TENDER SPECIFICATION OF MARINE AC DIESEL GENERATOR SETS (165-170 KW) WITH ACCESSORIES

INTRODUCTION

1. For better understanding and to evaluate all the prospective BIDDERS on same platform, the tender specification has been divided into three parts:

   a. **Part-1:** General Information and BIDDER'S Responsibility.

   b. **Part-2:** Operational and Technical Specification.

   c. **Part-3:** General Terms and Conditions.

2. Prospective BIDDERS are to comply with the requirements and terms & conditions mentioned in Part-1, Part-2, and Part-3 of the tender specification. BIDDERS are also to provide performance/ technical data, brochure, specific figures, and information as asked against each condition.

3. Prospective BIDDERs are to submit their offer in two envelopes:

   a. Technical Offer.

   b. Financial Offer.

4. BIDDER shall comply all the terms and conditions of the tender documents as compliance statement by the Bidder under the following tabular format:

Tender Article No	Description of Terms and Conditions (as mentioned in Part-1, Part-2 and Part-3 of the Tender)	Compliance/ Remarks by Principal/ manufacturer (To be agreed/ To be mentioned with detail explanations)

The financial quote is to be submitted separately in foreign currency on FOB basis, but compliance/remarks are to be indicated in the technical offer.

PART I: GENERAL INFORMATION AND BIDDER'S RESPONSIBILITY

5. Bangladesh Navy (BN) plans to procure two complete set of **Marine AC Diesel Generator sets (165-170 KW) with accessories** (herein after called as 'Genset').

6. **Installation Site**. Onboard **BNS GOMATI** at **Mongla Naval Area.**

7. **Site Visit Prior Tender Submission**. Supplier must visit the installation site to estimate installation materials and works involved in installation including **MCR monitoring panel, Synchronizing Panel and Cables** before submission of tender. Moreover, bidder shall have to send application for relevant personnel selected for site visit to BN for security clearance 04 (Four) weeks prior to site visit.

8. **Qualification of Bidder**. Manufacturers of Marine AC Diesel Generator set (165-170 KW) with accessories or their authorized distributor/ agent can submit quotations through their authorized local agent enlisted in DGDP. In case of offer from foreign trading company/ distributor/ agent, certificate of dealership/ agencyship from Original Equipment Manufacturer (OEM) is to be submitted with the offer. In this regard the following certificates are to be submitted with the offer (if not OEM):

a. Authorization Certificate from OEM.

b. Supply Assurance Certificate from OEM.

9. **Compliance Statement**. A compliance statement fulfilling all the requirement of the tender is to be submitted for evaluation of the quotations. Stating mere 'Yes or No' shall not suffice and detailed evidence with description/ information, brochures/ booklet, drawing and diagram as required is to be given. An incomplete compliance statement may attribute to cancellation of the offer. If any clause of this specification does not commensurate with offered item, the deviation is to be spelt out clearly.

10. **Equipment Manufacturer and Reliability/ Requirement**. The newly installed items should be brand new, unused and of recent model, proven reliability in the field of operation. The supplier shall ensure the continuity of the operation and availability of necessary spares for at least 15 years each in case of obsolete model over time.

11. **Condition for Acceptance of Quotation**. The quotation has to have supporting documents (booklets, catalogues, brochures etc) with details about offered equipment/ item. If detailed information regarding specifications, manufacturer's manuals and catalogue for the quoted equipment/ items are not provided the quotation may not be accepted.

12. **Acceptance/ Rejection of Bid**. DGDP/ BN reserves the right to accept or reject any bid or to terminate the bidding process and reject all bids at any time prior to the contract award (without thereby incurring any liability to the BIDDER).

13. **Validity**. The offer is to remain valid till 30 June 2025.

PART- II: OPERATIONAL AND TECHNICAL SPECIFICATION

14. **Name of the Equipment**. Marine AC Diesel Generator sets (165-170KW) with accessories.

15. **Purpose**. The Generator set shall be used to generate main electric power for the ships. The offered Generator set will replace the existing old Generator sets fitted onboard naval ships (BNS GOMATI). The offered Generator should be able to operate:

a. Independently.

b. Continuous parallel within offered genset and existing genset (**Brand/ Model**: Moteurs Baudouin (6M16S) Maine AC Generator, **Manufacturer**: Moteurs Baudouin, France).

c. Parallel load shifting automatically with existing generators (**Brand/ Model**: Paxman (Brush) AC Generator, **Manufacturer**: Brush Electrical Machine Ltd., England)

16. **Quantity**. 01 (One) complete set.

17. **Original Equipment Manufacturer (OEM)**. Name & Full address with telephone number and e-mail of OEM to be mentioned.

18. **Principal/ Supplier/ Bidder**. Name & Full Address with telephone number and e-mail of Principal/ Supplier/ Bidder is to be mentioned.

19. **Local Agent**. Name & Full Address with telephone number and e-mail of Local Agent is to be mentioned.

20. **Year of Manufacturing**. 2024 or later.

21. **Classification Standard**. The Marine AC Diesel Generator set (Prime Mover and Alternator) and associated accessories and items supplied under the scope of the supply are to be designed, constructed/ manufactured and tested up to the requirement of IEEE/ IEC/ ISO/ IMO/ marine internationally recognized classification society. The applicable classification standard(s) of offered items are to be mentioned and all the relevant certificates are to be submitted with the offer in English.

