

TENDER SPECIFICATION OF UNMANNED SURFACE SURVEY SYSTEM

1. **Name of Equipment.** Unmanned Surface Survey System.
2. **Purpose.** The Unmanned Surface Survey System (USSS) will be used for hydrographic and oceanographic surveys as well as underwater search operations, both at shallow and deep-sea area.
3. **General Description of the Equipment.** The USSS should be portable, light weight, and self-contained. It should be capable of carrying hydrographic & oceanographic sensors as payloads to carry out assigned surveys while maintaining special order of International Hydrographic Organization (IHO) standards. All payloads as mentioned below have to be provided/ supplied by OEM only.
4. **Quantity.** 01 (one) complete system, along with all standard accessories (Hardware and Software) required to operate the vessel. In addition, 01 in no portable SBES, 01 in no portable MBES with integrated SV probe, motion sensor (MRU) and dual frequency GNSS system RTK with Inertial Navigation System (INS) compatible with the MBES, 01 in no portable SVP and 01 in no portable ADCP (Optional and price to be quoted separately) as payload compatible and configurable/ fixable with the supplied Unmanned Surface Survey System with necessary softwares integration and kit.
5. **Brand/Model.** To be mentioned.
6. **Country of Origin.** USA, UK, Norway, Canada and EU Countries.
7. **Country of Manufacturer.** USA, UK, Norway, Canada and EU Countries.
8. **Name and Address of the Manufacturer.** To be mentioned (address, telephone, facsimile number, email address are to be mentioned).
9. **Date of First Introduction in the Market.** To be mentioned.
10. **Year of Manufacture.** 2024 or later.
11. **Qualification of Bidder.** Only genuine manufacturer or authorized dealer (Foreign principal) can submit quotation through authorized agents/dealer enlisted in the Directorate General of Defense Purchase (DGDP). For participation by agents/dealer, authenticity certificate is required.
12. **Scope of Supply.** The USSS will be supplied along with all accessories as per the specification mentioned in this document.
13. **Specifications of the Unmanned Surface Survey System.**
  - a. **Length.** 4-4.6 meters.
  - b. **Width.** To be mentioned.
  - c. **Height.** To be mentioned.
  - d. **Hull Material.** UV Resistant HDPE/ GRP/ Aluminum.
  - e. **Transducer Well.** Should have transducer well to set up Portable Single Beam Echo Sounder, Portable Multi beam Echo Sounder, Portable SVP and Portable ADCP.
  - f. **Hardware.** To be mentioned.
  - g. **Hull Weight.** Max 1100 kg (Except Payload).
  - h. **Endurance.** Min. 10 hours.
  - i. **Payload Capacity.** To be mentioned.

- k. **Power.** To be mentioned.
- l. **Sea State.** It should be capable of carrying out hydrographic surveys in sea state 3 (Sustainability up to sea state 4).
- m. **Remote Control.** Yes. Type to be mentioned with detail information.
- n. **Propulsion.** Battery/Diesel/Diesel-Electric/Hybrid (Diesel grade to be mentioned).
- p. **Propulsion System.** Autopilot and Remote Control.
- q. **Communication Range.** Autopilot minimum 10 km and Remote-Control minimum 2 km.
- r. **Alternate Communications.** Should have alternate communications system (To be mentioned).
- s. **Collision Avoidance.** Yes (Detail to be mentioned).
- t. **Data Storage.** To be mentioned.
- u. **Real Time Data Transmission.** Yes, for remote decision making. Type to be mentioned.
- v. **Launce and Recovery.** Should have single-point lift solution.
- w. **Standard Vehicle Control.** Mission planning (Lines, waypoints, station keeping, Georeferencing) Should have standard vehicle control.
- x. **Optional Vehicle Control.** To be mentioned.
14. **Additional Feature.**
- Remote workstation with necessary/integrated software and hardware for data acquisition and decision making.
  - Necessary servicing tools for portable sensor storage facilities.
  - Vehicle battery charger and two sets of spare batteries (if it uses battery).
  - One suitable cradle for housing the vehicle with movement facility to be provided (Price to be quoted separately).
  - The USSS should have the feature to be tracked (at least position) in the case of communication lost by GSM or any other modern technology (Details information to be mentioned in the offer).
15. **Optional feature.** Smooth and robust smart cast system (if available to fix with the USSS ) to automatically deploy a sound velocity profiler to user-selected depths may be offered and price to be quoted separately. The winch should be mounted on the USSS. The winch cable length should be a minimum of 50m. The USSS should have such facility that the user will be able to arm the system, enter the desired cast depth, and monitor cast activity all within the integrated software.

