

TENDER SPECIFICATION OF MAIN ENGINE FOR METAL SHARK BOAT

1. **Name of the Equipment.** Main Engine for Metal Shark Boat.
2. **Purpose.** The engines will be installed in Metal Shark Boat of Bangladesh Navy replacing the defective engines.
3. **Quantity.** 04 (four) complete sets.
4. **Manufacturer, Principal Supplier & Local Agent.** Name and full address to be mentioned.

a.	Manufacturer	To be mentioned
b.	Principle Supplier	To be mentioned
c.	Local Agent	To be mentioned
5. **Year of Manufacturing.** 2026 or later.
6. **Country of Origin.** USA, UK and EU Countries.
7. **Manufacturing Country.** USA, UK and EU Countries.
8. **Operating Environment of Engine.** The environment under which the engines will be operated, and their performances will be measured is mentioned below:

Ser	Parameters	Remarks
a.	Air Temperature	5 ⁰ - 50 ⁰ C
b.	Sea Water (SW) Temperature	5 ⁰ - 35 ⁰ C
c.	Relative Humidity	Up to 95%
d.	Sea Water Quality	35000 ppm salinity, sandy, muddy

9. **Maximum Allowable Inclinations.** The main engines and accessories should be able to run when the ship is subjected to the following rolling/pitching:

- a. **Transient Condition.**

(1)	Front/ rear end down (pitch)	± 10°
(2)	Left/ right side down (roll)	± 30°

- b. **Continuous Condition.**

(1)	Front/ rear end down	± 10°
(2)	Left/ right side down (heel)	± 15°

10. **Certificate/Document of Authentication.** Following certificate(s)/ document(s) must be provided with the offer/quotation:

- a. One certificate/document by the manufacturer in favour of the Local agent (in case of manufacturer is the principal Supplier).



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b. Two certificates/documents, one by the manufacturer to Principal Supplier and another by the Principal Supplier to Local agent (in case of Principal Supplier is not the manufacturer/distributor).

c. Three certificates/documents, first one by the manufacturer to authorized distributor/agent, second one by authorized distributor/agent to Principal Supplier and third one by Principal Supplier to Local agent (in case of principal supplier supplies the item from manufacturer's authorized distributor/agent).

11. **Standard.** All Engines are to be tested and certified (Type Approved) by a classification society (DNV, ABS, LR, BV). A necessary Type Approval certificate is to be provided for all individual engines before shipping. The detailed contact information of the local office in Bangladesh (if any) and the headquarters of the approving class society are to be submitted with the offer. The BIDDER must clearly state that the proposed propulsion machinery, i.e., main engines and their associated equipment, are compatible and that the arrangements suit the ship's stability, structural strength, vibration, and noise signature point of view.

12. **Supply Assurance Certificate.** The BIDDER should submit the necessary 'free for sale' governmental license for the concerned components/items, with an obligation to supply spare parts, technical advice, etc., in the future.

13. **Scope of Supply.** The scope of supply is to include the following:

Ser	Description
a.	04 x Main Engines Supply and installation of marine propulsion diesel engines, new shock and Vibration mountings and new torsional vibration damper as per paragraphs 16 and 17.
b.	Supply of accessories as per paragraph 18.
c.	Standard tools as per paragraph 19
d.	Spare parts as per paragraph 20.
e.	Pre-shipment Inspection (PSI) and Factory Acceptance Test (FAT) for the above items as per paragraph 21.
f.	Installation, Supervision of engines, Onboard Training, Drawing, Manual, Brochure and Test/Trial Acceptance of the above items as per paragraphs 22 to 26.
g.	Warranty as per paragraph 27.
h.	Any other relevant issue (if any).

14. **Sales and Record.** A record of sales by the BIDDER/ agent of engines mentioning the year and buyer (s) is to be included with the quotation.

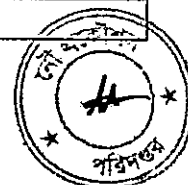
15. **Dimensions of Engine.** The allowable dimension of the new engines must not exceed (Similar to existing engines):

a. Length 3'.7" inch x Breadth 3'.1" inch x Height 3'.7" inch.

