1 March 2021

Ms. Jolie Harrison, Chief
Permits and Conservation Division
Office of Protected Resources
National Marine Fisheries Service
1315 East-West Highway
Silver Spring, MD 20910-3225

Dear Ms. Harrison:

The Marine Mammal Commission (the Commission), in consultation with its Committee of Scientific Advisors on Marine Mammals, has reviewed the application submitted by South Fork Wind, LLC (South Fork Wind) under section 101(a)(5)(D) of the Marine Mammal Protection Act (the MMPA). South Fork Wind is seeking authorization to take small numbers of marine mammals by harassment incidental to construction of the South Fork Wind Farm and associated high-resolution geophysical (HRG) surveys. The project area is approximately 30 km southeast of Block Island, Rhode Island[1]. The Commission also has reviewed the National Marine Fisheries Service's (NMFS) 5 February 2021 notice (86 Fed. Reg. 8490) requesting comments on its proposal to issue the authorization, subject to certain conditions.

South Fork Wind is proposing to conduct (1) impact pile driving to install monopiles, (2) vibratory pile driving and removal to install and remove a temporary cofferdam, and (3) HRG surveys of the inter-array cable and export cable construction area. South Fork Wind would install 16 11-m monopiles using an impact hammer on 16 days over a period of up to 31 days[2] in water depths from 33 to 41 m. Vibratory pile driving would occur for up to six days in water depths from 7.6 to 12.2 m. In addition, South Fork Wind would use sub-bottom profilers (including chirp, sparker, boomer, and parametric types), echosounders, side-scan sonar, and acoustic positioning systems during its HRG surveys in water depths up to 90 m[3].

[1] Bureau of Ocean Energy Management (BOEM) lease area OCS-A 0517.
[2] Installing 16 monopiles, with one pile installed every other day, would take 31 rather than 30 days as specified in South Fork Wind's application and the *Federal Register* notice.
[3] NMFS clarified that 90 m was the deepest water depth in which HRG surveys would occur. Various shallower water depths were provided in South Fork Wind's application, while the water depth(s) was omitted from the *Federal Register* notice. Water depth is a necessary parameter to estimate Level B harassment zones using NMFS's Level B harassment user spreadsheet (86 Fed. Reg. 8515), as well as Level A harassment zones when beamwidth is accounted for.

General concerns

The Commission reviewed South Fork Wind's application, JASCO Applied Sciences Inc.'s (JASCO) underwater acoustic[4] and animal exposure[5] modeling reports, NMFS's *Federal Register* notice, and the proposed incidental harassment authorization. The Commission's review revealed numerous inconsistencies, omissions, errors, and deficiencies. The most egregious issues involve—

- Underestimation of Level B harassment zones for impact pile driving of 11-m monopiles
  - JASCO's pile driving source model (PDSM) has not been validated by in-situ measurements, but the model's performance has been compared against other models as part of a benchmark validation[6] by Lippert et al. (2016).
    - Lippert et al. (2016) indicated that JASCO's time-domain finite-difference (TDFD) PSDM model predicted lower sound exposure levels (SELs) in the far-field region than various finite-element (FE) models, because the PDSM model did not reproduce the secondary decaying pulses characteristic of the other models, resulting in a faster decay of the pile vibration and lower SEL estimates (see Figures 3, 4, and 6)[7]. While the exact source level difference between the TDFD PDSM and FE models was not reported, Lippert et al. (2016) indicated that the SELs predicted by the TDFD PDSM were approximately 2.5 dB lower than the FE models at 750 m. The authors suggested that adjusting the bottom boundary parameters of the PDSM could create a closer match with the other models, but Denes et al. (2020b) provided no evidence that such an adjustment had been made, and thus the accuracy of the PDSM model for piles up to 11 m in diameter remains unknown. To help resolve this issue, JASCO could add 3 dB to the SEL predictions from the PDSM, which would be consistent with the differences identified in Lippert et al. (2016)[8].
    - JASCO also used the ORCA normal mode model for sound propagation in Lippert et al. (2016) to compare against the benchmark case. The *Federal Register* notice indicated that for sound propagation JASCO used its Marine Operations Noise Model (MONM) based on a wide-angle parabolic equation solution to the acoustic wave equation and the U.S. Naval Research Laboratory's Range-dependent Acoustic

