Request for Proposals (RFP) 2021-003847
Subsea Power Cable Manufacture, Delivery, and Installation: PacWave South

RFP #2021-003847

ADDENDUM NO. 10

ISSUE DATE: January 6, 2021

CONTRACT ADMINISTRATOR:
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NOTE: Supporting documents for this RFP are available at:
https://oregonstate.box.com/s/w6ak5y176s2mcgjd85u77nju26shnqfv

This Addendum is hereby issued to inform you of the following revisions and or clarifications to the above-referenced RFP and/or the Contract Documents for the Project, to the extent they have been modified herein. Any conflict or inconsistency between this Addendum and the Solicitation Document or any previous addenda will be resolved in favor of this Addendum. Proposals shall conform to this Addendum. Unless specifically changed by this Addendum, all other requirements, terms and conditions of the Solicitation Document and or Contract Documents, and any previous addenda, remain unchanged and can be modified only in writing by OSU. The following changes are hereby made:

QUESTIONS:

Item 1

1. **Q: CONTRACTOR's proposal will include a cable designed as follows: armored section on the WEC end that transitions to an armored section with wire ropes as strength members for the buried section that transitions to an unarmored section with wire ropes for the conduit/shore pull-in section. Each complete cable will be manufactured in one continuous length. For the spare section CONTRACTOR will provide the armored wire rope design. Please confirm acceptance.**

A: The design proposed is not entirely clear from the description, specifically, does the term “armored” specifically refer to multiple armor wires wound around the cable, or does this describe other types of armoring or cable protection? While we would be happy to review the proposed design details, we understand that suppliers may not wish to share proprietary solutions in a public format.

Please note that there is no pre-defined design for the cable beyond meeting the operating and performance criteria described in the specifications. Proposals should highlight the mechanisms and details of the proposed design with regards to meeting the performance criteria defined, in particular solutions that provide value through reduced manufacturing cost while meeting the specified performance criteria. OSU reserves the right to reject solutions which OSU determines are not in compliance with the specified capabilities. Proposers shall have opportunities to discuss proposed design details in confidence during the proposal review process, after the proposal submission deadline.

2. **Q: Will full testing of the 30 meter test sample have to be complete prior to the start of manufacturing the main cable lengths? If all testing has to be completed first this could significantly delay delivery of the cables.**
A: Vendors should propose a development and manufacturing schedule that meets the 2022 installation timing defined. Ideally such a schedule will allow for a sequence of operations that allows for full testing of sample cable prior to commencing manufacturing. However, OSU understands that this may not be possible and may require testing in parallel with manufacturing in order to maintain the defined installation schedule.

Assuming that the primary concern involves completion of a 200,000 cycle bending fatigue test of the semi-dynamic section of cable, please note that failure during such a test would not disqualify the cable for the buried or conduit installed sections of cable and would be strictly limited to the final 3 km of each cable defined as “Semi-Dynamic” in the specifications.

Should proposers test and manufacturing schedule require testing and manufacturing in parallel, proposer would need to provide a contractual remedy in the event of fatigue test failure. One option would be development of an alternative cable and successful testing, followed by cut back and replacement of the final 3 km per length of cable using factory splices. It is assumed that such a process would result in a delay of 1 year.

An alternative option would be to proceed with installation of the cable as is, with the knowledge that the cable is suitable for some period of operation prior to expected failure. Suppliers remedy would then consist of supply of five (5x) 500-meter dynamic jumpers, each consisting of:

- 500 meters of semi-dynamic cable that has successfully passed all type testing defined.
- Each end terminated with dry mate mating halves.

Semi-dynamic jumpers such as this would then be connected to the previously installed dry-mate connector half to serve as the recoverable element during further WEC mate/demate cycles.

Proposers should define proposed remedy in the event of type testing failure(s).

3. **Q: CONTRACTOR requests OSU clarify the scope of work to be included under the term, "Warranty Support". CONTRACTOR requires this clarification in order to accurately estimate the cost of said scope of work.**
A: Please refer to Section 7.2 ‘Evaluation Criteria’ subsection 7 ‘Warranty Support’ for description of the scope of the warranty coverages to be provided by the Proposer.