22. **Scope of Supply**. The Genset are to be supplied as per the specifications enumerated in the subsequent paragraphs. The Generator set and associated accessories should be complete with all standard accessories, ready in all respect for operation after installation onboard. The scope of supply shall include (but not limited to):

a. 01 x Genset with essential and standard accessories are as follows:

(1) Complete Genset (As per Para 24a(1)).

(2) Prime Mover (Engine) (As per Para 24a(2)).

(3) Alternator (As per Para 24a(3)).

(4) Engine Local Control and Monitoring Panel (As per Para 24a(4)).

(5) Switchboard monitoring panel (As per Para 24a(5)).

(6) MCR Monitoring Panel (As per Para 24a(6)).

(7) Synchronizing Panel (As per Para 24a(7)).

(8) Fuel Oil System (As per Para 24a(8)).

(9) Lubricating Oil System (As per Para 24a(9)).

(10) Cooling Water System (As per Para 24a(10)).

(11) Exhaust System (As per Para 24a(11)).

(12) Shutdown System (As per Para 24a(12)).

b. Necessary Cables (Power cable and Control cable) for connecting as necessary among Genset, Engine Local Control and Monitoring Panel, Remote Control & Monitoring Panel, MCR Monitoring Panel, Synchronizing Panel and Switchboard (As per Para 24b).

c. Software and firmware (As per Para 24c).

d. Certificates and Reports (As per Para 24d).

e. Drawing and Manuals/ Documents (As per Para 24e).

f. Spares (**Optional**) (As per Para 25).

g. Local Training (As per Para 26).

h. Factory Acceptance Test (FAT) (As per Para 27).

j. Installation, supervision and Setting To Work (STW) (As per Para 28).

k. Test/ Trial and Acceptance (As per Para 29).

23. **Additional Feature Offered by Bidder**. The bidders may suggest and offer additional features for the Generator set. In this case, Bidders have to explain the detailed advantage of that/ those features of the Generator set.

24. **Technical Specifications**.

a. **Genset with essential and standard accessories**:

(1) **Complete Genset:**

Ser	Description	Remarks
(a)	Country of Origin and Manufacturer (Assembler)	**Genset & Control/ Monitoring and Other parts/ accessories**. Canada/ EU country/ Japan/ Turkey/ USA/ UK (Country to be mentioned).
(b)	Type	Marine Type (To be mentioned).
(c)	Brand	To be mentioned.
(d)	Model	To be mentioned.
(e)	Quantity	01 (One)
(f)	**Operating Environment:**	
	i. **Ambient Condition.** The Generator set and associated accessories and items are to be designed to operate in the following ambient condition:	
	(i) Ambiant air température	$+5^0$ C + 50^0 C
	(ii) Sea Water (SW) temperature	$+5^0$C to $+32^0$ C.
	(iii) Relative humidity	Up to 95% (non-condensing)
	(iv) Salinity	Up to 34 gm/ltr
	(v) Quality of Sea Water (SW)	High Mud (Suspended solids in SW 2000 ppm) content SW in
	ii. **Maximum Allowable Inclinations.** The Generator set and associated accessories & items should be able to run when the ship (on which they shall be installed) is subjected to following rolling/ pitching:	
	(i) Roll	$\pm 30^0$.
	(ii) Pitch	$\pm 10^0$.
(g)	Power factor	0.8 Lagging.
(h)	Output	440V, 60Hz, 3 Phase, 165 - 170 KW, 1800 RPM.
(j)	Dimension	Dimension of the offered Genset (Prime Mover and Alternator combined) not more than existing Generator sets dimension (Dimension is to be mentioned). **Note**: Overall dimension of the existing Generator sets of the ship (Prime Mover and Alternator combined) are as follows: i. **Length**: 2870 mm. ii. **Breadth**: 1470mm. iii. **Height**: 1750 mm.
(k)	Type of Coupling (Prime Mover and Alternator)	Details to be mentioned.
(l)	Combined Base Frame	The Prime Mover and the Alternator are to be elastically mounted on a combined base frame to be rigidly fixed to the Generator seating. Lifting eyes are to be provided for lifting the complete Generator sets as a whole, and also the Prime Mover and the Alternator separately. The supplier is to supply standard shock and anti vibration mountings along with holding-down bolts.

(m)	General Features	i. Generator shall be suitable to operate at low load condition (25% loads) without hampering itself.
		ii. **Maintenance/ Overhauling Schedule**: (i) Time between top overhauls: 5000 or more (To be mentioned). (ii) Time between major overhauls: 10000 or more (To be mentioned).
		iii. **Loading Condition**: (i) The Generator and AVR system must be highly responsive. However the generator should meet the following transient condition as per ISO 8528-5 (Class G2) (Certificate is to be provided with the offer in this regards): a. **Voltage**. (1) Voltage transient tolerance: +25% to – 20% or better (To be mentioned). (2)Voltage transient recovery time: Max 6 sec or better (To be mentioned). (3) Voltage Regulation: Within ±5% or better (To be mentioned). b. **Frequency**. (1) Frequency transient tolerance: +12% to -10% or better (To be mentioned). (2) Frequency transient recovery time: Max 5 sec or better (To be mentioned). (ii) The above transient Conditions must be maintained under following load change: a. Load Changes from 0 to 50%. b. Load Changes from 50% to 100%. c. Load Changes from 100 to 0%. d. Sudden addition of largest 3 phase induction motor available onboard ship while generator running at 50% load. The Ship largest motor is of 45 KW (AC compressor motor).
		Note: Graphs showing various characteristics and response of transient voltage and frequency variation are to be submitted with the FAT Report.

