



**THIS IS NOT  
AN ORDER**

**REQUEST FOR BIDS/PROPOSALS COVERSHEET**  
**THE UNIVERSITY OF SOUTHERN MISSISSIPPI**  
**Procurement and Contract Services**  
**118 College Drive #5003, Hattiesburg, Mississippi 39406-0001**

**Date:** August 21, 2024

**BID No. 25-05**

THE UNIVERSITY OF SOUTHERN MISSISSIPPI is considering the purchase of the following item(s). We ask that you submit your bid and retain one copy for your files. Right is reserved to accept or reject any part of your bid. Your quotation will be given consideration if received in Bond Hall, Room 214 on or before:

2:00 p.m. CT

September 5, 2024

**Buyer:** Amber Floyd

Name: \_\_\_\_\_

Company: \_\_\_\_\_

Address: \_\_\_\_\_

City/State/Zip: \_\_\_\_\_

TERMS - Bidder should state terms of sale. Our terms are 2% ten days, net 45 days.

These terms will apply per Mississippi law.

AWARDING CONTRACT - Cash terms will not be used as a basis for awarding contracts; however, the University will accept cash discounts when earned.

NOTE: If you cannot quote on the exact material shown, please indicate any exception giving brand name and complete specifications of any alternate. If additional space is required, use a separate sheet or letter of transmittal.

ITEM	QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL NET PRICE
		<p><b>BID 25-05 Uncrewed Surface Vehicle</b></p> <p><b>RFx # 3160006830</b></p> <p>PROPOSAL MUST BE RETURNED TO THE UNIVERSITY IN ACCORDANCE WITH THE SPECIFICATIONS. RFP NUMBER AND DATE OF BID OPENING MUST BE SHOWN ON THE OUTSIDE OF THE ENVELOPE IF USING THAT METHOD.</p>		

We quote you as above - F.O.B. The University of Southern Mississippi.  
Shipment can be made in \_\_\_\_\_ days from receipt of order. DATE \_\_\_\_\_  
Return quotation to Procurement Services at above address.

**Signature Required** \_\_\_\_\_



THE UNIVERSITY OF  
**SOUTHERN**  
**MISSISSIPPI**

---

**SYSTEM DESIGN SPECIFICATIONS FOR AN UNCREWED SURFACE  
VEHICLE**

**The University of Southern Mississippi**

*Prepared by Steve Stanic and Landry Bernard*

*AUG 8/2024*

---

# **SPECIFICATIONS FOR AN UNCREWED SURFACE VEHICLE**

## **I. Background**

There is an increase in the development and use of unmanned technologies by the Navy, NOAA, and other commercial and educational entities. As a result, there is a need for cost-effective methods and instrumentation systems to provide critical surface and subsurface environmental data to support the demonstration and evaluation of these emerging unmanned maritime systems and their advanced sensor technologies.

The University of Southern Mississippi (USM) currently has several USVs that have provided data to enhance the development of USM's msbCOAWST model and on the Gulf of Mexico hypoxia distributions. These systems have also provided surface and subsurface data for several acoustic and magnetic target detection, localization and classification experiments.

The University of Southern Mississippi (USM) has received funding to add to its fleet of unmanned instrumented surface vehicles (USV). This new system shall be configured with acoustic and environmental measurement systems and will provide data to further develop a comprehensive understanding of the water space environment in areas off the Mississippi coast and in the Gulf of Mexico. This includes measurements in the various hypoxia regions in the Gulf of Mexico. The Gulf of Mexico is also an area that is being used for training, testing, and evaluating (TT&E) different advanced surface and subsurface unmanned maritime systems. Data from this USV shall be transmitted to USM's data fusion center and inputted to USM's CUBEnet data environment.

## **II. Purpose**

This document contains the minimum technical specification required for an unmanned surface vehicle and its advanced measurement and communication systems. This will include the engineering design required to interface with USM's Multibeam echosounder System (MBES), Side Scan Sonar System (SSS), and Ultra-Short Baseline positioning system (USBL). All these data shall be transmitted via Iridium SBD to USM's data fusion center.

## **III. General USV Requirements**

1. The USV shall be capable of running preprogrammed missions.
2. Mission parameters shall be changeable on the fly.
3. A night vision camera shall be provided. The height above the vessel's deck will be decided after contract award.
4. The USV shall have a lifting point molded into the hull that is suitable for crane deployments.
5. The USV shall have numerous handling brackets distributed around the hull for easy handling and line attachments.
6. A transport trailer shall be provided to easily deploy and recover the USV.
7. Vehicle securing straps shall also be provided.
8. A separate surface cradle shall be provided to safely secure the USV.
9. This cradle shall also come with all straps and hardware needed to secure the USV.
10. This surface cradle shall have wheels for easy movement of the cradled USV.