#### **SPECIFICATION OF PAYLOADS FOR UNMANNED SURFACE SURVEY SYSTEM (USSS )**

##### **Portable Shallow Water Multi Beam Echo Sounder (SWMBES)**

16. **Quantity.** 01 (one) complete system.
17. **Brand/Model.** To be mentioned.



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18. **Reference.** The offered SWMBES must be used by any of the renowned government Hydrographic Organizations like SHOM (France), NOAA (USA), UKHO (UK), JHD (Japan), AHS (Australia), IIDM (Italy), Dutch Navy, etc. and port authorities. The name of the hydrographic organization/department and the platform on which it is installed are to be mentioned clearly in the offer.

19. **Country of Origin.** USA, Canada, UK, EU Countries and Norway.

20. **Country of Manufacturer.** USA, Canada, UK, EU Countries and Norway.

21. **Name and Address of the Manufacturer.** To be mentioned (address, telephone, facsimile number, email address are to be mentioned).

22. **Date of Introduction in the Market.** To be mentioned.

23. **Year of Manufacture.** 2024 or later.

24. **Scope of Supply.** The SWMBES will be supplied along with all accessories as per the specification mentioned in this document.

25. **Technical Parameters.**

a. **Performance Requirements.**

(1) **Transducer Dimension and Weight.** The portable SWMBES will be fitted on a USSS. Dimension and weight is to be mentioned in detail.

(2) **Swath Coverage in Degree.** 170° or more (Must meet IHO special order requirement in shallow water).

(3) **Range Resolution.** <15 mm.

(4) **Number of Beams.** 512-1024 EA & ED.

(5) **Operating Frequency.** Frequency agility between 190-700 kHz.

(6) **Depth Range.** 0.2m - 250m or higher.

(7) **Pulse.** FM and CW.

(8) **Pulse Length.** To be mentioned.

(9) **Ping Rate.** At least 40 kHz.

(10) **Bandwidth.** To be mentioned.

(11) **Resolution (Across X Along).** 1° X 1° at nominal freq, 0.6° X 0.6° or better at maximum freq.

(12) **Positional Accuracy of Sounding.** HOR: ±(8mm +1ppm X Distance From RTK Station) or better. VER: ±(15mm +1ppm X Distance From RTK Station) or better.

(13) **Beam Stabilization.** Roll and pitch.

(14) **Motion Sensor.** Integrated with MRU provided system.

(15) **Heading Accuracy.** 0.02° (RTK) with 2m Antenna Separation or better.

(16) **Pitch/Roll Accuracy.** 0.01° or better Independent of Antenna Separation or better.

(17) **Heave Accuracy.** 2cm or 2% (True Heave), 5cm or 5% (Real Time).



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(18) **Weight.** To be mentioned.

**Interfaces.** To be mentioned.

(19) **Cable Length.** Min 10m (another additional 20m cable is to be provided).

(20) **Power Consumption.** 10-28VDC, 110-240VAC.

(21) **Operating Temperature.** +5°C TO +40°C (Topside 5°C to +55°C).

(22) **Storage Temperature.** +5° to +60°C.

(23) **Ingress Protection.** IP67.

b. **Mounting System.** The OEM-designed mounting system is to be attached to the Unmanned Surface Survey System. It should be corrosion resistant and capable to continue survey upto 08 (eight) Knot speed.

c. **Operational Requirements.**

(1) The system performance will not be affected by the warm, turbid, and turbulent water of the Bangladesh coast.

(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 SWMBES transducer shall be well protected against damage by floating or submerged 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 state-of-the-art and fulfill the above-mentioned accuracy criteria.

d. **Environmental Conditions.** The system should be robust enough to sustain rough sea conditions and operate without any performance degradation under the following environmental conditions:

(1) Freshwater, turbid sea water and water-oil-emulsions.

(2) Water temperatures: Between -5°C and +50°C.

(3) Higher humid conditions.

