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Directorate of Hydrography
Integrated Headquarters of
Ministry of Defence (Navy)
New Delhi - 110011

HY/PP/1145/RFI

12 Jan 21

REQUEST FOR INFORMATION
UNMANNED SURVEY VESSELS

1. The Ministry of Defence, Government of India, intends to procure three (03) '*Unmanned Survey Vessels*', for the hydrographic department of the *Indian Navy*.

2. This Request for Information (RFI) consists of two parts as indicated below:-

(a) **Part I**. The first part of the RFI incorporates operational characteristics and features that should be met by the equipment. A few important technical parameters of the proposed equipment are also mentioned.

(b) **Part II**. The second part of the RFI states the methodology of seeking response of vendors. Submission of incomplete response format will render the vendor liable for rejection.

(c) **Part III**. Guidelines for Vendor Selection/ Pre-Qualification in Buy Indian (IDDM), Buy (Indian) and Buy & Make (Indian) Cases.

PART I

3. The Unmanned Survey Vessels (USVs) will be used for collection of bathymetric data of shallow waters. The system is utilized for undertaking hydrographic surveys of shallow waters in autonomous/ unmanned mode using swath sounding and SBAS positioning techniques meeting the International Hydrographic Organisation (IHO) laid down standards. The broad based requirements envisaged for the *'Unmanned Survey Vessels'* are placed at **Enclosure 1**. Vendors are requested to *bring out in detail*, all the features that they are able to offer (*with numerical values where applicable*). Additional information/ features available, other than those indicated may also be given.

4. About three (03) Unmanned Survey Vessels are envisaged for procurement with an anticipated delivery timeframe within 06 to 12 months of conclusion of contract. The Request for Proposal (RFP) for procurement of the USVs is likely to be issued by end-2021. The vendors are to highlight the following in their response:-

(a) Whether the equipment is in use by any other Navy/ offered for use by other Governmental/ Non-Governmental agencies within India and if so, unit price (without taxes/ custom duties) and year in which it was supplied. The differences between these versions of equipment and the equipment presently being offered may also be highlighted.

(b) Manufacturer's Recommended List of Spares (MRLS), inclusive of the Onboard Spares (OBS) and Base & Depot Spares (B&D), for the equipment for a period of two years.

(c) Product support in terms of maintenance, materials and spares for a minimum period of **12** years from the time of delivery of the equipment. Even after the said mandatory period, the vendor would be bound to give at least two years notice to the Government of India prior to closing the production line so as to enable a Life Time Buy of all spares before closure of the said production line. The said aspect would also form an integral part of the contract. All upgrades and modifications carried out on the equipment during its life cycle must be intimated to the IHQ of MoD (Navy).

(d) Vendors would be required to provide training to the Buyer in operations and maintenance of the equipment during the installation/commissioning at the procurement stage and vendors are required to provide an indicative cost for the same in their proposals.

(e) Vendors are to bring out the availability of indigenous software for running applications on the equipment/system.

(f) Willingness to provide ToT (know-how and know-why) along with exact scope of ToT and Transfer of Production, transfer of maintenance infrastructure. Vendors are to indicate their willingness to set up dedicated manufacturing line, including design, integration and manufacturing processes in India.

(g) Feasibility/ willingness to set up repair facility in India/ presence of authorised local service providers for undertaking post-sales support and maintenance of the equipment. The maintenance contract, concluded subsequently for maintenance on completion of the system warranty, would be comprehensive in nature (i.e. including spares, toolkits, modules etc).

(h) Vendors would be required to ensure that adequate stocking of spares by the vendor authorised local repair agency for the complete life cycle of the equipment is ensured and also to prevent quick obsolescence of the equipment in case the vendor discontinues the particular model of the equipment in favour of the new version/model of the equipment.

(j) **Option Clause**. An Option Clause may be exercised in the procurement case. Vendors must express their willingness or otherwise for Option Clause, including the duration for which the Option Clause would be valid.

(k) Feasibility/ willingness to conduct No Cost-No Commitment (NC-NC) Field Evaluation Trials (FET) in vendor premises/ India and the modalities thereof.

(l) The cost estimate of the equipment is to be inclusive of taxes. Cost estimate including Taxes (to be indicated separately) is to be provided.

(m) Whether the Vendor would be able to comply with all provisions of Defence Acquisition Procedure 2020 (DAP) or not. If not, which Para/ Clause of DAP would not be agreed to, with reasons?