11. A lifting harness kit shall be supplied.
12. This kit shall include additional lines needed to keep the lifting hook and hardware above the deck of the USV.
13. The kit shall also include a quick release hook for USV at sea deployments.
14. A method (capture hook and cable) shall be provided for use in the USV recovery.
15. The USV shall be self-righting.
16. The USV shall have a deck located solar power battery charging system.
17. The USV shall have an automated collision avoidance capability.
18. The USV shall have the high-capacity battery and charging systems required for extended long-term around-the-clock operation.
19. Control and configuration software and computer dashboard shall be provided.
20. The vendor shall provide a list and cost of all optional onboard spares.
21. The delivery arrangements and transportation costs shall be the vendor's responsibility.
22. All systems shall be delivered to USM's Marine Research Center, 1030 30th Ave Gulfport, MS 39501.

#### IV. USV Specific Physical Technical Specifications

1. The following table provides the minimum specifications the USV shall meet to ensure that it is capable of performing the tasks necessary to satisfy USM's numerous program objectives.

<b>USV Technical Specifications</b>	
<b>Physical / Electrical</b>	<b>Description/Value</b>
Length	No less than 4.5 m
Width	No less than 1.24 m
Draft	At Least 40 cm
Weight	no greater than 300 kg
Payload capacity	At least 60 kg
Battery Power	At least 6.5 kWh. Additional battery power shall be provided to ensure continuous long-term operations
Payload power	At least 500 w
Solar generation	At least 700 W@ 1kW/m <sup>2</sup>
Surface speed	At least 4.5 knts
Endurance	Several months
Max Sea state	At least Beaufort 6

#### V. Integrated Internal Sensor Specifications

1. The following table outlines the minimum specifications the internal USV sensors shall meet.

<b>General Sensor technical Specifications</b>	
<b>Sensor System</b>	<b>Description/Value</b>
Communications	Cellular modem for short range USV control 900 MHZ RF Connection High bandwidth Iridium SBD modem and connection (e.g Starlink) AIS ID System
Collision avoidance	Visible running lights, 360° Camera System

Internal weather monitoring sensors	Wind speed, air and pressure, sea surface temperature, GPS, Speed, and heading
Visual system control	Shall include at least 360° HD cameras, vehicle control software
USV control	Control shall be manual, supervised autonomy, and full autonomy
Integrated smart antenna	Shall provide navigation from the available heading and positioning information Shall be fully integrated into the USV

2. The following table outlines the minimum specifications for a deck mounted winch that shall provide the USV with the capability to conduct conductivity, temperature, and dissolved oxygen profiles as a function of time and water depth.

<b>Sensor Technical Specifications</b>	
<b>Sensor System</b>	<b>Description/Value</b>
Sensor sonde	Shall be capable of interfacing with at least 6 sensors and shall have extended long-term operational capability.
Max depth	Maximum dept shall be at least 300 m
Pressure sensor	Max depth shall be at least 300 m Shall have an accuracy of at least 0.01% FS Shall have a resolution of at least 0.001 % Shall have a response time of at least 10ms
Combined conductivity and temperature sensor	Max depth shall be at least 300 m Shall have temperature range of at least 5 to 40°C, and conductivity range of at least 0-85 mS/cm Shall have temperature accuracy of at least $\pm 0.003$ °C, and a conductivity accuracy of at least $\pm 0.002$ mS/cm Temperature response times shall be no less than 100 ms, and conductivity response time no less than 25 ms
Dissolved oxygen sensor	Shall have a max operation depth of at least 300 m Shall have an accuracy of at least 2% of measured value, not less than 2.0 $\mu\text{mol/L}$ Shall have a response time of < 1.5 sec Shal have a measurement range of at least 0- 400 $\mu\text{mol/L}$
USV deck or transom mounted profiling winch	The winch shall be battery operated. The winch shall have the capability to wirelessly charge its battery and the attached sensing systems batteries. The maximum operating depth and cable length shall be at least 300 m
<b>The sensors shall all have the appropriate shipping cases</b>	

3. The following table outlines the minimum required specifications that an ADCP profiling system shall meet. This ADCP shall be integrated into the hull of the USV and will provide measurements of current profiles as a function of time and water depth.