4. **Q: Is it expected that cable stoppers will be permanently installed?**

A: No, removable cable stoppers are assumed in order to allow for variations in stoppering location and use of multiple stopper points as operations dictate.

5. **Q: Should the cables be protected at the exit points at both sides of the quadrant frame with bend restrictor or bend limiter devices?**
A: Section 4.2 of DOC-1004-10300 (36 kV Subsea Power Transmission Cable Specification) includes the following statement:
"The Quadrant shall be configured with mounting features to securely mount the dry mate connector in either the mated or un-mated configuration and maintain minimum bend radius requirements of the subsea cable."

Bend restrictors/limiters at the exit points of the quadrant is one method to maintain minimum bend radius. Alternatively, the quadrant assembly could include a suitably sized exit bellmouth. Other solutions may be possible. If a bend restrictor/limiter is the suppliers preferred solution, supplier shall only be responsible for supply of bend restrictor/limiter associated with the cable section being supplied. Supply of bend restrictors for the future mating connector cable is not within the scope of this supply, but quadrant should include mounting features appropriate for future bend restrictor attachment (i.e., identical to export cable bend restrictor/limiter attachment solution).

6. **Q: Addendum 4 stated that the ends of the cable conduits will be threaded. Has the size/type of the thread been determined?**

A: The offshore end of the conduit will be threaded and terminated with a flange adapter. On arrival, cable contractors will find an ANSI 8", class 300# flange and blanking plate with check valve. The conduit will be filled with nitrogen. Conduit termination offshore can be located by blowing compressed air through the conduit. Once located, the conduit will require filling with water from the surface prior to removal of the offshore flange.

The vault end of the conduit will feature an ANSI 8" Class #150 flange which will be welded to the conduit as shown on drawings previously released in Addendum 9.

7. **Q: Addendum 4 stated that the inside of the cable conduits will be flush (matching I.D.). Will the outside of the pipe have an offset?**

A: No, OD and ID of conduit are flush. Please refer to the documentation posted under addendum #9.

8. **Q: OSU has done a tremendous amount of work modeling and measuring currents in the project area to better understand the conditions along Oregon's coast and offshore over 40km. Please provide an easy understandable model and plots which includes the information Pacwave has developed for: in particular wave condition (period, height, spectral density information and most representative wave spectrum), tidal currents, surface currents, jet currents, counter currents, and currents throughout the water column. The understanding of currents corresponding to different tidal phases as well as over different months/season is a key component that will support the installation scheduling work. This information would need to relate to not only to surface conditions but also to the water column and covers from the HDD exits offshore to the waves generators testing areas as well as along the median cable route during the period called spring/summer (April to September). The objective is to have the best hourly assessment of current velocities and bearings during the spring/summer period to allow a better estimate of the following working task, all of which have different current and weather operational limitations:**

a/ Diving operations in the shallow waters 13m to 16m

b/ ROV Operations

c/ Trenching System Operations

d/ Cable surface lay

We have reviewed the "PacWave_Resource_Assessment_Data.zip" file which contains .mat files (Matlab matrices) and it appears to only include wind, wave and surface current data and reference sources for additional data which do not include full water column data. If water column data is included in the "PacWave_Resource_Assessment_Data.zip" file please point us to this information.

A: The physical oceanography of the open waters of the Oregon Coast is characterized by two seasons, the summer 'upwelling' season where winds are predominantly from the north, and the winter 'downwelling' season where winds reverse and blow from South to North. The predominant currents are alongshore, aligned with the wind in each respective season. There is an intensified jet that is typically located just inshore of the shelfbreak, at water-depths of ~100m or greater. Maximum velocities in the jet may reach 40 cm/sec in surface waters, and decrease toward the seafloor. Inshore of the jet, the currents are weaker and somewhat variable in direction, depending on the modulation of the wind forcing. Current velocities inshore of the jet are typically 10 cm/sec or less, with maximum values at the surface. The position of the jet is effectively always offshore of the PacWave South site, guided by bathymetry to the north where isobaths angle offshore to the SW associated with Stonewall Bank at the north end of the Heceta Bank complex. There are effectively no surface or subsurface counter currents on the shelf or in the PacWave region. The only counter current of any significance in the poleward-flowing undercurrent that is trapped at or slightly deeper than the shelfbreak at ~200m depth and 10s of km seaward of the PacWave site.

