



Republic of the Philippines

DEPARTMENT OF SCIENCE AND TECHNOLOGY

**Philippine Atmospheric, Geophysical and Astronomical Services
Administration (PAGASA)**

TERMS OF REFERENCE

for the

**SUPPLY, DELIVERY, INSTALLATION, TESTING, AND COMMISSIONING
OF ONE (1) BRAND NEW UNIT OF 50KVA, 120-240 VAC, 60HZ, THREE (3)
PHASE BRUSHLESS STANDBY POWER GENERATOR SET WITH AVR
AND THREE (3) PHASE AUTOMATIC TRANSFER SWITCH (ATS).**

I. GENERAL BACKGROUND

The existing 15 kVA Emergency Generator Set (EGS) at MACTAN CEBU PAGASA STATION COMPLEX is frequently encountered mechanical and electrical troubles, so that it is no longer reliable to provide emergency power during a power outage from the local power supply. The station is also equipped with additional IT equipment, machines and computers used as forecasting tools including additional cooling system such as Air-conditioning unit hence the need for replacement with an EGS brand new unit with a standby power capacity of 50 kVA is needed.

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 50kVA, 120-240 VAC, 60Hz, three (3) phase brushless standby power generator set with AVR and three (3) phase Automatic Transfer Switch (ATS) at MACTAN CEBU PAGASA STATION COMPLEX 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 MACTAN CEBU PAGASA STATION COMPLEX.

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.

"tracking the sky...helping the country"

Science Garden Compound, BIR Road, Brgy. Central, Quezon City,
Metro Manila, Philippines 1100
Postal Address: P.O. Box 3278 Manila

Tel. Nos. (632) 929 48 85; (632) 434 90 40
Fax: (632) 929 48 65
Website: <http://bagong.pagasa.dost.gov.ph>

V. TECHNICAL SPECIFICATIONS

a. Generator Specification Minimum Requirements

<u>ALTERNATOR</u>	
Output rating	45 kVA (Prime) 50 kVA (Standby)
Frequency	60 Hz
Phase	3 Phase, 4 wires
Rated Voltage	120 – 240V
Power factor	0.8 Lagging
Voltage Regulation	Within +/- 1.5%
Excitation	Brushless rotating exciter with Automatic Voltage Regulator (AVR)
Insulation	Class H
<u>ENGINE</u>	
Type	Vertical inline; water cooled; 4 stroke; direct injected
Output rating (kw/rpm)	44/1800
No. of cylinders-bore x stroke (mm)	4 – 108 x 115
Piston displacement	4.214 L
Fuel	ASTM no.2 Diesel
Fuel consumption @ 75% load	7.3 L/h
Lube oil capacity	13 L
Coolant Capacity	18.5 L
Battery capacity	12V-80Ah (2pcs)
Fuel tank capacity	100L
<u>UNIT</u>	
Length	2280 mm
Width	934 mm
Height	1180 mm
Dry weight	1180 mm
<u>SOUND LEVEL</u>	
dB @ 7m	68

FEATURES

- Manual or Automatic starting and stopping capability.
- Digital Controller.
- Direct injection diesel engine for fuel efficiency.
- Brushless rotating field generator with class H insulation.
- NEMA 3R enclosure suitable for outdoor use.
- Integral vibration isolators.
- Silent type generator.

"tracking the sky...helping the country"

b. Power Cables and Terminals

The contractor/supplier shall provide 3 – 38mm² THHN + 1 – wire 22mm² THHN (G), 25m 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:

- 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

"tracking the sky...helping the country"

Science Garden Compound, BIR Road, Brgy. Central, Quezon City,
Metro Manila, Philippines 1100
Postal Address: P.O. Box 3278 Manila

Tel. Nos. (632) 929 48 65; (632) 434 90 40
Fax: (632) 929 48 65
Website: <http://bagong.pagasa.dost.gov.ph>

- 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.

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 sets and other electrical equipment and accessories to be supervised by licensed professional mechanical and licensed professional electrical engineer, which shall consist of the following:

1. Supply and delivery of the Generator set with AVR & Automatic Transfer Switch (ATS).
2. Dismantling and re-location of the existing generator set to the designated storage area within the PAGASA field station.
3. Retro fitting and/or modification of existing concrete foundation to fit new EGS including anchor/machine bolts and epoxy grouts (if applicable).
4. Mounting and alignment of the new EGS to the existing foundation of the new EGS provided with skid and vibration isolators.
5. Provide a cable trench & other trench components.

"tracking the sky...helping the country"

Science Garden Compound, BIR Road, Brgy. Central, Quezon City,
Metro Manila, Philippines 1100
Postal Address: P.O. Box 3278 Manila

Tel. Nos. (632) 929 48 65; (632) 434 90 40
Fax: (632) 929 48 65
Website: <http://bagong.pagasa.dost.gov.ph>

6. Installation and positioning of the Generator set & ATS to the existing concrete pad and the designated location.
7. Tapping of existing power cables to Automatic Transfer Switch (ATS).
8. Testing and commissioning including initial supply of diesel fuel (good for one hour testing), engine oil lubricant and radiator coolant.
9. Training on-site of the operators on the operation, maintenance and trouble shooting of generator set.

VII. 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 should be responsible in the Application for Permit to Operate at DENR.
- 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

"tracking the sky...helping the country"

Science Garden Compound, BIR Road, Brgy. Central, Quezon City,
Metro Manila, Philippines 1100
Postal Address: P.O. Box 3278 Manila

Tel. Nos. (632) 929 48 65; (632) 434 90 40
Fax: (632) 929 48 65
Website: <http://bagong.pagasa.dost.gov.ph>

- 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 (Cebu) Service Center or a Branch in Cebu also capable as a Service Center.

VIII. ABC

Approved Budget of the Contract is PHP 2,200,000.00.