(n) The tentative delivery schedule for supply of the equipment after conclusion of Contract. Information on trials and training schedule for the equipment is also to be included.

(p) Acceptability to the terms of payment as per DAP, as amended from time to time.

(q) Additional details, as deemed appropriate.

(r) Vendors may consider RFI as advance information to obtain requisite government clearance. However, it is reiterated that RFI is not a commitment for procurement.

(s) Vendors are to indicate any restrictions related to export in their country and how long will it take to get clearance for the same in their response.

(t) Indian vendors, in addition, may also indicate their capability to Indigenously Design & Develop the USVs.

4. Vendors should confirm that following conditions are acceptable:-

(a) The solicitation of offers will be as per 'Single Stage-Two Bid System'. It would imply that a 'Request for Proposal' would be issued soliciting the technical and commercial offers together, but in two separate sealed envelopes. The validity of commercial offers would be at least 18 months from the date of submission of offers.

(b) The technical offers would be evaluated by a Technical Evaluation Committee (TEC) to check its compliance with RFP. Vendors are to provide information regarding the qualitative parameters which can be evaluated through simulation/ certification/ documentation/ demonstration etc.

(c) The equipment of all TEC cleared vendors would be put through a trial evaluation at the vendor premises/ India on a 'No Cost No Commitment (NCNC)' basis. A staff evaluation would be carried out by SHQ to analyse the result of field evaluation and shortlist the equipment for introduction into service. Vendors are to forward a list of equipment that would be made available for NCNC trials.

(d) Vendors are to confirm the feasibility to offer NCNC trials, including at sea (if applicable), of proposed equipment in India/ abroad, in exact configuration as proposed in response to the RFI. Alternatively, the differences between various configurations and their consequent costs may be highlighted. Vendors may clarify the proposed platform (naval/non-naval platforms, demonstration of equipment already fitted on any other non-*IN* platform, etc) and venue (India/ abroad) for conduct of FET.

(e) Amongst the vendors cleared by Staff Evaluation, a Contract Negotiation Committee would decide the lowest cost bidder (L1) and conclude the appropriate contract.

(f) Vendor would be bound to provide product support for time period specified in the RFP, which includes spares and maintenance tools/ jigs/ fixtures for field and component level repairs including obsolescence issue.

(g) The vendor would be required to accept the general conditions of contract given in the Standard Contract Document at Chapter VI of DAP as amended from time to time.

(h) **Performance-cum-Warranty Bond**. Performance-cum-Warranty Bond both equal to 5% value of the contract inclusive of taxes and duties is required to be submitted after signing of contract.

(i) **Confidentiality Clause**. Vendors are not to disclose/ divulge any classified information pertaining to the case to other agencies not involved in the bidding process.

5. Any additional information, if required, may be sought from:-

Cdr Amol G Merwade
Integrated Headquarters of Ministry of Defence (Navy)
Directorate of Hydrography (DOH)
Room No 5M, West Block 4, Wing 5,
RK Puram, Sector 1, New Delhi 110 066
Phone +91-11-26181834/ 26196165; **Fax** +91-11-26181834
Email ID doh@navy.gov.in

PART II

6. **Procedure for Response**.

(a) Vendors must fill the form of response as given in **Annexure II to Appendix A to Chapter II of DAP**. Apart from filling details about company, details about the exact product meeting other generic technical specifications should also be carefully filled. Additional literature on the product can also be attached with the form. The Information Proforma is placed at **Enclosure 2**. Vendors are also requested to fill in the questionnaire at **Enclosure 3** and enclose the same with the response.

(b) The response to the RFI should be clearly labelled as **RFI RESPONSE - USV** and dispatched to the under mentioned address:-

Commodore (Hydrography)
Integrated Headquarters of Ministry of Defence (Navy)
Directorate of Hydrography (DOH)
Room No 5M, West Block 4, Wing 5,
RK Puram, Sector 1, New Delhi 110 066
Phone +91-11-26181834/ 26196165; **Fax** +91-11-26181834
Email ID doh@navy.gov.in

(c) Last date of acceptance of filled form is **07 Apr 21**. The vendor short listed for issue of RFP will be intimated.

PART III

7. **General Parameters.**

(a) Applicant Entity should be an Indian Vendor as defined at Paragraph 20 of Chapter I of DAP 2020.

