

TENDER SPECIFICATION OF MAIN ENGINE - 5PC

1. **Name of the Equipment.** Main Engine 5PC Ships (BNS APARAJEYA, ADOYMA, ATONDRO, PADMA & SURMA).

2. **Purpose.** The Main Engines will propel 'The Padma Class Patrol Vessel of the Bangladesh Navy. These engines are intended to replace the Ships' existing engines (Model: TBD620V8 manufactured by Henan Diesel Engine Industry Co, Ltd, China, under the license of DEUTZ). No changes/modifications of the ship's hull and structure will be considered, and the ship's existing gearbox and shaft line must be kept intact. The proposed engines should be configured with the existing engine and machinery control system of the vessel. The new engines and accessories shall be accommodated in the existing ship's engine room and compartment(s)/ space(s). The engines and propulsion system must be independent and operated safely.

3. **Quantity.** 5(five) complete sets (Counter-Clockwise rotation).

4. **Manufacturer, Principal SUPPLIER & Local SUPPLIER.** Name and full address to be mentioned.

a.	Manufacturer	To be mentioned
b.	Principle SUPPLIER	To be mentioned
c.	Local SUPPLIER	To be mentioned

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

6. **Country of Origin.** To be mentioned.

7. **Manufacturing Country.** To be mentioned.

8. **Operating Environment of Engine.** The environment under which the engines will be operated, and their performances will be measured is as under:

Ser	Parameters	Remarks
a.	Air Temperature	5 ^o - 45 ^o C
b.	Sea Water (SW) Temperature	5 ^o - 35 ^o C
c.	Relative Humidity	Up to 95%
d.	Suspended Solids in SW	Up to 20,000 ppm
e.	Salinity	Up to 34 gm/ltr

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°



Ser	Description
e.	Supply of tools and special tools as per paragraphs 26 and 27.
f.	Pre-shipment Inspection (PSI) and Factory Acceptance Test (FAT) for the above items as per paragraph 28.
g.	Installation Supervision of engines, Onboard Training, Drawing, Manual, Brochure and Test/Trial Acceptance of the above items as per paragraphs 31 to 35.
h.	Warranty as per paragraph 36.
j.	Any other relevant issue (if any).

16. **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.

17. **Max Allowable Overall Dimensions of the New Engine.** The allowable dimension of the new engines must not exceed (Similar to existing engines):

a. Length 2500 mm x Breadth 1500 mm x Height (including sump) 2200 mm and Height (from existing foundation) 2300 mm.

18. **Expected General Particulars/ Characteristics of the Ship after Installation of Engines.**

a. No change in the hull/structure will be considered.

b. The new engines and other supplied accessories must be accommodated in the existing engine spaces of the ships.

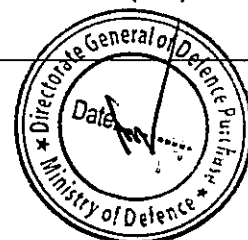
c. The existing shaft line and gearbox will remain intact.

d. Very minor changes in displacement and draught might be considered, but only if they are essential.

e. The proposed engines should be configured with the ship's existing engine and machinery control system.

19. **Existing Principal Particulars of the Ship.** The existing principal dimensions of the ship are as follows:

Ser	Description	Remarks
a.	LOA/LBP, m	50.40 m
b.	Breadth (max), m	7.50 m
c.	Depth (moulded), m	4.1 m
d.	Draught (d or T), m	
	Fwd	1.7 m
	Aft	1.9 m
e.	Height of mast above the keel, m	13.7 m
f.	Displacement, tonne	241.80 tons (light) / 281.30 tons (full)