<b>ADCP Technical Specifications</b>	
<b>Physical / Electrical</b>	<b>Description/Value</b>
Max Profiling depth	Greater that 150 m
Max Bottom Tracking Range	Greater that 250 m
Velocity range	$\pm 5$ m/s to $\pm 20$ m/s
Ping Frequency	2 Hz
Beam Angle	No greater than 20°
Velocity accuracy	At least 0.5% of measured velocity

Max depth rating	175 m
Additional internal sensors	Temperature, ADCP Tilt, and Compass

**VII. Additional general technical requirements**

1. Additional heavy weather deep keel and deflector skegs shall be provided.
2. The USV shall have a separate battery-operated GPS beacon.
3. The provider shall provide engineering design and integration support for USM’s Multibeam echosounder (MBES), Side Scan Sonar System (SSS), and Ultra-Short Baseline positioning system (USBL).
4. Provide 24 days of engineering and design support services for the integration of other sensor systems. This shall take place during the first 12 months after USV delivery.

**VIII. Software**

The vendor shall provide a Complete Software Package and product documentation for all systems. The vendor shall provide vehicle Interface program dashboards for mission programming and post-mission analysis.

**IX. Training**

The vendor shall provide training on the operation, software, maintenance and troubleshooting integration of all systems. This must include mission planning and basic mission data analysis and display. This training shall take place at the USM facility located at Stennis Space Center MS.

**X. Proof of Performance**

The vendor shall provide a proven record of the developing USVs, integrated systems, measurements, and operating system performance. The vendor needs to provide references where these systems and their operating system in a substantially similar configuration as specified above have operated successfully within the last 3 years. The above requested information will assist USM in determining the bidder’s capability of meeting these requirements.

**XI. Warranty Services**

At a minimum, the Contractor shall provide software/hardware warranty support for one year from acceptance. Longer warranty periods are preferred. The Vendor shall agree to repair, adjust, and/or replace (as determined by the University to be in its best interest) any defective materials at the Vendor and/or manufacturers’ sole cost. The University will incur no costs for service or replacement of materials during the warranty period. The Vendor will be the sole point of contact for warranty issues.

**XII. Documentation**

The Contractor shall provide Operations and Maintenance manuals to USM. Documentation provided shall include, but not be limited to the following:

- A. Theory of operation
- B. Operating procedures
- C. Interfacing instructions with connector pin outs
- D. Troubleshooting and maintenance procedures

- E. IPB (Isometric Parts Breakout) drawings showing how all parts, especially mechanical parts, relate to one another.
- F. Documentation of the various sensor and software packages.

**THE UNIVERSITY OF SOUTHERN MISSISSIPPI  
PROCUREMENT SERVICES  
118 COLLEGE DRIVE  
#5003  
HATTIESBURG, MS 39406-0001**

**GENERAL TERMS, CONDITIONS AND INSTRUCTIONS FOR BIDS/PROPOSALS**

- 1.) Failure to examine any drawings, specifications, and instructions will be at bidder's risk.
- 2.) Samples of items when called for must be furnished free of expense and if not destroyed in testing, will, upon request, be returned at the bidder's expense. Request for the return of samples must be made within ten (10) days following opening bids. Each individual sample must be labeled with bidder's name and manufacturer's brand name and number.
- 3.) Bids must be signed and sealed with bidder's name and address on the outside of the envelope, and the time and date of the bid opening and the bid file number shown in the lower-left corner of the packages; envelopes, express mailing labels, boxes, etc.
- 4.) At least one (1) signed original and one (1) signed copy of the bid **MUST** be provided. The University **requires** a portable electronic virus/malware free copy (thumb drive) of the bid response from the responding Vendor to be included in the bid response package. If an electronic copy is not included, the University reserves the right to request an electronic copy of the **exact** bid response prior to review of the bid.
- 5.) For your bid to be considered, it must be received, and time stamped in our office by 2:00 P.M. of the bid opening date. It is the responsibility of the vendor to ensure their bid is received within the appointed time. If your bid package is not received in Bond Hall, Room 214, by 2:00 P.M. of the bid opening date, it will not be considered.
  - a. If you are delivering your bid, you need to hand carry the bid package to: The University of Southern Mississippi  
Procurement Services  
Bond Hall, Room 214  
Hattiesburg, Mississippi
  - b. If you are mailing your bid package via U.S. Postal Service, mail to: The University of Southern Mississippi  
Procurement Services  
118 College Drive #5003  
Hattiesburg, MS 39406-0001
  - c. If you are express mailing your bid package via Federal Express or UPS, or any other delivery service which requires the use of a physical address, deliver to:



The University of Southern Mississippi  
Receiving Department  
2609 West 4<sup>th</sup> Street  
Hattiesburg, MS 39401

- 6.) Bids or proposals shall not be modified, corrected, altered, or amended after the specified closing time and the opening of such bids, unless otherwise noted in the request for bids or proposals.
- 7.) The University of Southern Mississippi reserves the right to reject any and all bids, to waive any informality in bids, and unless otherwise specified by the bidders, to accept any items on the bid. If the bidder fails to state the time within which bids must be accepted, it is understood and agreed that The University of Southern Mississippi shall have 90 days to accept. The University of Southern Mississippi reserves the right to make an award to this bid on an all or none basis, or on a line-by-line basis, whichever serves the best interest of The University of Southern Mississippi.
- 8.) Contracts and purchases will be made or entered into with the lowest, responsible bidder meeting specifications.
- 9.) A written purchase order or contract award mailed or otherwise furnished to the successful bidder within the time of acceptance specified in the Invitation for Bid results in a binding contract without further action by either party. The contract shall not be assignable by the vendor in whole or in part without the written consent of The University of Southern Mississippi.
- 10.) Unless written exception is provided in the bid response, the winning Vendor agrees to be bound by the USM Terms and Conditions, which are incorporated herein, and may be found at <https://www.usm.edu/procurement-contract-services/usm-terms-and-conditions>.
- 11.) Respondents are required to comply with all applicable local, State and Federal laws, codes, ordinances, and regulations in the provision of the materials required.
- 12.) Respondents must comply with Personally Identifiable Information (PII) data protection regarding State, Federal, and University regulations and policies.
- 13.) Mandatory Legal Provisions
  - a. Any provisions disclaiming implied warranties shall be null and void. See Mississippi Code Annotated Sections 11-7-18 and 75-2-719(4). The Vendor shall not disclaim the implied warranties of merchantability and fitness for a particular purpose.
  - b. The Vendor shall have no limitation on liability for claims related to the following items:
    - i. Infringement issues;
    - ii. Bodily injury;
    - iii. Death;
    - iv. Physical damage to tangible personal and/or real property; and/or

- c. The intentional and willful misconduct or negligent acts of the Vendor and/or Vendor's employees or subcontractors.
  - d. All requirements that the University pay interest are deleted, except for those in conjunction with USM's standard payment terms of Net 45 days. Payments made beyond 45 days are subject to late fees and interest.
  - e. Should any of the terms and conditions in the purchase contract conflict with the laws of the State of Mississippi, the laws of the State of Mississippi shall supersede and govern. A revision of the terms and conditions will be required to ensure compliance with Mississippi state law.
  - f. The University shall not pay any attorney's fees, prejudgment interest or costs associated with any legal action to or for the Vendor, except that which are ordered by a court of competent jurisdiction.
- 14.) Bid files may be examined during normal working hours by bid participants. Non- participants will be prohibited from obtaining any information relative to the bid until the official award has been made.
- 15.) If purchase orders or contracts are canceled because of the awarded vendor's failure to perform or request for price increase, that vendor shall be removed from our bidders'list for a period of 24 months.
- 16.) No addendum will be issued within a period of two (2) working days prior to the time and date set for the bid opening. Should it become necessary to issue an addendum within the two-day period prior to the bid opening, the bid date will be reset giving bidders ample time to answer the addendum.
- 17.) Alternate bids, unless specifically requested or allowed, will not be considered.
- 18.) Bid openings will be conducted open to the public. However, they will serve only to open the bids. No discussion will be held with any vendor as to the quality or provisions of the specifications, and no award will be made either stated or implied at the bid opening. After the close of the bid opening meeting, the bids will be considered to be in the evaluation process and will not be available for review by bidders. Proposal openings are not required to be open to the public; however, the resulting award is open for public inspection.
- 19.) Prices quoted shall be firm for the term of the contract or for the stated time of acceptance.
- 20.) The bidder understands that The University of Southern Mississippi is an equal opportunity employer and, therefore, maintains a policy which prohibits unlawful discrimination based on race, color, creed, sex, age, national origin, physical handicap, disability, or any other such discrimination; and the bidder, by signing this bid, agrees during the term of agreement that the bidder will strictly adhere to this policy in its employment practices and provision of products or services.
- 21.) Bidders must upon request of The University of Southern Mississippi furnish satisfactory evidence of their ability to furnish products or services in accordance with the terms and conditions of these specifications. The University of Southern

Mississippi reserves the right to make the final determination as to the bidder's ability.