Tides have little effect on the currents on the open coast. Tidal amplitudes are not extreme (~1-3m), and the absence of any channeled geomorphology or enclosed basins negates the amplification of current velocities associated with rising and falling sea level. Within local embayments, and in jetty-constrained channels, tidal velocities can be large, but none of the PacWave work site is in such locations.

There is no further simplified model of the physical oceanography that can be extended more than a few days into the future. Detailed modeling that is posted at http://nvs.nanoos.org/TunaFish incorporates local forecasts and is valid at essentially the forecast validity of the weather forecasts.

There is little depth-resolved time-series current data on the Oregon coast, less in inner shelf waters, and none specifically at the PacWave site. The closest long-term monitoring location is the Ocean Observatories station NH10 (https://oceanobservatories.org/how-to-access-data/), which should be a good proxy for the PacWave S site, although NH10 is more likely to periodically experience the effects of the coastal jet referenced above.

The wave resource data already provided in the RFP is the best information that exists for the area. As with the current/wind forcing, wave conditions are distinctly different between the summer upwelling and winter downwelling seasons. In summertime, waves are typically short-period wind waves in the 1-3m amplitude range and have a typical direction from the WNW. Longer-period non-local swell is less important, and generally comes from due west. In winter, maximum wind forcing is more intense and from the South, and local wind waves can reach or exceed 5m, and come from the WNW. Offshore-derived long period high-amplitude swell is more predominant in winter, originating from stormy conditions in the Gulf of Alaska. These waves tend to come from the W and can reach amplitudes of 10 m.

9. Q: OSU mentions the requirement of a flooded core design; however, the requirement needs clarification as there are also requirements to include water blocking features to support repairability, which typically includes longitudinal water blocking fillers and an overall water jacket. Can OSU clarify their definition of a flooded core design.

A: Flooded core refers to cables which do not include an outer sheath blocking water from entering the core of the cable assembly such that the outer jacket of cable elements (power conductors and fiber tubes) would be expected to be in contact with ambient seawater. Water blocking features are expected to be

incorporated into individual core elements. If a cable is cut or damaged in a manner that exposes the copper conductor, the only features that would slow water intrusion into the conductor would be incorporated into the conductor itself. Outer water blocking sheaths and water blocking fillers would not provide any protection against water intrusion into individual power or fiber elements.

10. **Q: Please direct us to the "Interpreted Survey Data", as a geotiff or ESRI shapefile, shown on slides 13 -23 in DOC-1070-10300 PACWAVE SUBSEA CABLE ROUTE ENG REV B 190903 (002).pdf. If this information, as a georeferenced file, is not in any of the already provided data please provide it. Please also provide SBP data collected during previous studies, in JSF or SEG-Y format, and interpreted profiles in .tif format tied to track lines in ESRI shapefile format.**

A: An ESRI shapefile of the requested Interpreted Survey Data has been uploaded to the Supporting documents folder on Box (under Appendices to the Scope of Work Documents and Data/Submarine Cable Route Engineering/). The direct link is: https://oregonstate.box.com/s/qc6qta4iddy5dft5hmf970ld4z06rxez

Sub-bottom data is not presently formatted in either JSF or SEG-Y formats. Reviewers are encouraged to utilize ESRI software to access the georeferenced sub bottom profile data. Please refer to question #2 of Addendum #6 for further details as follows:

It should be noted that georeferenced sub-bottom profile data is available in the ArcMap GIS project contained in the PacWave Marine Geophysical and Geotechnical Survey 2018 zip file available via the link at the top of this document. In ArcMap, the profiles can be accessed by turning on the SUB BOTTOM LAYERS and clicking on the survey lines using the "Hyperlink" tool.

11. **Q: Please clarify the comment in yellow that states, " Bullnose to be removed and replaced with 8" ANSI Class #300 flange adapter by HDD Contractor (i.e. not part of this scope of work). Subsea Cable Installer will be responsible for attachment to pre-installed flange." The first statement suggests the HDD contractor will remove the bullnose and replace with a 8" ANSI Class #300 Flange adapter; however, the second statement says this is not part of this scope of work. Please clarify how the subsea cable installers dive team will find the HDD conduit upon arrival.**

A: Please refer to question #6 above. The statement "This is not part of this scope of work" is intended to convey that this element is not within the scope of the cable installers work and will be performed prior to arrival for cable installation by other contractors.