(b) Business dealing with applicant Entity or any of its allied entities should not have been suspended or banned, by MoD/ SHQ or any Government Department or organization (as defined in Guidelines for Penalties in Business Dealings with Entities issued vide Ministry of Defence, D(Vigilance) MoD ID No 31013/I/2006-D(Vig) Vol II dated 21 Nov 2016). None of the Promoters and Directors of applicant entity should be a wilful defaulter.

(c) "Entities" will include companies, with whom the Ministry of Defence has entered into, or intends to enter into, or could enter into contracts or agreements.

(d) "Applicant entity" may be a company, subsidiary, an associate company (as defined in the Companies Act, 2013), a consortium or a Joint Venture (JV).

8. **Technical Parameters.**

(a) Vendor shall be a manufacturing entity or a system integrator of defence equipment and not a trading company, except in cases where the OEM participates only through its authorised Vendors.

(b) Minimum **two years'** experience in broad areas like manufacturing/ electronics. If not, then cumulative experience of at **least three years in above areas,** resulting in gaining of competence for manufacturing the proposed product.

(c) Where product involves integration, previous experience **of not less than one year/ one project** in integration of systems/ equipment shall be required.

9. **Financial Parameters.**

(a) **Net Worth**. Net worth of entities, ending 31st March of the previous financial year, should not be **negative**.

(b) **Insolvency**. The entity should not be under insolvency resolution as per Indian Bankruptcy Code at any stage of procurement process from the issuing of RFP to the signing of contract.

10. **Other Parameters.**

(a) **Registration.** Registered for a minimum of two years (one year for SMEs). Minimum number of years not applicable for JVs constituted specifically for a project.

11. The Government of India invites responses to this request only from Original Equipment Manufacturers (OEM)/ Authorised Vendors/ Government Sponsored Export Agencies (applicable in the case of countries where domestic laws do not permit direct export by OEMs). The end user of the equipment is Indian Navy.

12. This information is being issued with no financial commitment and the Ministry of Defence reserves the right to change or vary any part thereof at any stage. The Government of India also reserves the right to withdraw it should it be so necessary at any stage. The acquisition process would be carried out under the provisions of DAP.

(अमोल जी मेरवाड़े)
(Amol G Merwade)
कमांडर / Commander
कमांडर (एच)–पीपी / Cdr (H) - PP

Enclosure 1
(Refers to Para 3)

BROAD SPECIFICATIONS

UNMANNED SURVEY VESSEL (USV)

1. **Specifications of Main Body**. The minimum specifications for the Unmanned Survey Vessel is appended below:-

(a) **Type of Control**. Autonomous, Semi-autonomous and Controllable Remote.

(b) **Type of Hull**. Mono or Catamaran (as required).

(c) **Material of Hull**. UV resistant, carbon reinforced FRP/ ABS or equivalent.

(d) **Propulsion**. Battery, Li-Ion (field swappable) alongwith thrusters as required.

(e) **Survey Speed**. 0 - 5 knots.

(f) **Endurance**. 6-7 hours with full payload at speeds of 4 knots.

(g) **Operational Sea State**. Sea state 3.

(h) **Max Weight**. 100 kgs.

(j) **Dimensions**. Length - Not more than 3 meters
Breadth and Height - As required
Draught - Not more than 0.5 meters

(k) **Data Telemetry**. As required to meet the functionality and real time monitoring of data.

2. **Modes of Operation of USV**.

(a) Autonomous Mode. Autonomously and independent of support.

(b) Semi-Autonomous Mode. Combines supervised and autonomous mode of operation.

(c) Controllable Remote Mode. Provide operator supervision and control.

3. **Radio Frequency Link**. The radio link will be used to transfer data between the vessel and the control ship and to manually control the vessel. Range: atleast 3 Km.

4. Payloads.

(a) Multibeam.

