# TENDER SPECIFICATIONS FOR PORTABLE MULTIBEAM ECHO SOUNDER

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| 1. | **Name of Equipment**. | Portable Multibeam Echo Sounder (MBES) System. |
| 2. | **Purpose**. | To collect reliable high density geo-referenced bathymetric data and detection of under water hazard in accordance with IHO S-44 standard for hydrographic surveys in the coastal waters of Bangladesh. |
| 3. | **Type**. | A complete portable survey grade MBES Hydrographic survey system for bathymetric and hydrographic survey. The system shall be suitable for surveys in offshore, coastal water, estuarine, harbours etc. |
| 4. | **Quantity**. | 01 (one) complete system. |
| 5. | **Brand/Model**. | To be mentioned. |
| 6. | **Reference**. | The offered MBES must be used by any of the renowned government Hydrographic Organization like EPSHOM (France), NOAA (USA), Royal Navy (UK), JHD (Japan), AHS (Australia), IIDM (Italy), Dutch Navy etc. Name of the hydrographic organization and the ship on which it is installed, is to be mentioned clearly in the offer. |
| 7. | **Country of Origin**. | USA, UK, EU Countries, Norway, Japan, Australia, Canada. |
| 8. | **Country of Manufacturer**. | USA, UK, EU Countries, Norway, Japan, Australia, Canada. |
| 9. | **Date of First Introduction in the Market**. | To be mentioned |
| 10. | **Year of manufacture**. | 2026 or later. The offered system shall be brand new, unused and in fully operational condition at the time of delivery. |
| 11. | **Qualification of Bidders**. | Only genuine manufacturers and authorized dealers (Foreign Principal) can submit quotation through authorized agents. |
| 12. | **Scope of Supply**. | The MBES will be supplied along with all accessories. All standard accessories which are essential to install and operate the system (whether these are mentioned in this specification or not) must be included with the offer. |
| 13. | **Basic Composition**. | The MBES should be comprised of the following main units: |

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| a. | Portable Multibeam Transducer |
| b. | Transceiver Unit. |
| c. | Surface Sound Velocity sensor |
| d. | GNSS with RTK capability, integrated with the sonar system. |
| e. | Integrated Motion sensor/ Inertial Navigation system for attitude (roll, pitch and heading) and heave measurement. However, option should be available to interface external motion sensor. |
| f. | Data Acquisition software. |
| g. | MBES Split cable 20 m |
| h. | GNSS antenna with cable (Pair) 25 m |
| j. | STX Mounting Bracket |
| k. | Interface unit Ethernet cable 2.5 m |
| l. | Transducer mounting pole/bracket with rope guard (complete set) |
| m. | 01 in number ruggedized laptop for data acquisition, not less than a current-generation high-performance mobile processor, 64 GB DDR5 RAM, 14 inch or more Full HD display, Windows 11 Pro or later with license |
| n. | All accessories for Installation. |
| p. | Data Storage System |
| q. | Carrying/storage cases |

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| 14. | **Technical Specifications**. | | | |
| | a. | **Performance Requirements**. | | |
| | | (1) | Transducer Dimension and Weight | The portable MBES will be fitted on a survey boat. Dimension and weight is to be mentioned in detail (Light weight preferable). |
| | | (2) | Swath coverage in Degree | $140^0$ or more (Must meet IHO special order requirement in shallow water). |
| | | (3) | Depth Resolution | 10 mm or less. |
| | | (4) | Number of Beams | To be mentioned. |
| | | (5) | Operating Frequency | Nominal Frequency 400kHz (Frequency agility between 180-700kHz). |
| | | (6) | Depth Range | 0.2 m to 200 m or more. |
| | | (7) | Pulse | FM and CW. |
| | | (8) | Pulse Length | To be mentioned. |
| | | (9) | Ping Rate | To be mentioned. |
| | | (10) | Bandwidth | To be mentioned. |
| | | (11) | Beam Stabilization | Yes, both roll and pitch. |
| | | (12) | Resolution (Across X Along) | To be mentioned. |
| | | (13) | Positional Accuracy of Sounding | HOR: ±(8mm +1ppm X Distance From RTK Station) or better.<br>VER: ±(15mm +1ppm X Distance From RTK Station) or better. |
| | | (14) | Heading Accuracy | ≤0.05° with appropriate antenna baseline. |
| | | (15) | Pitch and Roll Accuracy | ≤0.03° Independent of Antenna Separation or better. |
| | | (16) | Heave Accuracy | 2.5 cm or 2% (True Heave), 5cm or 5% (Real Time). |
| | | (17) | Motion sensor angular accuracy | Up to 0.008° roll and pitch and 0.03° heading (RMS). |
| | | (18) | Sound velocity at Transducer | ±0.025 m/s or better |
| | | (19) | Interfaces | To be mentioned. |
| | | (20) | Cable Length | 25 m. |
| | | (21) | Power Consumption | <150w (10-28VDC, 110-240VAC). |
| | | (22) | Operating Temperature | $5^0$C to +$50^0$c (Topside $5^0$C to +$55^0$C). |
| | | (23) | Storage Temperature | $5^0$ to +$50^0$C. |
| | | (24) | Environmental | Topside: IP67: Dust tight. |
| | b. | **Mounting pole**. | | |
| | | (1) | Design | OEM designed mounting pole for the offered MBES. |
| | | (2) | Type | Corrosion resistant and fully dynamic. |
| | | (3) | Material | To be mentioned. |