16. **Specification of Engine to be supplied.** Technical specification of supplied items should meet the requirements of existing items mentioned below:

a. **Technical Specification of Engine.**

Ser	Parameters	Description
a.	Type	Inboard Engine
b.	Brand	Cummins Inc.



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c.	Model	Commercial Model No: QSB6.7-480GSI
		Service Model No: QSB6.7CM2250 Marine Diesel
d.	Injector timing code	Electronic
e.	Full Throttle Operating Range	480HP, 3300-3500 RPM
f.	Rating kW	353 at 3300 RPM
g.	Oil-Lubrication	SAE 15W-40
h.	System voltage	12V Battery
j.	Number of Cylinder	6 Cylinder Inline, Turbo charged
k.	Cooling Method	Water Cooled
l.	Design RPM	To be mentioned
m.	Rated Output @ Maximum RPM	Maximum 480HP @ 3500 RPM
n.	Approximate Engine Dry Weight (with standard accessories)	To be mentioned
p.	Fuel Type	High-Speed Diesel (HSD)
q.	Lube Oil to be Used	Commercially available lube oil (Grade to be mentioned).

b. **Control System.** Each boat will have a control system to control and monitor both engines. The control system shall be able to enable control of the diesel engines, through start, run, and load-unload and stop, to be exercised from engine room and remote-control room. All panels, cubicles, mountings, instruments, protective devices, control equipment and connections necessary for the safe, convenient and reliable operation of the engines and for effective fault indication shall be provided and installed. The system will have the following:

(1) **Control Panels.**

(a) **Meters.**

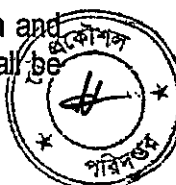
- i. RPM tachometer. (Digital and analog)
- ii. Hour counter. (All are incorporate in the vessel view)

(b) **Gauges/ Display.**

- i. Lub oil pressure gauges/ display
- ii. Fresh water temperature gauges/display.
- iii. Exhaust temperature gauge (Combined) (All are incorporated in the vessel view).
- iv. Battery voltage gauge.
- v. Details arrangement of main engine local control and monitoring panel with diagram is to be specified.

(2) **Instruments and Protection.**

(a) **All Engine Sensors, Gauges.** Automation/ instrumentation shall be mounted/ located in a manner allowing ease of access for service, testing, maintenance, trouble shooting and replacement of faulty components. Mounting of control panels and terminal boxes on the engine shall be extremely minimal and where it cannot be avoided, they shall be fitted with vibration mounting. Instrumentation and Control wires/cables as well as connection plugs and terminations to be used shall be



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double insulated and additional measures taken to avoid damage caused by excessive heat and vibration. Additional spare plugs, terminal lugs or jackets shall be provided (to be mentioned).

(b) **Local Engine Instrumentation.** Local engine instrumentation should include at a minimum:

- i. Lubricating oil pressure.
- ii. Coolant temperature.
- iii. Operating hours.

(c) **Safety Devices.** The following safety devices are to be fitted in the most appropriate places:

- i. Low lube oil pressure alarm-audio and visual.
- ii. High cooling water temperature alarm-audio and visual.
- iii. Main engine over speed alarm and auto shut down device/ over speed trip gear (with manual reset).
- iv. Manual emergency shut off device.
- v. Fault diagnostic portion monitoring and control display.

17. **Survey/ Site Visit.** The BIDDER may visit the boat in the boat pool at BNS MONGLA of before submitting the offer to avoid any difficulties or confusion.

18. **Standard Accessories.** Standard accessories must include all items and accessories essential to operating each Main Engine for Metal Shark Boat (Inboard Engine), whether mentioned in the specification or not. The price of standard accessories is to be included in the FOB value. However, an itemised price list of standard accessories is to be provided with the offer for reference value only.

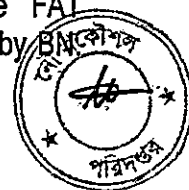
19. **Standard Tools.** 01 (One) set of standard tools for maintenance of each Main Engine for Metal Shark Boat (Inboard Engine) are to be provided. The price of standard tools is to be included in the FOB value. However, an itemised price list of standard tools is to be provided with the offer for reference value only.