Sl	Specifications	
(i)	**Type of System**	Multibeam
(ii)	**Transducer Frequency**	180 - 450 kHz (full spectrum)
(iii)	**Frequency type**	CW and FM
(iv)	**Beam width**	2° × 2° or better
(v)	**Swath**	Not less than 140°, Equi-distance and Equi-angle
(vi)	**Max Ping Rate**	50 Hz
(vii)	**Data**	Bathymetry, backscatter, side scan, snippets, water column
(viii)	**Transducer Mounting**	Light weight and non-corrosive single head mounting (flush mounted)
(ix)	**Real-Time Sound Velocity**	Integrated with transducer for real-time surface sound velocity correction, Range 1450 m/s - 1600 m/s
(x)	**Motion Sensor/ Inertial Measurement Unit (IMU)**	OEM recommended
(xi)	**Acquisition Software**	OEM Proprietary. Should be user-friendly with pull down menus capable of configuring, calibrating the system, including deriving calibration parameters from the calibration/ patch test and set for operation, log data of interfaced sensors and provide real-time coverage of the seafloor
(xii)	**Post-processing software**	(aa) Process multi-beam bathymetry, backscatter, side scan and Water Column Imagery (WCI) logged by the system (ab) Create DEM/ DTM and generate mosaic with draping utility for comparison (ac) Quality Assurance and Quality Control capabilities. Generate QA/ QC report as per IHO S 44 standards (ad) Convert to universally acceptable data format to be compatible with CARIS HPD at National Hydrographic Office, Dehradun, India (ae) Compute calibration values for the system from Patch Test data
(xiii)	**Software Licenses**	(aa) Life time for all software licenses (ab) Subscription on all software for 10 years which includes all upgrades and online maintenance licenses

(b) **DGPS**. GNSS Receiver

Sl	Specifications	
(i)	**Channels**	Minimum 40 Channels
(ii)	**Satellite Signal Tracking**	GPS: L1, L2, L2C SBAS: WAAS, EGNOS, GAGAN, MSAS, QZSS Subscription based L-Band signals for Indian Ocean Region.
(iii)	**RTCM Corrections**	Code Differential via radio
(iv)	**Design**	Portable, Compact, Rugged and lightweight
(v)	**Display**	Compact Colour, illuminated, toughened film on glass, touch screen/key pad operation
(vi)	**Data Format**	NMEA 0183, 1PPS output
(vii)	**Recording Rate**	Upto 20 Hz or better with programmable output rates
(viii)	**Data Interface**	RS232, RS422, USB, and Ethernet
(ix)	**Accuracy**	Code Differential: ± 50 cm + 3 PPM SBAS : ± 1m (rms) SBAS (subscription based): ± 10 cm (rms)
(x)	**Antenna**	High sensitivity, low signal level tracking, good multipath rejection, Low look angle L-Band antenna, built-in L-band receiver and interference suppression and beacon receiver
(xi)	**Software Licenses**	OEM certified Software with lifetime licenses. Subscription associated with Hydrographic software suites in equipment including subscription for SBAS satellite signal of DGPS for 10 years.

5. **Mission Planning and Control System**. The mission planning and control system must comprise of hardware and software for mission planning, initialization of vessel, status presentation, interactive command, control and communication.

6. **Data Acquisition System (DAS)**. The USV must be equipped with a proprietary data acquisition system along with the requisite hardware. The software functionalities and specifications of DAS are enumerated below:-

(a) Survey Planning. Plan route to survey area, survey lines in any direction, fill survey area polygon with survey lines with user defined line spacing and orientation.

(b) Real Time Navigation and Monitoring.

(i) Display the progress of survey.

(ii) Monitor the incoming data by a series of textual and graphic displays including display of vessels position on ENC background through pull down menus.

(iii) Online real-time data being logged.

(iv) Compute and display position on all displays for navigation and logging, in either geographical or grid coordinates with user selected datum, spheroid and projection.

(v) Log data digitally on a common spatial and temporal reference from Position Fixing Systems (GPS/DGPS), multibeam echo sounders, Motion Sensors/Heave Compensators and provide navigational and time data, annotation marks to specified sensors.

(vi) User-selectable pop-up displays are required for displaying coverage of survey completed vis-à-vis planned survey area, Real-Time Depth Profile.

(vii) Provide user control over all stages of data acquisition and achieve quality control over survey data.

(c) Time Stamping. Provide an accurate time stamp (with common time frame) to every record of data collected on the DAS with a resolution of not less than 1millisec. Provide the same time and position data in open format (eg. NMEA) to specified sensors, carrying on their own data logging functions.

(d) Real Time Quality Control.

(e) Logging Control. All raw data is to be logged in universal standard format. Logging format to be made available to the user. All data sets being logged should be time tagged with reference to common reference time frame and automatically named uniquely for identification for its source and time.

