all the details of design and construction. Such details are recognised as being the exclusive responsibility of the Supplier.

1.2. Details of the Works

1.2.1. Professional Services

The work to be done shall consist inter alia of the following:

a. Project Management of all Project activities, including Health & Safety for the Project. Only “ACCREDITED PERSONS” shall be permitted to carry out and supervise work. Sub-contracting of the work will be allowed but will remain the responsibility of the appointed Supplier who will be the Project Manager. All work shall be executed and supervised by suitably qualified staff. The Supplier shall at all times have an adequate number of employees available during the construction period to ensure that the work does not delay the construction programme.

b. All work and equipment shall be in accordance with the approved SANS Standards and shall comply with the Occupational Health and Safety Act, No 85 of 1993 and current regulations of all other codes applicable to this work.

c. Detailed design of electrical reticulation for the complete installation of a Standby Generator complying with all Standards, Codes and Regulations. The design must include all mechanical, civil and other ancillary Works as may be needed.

d. The Electrical reticulation design shall be signed off by an ECSA Registered Engineer that can take Professional responsibility for the designs of the works.

e. Issuing of Certificate of Compliance (COC) by an Approved Competent Person for all the electrical works.

f. As-built drawings & handover documentation indicating all relevant information as installed.

g. Application and approval for the connecting of the Standby Generator as required by the Local Supply Authority, including of all fees payable.

h. Provide suitable training to PetroSA operator and maintenance personnel (mechanical and electrical).

i. Compile Operation & Maintenance manuals for all the installed equipment. Supply 3 paper base copies and 1 electronic copy.

1.2.2. Standby Generator Set

The work to be done shall consist inter alia of the following:

a. It is the responsibility of the tenderer to verify the information on site to ensure that the design of the set is adequate for the required load.

b. It is the responsibility of the tenderer to verify the information on site to ensure that the final location of the generator meets the following criteria:

- The generator must have at least one metre (1m) minimum clearance distance from any structure, windows, doors or any wall openings and the orientation of the engine exhaust shall direct fumes away from any vents and building openings,
- ease of access to the generator for re-fuelling, maintenance and repairs
- the maximum allowed noise level of the generator when operating at full load is in compliance with SANS 101030.
- The generator shall be located within a non-hazardous classified area.

c. In assessing the Generator to be supplied, the Supplier must ensure that the Generator will meet the specific requirements given the altitude and normal climatic conditions of the geographical area.

d. The final position and orientation of the generator must be approved by the PetroSA representative before commencement of works. An alternative location of the generator set will be considered.

e. Supply, Deliver, Install, Connect, Test, Commission and handover a Three Phase Diesel Generator housed in a weather & soundproof canopy. NOTE: The rating of the mains incomer circuit breaker at the Depots Main Distribution Board located within the MCC room is 125 Amps, 400Volts, 3 Phase.

f. To ensure the batteries are maintained in a good condition until unit is connected, a facility must be provided so that the battery can be charged from an external 220V supply until permanently connected.

1.2.3. Electrical Work

All interruptions of the electrical supply that may be necessary for the execution of the work, will be subject to prior arrangement between the Supplier, Depot Manager and PetroSA's representative

The work to be done shall consist inter alia of the following:

a. The Supplier is responsible to provide cable routes and cabling from main Distribution Board (DB) to the Generator set.

b. The Supplier shall indicate the installation of new and relocation of all existing electrical services on "as-built" drawings that shall be submitted to the Client and supply authority concerned.

c. Circuit breakers, isolators and wiring to be correctly sized as per SANS 10142 wiring regulations.

d. Supply, deliver & install all LV PVC/SWA insulated armoured copper (Cu) cables required for the project. The cabling shall include all terminations, glands & shrouds and the connection to DBs and control panels as may be required.

e. The existing Municipal main incomer cable to be made safe, disconnected and re-routed to the generator change-over panel.

f. Generator output cable to be installed from Generator set to change-over panel.

g. Load cable to be installed from change-over panel to existing Main MCC panel.

h. Auxiliary cables for the control signals, battery charging and crankcase heating between the generator, change-over and MCC panel to be installed.

i. The termination of the incoming mains cable, outgoing feeder cables and control cabling to the generator, the control terminals in the Automatic Mains Failure (AMF) Panel, earthing and all required appurtenances and accessories remains the responsibility of the Supplier. Neutral earthing of the Generator set shall be done in accordance with SANS 10142-1.

j. Cables mounted against walls must be installed on medium duty galvanised cable ladder. Where crossing the floor, the cable must be protected by steel wiring channels or steel conduits.

k. Earth continuity shall be maintained throughout the complete installation.

l. Design, manufacture, supply and install of any additional required Electrical and Control Panels according to the approved design and specifications as required.

m. The electrical works shall be supervised by a full time registered “THREE PHASE ELECTRICIAN”.

