



TERMS OF REFERENCE

for the

**SUPPLY, DELIVERY, INSTALLATION, TESTING, AND COMMISSIONING OF
ONE (1) BRAND NEW UNIT OF 30KVA, 230 V, 60HZ, SINGLE (1) PHASE SILENT
TYPE STANDBY POWER GENERATOR SET WITH 150AT, 230V, SINGLE (1)
PHASE AUTOMATIC TRANSFER SWITCH (ATS).**

I. GENERAL BACKGROUND

The newly constructed Doppler Weather Radar PAGASA Station at Albuquerque, Bohol has a requirement to provide critical power generator equipment in order to support its radar facilities by providing a back-up emergency power in the event of the failure of the commercial power.

II. PROJECT DESCRIPTION

This project description covers the general technical and associated requirements for the supply, delivery, installation, testing & commissioning of one (1) brand new unit of 30kVA, 230 V, 60Hz, SINGLE (1) PHASE SILENT TYPE STANDBY POWER GENERATOR SET WITH 150AT, 230V, SINGLE (1) PHASE AUTOMATIC TRANSFER SWITCH (ATS). at Doppler Weather Radar PAGASA Station at Albuquerque, Bohol completed with power cables, instrumentations, overload protective device, other accessories and tools necessary to meet the safe and reliable operation of the generator set.

III. PROJECT LOCATION

The Standby Power Generator Set including the associated electrical equipment and devices shall be delivered, installed, tested and commissioned at the PAGASA Albuquerque, Bohol Radar Station.

IV. PROJECT DURATION

The work duration or delivery period of the project is One Hundred Twenty (120) calendar days reckoned from the date stated in the Notice of Award.

V. TECHNICAL SPECIFICATIONS

a. Generator Specification Minimum Requirements

Rated Output	31kVA/25kW
Standby Power	35kVA/28kW

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Power Factor	0.8
Rated Voltage	230V
Rated Current	109A
Frequency	60Hz
Engine	Cummins
Model	4B3.9-G2
Fuel Consumption	6.5 L/hr
No. of Cylinders	4L
Displacement	3.9L
Bore/Stroke	102/120mm
Noise	≤96 Db(A)
Exhaust Air Flow	135.6 M3/Min
Compress Air Flow	4.13 M3/Min
Exhaust Gas Flow	9.96 M3/Min
Exhaust Gas Highest Temp	475 Degree
Lub-Oil Pan Capacity	11L Cooling
Water Capacity	28L
Volt for Start	24V
Instrument for Adjusting Speed	Electronically Controlled
Alternator	
Excitation	Brush-Less
Insulation Class	H
Voltage Adjust Range	≥±6%
Protection Class	IP23
Steady State Voltage Regulation	≤±1%
Efficiency	93.9%
Voltage Control	AVR
Dimension (LxWxH)	225 x 108 x 187 cm

b. Power Cables and Terminals

The contractor/supplier shall provide 2 – 60mm² THHN + 1 – wire 22mm² THHN (G), 15m each, completed with terminal lugs and bare copper wire 1 x 2 meters length, cad-welded to grounding rod (20 mm x 3 m).

c. Maintenance Tools

The contractor/supplier shall provide the following set of tools. Complete set of common tools needed for generator set servicing, organized in molded compartment fitted for each tool, composed of the following:

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Handwritten signatures and initials in blue ink, including a large signature at the top right and three smaller initials below it.