7. **Hardware**. The hardware, associated components and interlinking conduits for smooth functioning of the vessel, onboard command and control system, communication systems and launch and recovery must be clearly included and indicated. The system should have a minimum memory size of 2 TB. All hardware must be of contemporary technology with latest version available in the market.

8. **Software**. The software for the vessel operation, communication, calibration, maintenance and integration with payloads must be supplied with the USV along with license subscription for at least 10 years. Software for acquisition and processing of the payload data must be supplied separately along with license subscription for atleast 10 years. The data generated by the software of individual system / equipment must be compatible with each other for mission planning and execution. All communication

transmission must be logged by the software for post-mission analysis. In addition, all real-time data measured as part of USV operation in all modes must be recorded for analysis.

(a) All software suites must be user-friendly operated on commercially available latest version of the OS.

(b) The software must provide output in universally accepted digital exchange format or should have a converter to convert the data in proprietary format to universal exchange format.

(c) Software Backup. In the event of software corruption or failure of memory devices, provision should be provided for the re-loading of the software. Software backup on magnetic media with necessary equipment and detailed procedure for reloading of software should be provided. The firm must supply a copy of all embedded software and detailed procedure for reloading of software and firmware loaded on various EPROMs / EEPROMs / Flash memory / Solid state Disks / HDD / Removable Compact Flash Cards etc. Any special to type tool / utility required for loading of software / firmware must also be provided. The version number of the software must be included.

(d) Vendors are to bring out the availability of indigenous software for running applications on the equipment/system

Enclosure 2
(Refers to Para 6 (a))

INFORMATION PROFORMA

1. **Name, Address and Unique ID (if any) of the Vendor/Company/Firm.**

_____

(Company profile, in brief, to be attached. In the eventuality of the firm emerging as L1, contract will be concluded in the **name and address** of the firm, as indicated here). Vendors are to undertake that any subsequent proposal for change in name of firm or address, will be intimated to IHQ MoD (N) at the first available opportunity and supporting documents be furnished accordingly within five working days of their approval by the competent authority.

2. **Type (Tick the relevant category).**

Original Equipment Manufacturer (OEM) Yes/No

Authorised Vendor of foreign Firm Yes/No (attach details, if yes)

Others (give specific details)

_____

3. **Contact Details.**
Postal Address: _____

City : _____ State : _____

Pin Code : _____ Tele : _____

Fax : _____ URL/Web Site:_____

Email : _____

4. **Local Branch/Liaison Office in Delhi (if any).**
Name & Address: _____

Pin code: _____Tel: _____ Fax: _____ Email:_____

5. **Financial Details.** Category of Industry (Large/Medium/Small Scale): _____

6. **Certification by Quality Assurance Organisation.**

Name of Agency	Certification	Applicable from (Date & Year)	Valid till (Date & Year)

7. **Details of Registration.**

Agency	Registration No.	Validity (Date)	Equipment
GeM			
DGQA/DGAQA/DGNAI			
OFB			
DRDO			
Any other Government Agency			

8. **Membership of FICCI/ASSOCHAM/CII or other Industrial Associations.**

Name of Organisation: _____

Membership Number : _____

9. **Equipment/Product Profile (to be submitted for each product separately).**

(a) Name of Product: _____
[Indigenous Design Development and Manufacturing (IDDM) Capability be indicated against the product]
(Should be given category wise for e.g. all products under night vision devices to be mentioned together)

(b) Description (attach technical literature): _____

(c) Whether OEM or Integrator: _____

(d) Name and address of Foreign collaborator (if any): _____

(e) Industrial Licence Number: _____

(f) Indigenous component of the product (in percentage): _____

(g) Status (in service/design & development stage): _____

(h) Production capacity per annum: _____

(j) Countries/agencies where equipment supplied earlier (give details of quantity supplied): _____

(k) Estimated price of the equipment: _____

10. Alternatives for meeting the objectives of the equipment set forth in the RFI.

11. Any other relevant information: _____

12. **Declaration**.

(a) It is certified that the above information is true and any changes will be intimated within five (05) working days of occurrence.

(b) It is certified that design and development in indigenous and belong to the vendor _____(Vendor) and/ or _____ (its Indian Sub Vendor). The Indigenous Content in the said equipment is ____% as on date and is likely to be raised to _____% by_____ (date). The certification for the same is enclosed.