(n)	Power Supply for Control System.	The required power supply for control system is to be mentioned. The existing control system power supply of ship is 24V DC.
(p)	Coupling	The Alternator is to be directly driven with flector (steel plate) to Prime Mover (Engine) as per SAE standard.
(q)	Labeling	Circuit breakers, control switches, instruments, indicating light and terminal blocks, etc are to be clearly labeled to identity their purpose and function.

(2) **Prime Mover (Engine):**

Ser	Description	Remarks
(a)	Manufacturer (OEM)	Manufacturer of Prime Mover should be as following: Wartsilla/ Scania Marine Engine/ Caterpillar/ SEMT Pielstic/ MAN Diesel/ MTU/ Moteurs Baudouin (To be mentioned).
(b)	Type	To be mentioned.
(c)	Brand	To be mentioned.
(d)	Model	To be mentioned.
(e)	Quantity	01 (One)
(f)	Country of Origin and Manufacturer	Finland/ France/ Germany/ Sweden/ USA/ UK (To be mentioned).
(g)	Year of Manufacture	2024 or later.
(h)	Overload Rating	110% of max continuous rating (1 hour within 12 hours).
(j)	Number of Cylinders and arrangement	To be mentioned.
(k)	Specific Fuel and Lube oil Consumption	To be mentioned.
(l)	Fuel and Lub Oil to be used	To be mentioned.
(m)	Governor	Electronic.
(n)	Turbo Charger	Make and Model are to be specified.
(p)	Shut down system	Details to be mentioned (Including emergency shutdown).
(q)	Starting System.	The prime movers shall be started by battery. The engines shall be fitted with self-starter and dynamo for charging the batteries (To be mentioned). Necessary batteries are to be provided (Battery Brand, Ratings and capacity are to be mentioned).
(r)	Safety Devices	Following safety protections are to be incorporated: i. Engine over speed. ii. High Engine temperature. iii. Low Engine oil pressure. iv. Others to be mentioned (if any).

(3) **Alternator**:

Ser	Description	Remarks
(a)	Manufacturer (OEM)	Manufacturer of Alternator should be as follows: Leroy Somer/ Stamford (To be mentioned).
(b)	Type	Self excited (To be mentioned).
(c)	Brand	To be mentioned.
(d)	Model	To be mentioned.
(e)	Quantity	01 (One)
(f)	Country of Origin and Manufacturer	France/ UK (To be mentioned).
(g)	Year of Manufacturer	2024 or later.
(h)	AVR	Electronic Type.
(j)	Insulation Class	F or Better.
(k)	Rotor	Dynamically balanced.
(l)	Stator	Durable winding in star configuration.
(m)	Connection	3 wire, star connection, neutral ungrounded.
(n)	Safety Devices	Following safety protections are to be incorporated: i. Over load protection. ii. Short circuit protection. iii. Under frequency indicator. iv. Excitation loss indicator. v. Reverse power protection. vi. Any others to be mentioned.

(4) **Engine Local Control and Monitoring Panel**.

(a) The engine local control and monitoring panel shall be marine standard and flexibly mounted on the generator sets to match inclination requirement. Necessary arrangement should be arranged so that the generator shall be started from this panel. The panel will also be equipped with following digital/ analog meters and gauges:

i. **Meters**:

(i) RPM tachometer.

(ii) Hour counter.

ii. **Gauges**:

(i) Lube oil pressure gauge (in & out).

(ii) Seawater pressure gauge.

(iii) Lube oil temperature gauge.

(iv) Fresh water temperature gauge.

(v) Exhaust temperature gauges (Combined).

(vi) Lube oil filter differential pressure gauge.

(vii) Fuel filter differential pressure gauge.

(viii) Additional analogue duel scale Lube oil pressure & temperature and seawater pressure gauge shall be fitted with prime mover.

(b) **Safety Devices**. Following safety devices are to be provided for each Generator:

i. Low lube oil pressure alarm- audio and visual.

ii. High cooling water temperature alarm- audio and visual.

iii. High lube oil temperature alarm- audio and visual.

iv Low lube oil pressure shutdown device with audio and visual alarm.

v. Prime Mover over speed alarm and auto shut down device/ over speed trip gear (with manual resets).

vi. Reverse power protection system.

vii. Over current protection system.

viii. Over voltage/ under voltage protection system.

ix. Over speed protection system.

x. All safety warning and fault warning are to be shown in the Generator control panel.

(5) **Switchboard monitoring panel.** Switchboard Monitoring Panel of the Generator sets shall be of marine standard and is to be fitted in the existing switchboard. Necessary modification in this regard is to be done by the bidder. The following components with Digital/ Analog meters to be included in the panel with **offered genset:**

(a) 01 x Kilowatt meter.

(b) 01 x Voltmeter with phase selector switch.

(c) 01 x Frequency Meter.

(d) 01 x Amps meter with phase selector switch.

(e) 01 x Ohm/insulator meter.

(f) Alternator droop kit.

(g) 01 x RPM decrease/ increase button.