12. **Q: Please confirm that the subsea conduit will be marked with a subsurface buoy as stated in addendum 4. The referenced section does not mention the installation of buoy's.**

A: Yes, subsurface buoys will be attached to the offshore conduit to assist with locating the buried conduit end.

13. **Q: Will OSU request a fishing exclusion zone from the appropriate Federal and State Authorities for the cable ROW during the cable installation to avoid any disturbance to active fishing operations and or delays in construction?**

A: Yes. OSU has been working closely with the local fishing community for a number of years. In particular, OSU collaborates with the Fishermen Involved in Natural Energy (FINE) committee. FINE was established by Lincoln County, Oregon and consists of appointed individuals who represent the spectrum of fisheries potentially impacted by the siting of ocean wave energy facilities. FINE and the County support the project and OSU will coordinate with them, the Oregon Fishermen's Cable Committee (OFCC), the US Coast Guard and other agencies to ensure that fishing is excluded from the area during cable installation.

14. **Q: Will OSU provide the necessary stakeholder outreach to local organization in an effort to ensure a smooth construction window without interruption?**

A: Yes. OSU has been working closely with all local stakeholders for a number of years and will continue to do so. It should be noted that there is widespread stakeholder support for this project. OSU will be the primary stakeholder outreach organization throughout the cable installation process. The selected contractor will be expected to provide OSU with information about the cable installation activities so that it can be incorporated into any outreach materials and will likely be asked to provide answers to specific questions as they arise. See also Q. 13.

15. Q: We have been contacted by one installation company to support their proposal with a cable bid and looking at the participant list of the project kick-off there appear to be a lot of other interested bidders, most of whom we do not have experience with. I was wondering if during your assessments prior to the RFQ you shortlisted some companies that are more likely candidates to secure the installation scope and with whom we should work together?

A: There is no shortlist of companies.

16. Q: CONTRACTOR to provide the following regarding Red, White & Black MV power core service loops: Minimum length of each individual MV power core service loop.

A: 60-foot-long service loops.

MODIFICATIONS:

Item 2:

Add the following bullet point to RFP Section 7.2 'Evaluation Criteria' subsection 6 'Cost' Item #2. PROPOSED LUMP SUM PRICING – Installation and Testing (10 Points)

- **Spare cable, Specify if spare cable is to be delivered at time of cable installation or separately after cable installation is complete. If one or the other or both options exist, please identify the cost of the options. Evaluations will be conducted on the option presented or if two options are presented, the lower cost option of the two. NOTE: If delivery is to occur after cable installation, that delivery must occur no later than 18 months after cable installation is complete.**

Add the following line item to RFP Section 7.2 'Evaluation Criteria' subsection 6 'Cost' Item #1 1. PROPOSED LUMP SUM PRICING – Cable System Design, Manufacture and Factory Test (10 Points)

Optional Testing Price Item (This item will not be scored):

Proposer's seeking to waive the RFP specified simulation cable testing in accordance with Cigre TB623 to demonstrate life greater than 200,000 cycles by use of a manufactured sample length of cable for simulated testing, in addition to actual tests, are to provide here a separate line item pricing of this test, coupled with justification for waiving this test. Suitable justification would include past use or testing history of cables with similar designs and/or past use or testing which validates the engineering simulation solution offered.

Price of simulated testing on manufactured sample length of cable
$_____*

Seeking to waive this option by including the Optional Test Price Item here does not release the Proposer from performing this test should that Proposer be identified for Award of Contract. OSU reserves the right to require the test or accept the justification to waive the

test (and waive the cost of the test). In the event of a waiver of the test by OSU, the manufacturer shall not be released from any warranty obligations otherwise established under testing and in conformance with specifications and standards as specified.

Item 3:

Add the following contractor to the Pre-Proposal Conference Attendees/Interested Parties list:

Name	Cliff Center	Email	ccenter@offshorebarriers.com	Prime □	Sub X
Company	Harbor Offshore Inc.	Phone	206 949 7133	Supplier □	Other □

END OF ADDENDUM NO. 10