(c) It is certified that the complete set of design and production drawing are available and source code for all software applications/ programmes are also available with the _____ Vendor and that these would be produced for verification when required.
Note:-*Certification for 12 (b) and (c) is required only if claiming IDDM category*

(d) It is certified that in the past that _____ (name of firm) has never been banned / debarred for doing business dealings with MoD/ GoI/ any other Government organisation and that there is no inquiry going on by CBI/ ED/ any other Government agency against the firm.

Note:- *Para 122 and Appendix K of Chapter II of DAP may be referred.*

(Authorised Signatory)

Enclosure 3
(Refers to Para 6 (a))

REQUEST FOR INFORMATION: QUESTIONNAIRE

UNMANNED SURVEY VESSEL (USV)

Ser	Specification / Parameter	Reply (indicate values and details as necessary and attach documentation)
1.	**Specifications of Main Body**. The minimum specifications for the Unmanned Survey Vessel is appended below:-	
(a)	**Type of Control**. Autonomous, Semi-autonomous and Controllable Remote.	
(b)	**Type of Hull**. Mono or Catamaran (as required).	
(c)	**Material of Hull**. UV resistant, carbon reinforced FRP/ ABS or equivalent.	
(d)	**Propulsion**. Battery, Li-Ion (field swappable) alongwith thrusters as required.	
(e)	**Survey Speed**. 0 - 5 knots.	
(f)	**Endurance**. 6-7 hours with full payload at speeds of 4 knots.	
(g)	**Operational Sea State**. Sea state 3.	
(h)	**Max Weight**. 100 kgs.	
(j)	**Dimensions**. Length - Not more than 3 meters Breadth and Height - As required Draught - Not more than 0.5 meters	
(k)	**Data Telemetry**. As required to meet the functionality and real time monitoring of data.	
2.	**Modes of Operation of USV**. (a) Autonomous Mode. Autonomously and independent of support. (b) Semi-Autonomous Mode. Combines supervised and autonomous mode of operation. (c) Controllable Remote Mode. Provide operator supervision and control.	
3.	**Radio Frequency Link**. The radio link will be used to transfer data between the vessel and the control ship and to manually control the vessel. Range: atleast 3 Km.	
4.	**Payloads**.	
(a)	**Multibeam**.	

	(i) **Type of System**	Multibeam	
	(ii) **Transducer Frequency**	180 - 450 kHz (full spectrum)	
	(iii) **Frequency type**	CW and FM	
	(iv) **Beam width**	2° × 2° or better	
	(v) **Swath**	Not less than 140°, Equi-distance and Equi-angle	
	(vi) **Max Ping Rate**	50 Hz	
	(vii) **Data**	Bathymetry, backscatter, side scan, snippets, water column	
	(viii) **Transducer Mounting**	Light weight and non-corrosive single head mounting (flush mounted)	
	(ix) **Real-Time Sound Velocity**	Integrated with transducer for real-time surface sound velocity correction, Range 1450 m/s - 1600 m/s	
	(x) **Motion Sensor/ Inertial Measurement Unit (IMU)**	OEM recommended	
	(xi) **Acquisition Software**	OEM Proprietary. Should be user-friendly with pull down menus capable of configuring, calibrating the system, including deriving calibration parameters from the calibration/ patch test and set for operation, log data of interfaced sensors and provide real-time coverage of the seafloor	
	(xii) **Post-processing software**	(aa) Process multi-beam bathymetry, backscatter, side scan and Water Column Imagery (WCI) logged by the system (ab) Create DEM/ DTM and generate mosaic with draping utility for comparison (ac) Quality Assurance and Quality Control capabilities. Generate QA/ QC report as per IHO S 44 standards (ad) Convert to universally acceptable data format to be compatible with CARIS HPD at National Hydrographic Office, Dehradun, India (ae) Compute calibration values for the system from Patch Test data	