(h) **01 x Air Circuit Breaker**. Air Circuit Breaker is to be provided by bidder mentioning appropriate ratings on completion of site visit.

(j) Lamp for bus-bar alive indication, Generator circuit breaker non-close, Generator air circuit breaker abnormal trip, Generator running indication green lamp.

(k) Earth Testing Facility is to be incorporated.

(l) Any other device/ meter necessary for control/ monitor the generator.

(6) **MCR Monitoring Panel**. Following visual and audio alarm indication shall be incorporated with MCR Monitoring Panel:

(a) Low lube oil pressure alarm- audio and visual.

(b) High cooling water temperature alarm- audio and visual.

(c) High lube oil temperature alarm- audio and visual.

(d) Low lube oil pressure shut down audio and visual alarm.

(e) Prime Mover over speed alarm and auto shut down alarm.

(f) Generator running status (ON/OFF) indication light.

(g) For installation of MCR Monitoring Panel required site survey shall be done before installation by the supplier (to understand about cable requirement, cable layout, fixing position at MCR and other arrangements as required.

(7) **Synchronization and Parallel Operation**.

(a) Onboard **BNS GOMATI**, there are currently **three diesel generators (DGs)**. One of these will be replaced by the offered genset. The other two existing gensets are of different brands and models, and their specifications are as follows:

i. **Paxman Generator**. Paxman Generator is Ship fitted generator. This generator Brand/ Model and manufacturer are as follows:

(i) **Brand/ Model**: Paxman (Brush) AC Generator.

(ii) **Manufacturer**: Brush Electrical Machine Ltd., England.

ii. **Baudouin Generator**. This genset already Procured in FY 2023-2024 and installation work done after shipment. Currently synchronized with the Paxman generator using the ship's existing synchronizing panel for parallel load transfer only. Baudouin Generator Brand/ Model and manufacturer are as follows:

(i) **Brand/Model**: Moteurs Baudouin (6M16S) Marine AC Generator.

(ii) **Manufacturer**: Moteurs Baudouin, France.

(b) The offered generator must replace one of the existing generators and be synchronized with the remaining two generators for seamless operation. Here below are the synchronization requirements:

i. **New Synchronization Panel for the Offered Generator**. A **new synchronization panel** must be provided to enable parallel operation of the offered generator with the **existing Baudouin generator** onboard. The following tasks and features are required:

(i) **Design and Provide New Synchronization Panel:** Capable of handling both **auto and manual synchronization.** Manual synchronization must include provisions for:

a. Synchroscope.

b. Synchronizing lamps.

c. Load-sharing controls.

d. Must include provisions for future expansion, allowing the addition of another generator.

ii. **Mandatory Features of the New Synchronization Panel.**

(i) 01 x **Synchroscope** for manual synchronization.

(ii) 03 x **Frequency Regulators/ Adjust Knobs:**

1. 02 x For current use (offered generator and existing Baudouin generator).

2. 01 x Reserved for future use.

(iii) 03 x **Voltage Regulators/Adjust Knobs:**

1. 02 x For current use (offered generator and existing Baudouin generator).

2. 01 x Reserved for future use.

Any additional components required for smooth synchronization and load transfer (to be specified and installed by the bidder).

(c) **Modification of the Existing Synchronization Panel**. The **existing synchronization panel**, currently used for the **Paxman generator**, must be modified to include the offered generator. The following tasks and changes are required:

i. **Update the Existing Synchronization Panel.**

(ii) Add a **selection switch** with the following operational modes:

1. **No Selection** (default position).
2. **Select the Paxman generator.**
3. **Select each of the newly offered generators separately.**

(d) **Integrate the Offered Generator**. Ensure the offered generator can operate in **parallel load-shifting mode** with the Paxman generator. Perform necessary modifications to:

i. Add appropriate wiring and connectors.

ii. Upgrade or adapt components like **AVR, Governor Control PCB**, and others as required.

iii. Ensure the panel accommodates smooth load transfers between generators.

(e) **Compatibility Check and Testing**: Verify the synchronization capability with both Paxman and Baudouin generators. Ensure the modified panel supports stable parallel operation and complies with operational requirements.

(f) **Bidder Responsibilities**. The bidder must conduct a **site visit** to inspect the existing setup. Assess the specific requirements for modifications and additions. Provide a detailed list of items and components necessary for:

i. The new synchronization panel.

ii. Modifications to the existing synchronization panel.

Submit a **technical plan** detailing the work and modifications to be carried out, ensuring seamless integration and operation of the offered generator with the existing system.

(8) **Fuel Oil System**. Fuel oil system should consist of the followings but not limited to:

(a) Prime Mover driven fuel oil feed pump including a Ready Use (RU) tank mounted on or beside the prime mover. If the existing feed pump and RU tank is suitable for the offered genset, then these are not to be included in the offer.

(b) Duplex type fuel filter with changeover valve. Filter elements are to be replaceable during operation Duplex type fuel filter with changeover valve. Filter elements are to be replaceable during operation.

(c) Pressure regulating valve.

(d) Flame proof hose lines for fuel pipe work to and from Prime Mover.

(e) Details of arrangement including those for pumps and fittings to be specified.

(9) **Lubricating Oil System**. The lube oil system should consist of the followings:

(a) Prime Mover driven lub oil pump (gear type) with relief valve on pump discharge.

(b) Lub oil pump for extracting oil from wet sump.