n. A Certificate of Compliance must be issued by an accredited person in respect of the electrical installation that ensures that the installation complies with SANS 10142.

o. The Supplier shall arrange, co-ordinate and obtain approval to connect the standby generator to the existing supply network in accordance with the standards of the Local Supply Authority and the contractual design drawings.

p. The Supplier shall comply with and is encouraged to take steps to ensure the use of the most recent editions of the documents listed below:

- SANS 10142-1 The wiring of premises Part 1 Low Voltage Installations
- Occupational Health and Safety Act, 1993 (Act 85 of 1993)
- Relevant Municipal Electricity Supply and other Bylaws, as applicable
- Municipal Electricity supply agreements / conditions with individual customers, as applicable

1.2.4. Civil works:

The generator foundation area to be constructed within an existing “shed” and surrounded by a wire mesh fence. All works require to prep the area will be part of the tenderer’s responsibility.

The work to be done shall inter alia consist of the following:

Concrete Foundation

a. Design, supply and construct a reinforced concrete foundation for the Standby Generator inclusive of all activities. (e.g. excavation, compaction, concrete placement, finishing, etc.). Detail of foundation, openings, etc. required for the proper installation of the Generator set must be supplied with the tender.
b. The foundation shall have a 28-day compressive strength of at least 20MPa.
c. The foundation shall be designed with a bund wall and suitable drain facility to prevent environmental contamination in case of a diesel or oil spill.
d. The foundation shall extend at least 300mm beyond the base support at all sides.
e. Final placement of the generator set shall make provision for access for repairs & maintenance of the plant as well as for re-fuelling. One (1) meter of space around the generator is required for maintenance.
f. Supply and install all signage as required to comply with OHS regulations, etc. This item is inclusive for all the installations eg. Stand-by Generator, Distribution Boards (DB), Control Panels, etc.

Cable Trenching

g. Underground cables shall be buried with a minimum cover of 0,7m. The underground installation of cables includes trenching, bedding, warning tape, backfilling and compaction (93% for clay material; 98% for sandy material: Mod ASSHTO).
h. Reinstate paved and road surfaces complete with all courses and curbing that intersect a trench. All courses must be properly compacted.

Fencing

i. The Supplier will be responsible for the supply and installation of a 1.8m high galvanised wire mesh fence surrounding the generator complete with 1.8m wide lockable double gate and all required mounting hardware and posts.

General

j. All building work and making good to any building, paving, road and any other components damaged and/or altered during the installation and commissioning of the generator sets.

2. CONSTRUCTION PROGRAMME

2.1. General

a. The submission of a construction programme is compulsory. Before any work is to be commenced on the site, the Supplier must submit a detailed project programme for the construction of the Works to the PetroSA representative for approval.

b. The programme must consist of a detailed schedule or block diagram covering all aspects of the Works and the planned time thereof must, with the Contract Period as time basis, be shown.

c. The Tenderer is required to state the time in which they are prepared to undertake and complete the works.

d. The following details must be stated:

- The quantity of work applicable to each bar item as well as the rate at which the work will be completed.
- A budget of the value of completed work, month by month, for the full contract period.
- The critical path.

e. The programme shall be kept up to date. If a Supplier fails to maintain progress in terms of the programme, he shall produce a revised programme showing the modifications to the original programme necessary to ensure completion of the Works before the Due Completion Date.

f. The approval of any programme by the PetroSA representative shall have no contractual significance, other than satisfying the PetroSA representative that the Work is carried out according to such programme and that the Supplier undertakes to carry out the work in accordance with the programme. The PetroSA representative will have the right to instruct the Supplier to revise the programme if necessitated by circumstances.

3. TECHNICAL SPECIFICATIONS

The Supplier must motivate the best engineered solution, considering the quality, longevity, local backup, initial capital and lowest running cost (including normal consumables).

3.1. General Features

This specification calls for the supply and delivery, installation, commissioning of a containerized weather and soundproof 400V four wire 3 phase and neutral 100 KVA Prime rated diesel engine driven Standby Generator complete with Automatic Changeover Control Panel.

Generator set and all ancillary equipment shall consist of the following main components:

3.1.1 Containerized and sound proofed prime rated diesel engine and alternator operating in an ambient temperature of 30°C DB with a prime rated generating capacity of 100 kVA into a load with a power factor of 0.8 at an altitude of 700 meters above mean sea level.

3.1.2 Automatic mains failure starting system and automatic load transfer switch (change over switch) rated at least 20% more than the base load and capable of switching under full load conditions. The changeover switch must also be fitted with a by-pass switch to allow for the servicing of the generator. The fault current capability of the change-over switch shall match the maximum possible fault current capability of the mains supply and generator set.

3.1.3 Water and dust proof enclosure complete with heavy duty skid, air inlet and outlet acoustic louvers, diesel tank inside the enclosure, large enough for a diesel supply to run the generating unit under full load for at least eight (8) hours, separate internal electrical control panel and all other requirements specified elsewhere.

