



INTERNATIONAL COMMITTEE OF THE RED CROSS

Geneva, November 22, 2022

ANNEX 1 – POWER GENERATOR & SPARE PARTS SPECIFICATIONS

1. INCOTERMS:

- FCA Manufacturing Plant

2. Technical conditions for the provision of generators voltage 380/220 Volts, diesel engine, built to order:

- 2.1 Maximum relative humidity 100%
- 2.2 Maximum ambient temperature 60°C
- 2.3 Minimum ambient temperature -10°C

3. Generators Set Specifications:

- 3.1 Must be brand new, not rebuilt nor refreshed
- 3.2 The bidder must submit catalogues and data sheet along with his technical offer
- 3.3 Nominal Voltage 380/220 for Africa, Middle East or as requested for other countries
- 3.4 Nominal frequency is 50Hz
- 3.5 Nominal power factor is 0.8
- 3.6 Governed engine speed is 1'500 rpm
- 3.7 Precision mechanical (static and dynamic) balancing for both engine and alternator shall be performed at the assembling company or manufacturing company according to the relevant below international standards
- 3.8 Capable of withstanding +10% of the nominal load for one hour every 12 continuous working hours
- 3.9 Should be compatible with below standards or its **updates versions**:

- 1. ISO 3046: Reciprocating Internal Construction Engines, Performance
- 2. ISO 8528: Reciprocating Internal Combustion Engine Driven Alternating Current Generating Sets
- 3. ISO 12100: Safety of machinery
- 4. ISO 13857: Safety distances to prevent hazard zones being reached by upper and lower limbs
- 5. CEI 60204-1: Machine safety for electrical equipment
- 6. CEI 61000-6-3: Limitation of voltage variations, voltage fluctuations and flicker in public low-voltage power supply systems. Emission standard for environments residential, commercial and light industry.

4. Soundproof Canopy Specification IP44:

Please to offer 2 sound level:

- 4.1 The sound level for all power generators should not exceed 58.0 dBA at seven meters
- 4.2 The sound level for all power generators should not exceed 70.0 dBA at seven meters
Sound level certificate is mandatory to provide as an example for this tender.
- 4.3 It can be installed at open lawns and rooftops

- 4.4 Avoid the transfer of vibration from generator to enclosure and surrounding with the help of specially designed internal and external anti vibration pads
- 4.5 Ecological base tank for liquid recovery
- 4.6 Fork pockets for easy handling with a forklift

- 4.7 Body made from steel components treated for anticorrosion according to standard ISO 9227 with two coats of primary and secondary color
- 4.8 Stainless steel locks and hinges
- 4.9 Engine exhaust outlet
- 4.10 Air intake baffle
- 4.11 Air outlet baffle
- 4.12 Large doors on each side allowing 180 degree opening rotation for access for maintenance
- 4.13 Doors with locks and keys
- 4.14 A metal nameplate should be mounted on the canopy mentioning the serial number and the model type of the generator, canopy, diesel engine, and the alternator

- 4.15 Battery should be fixed to the frame of the generator
- 4.16 Four eye hook on each side, 1 centered for 100 kva or less allowing easy crane loading
- 4.17 The canopy should include a window to observe the parameters on the control panels without opening the door
- 4.18 Small access hole to throw cables through for monitoring and testing
- 4.19 Prime and stand by power should be indicated in the exterior of the canopy.

- 4.20 Lube oil and cooling water drains piped to exterior of the enclosure
- 4.21 Exhaust silencing system inside canopy for operator safety
- 4.22 Fuel fill and battery can only be reached via lockable access doors
- 4.23- Emergency push button should be mounted outside the canopy
- 4.24 Temperature difference between outside the canopy and air inlet at radiator should be below 7 degrees. This parameter is basic in avoiding overheat and efficiency loss in high temperature areas.

5. Diesel Engine Specifications:

- 5.1 Must be brand new, built to order and must be equipped with Perkins or another engine brand such as Iveco, Baoudoin engine. The bidder must submit catalogues to clarify the manufacturer plan / brand along with its technical offer.
- 5.2 Operates on the standard local fuel with the following specifications:
 - Sp.gr @ 15C° 0.820-0.870
 - Flash point C° min 55
 - Sulfur Max 0.50 % wt

- 5.3 Capable of withstanding +10% of the nominal load for one hour every 12 continuous working hours
- 5.4 All parts of the engine should be genuine brand of engine

6. Engine Starter System:

- 6.1 Electrical starting system
- 6.2 Engine driven battery-charging system

7. Engine Cooling System:

- 7.1 Reinforced Water cooled (tropical radiator)
- 7.2 Water level sensor connected to the control panel

8. Exhaust System:

- 8.1 The exhaust pipes shall be made from thermal painted or galvanized steel, thermal isolated, suitable thickness, flexible connections and shall provide with exhaust silencer.