(c) Duplex type lub oil filter with cartridges. Filter cartridges are to be changeable during running.

(d) Flexible connections/ hoses.

(e) Details arrangement including pumps and fittings are to be specified.

(10) **Cooling Water System.** Prime Mover internal cooling is to be done by fresh water. Fresh water-cooling is to be done by seawater. Seawater is muddy in the harbor, where the ships will usually be berthed and operated. The Prime Mover cooling water system should include the following:

(a) Engine driven self priming seawater and fresh water circulating pumps with discharge pressure gauges. (Water pumps with rubber impellers will not be acceptable).

(b) Any type of fresh water cooler, external to the Prime Mover.

(c) Fresh water and seawater pressure gauges.

(d) Galvanized steel fresh water pipe external to the Prime Mover with flexible pipe connection.

(11) **Exhaust System.** The existing exhaust system (Stbd: length- 20070mm, inner diameter- 130mm, outer diameter- 140mm. Port: length- 560mm, inner diameter- 76mm, outer diameter- 92mm) may be used for the new Generator set. The exhaust system of the offered Generator set should match with the existing exhaust system of the ship from Generator outlet to ships outlet through funnel. In this regard, supplier may visit the installation site (BNS GOMATI at Mongla Naval Area). If cannot be matched, exhaust pipes from Generator outlet to ship's outlet will have to be supplied by the supplier. However, followings may be included in the exhaust system:

(a) Combined exhaust temperature gauge for both bank.

(b) Stainless steel expansion bellows with flange between the Turbo charger/ Engine exhaust manifold outlet and the main exhaust pipe.

(c) Exhaust silencers.

(12) **Shutdown System.** Genset shutdown system should include the following:

(a) Normal shutdown is to be provided from Local control panel and Switch board.

(b) Emergency shutdown (push button to be protected with open able cover).

(13) **Essential Spare.** The following essential spares are to be provided at the time of delivery and unit price is to be quoted separately with the offer:

Ser	Name of Item	Qty	Unit Price
1.	Oil Filter	02	To be mentioned
2.	Fuel Filter	02	
3.	Air Filter	01	

(14) **Standard Accessories.** Standard accessories must include every item and accessories, which are essential to make the offered system operational with full functionality, whether those are mentioned in the specification or not are to be supplied by the bidder within the scope of the supply. Any such accessories, kit and items associated to operate the said equipment in full functionality are to be mentioned clearly with purpose and submit with offer mentioning item wise price.

b. **Cables**. The supplier is to provide necessary high quality Power and Control cables for Generator set (as per IEC 60092-353 and IEC 60092-350 standard) for all power & control/ monitoring connections. **Actual requirement of cable are to be assessed by the supplier on site visit and to be submitted with the offer (if existing power supply cable from generator to switchboard are useable then separate power supply cable not be quoted).** Details of various cable specification and unit price (per meter) is to be quoted separately.

c. **Software and Firmware**. All necessary software and firmware of Generator set controller, Engine speed controller, AVR and other control circuit are to be provided. Method and items required for loading the software and firmware are also to be provided.

d. **Certificate and Reports**.

(1) Following certificates and reports are to be provided in English for each item including associated equipment/ accessories **with the offer**:

(a) 'Type approval certificates' of classification society (As per para 21).

(b) Supply Assurance Certificate.

(c) Guarantee and warranty certificates.

(d) After sales service support certificate.

(2) Following certificates and reports are to be provided in English for each item including associated equipment/ accessories **during delivery**:

(a) 'Type approval certificates' of classification society (As per para 21).

(b) 'Quality assurance certificates' for each item and their associated equipment and instruments from OEM is to be provided.

(c) 'FAT Certificates'.

(d) Certificate of genuine product and brand-new item.

(e) Supply Assurance Certificate.

(f) Guarantee and warranty certificates.

(g) After sales service support certificate.

e. **Drawing and Manuals/ Documents**.

(1) **Installation Drawings**. Following drawings are to be submitted for buyer's approval prior 04 (Four) months of commencing of installation work onboard ship:

(a) Layout drawing of the system.

(b) Cable diagram including cable type and cable grouping.

(2) **Manuals/ Documents**. 01 (One) set of following documents and manuals in English are to be provided for each genset at free of cost at the time of delivery:

(a) Operating Manual of the Prime Mover and Alternator.

(b) Technical Manual with Circuit Diagram.

(c) Maintenance Manual of the prime mover and alternator.

(d) Parts Catalogue of the Prime Mover and alternator.

(e) Circuit diagram of the AVR.

(f) Electrical wiring diagrams and faultfinding flow charts of the alternator.