3.1.4 Starting batteries and automatic charging system.

3.1.5 Fuel system with fuel pump(s), fuel filters, fuel tank vent with dust filter and desiccant drier, moisture traps, high and low level indication and alarms, electronic fuel level indicator, moisture removal system and fuse- able link fuel cut off and engine stop system.

3.1.6 Automatic engine speed governor with an over speed cut off system.

3.1.7 Engine exhaust system complete with silencer, flexible coupling, thermal lagging with rain protector and water trap to prevent rain water entering manifold during periods of non-use.

3.1.8 Electronic controller, monitoring and logging system complete with LCD display, data/gsm modem interface, programmable messaging, analogue, digital and no voltage inputs and outputs, non-volatile memory, real time clock and the facility to upload and download event logs, monitored parameters such as temperature, speed, voltage per phase and current per phase.

3.1.9 Monitoring and interface software and interface cable with all interface modules to download parameters and monitor the machine performance and parameters from the electronic controller.

3.1.10 All internal power and control cabling from generator to and from main control panel inside the enclosure with circuit breakers and protection to SANS 10142. All main isolators, circuit breakers, bypass switch and automatic change over switch shall be pre-wired to terminals capable of accepting at least 95mm2 cable. The gland plates and all bracketing shall be galvanized.

3.1.11 Anti-vibration mountings on engine and generator.

3.1.12 Complete engine cooling system including anti-freeze and corrosion inhibitor. The radiator and cooling system shall be tropicalized.

3.1.13 All cabling and control cabling to connect the automatic motorized change over switch to generator and the main incoming electrical supply and the main supply to the building.

3.1.14 Generator design and construction detail drawings and full electrical control diagrams and manuals.

3.1.15 Two sets of maintenance and operating manuals, parts lists, manufacturers data sheets, maintenance schedules and list of recommended spares for all equipment.

3.1.16 All test certificates, compliance certificates and local authority approvals.

3.1.17 All other items and requirements, whether specifically mentioned or not, for a complete, functional and safe packaged Standby generator set complying with all the relevant codes and specifications.

3.1.18 All safety notices and safety equipment.

3.1.19 Noise control systems/insulation to limit the noise level to 60 dBA as measured in a free field 3 meters away from any surface of the generator set.

3.1.20 An off-site full load test complete with recorded performance parameters for 100% and 50% up and down-load steps.

3.2. 3-PHASE ALTERNATOR

3.2.1. The alternator shall be brushless, self-exiting and with self-regulating voltage control. The alternator shall conform to the requirements of BS 5000 (IEC 34-1)

3.2.2. The insulation class shall be at least H and the temperature rise shall be limited to 15% below the maximum as set in BS 5000 for the rotor and stator windings.

3.2.3. The alternator shall be prime rated and be capable of delivering an output at 110% of the specified output.

3.2.4. The rotor and stator windings shall be tropicalized and treated with oil and fuel resistant varnish. The windings shall be adequately braced and secured to prevent movement during the application of sudden maximum and/or overload. The bracing shall however allow for movement during thermal expansion.

3.2.5. The alternator output shall comply with the following:

Frequency: 50 ± 1 Hz

Voltage: 380/400V ± 5% 3 phase and neutral during all load conditions, power factor from 0.8 lagging to 1 and 4.5% speed variation during transient switching between no load and full load.

Deviation factor of voltage wave form: 2%

Alternator Cooling: Built in fan cooled with filter

3.2.6. Alternator exciting system shall be such that recovery to within 5% of specified voltage can be achieved within 250ms during transient conditions. This includes sudden load changes from zero to 110% full load with a power factor of 0.8

3.2.7. Transient voltage dips shall not exceed 5% of the specified voltage.

3.2.8. The alternator shall be spigot mounted onto the engine and the shafts shall be connected with a shaft coupling working on the principle of rubber elements and interlocking cast steel blades. The coupling shall reduce the peak stresses in the shafts and torque shall be transmitted by compressing rubber elements. The rubber elements shall be oil and fuel resistant and capable of operating at the high temperatures present. The coupling shall be sized to withstand overload conditions and have a minimum life expectancy of 10 years.

3.3. ENGINE

3.3.1. The engine must be of the atomised injection, compression ignition type, running at a speed not exceeding 1500 rpm. The engine must be amply **rated** for the required electrical output of the set, when running under the site conditions. The starting period for either manual or automatic switching-on until the taking over by the generating set, in one step of a load equal to the **specified** site electrical output, shall not exceed 15 seconds.

3.3.2. The set shall be capable of delivering the specified output continuously under the site conditions, without overheating. The engine shall be capable of delivering an output of 110 % of the specified output for one hour in any period of 12 hours consecutive running in accordance with BS 5514.