26. **Communication.** User configurable communication setting option should be available. Type of data cable (RS 232/ RS 422) to be mentioned. Sufficient length of data cable to be supplied with each of the echo sounder. Length of the offered cable to be mentioned in the offer.

27. **Data Backup Facilities.** Two portable hard drives with a capacity of 2 Tera Byte (TB) is to be provided. Brand and model are to be mentioned with the offer.

28. **Hardware.** All necessary hardware for satisfactory installation and performance of the SWMBES system are to be provided.

29. **Power Supply.** Necessary power supply should be arranged from the boat. Continuous supply should be made. The detail description of continuous power supply solution is to be provided with the offer.

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30. **Software Packages.** Suitable software for data acquisition with workstation is to be provided with the offer. The software should at least fulfil the following basic criteria:
- a. The data acquisition software must be compatible with the offered SWMBES system.
  - b. Provision for real time high resolution 3D visualization.
  - c. Provision for real time corrections for motion compensation, Sound Velocity and Tidal data.
  - d. Output data formats must be internationally recognized, widely used and compatible with various well reputed, standard Multi-beam processing software like CARIS HIPS and SIPS, HYSWEEP, Qimera etc.

**Single Beam Echo Sounder (Portable)**

31. **Type.** Compact Hydrography Survey standard Dual frequency SBES for USSS. Must be compatible to the provided USSS.
32. **Quantity.** 01 (One).
33. **Brand/Model.** To be mentioned. The offered brand/model should be used by various national hydrographic offices around the world. List of such national hydrographic offices and other users is to be provided with the offer.
34. **Country of Origin.** UK, USA, Canada, Norway, EU countries (Name of the country to be mentioned).
35. **Country of Manufacture.** UK, USA, Canada, Norway, EU countries (Name of the country to be mentioned).
36. **Name and Address of the Manufacturer.** To be mentioned (address, telephone, facsimile number, email address are to be mentioned).
37. **Date of First Introduction in the Market.** To be mentioned.
38. **Year of Manufacturer.** 2024 or Later.
39. **Scope of Supply.** The Portable SBES will be supplied along with all accessories as per the specification mentioned in this document.
40. **General Features.** The Echo Sounder will have the following features:
- a. Robust in design and construction.
  - b. Provision for interfacing with provided positioning system.
  - c. Provision for interfacing with heave compensator/ motion sensor unit.
  - d. Recording of digital data.
  - e. Event mark with position, date, time, & depth.
  - f. Self-check functions.
  - g. Automatic gain control.
  - h. Both auto and manual phasing.
  - j. Annotation functions with built-in Clock and Calendar.
  - k. Digital display.
  - l. Audio alarm when exceeding/falling short of pre-set depth.
  - m. Provision for sea bottom layer classification.
41. **Portable Transducers.** Portable transducer assembly of Single Beam Echo Sounder specification as follows:
- a. **Size.** To be mentioned.
  - b. **Weight.** To be mentioned.

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c. **Associated Fittings.** Associated fittings for installation of transducer are to be provided along with the detailed list.

d. **Transducer Cable.** As required from data storage to transducer onboard Unmanned Surface Survey System (Additional to 20m cable is to be provided).

42. **Technical Parameter.**

a. **Frequency.** Low Band: 20 ~ 50 kHz and High Band: 130 ~ 250 kHz or higher.

b. **Depth Range.** 0.2-250m or higher.

c. **Measuring Accuracy.** 0.01 m @130-250 KHz (or better); 0.1 m @20-50 KHz (or better).

d. **Recording.** Digital data recording system.

e. **Depth Resolution.** At least 1 cm at 100 m depth.

f. **Proven Bottom Tracking Algorithms.** To be mentioned.

g. **Interfacing.** The recorded data of the Single Beam Echo Sounder should be compatible with HYPACK, QINSY, and similar hydrographic software. Necessary interfacing facilities to be provided.

h. **Beam Angle.** The echo sounder must have variable beam angle options both in high and low frequencies.

j. **Output Power.** To be mentioned.

k. **Motion Data.** The echo sounder should have capacity to receive input of heave data and able to process corrections.

l. **Real-Time Data Display.** Color display; enable to show depth, along the track, slope, and layer detection in both high and low frequencies with an in-built data logger (preferably a laptop) with IP 65 protection. The brand and model of the laptop has to be mentioned.

m. **Data Output Option.** Raw data and heave corrected data.

n. **Data Input / Output Format.** NMEA.

p. **Data Storage.** All necessary devices like Hard disk or other accessories to be provided for data backup.

q. **Multiple Functions.** Provisions of supporting "multi pulse function" for better accuracy, include TVG and variable pulse.