	(xiii) **Software Licenses**	(aa) Life time for all software licenses (ab) Subscription on all software for 10 years which includes all upgrades and online maintenance licenses	
(b)	**DGPS**. GNSS Receiver		
	(i) **Channels**	Minimum 40 Channels	
	(ii) **Satellite Signal Tracking**	GPS: L1, L2, L2C SBAS: WAAS, EGNOS, GAGAN, MSAS, QZSS Subscription based L-Band signals for Indian Ocean Region.	
	(iii) **RTCM Corrections**	Code Differential via radio	
	(iv) **Design**	Portable, Compact, Rugged and lightweight	
	(v) **Display**	Compact Colour, illuminated, toughened film on glass, touch screen/key pad operation	
	(vi) **Data Format**	NMEA 0183, 1PPS output	
	(vii) **Recording Rate**	Upto 20 Hz or better with programmable output rates	
	(viii) **Data Interface**	RS232, RS422, USB, and Ethernet	
	(ix) **Accuracy**	Code Differential: ± 50 cm + 3 PPM SBAS : ± 1m (rms) SBAS (subscription based): ± 10 cm (rms)	
	(x) **Antenna**	High sensitivity, low signal level tracking, good multipath rejection, Low look angle L-Band antenna, built-in L-band receiver and interference suppression and beacon receiver	
	(xi) **Software Licenses**	OEM certified Software with lifetime licenses. Subscription associated with Hydrographic software suites in equipment including subscription for SBAS satellite signal of DGPS for 10 years.	
5.	**Mission Planning and Control System**. The mission planning and control system must comprise of hardware and software for mission planning, initialization of vessel, status presentation, interactive command, control and communication.		

6.	**Data Acquisition System (DAS)**. The USV must be equipped with a proprietary data acquisition system along with the requisite hardware. The software functionalities and specifications of DAS are enumerated below:- (a) Survey Planning. Plan route to survey area, survey lines in any direction, fill survey area polygon with survey lines with user defined line spacing and orientation. (b) Real Time Navigation and Monitoring. (i) Display the progress of survey. (ii) Monitor the incoming data by a series of textual and graphic displays including display of vessels position on ENC background through pull down menus. (iii) Online real-time data being logged. (iv) Compute and display position on all displays for navigation and logging, in either geographical or grid coordinates with user selected datum, spheroid and projection. (v) Log data digitally on a common spatial and temporal reference from Position Fixing Systems (GPS/DGPS), multibeam echo sounders, Motion Sensors/Heave Compensators and provide navigational and time data, annotation marks to specified sensors. (vi) User-selectable pop-up displays are required for displaying coverage of survey completed vis-à-vis planned survey area, Real-Time Depth Profile. (vii) Provide user control over all stages of data acquisition and achieve quality control over survey data. (c) Time Stamping. Provide an accurate time stamp (with common time frame) to every record of data collected on the DAS with a resolution of not less than 1millisec. Provide the same time and position data in open format (eg. NMEA) to specified sensors, carrying on their own data logging functions.	

	(d) Real Time Quality Control. (e) Logging Control. All raw data is to be logged in universal standard format. Logging format to be made available to the user. All data sets being logged should be time tagged with reference to common reference time frame and automatically named uniquely for identification for its source and time.	
7.	**Hardware**. The hardware, associated components and interlinking conduits for smooth functioning of the vessel, onboard command and control system, communication systems and launch and recovery must be clearly included and indicated. The system should have a minimum memory size of 2 TB. All hardware must be of contemporary technology with latest version available in the market.	
8.	**Software**. The software for the vessel operation, communication, calibration, maintenance and integration with payloads must be supplied with the USV along with license subscription for at least 10 years. Software for acquisition and processing of the payload data must be supplied separately along with license subscription for atleast 10 years. The data generated by the software of individual system / equipment must be compatible with each other for mission planning and execution. All communication transmission must be logged by the software for post-mission analysis. In addition, all real-time data measured as part of USV operation in all modes must be recorded for analysis. (a) All software suites must be user-friendly operated on commercially available latest version of the OS. (b) The software must provide output in universally accepted digital exchange format or should have a converter to convert the data in proprietary format to universal exchange format. (c) Software Backup. In the event of software corruption or failure of memory devices, provision should be provided for the re-loading of the software. Software backup on magnetic media with necessary equipment and detailed procedure for reloading of software should be provided. The firm must supply a copy of all embedded software and detailed procedure for reloading of software and firmware loaded on various EPROMs / EEPROMs / Flash memory / Solid state Disks / HDD / Removable	