3.3.3. The engine shall be fitted with a battery-operated starter motor and be easily started from cold, without the use of any special ignition devices under summer as well as winter conditions. Irrespective of the type of engine, an automatically controlled electrical heating system shall be installed to maintain the engine at min. 40 °C

3.3.4. Bidders must state what arrangements are provided to ensure easy starting in cold weather. Full details of this equipment must be submitted. In the case of water-cooled engines, any electrical heaters shall be thermostatically controlled. The electrical circuit for such heaters shall be taken from the control panel and must be protected by a suitable circuit breaker and over temperature safety thermostat.

3.3.5. The set must be supplied with fully charged lead-acid type battery(ies), complete with necessary electrolyte. The battery must have sufficient capacity to provide the starting torque stipulated by the engine makers. The battery capacity shall not be less than 120 Ah and shall be capable of providing three 45 second consecutive start attempts from cold and thereafter a fourth attempt under manual control of not less than 45 seconds duration each. The battery must be of the heavy duty “low maintenance” type, housed in a suitable battery box that cannot corrode. The starting system shall however only initiate two single-start attempt of 45 seconds

after which the non-starting alarm shall be activated. The system must be manually reset in order to initiate another start attempt. The three start attempts described above is only for determining the battery capacity. The battery cable sizes shall be such that the starter motor short circuit current can be carried for at least five minutes. The battery charger shall be capable of charging at a rate of at least 8 Amps, shall be the "intelligent" type and shall be able to charge the battery from flat to fully charged in eight hours. The charger shall be such that over charging and electrolyte boiling cannot take place. The charger and starting controls shall be such that the charger is disconnected during the cranking cycle or that the starting current will not come from the charger circuit.

To ensure the batteries are maintained in a good condition until unit is connected, a facility must be provided so that the battery can be charged from an external 220V supply until permanently connected.

3.3.6. The engine may be either of the air or water-cooled type. In the case of water-cooling, a built-on heavy duty, tropical type pressurized radiator must be fitted. The radiator shall be fitted with an expansion tank adequately sized to prevent any loss of coolant. The radiator fins, tubes and tanks shall be from copper and shall be treated against corrosion.

3.3.7. For either method of cooling, protection must be provided against running at excessive temperatures. The operation of this protective device must give a visual and audible indication on the control panel. Water- cooled engines shall in addition be fitted with a low water cut-out switch, installed in the radiator, to switch the set off in the event of a loss of coolant. The protection shall operate in the same way as the other cut-outs (eg. low oil pressure). All air ducts for the cooling of the engine are to be allowed for. Ducts to be from galvanized sheet steel and painted.

3.3.8. The radiator shall be fitted with an easily accessible drain point and shall be so positioned that fan belt and water pump maintenance can be carried out without the requirement of major dismantling procedures.

3.3.9. Lubrication of the main bearings and other important moving parts shall be by an engine driven forced feed system. An automatic low oil pressure cut-out must be fitted, operating the stop solenoid on the engine and giving a visible and audible indication on the switchboard. If it is an air-cooled engine, it shall be fitted with a crankcase heater to prevent condensation. The heaters shall be complete with over current and over temperature protection. On a water-cooled engine, the coolant shall be kept at min. 40deg.C and shall be circulated through the engine.

3.3.10. The fuel pumps, engine and fuel injection equipment shall be suitable for operation with the commercial brands diesel fuel normally available in South Africa.

The tanks to be fitted with either a sight glass or dial indicator and a low level, switch for stopping the appropriate Generator and creating the appropriate alarm.

3.3.11. A manual pump with sufficient length of oil resistant hose to reach 3m beyond the surrounding generator perimeter fence shall be supplied, for filling the fuel tank.

3.3.12. It is essential to keep the noise level as low as possible. The noise levels shall be in compliance with **SANS 101030**. An effective exhaust silencing system of the residential type must be provided.

The exhaust pipe shall be installed in such a way that the exhaust fumes will not cause discomfort to the public and/or users of the building.

The exhaust pipe discharge outlet must point away from the Security building and at a suitable height to prevent exhaust fumes from entering the Security and Surrounding Buildings.

The exhaust pipe must be flexibly connected to the engine to take up vibrations transmitted from the engine, which may cause breakage. The exhaust piping and silencer shall be lagged to reduce the heat and noise transmission and shall be protected against the ingress of driving rain at 45° to the horizontal.

3.3.13. The engine and generator shall be mounted on anti-vibration mountings to prevent any vibration transmission to the structure. The engine/generator combination shall be such that no critical speeds exist from zero RPM to Maximum RPM plus 50%.

3.3.14. The engine must be supplied complete with all accessories, air and oil filters, the first fill of all lubricating oils, anti-freeze and corrosion inhibitors etc.

3.3.15. All trip conditions must be displayed on the locally mounted HMI.

A trip condition will generate a local alarm which can be acknowledged on the HMI.

Local alarm to be wired to a siren and flashing light for audible and visual notification of fault conditions.