Ser	Description	Remarks
		Bangladesh's local market.
(21)	Lube oil cooling system	The suspended solid in muddy seawater at 20,000 ppm should be considered for coolers to avoid clogging. To be mentioned
(22)	Specific fuel consumption (SFC, kg/kW-hr)	All ratings are to be mentioned in tabular form
(23)	Specific oil consumption (soc, kg/kW-hr)	
(24)	Type and Number of Turbocharger/engines	To be mentioned
(25)	Turbocharger Manufacturer's full particulars	To be mentioned
(26)	Dimension of Turbocharger (LxBxH, mm)	To be mentioned
(27)	Dry Weight of Turbocharger, kg	To be mentioned
(28)	Overall Dimension of the Engine (L x B x H, mm)	To be specified (as per Art 17)
(29)	Dry weight of engine (all inclusive), kg	To be specified. Preferably not more than 3,600 kg
(30)	Noise Level, dB	The noise level of the overall engine sets should be as minimal as possible so that the noise level in the machinery space does not exceed 115 dB(A)
(31)	Engine Safety features	To be mentioned
(32)	Engine Starting system	To be mentioned (Existing: Electric (044-2SA))

21. **New Shock and Vibration Mountings.** Shock and vibration mountings, according to international standards and duly vetted by the International Classification Society, are to be provided to withstand shock. Followings should be supplied with each set as per the class standard described:

- a. The number of marine-type shock and vibration mountings is required.
- b. Vibration insulators as required.
- c. Combined bedplate to match with engine seating.

22. **New Torsional Vibration Damper.** The engines should be fitted with torsional vibration dampers approved by the internationally recognised classification society.

23. **Auxiliaries and Accessories.**

- a. The standard accessories and auxiliaries must include every item essential to installing and operating the engine and control system, whether mentioned in the



(exact date is to be confirmed by the SUPPLIER depending on FAT facilities available) excluding journey period at the manufacturer factory premises. If the offered main engines are not from the same manufacturer/country, then BN FAT/PSI has to be conducted in different locations to complete FAT/PSI for all five engines. The SUPPLIER will have to inform the PURCHASER about the date and schedule of PSI and FAT along with complete documentation for suggested FAT Criteria at least 8 (eight) weeks prior to the commencement of PSI and FAT.

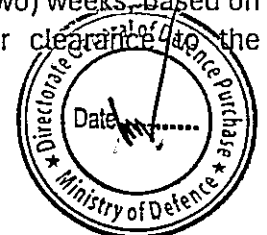
b. FAT procedure shall include all the tests to check the engine's proper functioning/ performance criteria according to the engine manufacturer's standard procedure. The FAT procedure shall be duly vetted by the classification society (member of IACS) and approved by BN. However, the following tests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

(1) **New 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 PSI and FAT.

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 PSI and FAT report within 2 (two) weeks, based on which Directorate General Defence Purchase (DGDP) will render clearance to the



- d. Parts Identification List (parts catalogue) with internationally recognised pattern no.
- e. Factory test and pre-delivery inspection certificate.

35. **Test/Trial and Acceptance.**

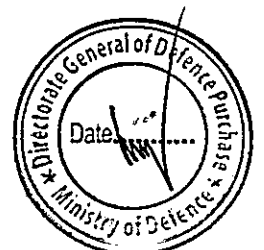
- a. Test/ trial will be carried out for all five engines by BN in the harbour (if any installation schedule is available within 3 months of delivery), or running test will be carried out at BN Dockyard (ICE Shop) in the presence of the manufacturer's representative.
- b. The engine manufacturer will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

36. **Warranty.**

- a. Warranty for trouble-free operation is to be given by the SUPPLIER 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 engine remains non-operational for any action pending by the SUPPLIER, the warranty period will be extended for the same period.
- 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 SUPPLIER will collect the defective item from NSD Chattogram /NSSD Dhaka (as applicable) and re-supply the same after warranty repair or replacement.

37. **Shipment.**

- a. The SUPPLIER will arrange transportation of all items by sea to Chittagong sea port, Bangladesh.



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.

Enclosures:

- | | | |
|----|--|-------------------|
| 1. | Ship General Description | - 1 (one) page. |
| 2. | Existing Propulsion System Particulars | - 4 (four) pages. |
| 3. | General Arrangement Drawing | - 1 (one) sheet. |
| 4. | Stability Information of Ship | - 1 (one) page. |