43. **Data Acquisition Software.** Suitable software for data acquisition is to be provided with the offer. The software should at least fulfil the following basic criteria:

a. The data acquisition software must be compatible with the offered SBES system.

b. Output data formats must be internationally recognized, widely used and compatible with various well-reputed, standard Single Beam data acquisition and processing software like HYPACK, CARIS HIPS & SIPS QINSY, QIMERA and similar hydrographic software.

44. **Power Requirement.**

a. **Supply Voltage.** To be mentioned.

b. **Average Power Consumption.** To be mentioned.

c. **Data Cable.** Minimum 10m to be provided.



45. **Environmental Conditions.** The echo sounder will be used in and around Bangladesh's coastal area where sea water is turbid and the subtropical environment persists.

a. **Operating Temperature.** To be mentioned (suitable for the subtropical region).

b. **Operating Humidity.** To be mentioned (suitable for the subtropical region).

**Dual frequency GNSS system RTK**

46. **Quantity.** 01 (One) complete sets (01 set as Master and 03 sets for Rover).

47. **Brand /Model.** To be mentioned.

48. **Country of Origin.** USA/UK/Canada/Australia and EU Countries.

49. **Country of Manufacture.** USA/UK/Canada and EU Countries.

50. **Name and Address of the Manufacturer.** To be mentioned (address, telephone, facsimile number, email address to be mentioned).

51. **Date of First Introduction in the Market.** To be mentioned (Latest series of the production is preferred).

52. **Year of Manufacturer.** 2024 or latest.

53. **Scope of Supply.** Dual frequency GNSS system RTK with Inertial Navigation System (INS) to be supplied along with all accessories as per the specifications mentioned in this document.

54. **Robust.** The equipment should be light weight but Robust so that, it withstands rugged field work in the weather condition.

55. **Essential Components.** All essential components for the effective use of master and rover receiver units are to be provided. Detail list to be submitted.

56. **Technical Specification:**

a. **Receiver Type.** Dual frequency, Geodetic, Real-time RTK.

b. **Receiver Technology.** To be mentioned.

c. **Measuring Modes.** Sooner and faster with HD-GNSS technology, Carrier phase real-time RTK standard.

d. **Receiver Modes.** Real-time Kinematic, static GNSS, static and fast, stop & Go, Kinematic on the Fly, Post processing etc. will be preferred.

e. **No of Channels.** To be mentioned.

f. **Encoding.** To be mentioned.

g. **Measurement.** To be mentioned. However, followings are preferable:

(1) **Satellite signals traced simultaneously:**

- (a) GPS: L1C/A, L1C, L2C, L2E, L5
- (b) GLONAS: L1C/A, L1P, L2C, L2P, L3
- (c) SBAS: L1C/A, L5
- (d) Galileo: E1, E5a, E5B
- (e) BeiDou (COMPASS): B1, B2

(2) **Position Update Rate.** 1 Hz, 2 Hz, 5 Hz, 10 Hz and 20 Hz or better.



