



United States Department of the Interior

BUREAU OF OCEAN ENERGY MANAGEMENT
WASHINGTON, DC 20240-0001

Ms. Patricia DiOrio
Revolution Wind, LLC
56 Exchange Terrace, Suite 300
Providence, Rhode Island 02903

Dear Ms. DiOrio:

I am writing on behalf of the Bureau of Ocean Energy Management (BOEM), Office of Renewable Energy Programs, regarding Revolution Wind, LLC's (Revolution Wind) variance request submitted on October 16, 2024, pursuant to lease number OCS-A 0486 Conditions of Construction and Operations Plan (COP) Approval (Conditions), conditions 5.10 (Wind Turbine Generator (WTG) and Offshore Substation (OSS) Foundation Installation Conditions) and 5.10.5.f (Soft Start for Pile Driving) for the installation of the OSS Z01 monopile (pile) foundation.

On October 4, 2024, Revolution Wind initiated a first attempt to install pile Z01 and encountered challenging conditions where the pile deviated from its vertical position. The Revolution Wind installation team determined the pile had reached a stable penetration depth and that pile driving should stop in order to establish a path forward.

Pursuant to condition 1.5, Revolution Wind requested a variance from 5.10 to continue with the installation of the Z01 OSS pile and allow for the use of the full hammer energy (4,400 kilo joules) due to the challenging pile driving conditions. Revolution Wind also requested a variance from 5.10.5.f to modify the soft start procedures to ensure all efforts can be made to achieve the final pile penetration depth while using the minimum amount of hammer energy necessary to safely install, maintain the integrity of the pile, and reduce the risk of damaging the hammer. Revolution Wind proposed the following methodology:

1. Soft start of Z01 will use approximately 10% of the maximum hammer energy to strike the pile with a single strike once per minute for a total of 10 minutes, resulting in ten strikes over a ten-minute period. It is crucial that the project limit the energy level and amount of strikes for the soft start as it is anticipated that the energy will not be sufficient to advance the pile and therefore the hammer will be absorbing the energy, risking damage to the hammer and therefore additional delay and future activity.
2. Following the completion of the soft start procedure described above, the hammer energy will be ramped up until satisfactory advancement of the pile is achieved. It is anticipated that the ramping up of energy will occur over a 5-to-10-minute period, but the duration and energy levels will be field determined based on the behavior of the pile and hammer during this period.

3. Pile driving will continue using the minimum hammer energy necessary to continue advancement of the pile until either the pile achieves target penetration depth or refusal occurs. Refusal is determined contextually by the operator based on the number of strikes per centimeters of advancement of the pile. This refusal determination may vary based on the status of the pile (i.e., restart, normal pile driving, or nearing full penetration), but under most conditions would be deemed to have occurred when piling exceeds 400 strikes per 25 centimeters of advancement. Although this is typically the official determination, often refusal would be determined to have occurred well before reaching the 400 strikes based on lack of advancement observed.

In support of the variance request, Revolution Wind proposed enhanced mitigation actions. Revolution Wind proposed to conduct Thorough Sound Field Verification (SFV) as described in the Revolution Wind SFV Plan (condition 5.4.5) and enhanced clearance and shutdown zones for listed and protected species according to Table 1 below. North Atlantic right whales (NARWs) and unidentified whales will continue to have mitigation implemented at any distance.

Table 1. Proposed enhanced clearance and shutdown zones

	Marine Mammal Protection Act (MMPA) Letter of Authorization (LOA) and Endangered Species Act (ESA) Biological Opinion Clearance and Shutdown Zone Radii	Enhanced Mitigation Clearance and Shutdown Zone Radii
NARW and Unidentified Whales (Visual)	Any distance	Any distance
NARW and Unidentified Whales (Passive Acoustic Monitoring (PAM))	10 kilometers (km)	10 km
Large Whales (non-NARW)	2,300 meters (m)	4,000 m
Delphinids	Noise Abatement System (NAS)*	1,500 m
Harbor Porpoises	1,400 m	1,500 m
Seals	500 m	1,500 m
Sea Turtles	200 m	500 m

*NAS distance means that the zone is small enough that it will be encompassed by the bubble curtain.