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| | | (4) | Strength | Capable to continue survey upto 08 (eight) Knot speed. |
| | | (5) | Weight | Light weight. |
| | | (6) | Calibration | Repeatable patch test can be done. |
| | | (7) | Accessories | All standard accessories available to mount MBES, GPS antennas. |
| | | (8) | Antenna Mast | Should have antenna mast to install primary, Secondary and an auxiliary GPS as DGPS. |
| | | (9) | Foldable | Yes. |
| | c. | **Operational Requirements**. | | |
| | | (1) | The system performance will not be affected by Bangladesh deltaic coastal characteristic which contains mud and fuzzy warm water. | |
| | | (2) | The system shall be effective for sound velocity between 1,400 m/s and 1,600 m/s (warm Bangladeshi sea water). | |
| | | (3) | The MBES transducers shall be well protected against damage by floating or submerge fishing nets/ sticks and suspended materials at sea. | |
| | | (4) | The system shall be insensitive to electromagnetic and electrostatic disturbances. The influence of electrostatic and electromagnetic disturbances should be reduced by appropriate method if necessary. | |
| | | (5) | All type of motion and heading sensors should be the state of the art sensor and fulfill the above mentioned accuracy criteria. | |
| | d. | **Environmental Conditions**. The system should be robust enough to sustain rough sea condition and operate without any performance degradation under the following environmental conditions: | | |
| | | (1) | Freshwater, fuzzy sea water and water-oil-emulsions. | |
| | | (2) | Water temperatures: Between $10^0$C and +$40^0$C. | |
| | | (3) | Higher humid condition. | |
| 15. | **Software Packages**. | | | |
| | a. | The system shall be supplied with its own acquisition and control software with license. | | |
| | | (1) | Provision for real-time high-resolution 3D visualization. | |
| | | (2) | Provision for real time corrections for Motion compensation, Sound Velocity and Tidal data. | |
| | | (3) | Output data formats Shall include HSX, XTF, ALL, KMALL, ASCII XYZ and BAG. | |
| | | (4) | Output data formats Shall be compatible with the hydrographic acquisition and processing software in service including CARIS HIPS and QIMERA. Compatibility with other common industry packages is preferred. | |
| 16. | **Communication**. User configurable communication setting option should be available. Type of data cable (Ethernet, Serial RS-232/RS-422, GNSS, PPS, NMEA, External Motion & External Sound Velocity.) to be mentioned. Sufficient length of data cable to be supplied with each of the echo sounder. | | | |
| 17. | **Data Backup Facilities**. Two portable hard drives with a capacity of 2 Tera Bite (TB) are | | | |