- (3) Worldwide centrimetric level positioning.
- h. **Accuracy.** To be mentioned. However, followings are preferable:
- (1) **Kinematic.**
    - (a) **Horizontal.** 10 mm 1 ppm RMS or better.
    - (b) **Vertical.** 20 mm 1 ppm RMS or better.
    - (c) **Initialization Time.** To be mentioned.
  - (2) **Static/Rapid Static.**
    - (a) **Horizontal.** 5 mm + 0.5 ppm RMS or better.
    - (b) **Vertical.** 5 mm + 0.5 ppm RMS or better.
  - (3) **GNSS.**
    - (a) **Horizontal.** 0.25 m + 1 ppm RMS or better.
    - (b) **Vertical.** 0.50 m + 1 ppm RMS or better.
- j. **Baseline Length/Range.** To be mentioned (At least 30 km. However, longer range will be preferred).
- k. **Connectivity.** To be mentioned. However, followings are preferable:
- (1) **Bluetooth.** Fully integrated, fully sealed 2.4 GHZ communications port (Bluetooth 11).
  - (2) **Wifi.** 802.11 b, g access point and client code, WPA/WPA2/WEP64/WEP 128 encryption.
  - (3) External communication devices for corrections supported on Serial, USB, Ethernet and Bluetooth ports to be mentioned.
  - (4) **Radio modem.** Fully Integrated, sealed 450 MHZ wide band receiver/transmitter with frequency range of 403 MHZ to 470 MHZ.
  - (5) **Transmit power.** To be mentioned.
  - (6) **USB v2.0.** Supports data download and high speed communications. Detail information and options for radio modem are to be mentioned.
- l. **Memory Capacity.**
- (1) **Internal memory.** To be mentioned.
  - (2) **Extendable Memory.** To be mentioned.
- m. **Data Recording.** Data storage rate based on recording every 15 sec from an average of 14 satellites.
- n. **Data Format.**
- (1) CMR+, CMRx, RTCM 2.1, RTCM 2.3, RTCM 3.0, RTCM 3.1, RTCM 3.2 Input and output NMEA, ASCII output.
  - (2) 24 NMEA outputs, GSOF, RT17 and RT27 outputs.
  - (3) GIS/CAD export.
  - (4) Any other additional information if available are to be mentioned.





- p. **Power Requirements.**
- (1) **Supply Voltage.** Power 11 to 24 V DC external power input with over voltage protection.
  - (2) **Power Source.** Rechargeable, removable Lithium-ion smart battery with LED status indicators.
  - (3) **Battery Charger.** Charger for internal battery to be provided.
  - (4) **Power Consumption.** To be mentioned.
- q. **Co-ordinate System.**
- (1) **Ellipsoids.**
    - (a) All common ellipsoid including WGS -84 and ITRF14.
    - (b) User definable Ellipsoid.
  - (2) **Datum.**
    - (a) WGS -84 and local.
    - (b) User definable.
  - (3) **Projection.**
    - (a) All common projections like Mercator, Transverse Mercator's to be supported.
    - (b) User definable and country specific projections like UTM, Lambert etc. to be supported.
- r. **Display type and Size.** Should have built in display and keyboard. Display type and size to be mentioned.
- s. **Differential Correction.** The receiver should be capable of receiving DGPS Correction message from SBAS (WAAS, EGNOS etc).
- t. **Operating Temperature.** -10c to +50c.  
**Humidity Tolerance.** At least 95%
- u. **Antenna Connector.** Positioning system (To be mentioned).
- v. **Serial Ports.** At least 01 RS-232/RS-422 serial port & 02 USB.
- w. **Data Input /Output Protocol.** NMEA 0183 (Latest Version).
- x. **Data Cable.** At least two standard interfacing cable to be provided.
- y. **On Board Post Processing Software.** All necessary software and divers are to be provided for post processing using IGS station, PC interface, data uploading and down loading etc. which should be windows based. Details information regarding the software are to be mentioned.
- z. **Interchangeable Role as Reference Station and Rover.** The receiver should be usable as Reference station, as well as Rover.
57. **Environmental Specifications.**
- a. **Operating temperature.** To be mentioned.
  - b. **Humidity.** 100% condensing.
  - c. **Protection against Water, Dust and Sand.** To be mentioned (IP67 will be preferred), protection from temporary immersion to depth of 1m (3.28 ft).

58. **Power Supply.** To be powered from the boat's power supply.
59. **Interfaces.** The recorded data of the GNSS Receiver should be compatible with HYPACK/HYSWEEP, CARIS HIPS & SIPS, Qinsy, and similar hydrographic data acquisition software. Necessary interfacing facilities to be provided. The output data will be used for MBES and SBES of the boat. As such the GNSS Receiver data format should be compatible and effectively able to be fed into the offered MBES system and SBES system.