20. **Spare Parts.** A recommended list of spare parts required for the Main Engine for Metal Shark Boat (Inboard Engine) for 05 years running is to be provided with the quotation indicating itemised price. BN shall have option to choose from the list of spares partially or completely. However, these prices will not be included for financial evaluation of offer.

21. **Factory Acceptance Test (FAT) and Pre-Shipment Inspection (PSI).**

a. Factory Acceptance Test (FAT) and Pre-Shipment Inspection (PSI) of 4 Inboard Engines will be carried out by 2 (Two) officers of BN for a duration of 4 (Four) working days (exact date is to be confirmed by the supplier depending on FAT facilities available) excluding journey period at the manufacturer factory premises. During FAT maximum power for at least 1 hour of engine has to be shown mandatorily. The supplier will have to inform the purchaser about the date and schedule of FAT and PSI along with complete documentation for suggested FAT Criteria at least 8 (eight) weeks prior to the commencement of FAT and PSI.

b. FAT procedure shall include all the tests to check the engine's proper functioning/ performance criteria according to the engine manufacturer's standard procedure. The FAT procedure shall be duly vetted by the classification society (member of IACS) and approved by BN. However, the following tests should be included in the FAT procedure:



(1) **Engine Load Testing.** Engine load tests and trials for several hours on the water brake/dynamometer (series factory acceptance testing) are to be carried out on factory premises in the presence of the buyer's representative. Engine load test records and reports are to be supplied. Acceptance trials should include the following:

- (a) Starting trials.
- (b) Maximum continuous load operation.
- (c) Maximum load operation.
- (d) 75% of maximum load operation.
- (e) 50% of maximum load operation.
- (f) No load trial.
- (g) The following parameters are to be recorded during the trial:
 - i. Power Ratings (kW).
 - ii. Speed (rpm).
 - iii. Fuel consumption.
 - iv. Lub oil consumption.
 - v. Fuel rack position.
 - vi. Oil pressure and temperature.
 - vii. Cooling water temperature.
 - viii. Exhaust gas temperature per cylinder
 - ix. Combined exhaust gas temperature.
 - x. Governor function.
 - xi. Turbocharger's rpm.
 - xii. Charge air pressure.
 - xiii. Noise level.

c. The supplier and purchaser's representatives will prepare and sign Joint inspection reports for FAT and PSI.

d. On return from the country of FAT and PSI, BN officers will submit reports to the Directorate of Naval Engineering (DNE) of Naval Headquarters (NHQ). DNE will, in turn, forward the final decision along with the FAT and PSI report within 2 (two) weeks, based on which Directorate General Defence Purchase (DGDP) will render clearance to the supplier concerned for shipment of stores. The supplier will not arrange the shipment of any item mentioned in the contract without clearance from DGDP.

e. The purchaser will bear All costs related to FAT and PSI, including airfare, accommodation and food for BN Officers. The supplier will arrange local transportation (air/sea/road/rail) for BN officers within the manufacturer /supplier's country, reception and arrangement for entry into the country/ concerned area for FAT and PSI. However, if FAT/PSI must be conducted at different countries/times, then the purchaser will bear the above cost only for the first team/FAT. All costs for the subsequent FAT are to be borne by the supplier.

22. **Installation and Installation Supervision.** The BIDDER will install the all Main Engine and other associated fittings onboard the Metal Shark at the supplier's cost. The supplier will have to provide technical support from a qualified engineer(s) for installing the engines (if necessary, online/offsite support can be provided). It may require hot work to install the engine. The hot work facility docking and man power for hot work will be provided by BN only.



23. **Production and Supply of Drawing and Technical Information.** The BIDDER will prepare and supply the installation drawings and instructions to BN. These will include a general arrangement drawing of the main engines, gearbox, and couplings, final seating plans of the main engines, and working drawings. The drawings are to be submitted to BN for approval before installation.

24. **Brochures and Drawings to be Submitted with the Offer.** The following brochures/ drawings are to be submitted with the offer for evaluation and assessment (free of cost):

- a. One set of brochures/booklets with details of the main engines offered.
- b. One set of installation plans (Phase wise).