Each Trip Condition can be reset when the fault condition has been cleared.

Provision must be made for the ease of incorporation of a cell phone modem for remote alarm signaling.

3.4. Enclosure

3.4.1. The diesel generating set and associated equipment including the control panel shall be mounted inside a Complete lockable, Weather resistant, sound attenuated skid based enclosure suitable for outdoor use.

3.4.2. The electrical and control panels shall be mounted inside the enclosure and shall be mounted on anti-vibration mountings. Additional enclosure doors shall protect the electrical and control panels from dust and rain.

3.4.3. The enclosure shall be fitted with either a single lifting eye or four corner mounted lifting eyes from which the complete system with generator, engine, control panels fuel and appurtenances can be lifted by a crane truck. The single lifting eye shall be positioned such that the complete system centre of gravity is below the lifting eye. A capability certificate for the complete structure shall be provided. The corner mounted lifting eyes shall be adequately braced to allow for the horizontal forces caused by a sling angle of 30 degrees. Sling limitations must be clearly marked on the container at each lifting eye.

3.4.4. All air inlets and outlets shall be attenuated to the extent that the free field noise level does not exceed 60 dBA when measured 3m from any surface of the enclosure.

3.4.5. The Contractor must select a suitable site for mounting the Automatic Changeover Switch, which must be contained in a lockable and weatherproof enclosure.

3.5. Exhaust System

An effective exhaust silencing system of the residential type must be provided.

As the generator will be housed indoors the contractor shall safely extent the engine exhaust to the outside of the building for dispersing of exhaust fumes away from people. The system shall be so installed to minimise backpressure on the engine.

Flexible, seamless corrugated exhaust piping shall be connected to the engine exhaust outlet to allow for thermal expansion and generator set movement.
The horizontal run of the exhaust pipe shall be sloped downwards, away from the engine, to a condensate trap before turning vertical.

The exhaust pipe shall be installed in such a way that the exhaust fumes will not cause discomfort to the public and/or users of the building as well as surrounding buildings.

A rain cap shall be fitted to the vertical exhaust outlet to prevent rain from entering the system. The exhaust pipe discharge outlet must point away from surrounding buildings and at a suitable height to prevent exhaust fumes from entering any surrounding buildings.

The exhaust pipe must be flexibly connected to the engine to take up vibrations transmitted from the engine, which may cause breakage. The exhaust piping and silencer shall be lagged to reduce the heat and noise transmission and shall be protected against the ingress of driving rain at 45° to the horizontal.

4. TESTING & COMMISSIONING

The Supplier shall make allowance in his tender for the complete testing and commissioning of the installation.

The PetroSA Project Engineer reserves the right to attend or not to attend any of the inspections, tests or commissioning. Whether the Depot Manager or PetroSA Project Engineer attends these or not, written reports and test results shall be submitted to the PetroSA Project Engineer.

All labour, power, fuel, dummy loads and all instruments and appliances that may be required for the tests and commissioning shall be provided by the Supplier at the Supplier’s own expense that forms part of the total tendered amount.

The Supplier shall make allowance in his tender for the supply of all instruments, materials and tests which will be required for the commissioning.

The work specified in this document shall not be considered to have been completed until the installation inspectors of the responsible authorities have issued a clearance certificate for the electrical installation.

All test certificates are to be countersigned by the PetroSA Project Engineer as "witnessed" or "accepted" or "seen".

Handover of the certificates and records is a prerequisite for handover of the installation.

With Final Acceptance, the Electrical Supplier shall accept in writing the responsibility for the total installation as installed by the service provider, certifying the correctness of the installation in accordance with and on the certificates of Compliance of electrical works.

After completion of the works and before first delivery is taken, a full test (including a full load test) will be carried out on the installation for a period of 30 days, normal daily operation per day thereof, to determine the satisfactory working thereof.

During this period the installations will be inspected and the Supplier shall make good, to the satisfaction of the PetroSA Project Engineer, any defects which may arise.

Should any part of the installation fail during a test or should the equipment in the opinion of the PetroSA Project Engineer not meet with the requirements, the Supplier shall replace, repair or correct such equipment at his expense, to the satisfaction of the PetroSA Project Engineer.

The Supplier must perform the following tests which must be witnessed and signed off by the PetroSA Project Engineer and / or designated representative.

- Full Load Testing
- Site functional Testing in the Auto and Manual modes

5. WARRANTY

Guarantee Period: One year or 1000 hours whichever comes first.

The Supplier is to guarantee all the equipment and workmanship for a period of twelve (12) months against any defects (latent or obvious), non-conformance and/or failure from date of machine being connected and commissioned. (It is anticipated that the unit will be commissioned within 3 months after delivery)

Any such defects and/or failure that may occur or become evident during the twelve-month guarantee period shall be rectified within twenty four (24) hours after being notified of the occurrence of the defect.

