



# Oregon State University

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

**RFP #2021-003847**

**ADDENDUM NO. 7**

ISSUE DATE: December 9, 2020

**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:**

- Q: Because the cable length is relatively too long to carry out PD testing at FAT for complete cable, we would like to waive PD test for completed cable.**

**Instead of carrying out PD test for complete cable, we would like to carry out at core test.**

**After core test, it will not be affected PD characteristic by during manufacturing process.**

**A: OSU is not aware of any particular PD testing length limitation with most techniques. OSU does recognize potential issues with the quality of the results in unshielded environments but are also aware of**

techniques to mitigate these concerns.

IEC 63026 does allow for PD testing of manufactured core lengths. IEC 63026, clause 9.2.1 provides for PD testing of core manufacturing lengths prior to factory jointing to in process cable. IEC 63026 further defines recommended factory testing of Factory Joints during the manufacturing process, including X-Ray and PD testing.

OSU expects proposals to define a manufacturing process testing program in accordance with the defined (or otherwise agreed to) specifications and industry standards. OSU understands that many of these in process tests are intended to mitigate supplier risk by mitigating potential for failure of completed cable delivery lengths during factory and post installation HV testing.

OSU does request that PD testing of the completed cable length be performed during cable FAT. Proposer is free to define reasons that such a test should be considered as "For Information Only" vs. being included in Final Acceptance. Factory records provide a baseline for future reference when monitoring cable life. PD testing "For Information Only" shall be per mutually agreeable procedures applicable to field installations.

**2. Q: The lightning impulse test shall be waived.**

**Lightning impulse test is only required for cables with a nominal electric conductor stress > 8.0kV/mm while the electric conductor stress of the offered cable is 3.6kV/mm in accordance with IEC 60840.**

**A:** Referencing section 3.4 of DOC-1004-10300 (36 KV Subsea Power Transmission Cable Specification). The last two sentences of the first paragraph read as follows:

"Cables shall be designed and manufactured in accordance with IEC 60502. Cables shall be tested at each point of the manufacturing, acceptance, handling and installation process in accordance with IEC 63026."

The details of IEC 60840 notwithstanding, IEC 63026 specifies Lightning Impulse testing to 170 kV in accordance with IEC 60230 as part of type testing both a sample length of cable (12.5.6) and a factory joint (11.1.3), in addition to other tests described. Type testing of supplied cable, factory joints and all accessories (including Dry Mate Connector) shall be in accordance with IEC 63026.

**3. Q: We would like to clarify if the test of 200,000 bending cycles with tensions (Cigre TB623 Clause 5.6) can be proven by a results of our simulation engineering which has been used for the analysis of dynamic cables in our past project.**

**We consider that the exact testing require huge cost and lead time to complete.**

**A:** Engineering for fatigue life of the offshore semi-dynamic cable system showing fatigue life greater than 200,000 cycles under the conditions defined is expected as part of cable engineering. Given the nature of the offshore operations and environment, simulation testing in accordance with Cigre TB623, Clause 5.6, is specified and expected to be included in proposer's response. It is understood that this process requires manufacturing of a sample length of cable for testing, in addition to actual tests.

Proposer's may offer this test program as an option with separate line item pricing, 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.

4. **Q: Please clarify which you require;**

1) 2 copper tapes each layer has 50% overlap over copper wire. (It forms 4 layers of copper tape)

2) 2 copper tapes that has 50% overlap each other over copper wire. (it forms 2 layers of copper tape)

**We consider it becomes not flexible either 1) or 2). We would like to recommend that copper tape shall be wrapped with suitable gap over copper wires considering with flexibility of cable. Please refer clarification No.39.**

**A:** Specific to this question, the specification calls for Option # 2) above defined as “it forms 2 layers of copper tape”. Please refer to the response to question #5 below for further clarification.

5. **Q: For metallic screen, we would like to apply copper wires and one copper tape with suitable gap. In case there are 2 layers of 50% lapped copper tape wires at dynamic section, there is a risk that copper will easily make wrinkle because of its Strong rigidity. To avoid a damage to insulation due to the wrinkle, one copper tape with suitable gap is recommended.**

**A:** OSU understands that optimum metallic screen construction details may differ from the details defined. The primary goal is a robust solution to meet the flexure requirements of the semi-dynamic section of cable, while also meeting the short circuit ratings defined. Section 3.4.1 of DOC-1004-10300 includes the following statement:

“The vendor may propose alternatives to the construction of the conductor elements that meet the performance requirements as identified within.”