25. **Manuals, Drawings and Documents.** The following manuals and drawings in English (hard and soft copy), 4(four) sets are to be supplied at the time of delivery without any cost:

- a. Operation and Maintenance Manuals.
- b. Maintenance Schedules (if not provided with the operation manual).
- c. Workshop Level Repair Manual.
- d. Parts Identification List (parts catalogue) with Internationally Recognised Pattern no.
- e. Factory Test and Pre-delivery Inspection Certificate.

26. **Test/ Trial and Acceptance.**

a. Test/ trial will be carried out for all engines by BN in the harbour (if any installation schedule is available within 3 months of delivery), or running test will be carried out at BN Dockyard MONGLA, (Adhoc) in the presence of the manufacturer's representative.

b. The engine manufacturer will provide the services of at least one engineer to supervise the test, trial, and acceptance for the duration of the running test at the Dockyard/harbour/sea trial. The manufacturer's engineer(s) will be responsible for demonstrating and ensuring that the tests, trials and acceptance of main engines and accessories are satisfactory as per the contract requirements. The duration of his/their stay for the test and trial is to be specified.

c. The BIDDER will bear the cost of airfare, accommodation and food of the manufacturer's engineer (s).

d. After a satisfactory test and trial, an acceptance certificate will be signed by the buyer and the BIDDER.

e. If the purchaser cannot arrange installation or test trial of any individual engine within 4(four) months from the date of supply of all items (required for operation), the engine(s) will be considered accepted.

27. **Warranty.**

a. Warranty for trouble-free operation is to be given by the BIDDER for the supplied engines for a period of 12(twelve) months from the date of acceptance by the purchaser.

b. During the warranty period, if any Main Engine for Metal Shark Boat (Inboard Engine) remains non-operational for any action pending by the BIDDER, the warranty period will be extended for the same period.



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- c. The warranty should cover all parts, accessories and labour (including the service engineer's cost, if any) throughout the warranty period.
- d. For warranty repair/replacement, the BIDDER will collect the defective item from NSD Khulna /NSSD Dhaka (as applicable) and re-supply the same after warranty repair or replacement.

28. **Shipment.**

- a. The Supplier will arrange transportation of all items by sea to Mongla sea port, Bangladesh.
- b. All items are to be delivered in sea worthy packing/container to ensure safe transportation by sea.
- c. All packages are to have packing notes showing their contents in detail, and all packages shall be marked with the consignee's name and address and gross weight.
- d. The Supplier will arrange transportation of all supplied items from Mongla sea port to the installation site.
- e. **Port of Shipment.** Any port of the manufacturing country.

29. **Delivery.**

- a. The items are to be delivered within **9 (Nine) months** from the date of signing the contract to the following consignee:

Officer in Charge (OIC),
Naval Stores Depot Khulna
Town Khalishpur, Khulna-9000, Bangladesh

- b. **Place of delivery.** NSD Khulna.
- c. In the case of CFR, the supplier will carry the items from MONGLA sea port to NSD Khulna at the cost and risk of the supplier.

30 **Validity of Offer.** The offer should remain valid until 30 June 2027.

31. **Terms of Payment.** L/C for the full purchase amount will be opened in favour of the principal supplier under the following payment terms:

- a. 80% of the total LC value will be paid on delivery of the items described under the scope of supply and on production of necessary shipping documents.
- b. The remaining 20% of the LC value will be paid upon producing an 'Acceptance Certificate' after satisfactory test and trial jointly carried out by the buyer's and supplier's representatives.

32. **Condition for Acceptance of Quotation.** Quotation has to have supporting documents (booklets, leaflet, catalogue, brochure etc) having detailed particulars of the offered Main Engine for Metal Shark Boat (Inboard Engine). If detailed information regarding specifications, maker's books and catalogues, spare parts, accessories, scope of supply, authentication certificate etc are not provided, the quotation will not be accepted.



32. **Compliance Statement.** A compliance statement fulfilling all the tender requirements is to be submitted for evaluation of the offer. Merely stating 'Yes' or 'No' will not suffice, and detailed description/information as required is to be given. An incomplete compliance statement may contribute to the cancellation of the offer. If any clause of this specification is not commensurate with offered items, the deviation must be spelt out clearly.