**The University of Southern Mississippi**

**Request for Bid # 24-011**

# SPECIFICATION FOR CTD

## I. Background

USM (University of Southern Mississippi) is seeking to purchase one fully operational water sampling and hydrographic profiling device, including underwater unit, deck unit, and water sampler, to assist research projects and ensure accurate measurements of hydrodynamic parameters. The device, commonly know as a CTD (conductivity, temperature, depth) is critical to oceanographic research.

## II. General Performance Specification

The CTD shall perform oceanographic profiling in water depths from 10-6800 meters and in water temperature ranging from 0º C to 35º C. The CTD shall have the capability of data transmission in real-time through wired connection. The CTD must be deployable/recoverable off a regional class research vessel with a crane and winch.

## III. Required Specification

The following specifications are to ensure that the CTD will perform the tasks necessary to satisfy objectives of research. Any deviation from the following specifications must be explained and justified.

#### A. Underwater Unit

1. Operating Depth shall be 6800 meters with all sensors having a depth range of at least 6000 meters and pressure range of 10,000 psia.
2. The Underwater unit shall include temperature sensor, conductivity sensor, titanium submersible pumps, and associated cabling, plumbing, and mounting. Wet-pluggable connectors with Serial Uplink are necessary.
3. The Underwater Unit shall have an aluminum housing for the main housing and the sensors.
4. The Underwater Unit shall have a 24 Hz sampling rate.
5. The Underwater Unit must have the capacity for real-time data operation to an associated deck unit aboard a research vessel.

#### B. Deck Unit

1. The Deck Unit shall make real-time data operation possible from the Underwater Unit to the ship.
2. The Deck Unit shall include IEEE\_488 and RS-232 interfaces, water sampler modem channel, NMEA 0183 GPS interface, A/D input channel for Surface PAR reference sensor, and associated cabling.
3. The Deck Unit shall be capable of ASCII serial data outport, CTD pressure signal output, and provide a bottom contact alarm.
4. A deck unit signal input cable with extended length of at least 30 meters is also needed.

#### D. Sensors

The following sensors must be included with the purchase of the CTD. The CTD should allow for future sensors to be added.

* 1. Two Dissolved Oxygen (DO) sensors
     1. Two DO sensors with a depth rating of 6800 meters, plus the mounting hardware and wet-pluggable cables are necessary.
  2. Two Conductivity sensors with depth rating of 6800 meters, plus mounting hardware and wet-pluggable cables
  3. Cholorphyll-a and Turbidity sensor
     1. A combined Cholorophyll-a and turbidity sensor with a depth rating of at least 6000 meters, sampling rate up to 8 Hz, and a wet-pluggable connector is necessary.
  4. C-Star Transmissometer
     1. A C-Star Transmissometer with a 25 cm path and 6000 m depth rating and associated mounts and cables is necessary.
  5. pH sensor
     1. A pH sensor with a depth rating of 12000 m with associated mounts, cables and plugs is necessary.

#### E. Water Sampler

1. The CTD shall have a means of collecting water samples from various depths as directed by the real-time deck unit and bring the water to the ship
2. The water sampler should have a 12-place aluminum pylon with a depth rating of 6800 meters.
3. The water sampler should have a carousel water sampler frame for the pylon and hold up to 12 full size (12L) water collection binders.
4. The water sampler shall come with all associated interface cables.
5. Twelve 12L bottles are necessary for the water sampler.

## IV. Documentation

The Contractor shall provide Operations and Maintenance manuals to USM. Software and all documentation will also be provided