In the event that such failure and/or defect constitute a threat to the health and safety of the user and/or occupants, the Supplier shall take immediate steps to rectify the fault. Any faulty item that becomes evident during the guarantee period shall be replaced with new and not repaired.

The Supplier shall also submit to the PetroSA Project Engineer AND the management at the Tzaneen Depot a full report describing the nature of failure, cause of failure and possible methods to prevent failure in the future.

In the event that the Supplier does not attend to such defects after being notified, PetroSA reserves the right to effect the rectification of the defect and recover the costs thus incurred from the Supplier.

6. SERVICE AND MAINTENANCE

6.1. Service & Commissioning Spares

Supplier to provide commissioning and running SPIR (**Spare Parts list and Interchangeability Record)** list with component prices.

6.2. Maintenance Agreement

The Supplier is requested to submit a cost proposal to enlist the services of Qualified Service Providers to maintain, service and repair initially for a period of twelve (12) months with a possible yearly renewal including 24/7/365 on-call repairs services in cases of unpredictable breakdowns

The Supplier must provide full cost of this maintenance agreement in the tender price, inclusive of all labour, transport, and other costs to perform a complete service.

An outline of the maintenance schedule and inspections frequency shall be provided as part of the tender documentation.

The Manufacturers maintenance recommendations should be followed and supersede recommendations in the basic generic scope.

Details of the services to be provided by the Supplier will include, but shall not be limited to, the tasks as outlined below:

- Annual, Monthly, Quarterly inspections, service, visits and tests
- Supply and install all filters, oil and antifreeze required at intervals or point of service
- Supply and install all piping, trunking, and other wear-and-tear minor replacements
- All top-up fluids needed excluding diesel or fuel.
- 24/7/365 on-call for urgent repairs comprising 2 contactable immediate personnel and 1 contactable for escalations.
- Replacement Spares and Emergency major part replacements would be subject to submitting (3) written quotes for client concurrence. Emergency diesel refill would be subject to client concurrence.

Acceptance of the tender shall not bind PetroSA to accept the Maintenance Agreement.

7. TRAINING

After completion of the installation and when the plant has been commissioned, the Supplier will be required to train a PetroSA operator to be fully conversant with the equipment and the handling thereof.

On completion of training the Operations Supervisor should, as a minimum but not limited, be able to do the following:

- startup, shutdown and run the generator in manual and auto mode.
- general fault finding, alarm acceptance and resetting.
- general maintenance inspection and re-fueling of the Generator

8. SITE INFORMATION

8.1. General

The Standby Generator is intended for use at the PetroSA Fuel Depot located within the Limpopo Province of South Africa, 5 Koedoe Street, Industrial Sites, Tzaneen.

The site is an operative fuel depot facility where offloading, loading and storage of fuels take place.

All works must be carried out by the Supplier in a manner that protects all occupants on site in respect of all health and safety.

Access into and out of the site shall be subject to security control. All access arrangements must be cleared by the Depot Manager.

8.2. Working Hours

Normal working hours are as follows:

- Monday to Friday: 08h00 to 17h00
- Saturday and Sunday: Normal day off

8.3. Safety Equipment and Apparel

The Supplier shall ensure that all its personnel engaged in the performance of the services are provided as a minimum with the following safety equipment/apparel in good condition:

- Steel capped Safety boots
- Fire retardant clothing with reflective strips
- Hard hat
- Safety glasses
- Gloves where required

The Supplier shall supply any additional safety equipment/apparel required for the safe execution of the services.

All safety equipment/apparel to bear the SABS mark and be approved by the PetroSA Safety Department.

8.4. Induction To Safety, Health And Environmental Policy

All the employees of the Supplier must attend an induction to the Safety, Health, Environmental and other practical safety policies of PetroSA at the Depot.

All employees and the Supplier will be subjected to breathalyzer tests each time on entering the premises of PetroSA.

8.5. Work Permits

No work on site will be performed unless a Work Permit has been issued by the Depot Manager or Operation Supervisor.

The Main Suppliers appointed supervisor will be required to undergo Permit to Work training.

9. SITE ESTABLISHMENT

9.1. Office Facilities for the Supplier

If a site office for the Supplier and personnel is required, the details of the Site Offices must be included in the bill of quantities.

The Supplier is responsible to provide suitable mess facilities for his personnel and labourers, if required. If the Client can make any specific site available to the Supplier, such site will be pointed out to the Supplier.

The chosen site shall be subject to the approval of the PetroSA Depot Manager.

Possible locations for a site office and mess area shall be pointed out at the Site inspection. The Supplier shall conform to all local authority, environmental and industrial regulations.

9.2. Supervisory Staff and Identification

All work done on site shall at all times be under the direct and fulltime supervision of a contract manager. Full particulars of the site organisation, complete with names of officials the Supplier proposes to allocate to this project, are to be submitted upon construction.

For the duration of this contract the above detailed officials will be permanently assigned to this project and may only be relieved of their duties after prior agreement by the PetroSA Project Engineer.