25. **Spare (Optional).** A list of the following spares (optional) is to be quoted separately with item wise unit price. The buyer may select the any of the spares as required from the list:

Ser	Name of Item	Quantity	Unit Price
a.	AVR	01	To be mentioned
b.	ACB with appropriate ratings	01	
c.	Oil Filter	01	
d.	Fuel Filter	01	
e.	Air Filter	01	
f.	Belt (As applicable)	01	
g.	Engine Oil Pressure Sensor (High & Low)	01	
h.	High Cooling Water Temperature Sensor	01	
j.	High Lub Oil Temperature Sensor	01	
k.	Reverse Power Relay	01	
l.	Over Voltage Relay	01	
m.	Over Current Relay	01	
n.	Under Voltage Relay	01	
p.	Over Speed relay	01	
q.	Local Control Display	01	
r.	Remote Control Display	01	

26. **Local Training.** The supplier is to send one qualified representative who will provide onboard operation and maintenance training in Bangladesh to BN personnel for duration of 03 (Three) working days after test, trial and commissioning of Generator sets. During training, emphasis is to be given on operation, maintenance and faultfinding of Prime Mover, Governor, Alternator, AVR, Engine and Generator sets Controller including software/ firmware installation procedure and Control Circuit etc. Cost of transportation, accommodation and food of the supplier representative is to be borne by the supplier. Cost of onboard training is to be quoted separately. A set of detail training content is to be provided by bidder to BN 02 (Two) weeks prior to the said training. The training should include (but not limited to) the following:

a. System composition, configuration, principle of operation and troubleshooting.

b. Software installation, operation and configuration for smooth conducting of all the tests.

c. Theoretical concept and procedure of tests (practical).

d. Repair and maintenance.

27. **Factory Acceptance Test (FAT).** Following FAT(s) criteria to be carryout in OEM or manufacturer of prime mover/ alternator/ assembler premises for the offered System:

a. FAT shall be carried out by a team of 02 (Two) BN members for duration of 03 (Three) working days in OEM premises at the buyer's expense. Both way air fare,

accommodation and food for the FAT team shall be borne by BN. All types of movement/ transportation (air/sea/road) of the team within the manufacturer's country, reception and arrangement for entry into the country/ concerned area for the FAT are to be arranged by the supplier. The supplier should inform the buyer about the date of FAT (schedule) and FAT criteria at least 08 (eight) weeks prior to the date of FAT. FAT procedure shall be forwarded to the buyer 6 (six) weeks prior to the date of commencement of the FAT to the concerned directorate for approval of BN. Serial No of Prime Mover and Alternator are to be provided eight weeks before FAT. The cost of FAT in this respect is to be quoted in the offer.

b. On return from the country of manufacturer, the FAT team will submit the report to concerned Directorate at Naval Headquarters. Naval Headquarters will, in turn, forward final decision along with FAT report, basing on which DGDP will render clearance for shipment of stores to the supplier concerned. The supplier will not make shipment of any item of the contract without clearance from DGDP.

c. The FAT shall be carried out at manufacture's factory premises following approved FAT protocols. In this regard, the FAT protocol is to be approved by BN well in advance.

d. During FAT, tests shall be carried out to fulfill the required condition mentioned in technical specification of the offered system. Various tests for checking performance are to be carried out and recorded. After FAT, a joint test report shall be prepared and signed by both the seller and buyer's representative.

e. The FAT criteria in details is to be submitted, which should include the following:

(1) **Generator Load Tests**. Generators load test shall be carried out to fulfill the required condition mentioned at Para 24a(1)(l)iii. Recording of voltage, frequency, transient voltage and frequency variation and recovery time shall be made to ascertain the specified condition.

(2) **Prime-Mover Test**. Factory Test Reports of prime mover are to be provided.

(3) **Tests of Alarm and Safety Devices**. Various test for checking temperature, pressure, fuel oil consumption etc. with recording of alarm and shutdown steps are to be carried out.

(4) **Test Report**. Test reports are to be prepared in English which will include all test results and other relevant information. Test report is to be submitted to BN before shipment.

f. **Location of FAT**. Location of FAT with full address is to be mentioned.

28. **Installation, Supervision & Setting to Work (STW)**. Installation, Supervision, and Setting to Work (STW) shall be done as following:

a. **Installation Material and Accessories**. All installation materials, test equipment/ instrument, tools, cables, cable gland and other necessary accessories required for the installation, STW and supervision are to be provided by the supplier.

b. **Bidder/ Supplier Responsibility**.

(1) Installation of genset with standard accessories and software installation (if required/necessary) are to be done by supplier. As such, any accessories required for the operation and maintenance shall be provided by the supplier.

(2) The offered genset and other accessories are to be installed by replacing the existing genset of the ship's and to be commissioned by the qualified OEM Engineers.

(3) The Supplier at no additional cost shall do any modification/ alteration (if required) to install the offered genset as per scope of supply.

(4) Any damage during installation of offered genset, existing onboard equipment, machineries and items/ systems shall be compensated by supplier. Damaged equipment, machineries and items/ systems are to be made operational with its full functionality by supplier.

(5) Qualified OEM Engineers are to be employed for the installation and STW, HAT and SAT and commissioning. All types of expenses related with both-way airfare (to and from Bangladesh (installation site)), food, accommodation and internal travel of the OEM engineer during installation are to be borne by the supplier.

c. **Purchaser Responsibility**. Purchaser (BN) shall provide available assistance (if required) for installation under the direct supervision of OEM Engineer. BN Dockyard shall provide available work/ facility (if required) for installation. Support equipment may be provided (if available) from the user side upon request prior installation.