To be clear, if proposer believes that alternative construction details (vs details specified in OSU’s specifications) will result in a superior product, proposer is encouraged to offer alternative solutions with explanation of reason for the variation.

Further, noting that the details originally specified (2 layers of copper tape over copper wire or braid) is intended specifically for fatigue performance of the offshore, semi-dynamic end of the cable. Please make particular note of OSU’s response to Question # cc on the previously released Addendum #4 which includes the following statement:

“Tape only solutions that otherwise meet the other specifications defined within would be acceptable over the remaining length of cable starting at 3 km from the dry mate connector to the termination at the Driftwood termination vaults.”

6. **Q: Will whales in the area during cable laying or cable protection operations stop subsea operations?**

**A:** No. Once cable laying operations have started, whales in the area will not require stoppage of cable laying or cable protection operations. However, “startup” of vessel dynamic positioning (DP) systems for cable laying must occur in daylight hours in order to visually confirm that whales are not in the immediate area. Once vessel DP systems are engaged, shut down is not required should whales be observed in the area.

7. **Q: What are the dive vessel anchoring limitations for dive operations on the offshore end of the HDD conduit?**

**A:** Avoid, to the extent practicable, anchoring in areas known to contain hard substrate or rocky reef habitats as identified by available seafloor mapping.

**8. Q: Will diver hand jetting, educting or air lifting of bottom material be allowed to bury the cable?**

**A:** Yes. The shore landing conduit will be buried approximately 3 feet below seabed on arrival for cable installation. Diver dredging and jetting operations will be required to uncover each conduit to attach and install a cable bellmouth during cable pull in, followed by cast iron split pipe for final protection. Offshore from the conduit exit, jetting and/or dredging will be required for burial of all cables to site. These operations can be robotic, or diver etc. as required.

**9. Q: The installation specification states that a Power Meter test is required for the fibers once the cable is installed. Typically, for submarine cables, power meter tests are not conducted post installation due to the logistics required to perform the tests. OTDR testing is typically the only testing performed. Would it be acceptable to only perform OTDR tests?**

**A:** Please reference Addendum #6, Question #16. Fibers are expected to be looped back within the capped Dry Mate connector half to allow for power meter testing of looped pairs from the Shore landing vault which should eliminate concerns with logistics and holding the lay vessel on station for cable testing.

**10. Q: The cable specification states that conduit segments which rise above the local water table will be backfilled with thermal grout. Please confirm that this is between the soil and the outside of the conduit segments. Also confirm that this is not part of this RFP.**

**A:** Yes, this grouting will be placed between the outside of the conduit and the soil. This work will be performed under separate contract and prior to commencement of cable installation and is not within scope of this RFP.

Please reference Addendum #6, Question #30 for further detail, which reads in part:

“This section of conduit will be back filled with CLSM (Concrete, low strength mix) for the purpose of stabilizing the conduit and providing a minimum thermal conductivity of 0.9 W/(m °C) for a 16” diameter around the conduit.”

**11. Please clarify when OSU would like to receive the 30 meter test cable with dry mate connector. In addition, also clarify how OSU would like the cable packaged ( Crated Coil, Reel, or manufacturers discretion)**

**A:** Given that the offshore, Dry Mate connector and quadrant is the last portion of each cable to be installed, OSU’s nominal assumption is that test cable and connector assembly would/could be used during cable handling and lay operations for testing and monitoring cable health (all testing other than HV acceptance testing) as a quick means to interface onboard test equipment with each cable. On completion of the project, the test cable would be crated and delivered to OSU’s designated port in Oregon.

Should delivery of this article impact installation vessel options, suppliers are free to specify shipment and delivery of cable via separate means within 6 months of cable system acceptance. This test article shall be coiled and crated for long term storage on delivery.

**12. Please provide drawings of the Beach Man Hole (BMH)**

**A:** Engineering drawings are undergoing final review and should be available in early December. This drawing package will be posted alongside the other supporting documents currently available via the link at top of this Addendum

**13. Please provide a copy of the sample contract**

**A:** OSU anticipates publishing the sample contract by addendum on or before December 31, 2020.

Proposing contractors will have an opportunity to review the sample contract and its terms before submitting a proposal and should add comments as part of the proposal submission. All comments and proposed edits to the terms of the sample contract must be submitted with the proposal, see Section 7.5 'Contract Award' subsection b for details.

END OF ADDENDUM NO. 7