	Compact Flash Cards etc. Any special to type tool / utility required for loading of software / firmware must also be provided. The version number of the software must be included.	
9.	Compliance to Environmental Norms - The USV would be operating in marine environment and compliance to environmental standards viz., Corrosion, shock etc. to be indicated along with necessary certification.	
10.	Compliance to Industry/ Mil Standards - Conformity to various industrial and military standards related to operations and safety for various components and sub-components to be indicated.	
11.	Whether the equipment is in use by any other Navy/ offered for use by other Governmental/ Non-Governmental agencies within India and if so, unit price (without taxes/ custom duties) and year in which it was supplied.	
12.	The differences between the versions of equipment in use by other agencies and the equipment presently being offered may also be highlighted. Attach necessary documentation.	
13.	Whether Manufacturer's Recommended List of Spares (MRLS), inclusive of the Onboard Spares (OBS) and Base & Depot Spares (B&D), for the equipment for a period of two years has been included? Attach necessary documentation.	
14.	Whether product support in terms of maintenance, materials and spares for a minimum period of 12 years from the time of delivery of the equipment being provided?	
15.	Vendors would be required to provide training to the Buyer in operations and maintenance of the equipment during the installation/commissioning at the procurement stage. Confirm acceptability of the clause.	
16.	Vendors are required to provide an indicative cost for the training in their proposals. Confirm cost included and quote reference.	
17.	Confirm the availability of indigenous software for running applications on the equipment/system.	
18.	Willingness to provide ToT (know-how and know-why) along with exact scope of ToT and Transfer of Production, transfer of maintenance infrastructure. Vendors are to indicate their willingness to set up dedicated manufacturing line, including design, integration and manufacturing processes in India.	
19.	Feasibility/ willingness to set up repair facility in India/ presence of authorised local service providers for undertaking post-sales support and maintenance of the equipment.	
20.	The maintenance contract, concluded subsequently for maintenance on completion of the system warranty, would be	

	comprehensive in nature (i.e. including spares, toolkits, modules etc).	
21.	Option Clause. An Option Clause may be exercised in the procurement case. Vendors must express their willingness or otherwise for Option Clause, including the duration for which the Option Clause would be valid.	
22.	Feasibility/ willingness to conduct No Cost-No Commitment (NC-NC) Field Evaluation Trials (FET) in vendor premises/ India and the modalities thereof. Confirm acceptability and inclusion of the modalities in the response (quote reference).	
23.	The cost estimate of the equipment is to be inclusive of taxes. Cost estimate including Taxes (to be indicated separately) is to be provided. Confirm inclusion and quote reference.	
24.	Whether the Vendor would be able to comply with all provisions of Defence Acquisition Procedure 2020 (DAP) or not. If not, which Para/ Clause of DAP would not be agreed to, with reasons?	
25.	Indicate the tentative delivery schedule for supply of the equipment after conclusion of Contract. Information on trials and training schedule for the equipment is also to be included (quote reference).	
26.	Acceptability to the terms of payment as per DAP, as amended from time to time.	
27.	Indicate any restrictions related to export in their country and how long will it take to get clearance for the same in their response.	
28.	Indian vendors to indicate their capability to Indigenously Design & Develop the USVs.	
29.	Is the commercial offer valid for at least 18 months from the date of submission of offers?	
30.	Vendors are to provide information regarding the qualitative parameters which can be evaluated through simulation/ certification/ documentation/ demonstration etc.	
31.	Is the list of equipment that would be made available for NCNC trials included? Quote reference.	
32.	Is the equipment offered for NCNC trials, including at sea (if applicable), in India/ abroad, in exact configuration as proposed in response to the RFI? Alternatively, the differences between various configurations and their consequent costs may be highlighted. Vendors may clarify the proposed platform (naval/non-naval platforms, demonstration of equipment already fitted on any other non-*IN* platform, etc) and venue (India/ abroad) for conduct of FET.	

33.	Acceptance to providing product support for time period specified in the RFP, which includes spares and maintenance tools/ jigs/ fixtures for field and component level repairs including obsolescence issue.	
34.	Acceptance of the general conditions of contract given in the Standard Contract Document at Chapter VI of DAP as amended from time to time.	
35.	Acceptance to providing a Performance-cum-Warranty Bond both equal to 5% value of the contract inclusive of taxes and duties after signing of contract.	
36.	**Acceptance of Confidentiality Clause**. Vendors are not to disclose/ divulge any classified information pertaining to the case to other agencies not involved in the bidding process.	
37.	For indigenous manufacturers, indicate the Indigenous Content (%) that would be achieved for the finalized product.	