**Sound Velocity Profiler (Portable)**

60. **Quantity.** 01 (One) complete set.
61. **Brand/Model.** To be mentioned.
62. **Country of Origin.** USA/ UK/ Canada/ EU countries/ Norway (Name of the country to be mentioned).
63. **Country of Manufacture.** USA/ UK/ Canada/ EU countries/ Norway (Name of the country to be mentioned).
64. **Name and Address of the Manufacturer.** To be mentioned (address, telephone, facsimile number, email address are to be mentioned).
65. **Date of First Introduction in the Market.** To be mentioned.
66. **Year of Manufacturing.** 2024 or later.
67. **Measuring Sensors.** The equipment should have at least sound velocity, temperature, salinity, and pressure measurement sensors with the following specifications:

a. **Sound Velocity.**

Ser	Description	Requirement
1.	Range	1375-1700 m/sec
2.	Accuracy	±0.02m/sec or better.
3.	Resolution	0.001m/sec or better.
4.	Sampling	To be mentioned.
5.	Type of Sensor	To be mentioned.

b. **Temperature.**

Ser	Description	Requirement
1.	Range	-5°C to + 35°C.
2.	Accuracy	±0.05°C or better.
3.	Resolution	0.005°C or better.
4.	Sampling Rate	To be mentioned.
5.	Type of Sensor	To be mentioned.

c. **Pressure.**

Ser	Description	Requirement
1.	Range	0-300m or better.
2.	Accuracy	±0.01% of full scale or better.
3.	Resolution	0.001% or better.
4.	Sampling Rate	To be mentioned.
5.	Type of Sensor	To be mentioned.

d. **Conductivity.**

Ser	Description	Requirement
1.	Range	0-80mS/cm.
2.	Accuracy	±0.01mS/cm or better.
3.	Resolution	0.002mS/cm or better.
4.	Sampling Rate	To be mentioned.
5.	Type of Sensor	To be mentioned.

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68. **Basic Composition**

- a. SV Profiler (capable to measure parameters at least up to 300m).
- b. Data Cable.
- c. All accessories for Installation.

69. **Data Recording**

- a. **Memory.** Total number of data points that can be stored in the memory is to be mentioned in the offer. A larger memory capacity will be preferred.
- b. **Sampling Mode.** The equipment should have the following sampling mode of operation:
  - (1) Continuous.
  - (2) Profile (with change of pressure/depth).
  - (3) Conditional.
- c. **Synchronization.** Should have true synchronous sampling for all sensors.

70. **Communication.** The equipment should have a user-configurable communication setting option. Sufficient length of data cable is to be offered with the equipment. The length and specification of the data cable is to be mentioned in the offer.

71. **Interfaces.** The recorded data of the SV Probe should be compatible with HYPACK/ HYSWEEP, CARIS HIPS & SIPS, Qinsy and similar hydrographic data acquisition software. Necessary interfacing facilities to be provided. The output data will be used for the MBES and SBES of the boat. As such the SV Probe data format should be compatible and effectively able to be fed into the offered MBES system and SBES system.

72. **Software.** Software for data acquisition and processing is to be included with the offer. The software should be Windows OS based and should allow configuration for data sampling. It should also allow visualization of extracted data in graphical and tabular form. A detailed description of the software is to be provided with the offer.

73. **Power supply.** The power supply option for the SV probe is to be mentioned.

74. **Mechanical Details.** To be mentioned. The physical specifications like size, dimension, weight, construction material etc. of the equipment is to be provided in details in the offer.

**Acoustic Doppler Current Profiler (Optional and Price to be quoted separately)**

75. **Name of Equipment.** Acoustic Doppler Current Profiler (Portable) and compatible to the supplied USSS.

76. **Purpose.** The Current Profiler will be used to determine the current profile (speed and direction) of the water column which will be used for the Hydrographic and Oceanographic survey.

77. **General Description of the Equipment.** The Equipment should be self-contained, portable, lightweight, and robust in nature. It should be capable of measuring current velocities over a range of depths. It should be operated on the Acoustic Doppler principle.

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

79. **Brand/Model.** To be mentioned.

80. **Country of Origin.** UK, USA, Canada, Norway, EU countries (Name of the country to be mentioned).

81. **Country of Manufacturer.** UK, USA, Canada, Norway, EU countries (Name of the country to be mentioned).

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82. **Name and Address of the Manufacturer.** To be mentioned (address, telephone, facsimile number, email address are to be mentioned).

83. **Date of First Introduction in the Market.** To be mentioned.

84. **Year of Manufacture.** 2024 or later.