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| | to be provided. Brand and model are to be mentioned with the offer. | |
| 18. | **Hardware**. All necessary hardware for satisfactory installation and performance of the MBES system are to be provided. Details of the hardware such as laptop, SV sansor, motion sensors, positioning system etc are to be provided along with their brands and models. | |
| 19. | **Lifetime of the MBES**. The life time of the equipment should be at least 10 years. | |
| 20. | **Condition of MBES while Supplying**. The offered MBES must be brand new and in operational condition. | |
| 21. | **Certificate/Document of Authentication**. The local supplier must provide following original certificate/document with the offer/quotation to ascertain the ingenuity of source and items in order to establish chain of links from the original source to supply items: | |
| | a. | One certificate/document by the manufacturer in favour of the supplier (In case of manufacturer as direct source). |
| | b. | Two certificates/documents, one by the manufacturer to authorized agent and other by the authorized agent to supplier (In case of authorized agent as immediate source). |
| 22. | **Optional Items**. List of optional items which are nice to have is to be provided with the offer. However, the 100% performance of MBES should be achieved without those optional items. Prices of optional items are to be quoted separately. | |
| 23. | **Tools**. Tools required for servicing and maintenance are to be supplied with the offered MBES. | |
| 24. | **Standard Accessories**. Standard accessories must include every item and accessories, which are essential to install and operate the MBES, whether those are mentioned in the specification or not. List of standard accessories is to be provided with the offer. | |
| 25. | **Spares**. Supply of spares for minimum 08 years is to be ensured and in this regard a certificate to be submitted in original pad of the manufacturing company. List & price of consumable/spares are to be submitted separately. Yearly maximum 5% inflation of price may be accepted. Quoted price of spares will influence the evaluation of final acceptance. | |
| 26. | **Pre Shipment Inspection (PSI) and Factory Acceptance Test (FAT)**. | |
| | a. | Pre Shipment Inspection (PSI) and Factory Acceptance Test (FAT) will be carried out by a team of 02 (two) BN officers for a duration of 03 (three) working days excluding journey period, at the buyer's expense. The supplier should inform the buyer about the date and schedule of PSI and FAT at least 08 (eight) weeks prior to the date of commencement of the said PSI and FAT. After inspection, a joint inspection report will be prepared and signed by both the seller and buyer's representatives. |
| | b. | All types of internal facilities and transportation of the PSI and FAT team within the manufacture/supplier's country, reception and arrangement for entry into country/concerned area for the PSI and FAT are to be arranged by the supplier. The PSI and FAT will be carried out at manufacturer's factory premises. |
| | c. | On return from the country of manufacturer, the PSI and FAT team will submit report to the concerned directorate of Naval Headquarters (NHQ). NHQ will, in turn, forward final decision along with PSI and FAT report at the earliest, 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 the DGDP. |
| | d. | During PSI and FAT, tests will be carried out to fulfill the required conditions mentioned in the technical specification of the MBES system. Various tests for checking performance are to be carried out and recorded. |

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| 27. | **HAT and SAT Protocol**. The HAT and SAT protocol/procedures shall be approved by BN at least 06 (six) weeks prior to commencement of individual schedule. | |
| 28. | **Test, Trial, Commissioning and Acceptance**. Manufacturer foreign representative will carry out joint test, trial and commissioning of MBES and its accessories and hand over all the items in fully operational condition. Successful data collection and processing is to be completed in co-ordination with BN staff. Initial test and trial will be done at harbour. Final trial will be conducted at sea with manufacturer representative on board a Suitable BN Survey Ship. Acceptance certificate will be signed jointly by the representative of manufacturer/authorized dealer and the buyer after satisfactory installation, calibration, test, trial and detail training as mentioned above. Expenditures for the representative of manufacturer visiting in Bangladesh related with the installation, calibration, test, trial and training will be borne by the supplier. | |
| 29. | **Training**. On completion of successful installation, test, trial, commissioning and calibration of the system, training is to be conducted at a suitable BN survey ship by the manufacturer.<br>Followings are to be considered: | |
| | a. | Operation and maintenance level training for a period of 03 working days to be provided. |
| | b. | Outline of the detail training programme is to be submitted with the offer along with the qualifications of the trainers. Schedule of training must not be merged with test/trial schedule. |
| | c. | Training charges are to be quoted separately. |
| 30. | **Local Service Support**. Capability of Local Service supports needs to be available. | |
| 31. | **Requirement of the Principal**. The Principal shall fulfill the following outlines: | |
| | a. | To assess the quality management system (QMS) of the manufacturer, ISO or equivalent certificate must be provided. Details of the organization, resources and measures for quality assurance are to be mentioned. |
| | b. | The service provider shall have proven competence in producing and selling of MBES or similar equipment. |
| | c. | Record of Sale for last 05 years period is to be provided indicating year and name of the user. |
| | d. | Details on maintenance and repair services must be described. |
| | e. | All certificates should have correct reference number along with authenticated address for quick verification / validation if needed. |
| 32. | **Manuals/drawings**. Following manuals are to be supplied free of cost with the equipment (both soft and hard copy): | |
| | a. | Two sets of operating and technical manual in English. |
| | b. | Parts Catalogue. |
| | c. | Detailed installation Diagrams. |
| 33. | **Documents**. The documentation to be submitted with the offer shall include: | |
| | a. | Two sets of original Catalogue/Brochure in English. |
| | b. | List of Standard Accessories. |
| | c. | List of Optional Accessories. |