The Supplier must ensure that all his employees as well as the employees of any sub-contractor/s are able to identify themselves as members of the construction team.

9.3. Ablution and Sanitary Facilities

The Supplier shall erect and maintain on the site proper ablution facilities. The Supplier shall service and maintain the facilities in a clean and hygienic state for the duration of the contract period and on completion of the works it should be removed from the site.

10. LIST OF RETURNABLE DOCUMENTS AND DRAWINGS

10.1. Returnable Schedules required only for Bid Evaluation purposes

A. Covering letter.

B. Company profile clearly stipulating the number of years rendering similar construction/electrical services.

C. Schedule of Bidder's Experience

D. Provide a list of at least two (2) contactable references not older than five years, for similar work provided; Bidder must provide list of previous and current projects with contactable references. The information must include name of project, nature, value, start and end date, contact details.

E. Schedule of Key personnel

- Provide Organogram of Key Personnel
- Provide Resume of Electrical Engineer with a minimum of one (1) years' experience in similar electrical installation services;
- Provide proof of Electrical Engineers registration with the Engineering Council of South Africa as a Professional Engineer.

- Provide detailed CV of a Technician with a minimum of one (1) years' experience in similar electrical installation services;
- Provide proof of the electrician's registration document with Department of Labour (DOL) of Technician;
- Provide Three (3) Phase installation certificate of the Technician;

F. Schedule of Sub-Contractor

- Provide Details of sub-contractor/s; the nature and extent of work

G. Copy of the Workmen's Compensation Registration Certificate

H. Construction Industries Development Board (CIBD) Registration

- Provide a proof of active and valid CIDB registration with 4EP, 4EB or higher CIDB grading.

I. Provide Central Supplier Database Summary Report;

J. BBBEE Status Level Verification Certificate

K. Execution Programme / Program of works

L. Detailed Method Statement.

- The bidder should describe the methods and procedures that will be employed to successfully complete the various activities as identified for the foregoing Execution Programme.

M. Suppliers Safety Plan.

- The Supplier shall submit the Supplier's Health and Safety Plan as required in terms of Regulation 5 of the Occupational Health and Safety Act 1993 Construction Regulations 2003, before commencement of the Works.

N. Maintenance Agreement

- The Supplier is requested to submit a cost proposal to enlist the services of Qualified Service Providers to maintain, service and repair, initially for a period of twelve (12) months with a possible yearly renewal including 24/7/365 on-call repairs services in cases of unpredictable breakdowns

O. Final Summary of Bills of Quantities or a complete Pricing Schedule

10.2. DRAWINGS

10.2.1. General

The Annexed drawings generally show the scope and extent of the proposed work and shall not be held as showing every minute detail of the work to be executed.

The Proposed drawing generally suggest the position of the generator in relation to the MCC room, a suggested cable route or sleeve route but may be influenced by site conditions (landscape, noise levels etc.) and must be established on site, prior to these items being built in.

If there is any discrepancy in or contradiction between drawings and specifications, it shall be referred to the PetroSA Project Engineer in writing for a ruling.

The Supplier should note that approval of drawings and documentation is an approval in principle and in no way absolves the Supplier of his obligations regarding the correctness thereof or of any mishaps resulting from incorrect design, material selection, dimensions on drawings or any other aspect that will influence the efficiency or integrity of the equipment or the installation, fastening down or operating conditions of the equipment.

Any deviations from the scope of work, prescribed standards or specifications shall be highlighted by the Supplier in their proposal.

10.2.2. Drawings with the Tender

The Supplier shall prepare drawings, diagrams, schedules, brochures and other data to illustrate understanding of the scope of work.

These drawings are not regarded as Detail and Construction Drawings.

10.2.3. Detail and Construction Drawings

The Engineering drawings covering the various sections of the installation Works are to be provided by the Supplier upon tender award for approval. The working drawings of the Contract shall, consist of:

- The Electrical Engineer's drawings;
- The Civil Engineer’s drawings;
- The Structural Engineer's drawings, and;
- The Mechanical Engineer's drawings.

The following information, but not limited to, must appear on the drawings:

1. A full detailed plot/plan of the generator set and automatic changeover panel with the arrangement of all necessary equipment, and on which all measurements of the equipment and the construction are indicated;
2. The detailed reticulation and cable routing layout.
3. The detailed general arrangement of the generator on the plinth base;
4. Detail circuit and wiring diagrams
5. Overall schematic diagram
6. The make, ratings, catalogue number of all components proposed (eg. capacity of circuit breakers, fuses, contactors, distribution boards, etc.;

7. The detailed foundation drawings must be provided by the showing the concrete strength and reinforcing requirements together with any holding down bolt details. The Supplier shall perform foundation cube test on the plinths of all structures.