85. **Scope of Supply.** 01 in number Current Profiler will be supplied. The basic composition of the supply will be as follows:

- a. Standard housing including double internal alkaline battery.
- b. Memory on the motherboard.
- c. Pressure 0-100m.
- d. Compass.
- e. Required cable for onboard connection (Additional 50m polyurethane cable w/8-pin connector is to be provided and Price to be quoted separately).
- f. 2 Alkaline batteries(18AA/50Wh).
- g. 2 Lithium-Ion(rechargeable) batteries (50Wh) with one charger.
- h. Professional Shipping Case.
- j. Software

86. **Technical Specification.** The Current Profiler Should have the following specifications:

- a. **Size& Dimension.** To be Mentioned.
- b. **Construction Material.** Delrin and polyurethane plastics with titanium screws.
- c. **No of Beams.** Three or more.
- d. **Weight.** To be Mentioned.
- e. **Profiling Range.** 40 m or more.
- f. **Maximum Altitude.** To be Mentioned.
- g. **Cell Size.** To be Mentioned.
- h. **Operation Frequency.** 400- 600 kHz
- j. **Ping Rate.** 1 Hz
- k. **Velocity Range.**  $\pm 10\text{m/sec}$
- l. **Accuracy.** At least  $\pm 1\%$  of measured value.
- m. **Resolution.** Minimum 0.00001 cm/s
- n. **Minimum Blanking Range.** 0.5m
- p. **Memory.** To be Mentioned.
- q. **Operating Temperature.** 0° C to 40° C
- r. **Depth Rating.** Up to 500m.
- s. **Data Recording Capacity.** To be Mentioned.
- t. **Power Supply.** 12-48 volt DC.

87. **Standard Sensors.** The equipment will have the following sensors with specifications stated against them:







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Ser	Description	Specification
a.	Temperature sensor	Thermistor embedded, Range: -4°C to 30°
b.	Tilt Sensor	Solid state accelerometer (Max 1 Hz sample rate)
c.	Compass	Type: Magnetometer Accuracy/resolution: 2°/0.1 ° for tilt: <20°/30°
d.	Pressure	Type: Piezoresistive, Range: 0-100m

88. **Software.** Software for data acquisition and post-processing is to be included with the offer. The software should be Windows-based and should allow configuration for data sampling. It should also allow real-time visualization of data and data analysis. The details of the software are to be given in the offer.

89. **Communication.** The equipment should have user configurable real time interfacing option for high-speed data download. Adequate length of data cable (RS 232/RS 422) is to be supplied with the equipment. Detail is to be mentioned with the offer. User configurable communication setting option should be available.

90. **Lifetime of the System and All Equipment.** At least 10 years.

91. **Condition of the System and All Equipment while Supplying.** The offered system and equipment must be brand new and in operational condition.

92. **Catalogue/Brochure.** Two sets of original Catalogue/Brochure USSS and equipment in English to be supplied with the offer.

93. **Quality Management System.** To assess the quality management system (QMS) of the manufacturer, ISO or equivalent certificate has to be provided with the offer.

94. **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 in favour of the authorized agent and other by the authorized agent in favour of the supplier (In case of authorized agent as immediate source).

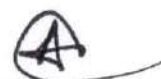
95. **Manuals/drawings.** Following manuals are to be supplied free of cost with the equipment at the time of delivery:

- a. Two sets of operating manual in English.
- b. Two sets of technical manual in English (If any).
- c. Two sets of maintenance manual.

96. **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 (including return air ticket, food and accommodation). 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 movement/transportation of the PSI/ FAT team within the manufacture/ supplier' scountry, 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/FAT, tests will be carried out to fulfill the required conditions mentioned in the technical specification of the Unmanned Surface Survey System (USSS). Various tests for checking performance are to be carried out and recorded.

#### **For All Sensors and Equipment**

##### 97. **Installation and Settings.**

a. **Assembling of System Components.** The system components of the USSS and payload sensors should be assembled by the manufacturer's experts. All installation materials like cables, junction boxes, power cables, sockets, etc. are to be provided accordingly.

b. **Other Requirements.** Interfacing the whole system and sensors with onboard facilities should be ensured by the manufacturer's experts.

98. **Test and Trial.** Manufacturer representative will carry out test and trial of the USSS on board suitable Bangladesh Navy Ship at Chattogram. Initial test and trial will be done at Harbour. Final trial will be conducted at sea with manufacturer representative on board. Cost of test and trial to be quoted separately.