- ¼" Square drive sockets, sizes 4, 5, 6, 7, 8, 9, 10, 11, 12, and 13 mm
- ¼" Square drive impact sockets, sizes 8, 9, 10 and 12 mm.
- ¼" Square drive ratchet, spinner handle, 3' extension bar, ¼" H coupler, universal joint,
- ¼" Square drive hex bit sockets sizes, 3, 4, 5, 6, 7 and 8mm.
- ¼" Square drive flat bit socket sizes 4, 5.5 and 6.5 mm.
- ¼" Square drive Phillips bit socket sizes #1, #2 and #3.
- ¼" Square drive Pozidriv bit socket sizes #2 and #3,
- ¼" Square drive Torx bit sockets sizes TT10, TT15, TT20, TT25, TT27, TT30 and TT40.
- 3/8" Square drive sockets, sizes 10, 11, 12, 13, 14, 15, 16, 17, 18, and 19 mm.
- 3/8" Square drive ratchet, 3" extension bar, 6" extension bar, 16 mm and 20mm plug socket, universal joint, 3/8" female to ¼" male adaptor, 8" sliding handle,
- ½" Square drive sockets, sizes 20, 21, 22, 24, 27, and 32 mm.
- ½" Square drive impact sockets, sizes 17,19, 21, and 23mm.
- ½" Square drive ratchet, 5" extension bar, 10" extension bar, universal joint, ½" female to 3/8"
- Adjustable 3-claw oil filter wrench
- Test pen, hex key set, bit set,
- Combination wrenches sizes 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19 mm.
- Socket for air cylinder.

VI. SCOPE OF WORKS

The contractor shall furnish high quality work, materials and equipment, meeting the requirements of this specification and applicable international codes and standards.

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The contractor shall conduct actual inspection of site and make assessment on the physical conditions of the existing equipment, its components/parts, and associated structures i.e. foundations, power/controls cables and associated cable trays/trench including terminal points, control panels and its component parts and determine/verify the extent of the scope of works required for the proper installation and reliable operation of the new generating set and associated equipment.

Generator's Load bank testing at 0%, 30%, 50% and 100% load shall be conducted and witnessed by PAGASA technical staff at contractor's warehouse prior to delivery to PAGASA Field Weather Station.

The scope of work shall cover but not limited to the design, manufacture, supply, delivery, installation, testing and commissioning of diesel generator set and other electrical equipment and accessories to be supervised by licensed professional mechanical and registered electrical engineer, which shall consist of the following:

1. Supply and delivery of the Generator set with AVR & Automatic Transfer Switch (ATS).
2. Retro fitting and/or modification of existing concrete foundation to fit new generator set including anchor/machine bolts and epoxy grouts (if applicable).
3. Installation and positioning of the Generator set & ATS to the existing concrete pad and the designated location.
4. Installation of muffler extension.
5. Installation of hangers and supports.
6. Provide a cable trench & other trench component.
7. Tapping of power cables to Generator's circuit breaker and Automatic Transfer Switch (ATS).
8. Restoration of the affected areas.
9. Testing and commissioning including initial supply of diesel fuel (good for one hour of testing), engine oil lubricant and radiator coolant.
10. Training on-site of the operators on the operation, maintenance and troubleshooting of generator set.

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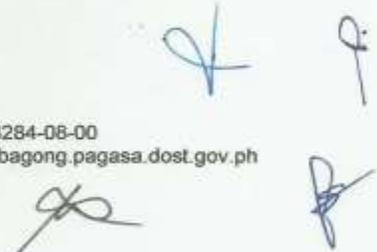
VI. ADDITIONAL REQUIREMENTS

- The contractor/supplier shall submit a valid Distributorship Agreement with the manufacturer of the generator set.
- Generator set Manufacturer should be ISO 9001:2015 and ISO 14001:2015 Certified.
- The contractor/supplier may or may not be an ISO 9001:2015 Certified.
- The contractor/supplier shall provide upon completion of installation and commissioning a Warranty Certificate for two (2) years on all parts and components, free service, repair and/or replacement of defective parts during the warranty period.
- The contractor/supplier shall submit together with the bid a Ghant Chart outlining in detail the schedule of works starting from the date of award of contract up to testing and commissioning of the EGS.
- The contractor/supplier shall submit Electrical as built drawings signed by a licensed professional electrical engineer upon completion of installation and commissioning of the EGS.
- The contractor/supplier shall be responsible in the application of Permit to Operate at DENR including the preparation of the required documents.
- The contractor/supplier shall submit the resume of the following personnel who shall undertake the works.
 - Licensed Mechanical Engineer
 - Licensed Electrical Engineer/Registered Master Electrician
 - Safety Officer
 - Technicians/Helpers
- The contractor/supplier shall submit a certification from the Generator Set Manufacturer as to availability of spare parts for at least 10 years.
- The contractor/supplier must have an Authorized Local (Bohol) Service center or a nearby branch in Visayas area also capable as a Service Center.

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