Further, Revolution Wind proposed to enhance protected species observer (PSO) monitoring with the following:

1. Two PSO vessels will conduct visual monitoring of the Clearance/Shutdown Zone during the planned pile driving on Z01. Each vessel will have 6 PSOs (3 PSOs on watch at a time). Each PSO will have standard 7x or 10x handheld binoculars and each vessel will have 2 sets of 25x “Big Eye” binoculars, and all other required PSO equipment.
2. The two PSO vessels will conduct monitoring at a distance of 3 km from pile Z01 in order to better observe the full 4 km zone for large whales.
3. PAM locations and procedures will continue to be conducted as described in the approved Revolution Wind PAM Plan.

In addition to submitting a variance request to BOEM and the Bureau of Safety and Environmental Enforcement (BSEE), on October 16, 2024, Revolution Wind notified the National Marine Fisheries Service (NMFS), Office of Protected Resources (OPR), and Greater Atlantic Regional Fisheries Office (GARFO) Protected Resources Division of the request in writing. On October 17, 2024, BOEM provided NMFS GARFO its determination that: (1) the variance request for a single pile does not result in a change to the proposed action that would result in effects to ESA-listed species not considered in the April 30, 2024, Biological Opinion; and (2) the activity does not require reinitiation under the ESA. NMFS GARFO concurred with BOEM’s determination on October 17, 2024.

On October 17, 2024, BOEM, in coordination with BSEE, provided the following provisional approval to Revolution Wind for the installation of the Z01 OSS foundation location via email, which remained effective until BOEM provided its final determination:

5.10. WTG and OSS Foundation Installation Conditions

Monopiles must be no larger than 15 m in diameter. For all monopiles, the minimum amount of hammer energy necessary to effectively and safely install and maintain the integrity of the piles must be used. **Hammer set energies must not exceed 4,400 kilojoules.**

5.10.5.f. Soft Start for Pile Driving

The Lessee must use a soft start protocol for impact pile driving of monopiles by performing a **single strike once per minute at 10 percent of the maximum hammer energy, for 10 minutes**. Soft start must be used at the beginning of each day's monopile installation, and at any time following a cessation of impact pile driving of 30 minutes or longer. If a marine mammal or sea turtle is detected within or about to enter the applicable clearance zones, prior to the beginning of soft-start procedures, impact pile driving must be delayed until the animal has been visually observed exiting the clearance zone or until a specific time period has elapsed with no further sightings (i.e., 15 minutes for small odontocetes and 30 minutes for all other marine mammal species and sea turtles).

BOEM concurred with the implementation of the enhance mitigations actions as described in the variance request with Thorough SFV, enhanced clearance and shutdown zones, and enhanced PSO monitoring for pile driving at the Z01 OSS foundation location.

On October 18, 2024, BOEM clarified to Revolution Wind that it must notify BOEM of any objections from NMFS to the activities proposed in the variance request pursuant to their authorities under the MMPA. On October 18, 2024, OPR determined that the soft-start procedure aligned with the LOA measure as described in the recently modified LOA. In recognition of the need to possibly use hammer energies that exceed that allowed for in the LOA, OPR stated that it appreciated Revolution Wind's proposed use of expanded clearance and shutdown zones and Thorough SFV acoustic monitoring during installation. Upon completion of the installation of Z01, OPR requested information related to these measures.

Pursuant to condition 1.5, BOEM determined that the variance: (1) would not result in a change in the Project impact levels described in the Final Environmental Impact Statement and Record of Decision for the Project; (2) would not alter obligations or commitments resulting from consultations performed by BOEM and BSEE under Federal law in connection with the COP approval, in a manner that would require BOEM to reinitiate or perform additional consultation for applicable laws (e.g., ESA, MMPA, or Magnuson-Stevens Fishery Conservation and Management Act); and (3) would not alter BOEM's determination that the activities associated with the Project would be conducted in accordance with section 8(p)(4) of the Outer Continental Shelf Lands Act.

This letter is BOEM's final determination of approval for a variance from conditions 5.10 and 5.10.5.f which documents for the record the provisional approval provided via email October 17, 2024. Revolution Wind must still provide an assessment of the structural integrity of the Z01 foundation monopile to BOEM and BSEE after the completion of pile driving and prior to any further OSS installation.

If you have any questions regarding this matter, please contact Whitney Hauer at (571) 536-8698 or Whitney.Hauer@boem.gov.

Sincerely,

David B. Diamond
Deputy Chief for Operations,
Atlantic Outer Continental Shelf
Office of Renewable Energy Programs