99. **Operation and Maintenance Training.** 06-08 BN personnel are to be trained for 07 working days by the manufacturer's engineer or OEM who has adequate qualification and experience on the system for troubleshooting and maintenance in Bangladesh. The training should cover the following:

- a. Rigging techniques and function of all individual components.
- b. Periodical maintenance.
- c. Theoretical and practical training on calibration and data acquisition.
- d. In-depth training on operational deployment, data acquisition and processing.

**Note:** The supplier should provide two copies of supporting manuals for the above mentioned topics in English. Training should be conducted by OEM experienced trainers/engineers having in-depth knowledge of data acquisition, processing and maintenance. The name and detail profile of the trainer is to be submitted with the offer. The price of the training is to be quoted separately.

100. **Acceptance.** On completion of satisfactory test and trial final acceptance certificate will be signed jointly by the representative of manufacturer and the buyer.

##### 101. **Warranty.**

a. At least two years warranty for USSS and One year warranty for all equipments after satisfactory acceptance by BN is to be provided.

b. For warranty repair/replacement, the supplier will collect the defective item from NSD Chattogram and re-supply the same to collecting place after warranty repair or replacement within 90 (ninety) 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.

102. **Tools.** Tools required for servicing and maintenance for the USSS and equipments are to be supplied at the time of delivery. List of tools are to be provided with the offer.





103. **Standard Accessories.** All standard accessories to be provided by the supplier. It must include every item and accessories, which are essential to install and operate the USSS in standard level, whether those are mentioned in this specification or not.

104. **Spares.** Following are to be given with the offer for the USSS and equipments:

- a. One set of spare battery is to be provided at the time of delivery of USSS.
- b. Spares require for 05 years trouble free operation are to be quoted separately.
- c. Supply of spares for minimum 10 years is to be ensured and in this regard a certificate is to be submitted in original pad of the manufacturing company.
- d. List & price of consumable/spares are to be submitted separately.
- e. If the item is of one time use/not reparable that is to be mentioned clearly.

**Note:** Quoted price of spares will influence the evaluation of final acceptance.

105. **Optional Items.** Any optional items which may be provide are to be quoted, indicating item wise price. However, 100% performance guarantee of the main equipment is to be given without such optional items.

106. **Documents.** Following documents are to be submitted with the offer:

- a. Two sets of original catalogue/brochure in English.
- b. List of standard accessories with pattern number and other specification.
- c. List of optional accessories.
- d. List of 10 years spares parts.
- e. List of Tools.
- f. User list.
- g. Manufacture's authenticity certificate.
- h. Design/drawing of portable installation method and associated fittings (if not included in original catalogue).

107. **Record of Sale.** The offered USSS must be used by any of the reputed government Hydrographic Offices like SHOM (France), NOAA (USA), UKHO (UK), JHD (Japan), AHS (Australia), IIDM (Italy), KHOA (Korea) etc. Record of sale for last five years indicating year and name of the user to be provided in the offer.

108. <sup>offer</sup> **Validity.** Up to 30 June 2025.

109. **Shipments and Delivery.**

- a. The supplier will arrange shipment of all items by sea/air to Chattogram sea/air port, 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/air port (as applicable) to NSD Chattogram at the cost and risk of supplier.

110. **Source of Supply.** The bidder is to mention the name, address and contact detail of original source (Manufacturer) from where the USSS will be imported.

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111. **Port of Shipment.** Any port of the manufacturing country (to be mentioned).
112. **Consignee.** The Commanding Officer, Naval Store Depot, New Mooring, Chattogram, Bangladesh.
113. **Price without Import Duties.** Quoted price is to exclude all import duties as those will be consigned against BN.
114. **Terms of Payment.** Necessary letter of credit will be opened for full purchase amount in favor of the principal with the 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 amount will be paid after satisfactory acceptance by BN.
115. **Condition for Acceptance of Quotation.** Quotation may not be considered if detailed information/specification, original maker's books and catalogue about the same model of the offered item, accessories, scope of supply etc are not provided.
116. **Compliance Statement.** A complete statement fulfilling all the requirements of the tender is to be submitted for evaluation as required:
- a. Article wise compliance report must be given. An incomplete compliance statement may attribute to cancellation of the offer.
  - b. If any clause of this specification does not commensurate with offered item, the deviation has to be spelt out clearly.

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