10.2.4. Deliverables required on completion of installation and commissioning:

1. Comprehensive Quality Control/Acceptance Plan complete with test reports, checklists, Factory acceptance certificate.
2. The Supplier to submit "As-built" drawings of all engineering drawings in Bentley Micro station DGN format or alternatively in AutoCAD. PetroSA will issue PetroSA logo drawing templates with drawings numbers.
3. Three copies of full maintenance and operating manuals in file with plastic sleeves format and electronic format shall be provided at delivery.

   The minimum contents of the manuals shall be:

   i) Schematic diagrams, control diagrams and circuits, manufacturer's data sheets, test data, fuel tank test certificate, copy of equipment COC, lifting safety certificate and as build drawings.

   ii) Basic start up, shut down and running procedures.

   iii) Fault check list in flow diagram format

   iv) Controller programming procedure and software.

   v) Routine maintenance plan, full service descriptions and checks to be performed complete with van belt sizes and fuel, oil and air filter details and model numbers/sizes.

   vi) Fill volumes of oil, coolant fuel etc.

   vii) Operating points eg. oil pressure, temperature, engine speed

   viii) List of critical spares and recommended spares to be kept on site complete with names and contact details of suppliers.

   ix) Material Safety Data sheets.

   x) Emergency containment procedure in the event of an oil and/or fuel spill.

   xi) Manufacturers data sheets and equipment brochures including engine and generator parts drawings and lists.

   xii) Engine and generator load test certificates

   xiii) Any other information regarded as pertinent to the installation and operation of the system.

11. DELIVERY AND COMPLETION TIME

The Supplier shall ensure that the generator is commissioned <u>within 3 months</u> after the award of the tender.

The Supplier is to specify in their bid, the optimised duration (lead time) from the date of order for the following:

[1] Lead time from order to ex-works delivery

[2] Lead time from order to delivery to Tzaneen Depot site

[3] Lead time from order to completion of installation

[4] Lead time from order to completion of commissioning.

12. COMMUNICATION

12.1. Tender Enquiries

Any communication with respect to this tender should be directed to the person below:

All Enquiries	
Name:	Nesha Gaca
Email:	nesha.gaca@petrosa.co.za

12.2. Site Visit

The arrangements for the briefing and clarification meeting are as follows:

Location: PetroSA Tzaneen Depot, 5 Koedoe St, Tzaneen, Limpopo

Date: Friday, 26 May 2023

Starting time: 07:30

Suppliers must send an e-mail to the PetroSA Contracts Manager (Nesha Gaca: nesha.gaca@petrosa.co.za to confirm attendance)

13. PRICING / BILL OF QUANTITIES

No payment or reimbursement shall be due by PetroSA to the Supplier unless otherwise specifically provided for in this Agreement.

The Supplier's rates are fully inclusive of all the Supplier's costs and expenses for rendering the Services pursuant to this Agreement, including protective and safety clothing, mobilisation and demobilisation costs, compliance with laws, including but not limited to, the Supplier's portion of any employee insurance and social security benefits, payroll and income taxes, levies, premiums for insurance and all other contributions and benefits and the costs to the Supplier for its personnel, unless otherwise specifically provided for in this Agreement.

For the purpose of the Bill of Quantities, the following words shall have the meanings hereby assigned to them:

Unit: The unit of measurement for each item of work as defined in the Specifications

Quantity: The number of units of work for each item.

Rate: The agreed payment per unit of measurement.

Amount: The product of the quantity and the agreed rate for an item.

Lump sum: An agreed amount for an item, the extent of which is described in the Bills of Quantities but the quantity of work of which is not measured in any units.

The prices and rates in this Bill of Quantities shall cover all costs and expenses that may be required in and for the execution of the Work described in accordance with the provisions of the Scope of Work, and shall cover the cost of all general risks, liabilities, and obligations, as well as overhead charges and profit. These prices will be used as a basis for assessment of payment for additional Work that may have to be carried out.

Pricing shall include generator delivery and transportation to Tzaneen Depot site.

It will be assumed that prices included in the Bill of Quantities are based on Acts, Ordinances, Regulations, By-laws, International Standards and National Standards that were published 28 days before the closing date for bids.

Where the Scope of Work requires detailed Drawings and designs or other information to be provided, all costs associated therewith are deemed to have been provided for and included in the unit rates and sum amounts priced for such items (all rates should exclude VAT).

An item against which no price is entered will be considered to be covered by the other prices or rates in the Bill of Quantities. A single Lump Sum will apply should a number of items be grouped together for pricing purposes.

The tenderer shall provide a breakdown of the Bill of Quantities under the following Sections:

ITEM NO.	DESCRIPTION
1	Preliminary & General
2	Standby Generator Equipment
3	Cables, Earthing & Termination
4	Cable Supports
5	Civil Requirements
6	Ancillary Equipment
7	Service Maintenance Agreement

14. APPENDIX

APPENDIX A: Proposed Generator Location

APPENDIX B: Returnable Checklist