29. **Test/ Trial and Acceptance**. Test, Trial and Acceptance requirements are as follows:

a. **General**. The OEM Engineer shall ensure satisfactory tests, trial and functioning/ commissioning of the equipment at purchaser's premises after all necessary replacement. Necessary software installation shall be done before test/trial. All instruments and consumables for HAT, SAT and Acceptance are to be provided by the supplier.

b. **HAT and SAT Protocol**. The HAT and SAT protocol/ procedures including schedule are to be submitted to BN 04 (four) weeks prior HAT and SAT.

c. **HAT**. Harbour Acceptance Test (HAT) shall be carried out at harbour on completion of Setting to Work (STW).

d. **SAT**. Sea Acceptance Test (SAT) shall be carried out at sea on completion of satisfactory HAT.

e. **Acceptance**. On completion of satisfactory Test/ Trial (HAT and SAT), Final acceptance certificate shall be signed by purchaser and supplier.

PART III: TERMS AND CONDITIONS

30. **Delivery**.

a. **Delivery and Installation Time**. Item delivery and installation shall be completed within 12 (Twelve) months and breakdown of said time line is appended bellow:.

(1) **Delivery Time**. The items shall be delivered to the Place of Delivery within **09 (Nine)** months after signing the contract.

(2) **Installation Time**. The Gengets shall be installed onboard ships within **03 (Three)** months after delivery of the items.

b. **Place of Delivery**: NSD, Khulna.

c. Incase of CFR/CPT, the supplier shall carry the items from any sea port/ air port (as applicable) to NSD Khulna at the cost and risk of supplier.

31. **Shipment**.

a. **Source of Raw Material**. To be mentioned.

b. **Source of Supply**. The source of supply of the offered items/ systems are to be mentioned. It should be from the country of manufacturer or country of origin.

c. **Port of Shipment**: To be mentioned. The port of shipment is to be from the country of manufacturer or country of origin.

d. **Consignee**. The supplied item shall be the following consignee:

The Commanding Officer Naval Stores Depot New Mooring, Chattogram, Bangladesh BIN-002349278-0503	or	Officer In Charge Naval Stores Sub Depot Dhaka Naval Unit Khilkhet Namapara, Dhaka-1229, Bangladesh

e. All items are to be brand new and to be delivered in seaworthy packing to ensure safe transit by sea. Certificates in this regard are to be provided during delivery.

f. All packages are to have packing notes showing their contents in detail and all packages shall be marked with the name and address of the consignee and gross weight.

32. **Project Timeline**. A forecasted project timeline indication month-wise event is to be provided with the offer and another reviewed project time line with project implementation plan is to be submitted after 15 days of signing the contract.

33. **Warranty, Guarantee and After Sales Service**.

a. **Warranty**.

(1) 12 (Twelve) months manufacturer's warranty for trouble free operation is to be provided for the item from the date of acceptance by the purchaser. If any component and submit of the supplied items becomes defective during the warranty period, the overall warranty shall be extended automatically for the period of subject component remains defective.

(2) For warranty repair/ replacement, the supplier shall collect the defective item from NSD, Chittagong/ NSD Khulna/ NSSD, Dhaka (as applicable) and re-supply the same to collecting place after warranty repair or for replacement within 90 (ninety) days from the date of defect at no cost to the purchaser.

b. **Bank Guarantee (BG) for Warranty**. The BIDDER shall issue a Bank Guarantee (BG) during submission of last 20% payment for a value of **@ 05% (Five percent) of the total CFR/CPT value** from any scheduled bank in Bangladesh in favour of The Senior Finance Controller (Navy), Sailors Colony, Lalasarai, Mirpur–14, Dhaka-1206, representing Bangladesh Navy, Peoples Republic of Bangladesh, information to The Directorate General Defence Purchase, Ministry of Defence, Peoples Republic of Bangladesh. This BG shall remain valid until the warranty period of the supplied Genset and other items (notwithstanding minor deficiencies which would be mutually settled and agreed between PURCHASER and BIDDER) in Bangladesh, and it shall expire on receipt of **Warranty Completion Certificate**. If the contractual obligation warrants the extension of the validity of the BG, the BIDDER shall remain liable to do so at its own cost. In case of material failure of the BIDDER to fulfill its contractual obligation as per the terms and conditions of the contract, the BG in full or part thereof may be forfeited at the discretion of the PURCHASER.

c. **Guarantee.** The supplier is to give guarantee of continued supply of spares for at least 10 (Ten) years at a reasonable price (not exceeding 3% per year). Certificate is to be submitted with the offer.

d. **After Sales Service.** After sale service should be available with the local agent of supplier and is to be provided as and when required for indefinite period or at least 15 years after the installation. If any system, equipment etc becomes obsolete or out of production during or after the installation period (at least upto 15 years), the supplier is to submit alternative of same/ improved version for selecting the suitable replacement.

34. **Terms of Payment.** Payment shall be made through an Irrevocable Letter of Credit (LC). LC shall be opened at the expense of the PURCHASER and **100% LC** value shall be made operative in favour of Supplier. CFR/ CPT value being the value of the supplied goods, payment shall be made as under:

a. **1st Installment.** 80% of CFR/ CPT value shall be paid **after shipment of the Genset with essential and standard accessories** and on submission of the following documents to the bank:

(1) Original Airway Bill (AWL)/ Bill of Landing (BL) must be issued by air lines/ shipping lines or authorized agent of shipping lines/ air lines against DGDP contract reference (after signing the contract). LC number, and Bangladesh bank registration number are to be mentioned in AWL/ BL. Freight amount must be shown separately otherwise only FCA value shall be paid. All documents to be submitted (01) original with at least (05) five copies other than bill of lading shall be (03) three original with (03) three copies. In addition to this, following shall also be considered:

(a) Name of the carrier must be indicated in AWL/ BL.