- 8.2 Anticorrosion

9. Lubrication System:

Forced lubrication system using a mechanical oil pump. The lubrication system shall include the following items:

- 9.1 Pressure and temperature measurements
- 9.2 Oil drain valve to use for changeover oil
- 9.3 Oil level dipstick
- 9.4 Oil cooling heat exchanger
- 9.5 Oil sump with extended drainage valve and filters

10. Fuel Providing System:

- 10.1 The fuel should provide to the engine 8 hours of operation by using the daily fuel tank that is installed in the frame of the canopy
- 10.2 Operates on the standard diesel fuel
- 10.3 Tank capacity in liters should be painted visible
- 10.4 Mechanical fuel level gauge with fuel level sensor connected to control panel
- 10.5 Engine should include all required filters/pre-filter such as fuel filter, internal water separator (or second fuel filter)
- 10.6 External fuel water separator, with filter and heater (individually priced as an option)
- 10.7 Fuel tank drain to be connected to the outside inspection hole
- 10.8 Vent to be connected to the outside
- 10.9 Fuel filling from the outside

11. Charged System:

- 11.1 Mounted air filter and turbocharger

12. Engine Rotation Speed Displays:

- 12.1 For generators the engine should be provided with RPM display (with electronic governor – speed control) to adjust the rotation speed between loads-no load operation
- 12.2 The display must be of a well-known internationally branded in this regard

13. Flywheel:

High inertia balanced flywheel

14. Alternator:

- 14.1 Must be new, not rebuilt nor refreshed. Stamford, Leroy Somer Mecc Alte or alternative brand with clear indication of make, model and year of manufacturing. The bidder must submit catalogues to clarify the manufacturer/brand along with his technical offer.
- 14.2 Three phase with neutral, 380/220V, 50Hz
- 14.3 Power factor not less than 80%
- 14.4 Class H insulation or more (tropical)
- 14.5 Voltage regulator around 2.5% between load-no load operation
- 14.6 Automated self-excitation
- 14.7 Alternator and engine are directly coupled, and the coupling shall be protected
- 14.8 Enclosure protection not less than IP23
- 14.9 Automated self-ventilation
- 14.10 Capable of withstanding +10% of the nominal load for one hour every 12 continuous working hours
- 14.11 The starting kVA should be specified for the alternator at 10,20,30% of voltage drop

15. Alternator Protection:

The alternator should provide with the following system protection:

- 15.1 Increase and decrease voltage protection
- 15.2 Low frequency and high frequency protection

16. Gathering:

Alternator and engine are directly coupled

17. Battery, Cabling and Circuit breaker:

- 17.1 The battery should be type for sizes of the engine can be lead acid
- 17.2 Extra battery charger to keep the battery fully charged when the generator standby (optional)
- 17.3 The circuit breaker should be 4 poles sized (upgrade individually priced to handle 110% of the rated current of alternator)
- 17.4 Ground cable same size than other cables from alternator to circuit breaker
- 17.5 Grounding of all elements in the generator to a point where ground connection will have to be performed
- 17.6 An earth bus bar should be provided within the generator base; alternator and control panel should be connected with appropriate equipotential bonding cables to the earth bus bar
- 17.7 The control panel should be earthed. Control panel door should be provided with an equipotential earth wire connection.
- 17.8 Cable sizes should be as per BS 7671 or IEC 60364

18. Control Panel:

The electrical panel shall include at least the following:

- 18.1 Measurement amperes per phase
- 18.2 Temperature measurement
- 18.3 Actual power measurement
- 18.4 Power factor measurement
- 18.5 Oil pressure measurement
- 18.6 Indication lights
- 18.7 Volt measurement
- 18.8 Frequency measurement
- 18.9 The following Buttons operated:
 - Test button for indication lights to clarify Indication at the malfunction screen
 - Omitted button, to remove the malfunction name from the malfunction screen

Switch off button for the sound alarm

Switch on/off button for the generator set

Emergency stop

19. Diesel Engine Protection:

- 19.1 High water temperature protection (sound and light alarm with identification sticker) then shut off and stop engine operate with clarify clear indication at the malfunction screen. Protection should disconnect load first and then stop engine.
- 19.2 Low water level protection (sound and light alarm with identification sticker) then shut off and stop engine operate with clarify clear indication at the malfunction screen. Protection should disconnect load first and then stop engine.
- 19.3 Low lubrication oil pressure protection (sound and light alarm with identification sticker) then shut off and

stop engine operate with clarify clear indication at the malfunction screen.

20. Spare Parts, Switches and Manuals:

- 20.1 Recommended spare parts and changeover switches will be requested separately from the offer

21. Diagnostic tool

21.1 On request, Supplier will provide ICRC with the offer for diagnostic tool for the generator engine and licences renewal.

22. DOCUMENTATION:

For tendering process evaluation by email:

- Gen set brochure
- Engine data sheet
- Engine derating chart (not table)
- Alternator data sheet

Canopy data sheet (part number, dimensions, inlet and outlet dimensions, effect on engine performance, calculated restriction pressure, airflow, differential temperature between radiator inlet

Alternator derating chart or table and ambient temperature, ...). Test level report to be included.

One week prior to generator acceptance test date to be sent to third party inspectors or ICRC offices (and accompanying the generator) by hard copy & CD the above documents plus:

- Serial numbers document: a document to be generated by the supplier including month/year of manufacture, manufacturer, model and serial number for generator, canopy, engine and alternator

Circuit breaker data sheet and trip curve

- Insulation data sheet
- Coolant data sheet
- Oil data sheet
- Operating manual
- Maintenance manual

Preventive maintenance instruction for both prime and emergency source of energy

- Trouble shooting manual
- Wiring diagram
- Illustrated parts catalog for the engine, alternators and canopy
- Calculations of cable sizing as per standards BS 7671 or IEC 60364
- Recommended spare parts list up to 5000 hours of operation
- On demand: diagnostic tool with platform access for specific engines

Mandatory: Certificates of origin for each generator

Mandatory: Certificates of conformity

Generator will not be considered delivered and acceptance test will not be performed until all documentation is accepted by third party inspectors or ICRC

23. Technical Training:

On demand the supplier must be able to train the ICRC Technicians on the following subjects in French and English:

- Instruct how to connect the generator and install the changeover switch
- Utilization of provided Diag Tools
- Find and solve electrical and engine problems related the supplied generators
- Identify the spare parts with the provided parts catalogue

Identify training capacities (localization to regional delegations) and map the worldwide maintenance network