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| | d. | List of Installation Materials. |
| | e. | List of spares parts for 5 years. |
| | f. | Manufacturer's authenticity certificate. |
| | g. | Certificate of assurance for minimum 08 years supply of spares. |
| | h. | List of tools required for servicing and maintenance. |
| 34. | **Warranty**. | |
| | a. | At least 01 (one) year warranty after satisfactory acceptance by BN is to be provided. |
| | b. | For warranty repair/replacement, the supplier will collect the defective item from NSD Chittagong and re-supply the same to collecting place after warranty repair or replacement within 180 days from the date of defect. Cost of the replaced unit/component including air freight is to be borne by the supplier. |
| | c. | Warranty period will be extended for the duration of non-operational time for the equipment. |
| 35. | **Record of Sale**. Record of sale for last five years indicating year and name of the user to be provided in the offer. | |
| 36. | **Validity of offer**. Up to 30 June 2027. | |
| 37. | **Shipments and Delivery**. The following requirements should be completed: | |
| | a. | The supplier will arrange shipment of all items by sea/air to Chattogram sea/airport, Bangladesh within 180 days from the date of contract signed. |
| | b. | All items are to be delivered in proper packing to ensure safe transit by sea/air. |
| | c. | 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. |
| | d. | The supplier will supply the item at NSD Chattogram. While delivering, the supplier will carry the items from Chattogram sea/airport (as applicable) to NSD Chattogram at the cost and risk of supplier. |
| 38. | **Source of Supply**. The bidder is to mention the name, address and contact detail of original source from where the Portable Multibeam Echo Sounder will be imported. | |
| 39. | **Port of Shipment**. Any port of the manufacturing country (to be mentioned). | |
| 40. | **Consignee**. The Commanding Officer, Naval Store Depot, New Mooring, Chattogram, Bangladesh/ The officer-in-charge, Naval Store Sub Depot, Dhaka Bangladesh. | |
| 41. | **Price without Import Duties**. Quoted price is to exclude all import duties as those will be consigned against BN. | |
| 42. | **Price and Other Cost**. Price of each item of the total offer is to be shown separately (e.g., price of the main items, consumables, additional and optional accessories, Installation, FAT, PSI, local training, warranty/ guarantee etc.) and then grand total of the foreign currency to be shown on the original offer submitted by the bidder. | |

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| 43. | **Terms of Payment**. Necessary letter of credit will be opened for full purchase amount in favour of the principal with following terms of payment: | |
| | a. | 80% of CFR value will be paid on delivery of the items described under the scope of supply on production of necessary shipping document. |
| | b. | Remaining 20% CFR value and 100% cost of test/trial & training amount will be paid after satisfactory acceptance by BN. |
| 44. | **Condition for Acceptance of Quotation**. Quotation may not be considered if detailed information/Specification, original maker's books and catalogue about the same model/version of the offered software, accessories, scope of supply etc. are not provided. | |
| 45. | **Compliance Statements**. A clear and complete compliance statement fulfilling all the requirements of the tender is to be submitted for evaluation as required: | |
| | a. | Article wise compliance report must be given. "Yes/No/Complied" will not be enough. An incomplete compliance statement will attribute to cancellation of the offer. |
| | b. | If any clause of this specification dose not commensurate with offered items, the deviation has to be spelt out clearly. |