(b) Must be signed by carrier or a named agent for/ on behalf of the carrier.

(2) 'Supplier's Signed Commercial Invoice' for (freight/ services amount to be shown separately (if applicable)) representing 80% of CFR/CPT value as stated in the contract.

(3) "Packing List" signed by the authorized representative of the shipping company or exporter.

(4) "Certificate of Origin" signed by the Manufacturer's Authorized Person/Authorized Official of the exported country.

(5) 'Manufacturer's Certificate" Signed by the MANUFACTURER/ SUPPLIER. Certifying that product has been produced as per technical data/ analytical data and specification as per contract.

(6) "Manufacturer's Warranty Certificate" Signed by the MANUFACTURER/ SUPPLIER.

(7) "Factory Acceptance Test (FAT) Completion Certificate" signed by the SUPPLIER.

(8) 'Quality Assurance Certificate' (QAC) signed by the SUPPLIER.

(9) 'Shipment Clearance Letter' Signed by DGDP (Directorate General Defense Purchase, Dhaka, Bangladesh) as PURCHASER.

b. **2nd Installment**. 20% of CFR/CPT value shall be paid **after successfully commissioning** and on submission of the following documents to the bank:

(1) 'Supplier's Signed Commercial Invoice' for representing 20% of CFR/CPT value as stated in the contract.

(2) 'Final Acceptance Certificate' issued by the PURCHASER after successful completion of installation, HAT, SAT and commissioning of system.

(3) The bidder shall submit the relevant document of 5% BG of CFR value, which shall be released on submission of warranty completion certificate.

c. **Installment of Factory Acceptance Test (FAT), Training and Services**.

(1) **Factory Acceptance Test (FAT)**. 100% cost of FAT shall be paid **after successful completion of FAT** and on submission of the following documents to the bank:

(a) 'FAT report' signed by the PURCHASER for the successful completion of the 'FAT' in OEM premises.

(b) 'Supplier's Signed Commercial Invoice' for 100% of FAT value as stated in the contract.

(2) **Local Training**. 100% cost of Local Training shall be paid **after successful completion of local training** and on submission of the following documents to the bank:

(a) Certificate Signed by the PURCHASER for the successful completion of 'Local Training' in Bangladesh.

(b) 'Supplier's Signed Commercial Invoice' for 100% of Local Training value as stated in the contract.

(3) **Installation and Final Acceptance**. 100% cost of 'Installation shall be paid after successful completion of Installation and Final Acceptance on submission of the following documents to the bank:

(a) Certificate Signed by the PURCHASER for the successful completion of the 'Installation and Final Acceptance' in Bangladesh.

(b) 'Supplier's Signed Commercial Invoice' for 100% of Installation and Final Acceptance value as stated in the contract.

35. **Import Duties**. These are the Defence stores and shall be used by the Defence Forces only and hence are exempted from payment of Custom Duties and Sale Taxes as per ministry of finance (NBR) memo no 9(41) NBR/CUS-IV/27/246 dated 10 April 1981. Therefore, if the item is imported against this tender, price to be quoted without import duties.

36. **Terms and Conditions (DGDP)**. Following terms and conditions shall governed by the tender schedule/ existing rules of Directorate General Defence Purchase (DGDP):

a. Agency Commission.

b. LC Amendment Charges.

c. Insurance Charges.

d. Liquidated Damages (LD).

e. Arbitration.

f. Force Majure and War Risk.

g. Termination of Contract.

h. Letter of Credit.

j. End User Certificate (EUC).

k. Recoveries.

l. Performance Guarantee (PG).

m. Other Conditions.

37. **Price and Financial Offer.** Price of each item (for each point of scope of supply) of the total offer is to be shown separately and then grand total of the foreign currency to be shown on the original offer submitted by the bidder. The BIDDER shall comply as asked in the tender specification. The BIDDER may mention the price of additional items and services in the financial offer. Item-wise price for additional item are to be mentioned for each item and services. The BIDDER may also explain the financial terms and conditions in the financial offer as appropriate. To evaluate the financial competitiveness, BIDDER has to submit the summary of financial offer as per following format:

Ser	Nomenclature	A/U	Qty	Unit Price	Currency (USD, EURO, GBP etc.)	Total Value
1.	Genset including the following: a. AC Diesel Generator sets with standard accessories b. Essential accessories (If any) c. Cables d. Certificates and Reports e. Drawing and Manuals/ Documents	Set	01	To be mentioned	To be mentioned	To be mentioned
2.	Spares (Optional)	Set	-	To be mentioned	To be mentioned	To be mentioned
3.	**Total FOB Value**				To be mentioned	To be mentioned
4.	(-) Agency Commission on FOB Value				To be mentioned	To be mentioned
5.	**Net FOB Value after Agency Commission**				To be mentioned	To be mentioned
6.	Sea/ Air Freight Charge				To be mentioned	To be mentioned
7.	**Total CFR Value in Foreign Currency**				To be mentioned	To be mentioned
8.	**Total CFR Value in Bangladeshi Currency**				-	Buyer shall be fill up
9.	Local Training				To be mentioned	To be mentioned
10.	Factory Acceptance Test (FAT)				To be mentioned	To be mentioned
11.	Installation and Acceptance				To be mentioned	To be mentioned
12.	Total Quoted Price				To be mentioned	To be mentioned