- 22.) Questions or problems arising from bid procedures should be directed to the Buyer listed on the solicitation at:

The University of Southern Mississippi  
118 College Drive #5003  
Hattiesburg, MS 39406-0001  
Phone: (601) 266-4131  
[Bids@usm.edu](mailto:Bids@usm.edu)

- 23.) All items must equal or exceed the specifications listed. The absence of detailed specifications or the omission of detailed description shall be recognized as meaning that only the best commercial practices are to prevail, and that only first quality materials and workmanship are to be used.
- 24.) It is the intent of the specifications to obtain a product that will adequately meet the needs of the user while promoting the greatest extent of competition that is practicable. It is the responsibility of the prospective bidder to review the entire Invitation to Bid packet and to notify The University of Southern Mississippi if the Specifications, Instructions, General, or Special Conditions are formulated in a manner which would unnecessarily restrict competition.
- 25.) It shall be incumbent upon the bidders to understand the specifications. Any requests for clarifications shall be in writing and shall be submitted to our Procurement Services office at least seven (7) business days prior to the time and date set for the bid opening, unless otherwise noted in the bid or proposal specifications.
- 26.) The minimum specifications are used to set a standard and in no case are used with the intention of discriminating against any manufacturer. Bidders should note the name and the manufacturer and model number of the product they propose to furnish and submit descriptive literature.
- 27.) Trade names, brand names, and/or manufacturer's information used in these specifications are for the purpose of establishing quality, unless otherwise noted. Bids on products of other qualified manufacturers are acceptable, provided they are demonstrated as equal to those specified in construction, design and suitability. Each bidder shall submit with his bid a complete brochure with pictures on each item and shall point out specifically any deviations from the specified items. Failure to do so may disqualify any bid. Please bid as specified or an approved equal.
- 28.) A copy of the manufacturer's standard guarantee/warranty shall accompany and become a part of this bid.
- 29.) There are no federal or state laws that prohibit bidders from submitting a bid lower than a price or bid given to the U.S. Government. Bidders may bid lower than U.S. Government contract price without any liability as The University of

Southern Mississippi is exempt from the provisions of the Robinson-Patman Act and other related laws. In addition, the U.S. Government has no provisions in any of its purchasing arrangements with bidders whereby a lower price to The University of Southern Mississippi must automatically be given to the U.S. Government.

30.) All invoices, unless noted otherwise, are to be billed to:

The University of Southern Mississippi  
IT Invoices  
118 College Drive #5181  
Hattiesburg, MS 39406-0001  
[ITInvoices@usm.edu](mailto:ITInvoices@usm.edu)

31.) All equipment bids shall be of current production and of the latest design and construction.

32.) Where all, or part(s), of the bid is requested on a unit price basis, both the unit prices and the extension of the unit prices constitute a basis of determining the lowest responsible and responsive bidder. In cases of error in the extension of price, the unit price will govern.

33.) Should the University of Southern Mississippi close due to inclement weather conditions, or any other unforeseen events on the bid opening date, sealed bids will open the following business day at the same time and location.

34.) As an alternative to traditional sealed bids in envelopes, the University of Southern Mississippi is capable of receiving electronic bid responses. While this option is available, it is not required, and we ask that all potential respondents keep in mind that with any electronic system there could be delays or glitches with the submission process; therefore, the University highly encourages traditional sealed bids which are either mailed or submitted in person. Should a vendor choose to submit their response electronically, please follow the instructions below using the following website: [https://www.ms.gov/dfa/contract\\_bid\\_search/Home/Sell](https://www.ms.gov/dfa/contract_bid_search/Home/Sell). On this site you will find helpful links to procurement opportunities, as well as a link to supplier registration. If not already registered in this system, potential bidders will first need to click on 'Supplier Registration' and follow the steps outlined (a one-time process). Once registered, they can return to the original website and click on 'Procurement Opportunities' where they can either search by keyword for the bid they desire to respond to or leave the search box blank and click 'Search' for a listing of all current bids and proposals for the various State of Mississippi offices.

Regarding construction bids, there is one additional step required during the bid submission process. Along with the bid response and other attachments, contractors will also need to attach their Certificate of Responsibility (COR), or a statement that the bid enclosed does not exceed Fifty Thousand Dollars (\$ 50,000.00). If their COR or such statement is not attached, the bid will be invalid and not considered.

**AA/EOE/ADA**