[4] There are two underwater acoustic modeling reports: February 2020 and February 2021. NMFS indicated that the latter report included revisions related to species other than marine mammals (e.g., sea turtles). As such, the Commission's comments are based on the February 2020 report (Denes et al. 2020b).
[5] There are four animal exposure modeling reports: February 2020, July 2020, December 2020, and February 2021. NMFS indicated that the latter reports included revisions related to species other than marine mammals (e.g., sea turtles). As such, the Commission's comments are based on the July 2020 report (Denes et al. 2020a).
[6] For a 2-m pile in 10 m of water.
[7] Lippert et al. (2016) indicated that PDSM was unable to be compared to the frequency-domain damping coefficients specified in the benchmark case in a straightforward manner, and this issue highlights an important difference between time-domain and frequency-domain methods.
[8] Generally speaking, Level B harassment zones can be scaled based on differences in source levels and known initial zones. If one were to use the damped cylindrical spreading model (DCSM) and assume a 3-dB difference in source levels, the model-estimated Level B harassment zone of approximately 4,500 m and α=0.9 dB/km (based on medium sand, the worst-case scenario of 41 m of water depth, and the DCSM spreadsheet tool (DCSiE) discussed further herein), the model-estimated Level B harassment zone would increase by 38.5 percent resulting in a zone of more than 6,230 m.

Model (RAM)[9] for frequencies ≤2 kHz, a BELLHOP Gaussian beam ray-trace propagation model for frequencies >2 kHz, and its Full-Wave Range-dependent Acoustic Model (FWRAM) based on the wide-angle parabolic equation algorithm[10] (86 Fed. Reg. 8511–8512). JASCO's modeling report indicated that FWRAM was used for sound propagation modeling of impact pile driving only and MONM was used for modeling non-impulsive sources—BELLHOP was not mentioned at all (Denes et al. 2020b). The sound propagation model(s) that JASCO used must be clarified, as well as how the model(s) would compare to the model used for the benchmark case in Lippert et al. (2016).

  - NMFS could have used DCSM (Lippert et al. 2018) to substantiate the Level B harassment zones, as it was developed using and validated by in-situ measurements and is fairly simple to implement[11].

- In-situ measurements from other recent pile-driving activities also suggest that the Level B harassment zones have been underestimated. JASCO estimated[12] the Level B harassment zone for impact driving of *11-m piles* to be 4,684 m, assuming a 10-dB sound attenuation reduction factor based on use of a *single bubble curtain*[13] and up to *4,000 kJ* of hammer energy[14] (see Tables 12 and 13; Denes et al. 2020a). In contrast, in-situ measurements[15] for impact driving of a *7.8-m pile* with a measured 9–12 dB sound attenuation reduction during use of a *double big bubble curtain*[16] for a hammer operating at a maximum of *550 kJ* estimated the Level B harassment zone to be 3,891 m[17] (WaterProof 2020[18]). It is unrealistic that an impact hammer with five times more energy intensity

[9] Which is not capable of tracking temporal aspects of the propagating signal or producing time-domain waveforms.
[10] Which is capable of producing time-domain waveforms (Denes et al. 2020b).
[11] The Bureau of Ocean Energy Management (BOEM) funded the development of DCSiE (Heaney et al. 2020) for wind energy development. The spreadsheet tool incorporates information related to bathymetry and substrate type, in addition to the measured sound level at a reference distance (typically no less than three times the water depth at the source). Although the DCSiE results cut off at 5 km, DCSM-fit equations can be easily extended beyond 5 km. Heaney et al. (2020) indicated that DCSM is valid up to $\alpha r<20$ dB and, for the studies they investigated, that equated to 8.7 km from the source, after which 25logR should be used as a precautionary estimate.
[12] In water depths of 34–36 m with medium sand substrate.
[13] It is unclear whether a 'big' bubble curtain will be used or whether a smaller bubble curtain will be placed closer to or immediately surrounding the pile. However, Bellman et al. (2020) indicated that a single big bubble curtain in 40 m of water resulted in an average sound attenuation reduction of 9 dB for piles up to 8 m in diameter. The authors also indicated that effectiveness of the big bubble curtain diminishes with water depth and specifically that operators must apply a combination of different sound attenuation devices both near to (e.g., resonator/dampener devices) and far from (e.g., big bubble curtains) the pile for water depths > 25 m and pile diameters ≥ 6 m (Bellman et al. 2020).
[14] JASCO's underwater acoustic modeling report estimated smaller zones (see Tables E13 and 14 in Denes et al. 2020b) than used in its animal exposure modeling report. It is unclear which zones are correct.
[15] In water depths of approximately 25 m with medium sand substrate. The observed sound propagation was fit and supported by DCSM from Lippert et al. (2018; see Figure 3.4 in WaterProof Marine Consultancy & Services BV (WaterProof) 2020). Based on Heaney et al.'s (2020) assertion that DCSM is valid for a range up to $\alpha r<20$ dB, WaterProof (2020) indicated that DCSM could be applied up to 13.6 km from the source based on its measurements and environmental parameters, including an $\alpha=1.47$ dB/km.
[16] Deployed 84 and 124 m from the pile.
[17] Dominion Energy Virginia (Dominion) estimated the Level B harassment zone with a 10-dB sound attenuation reduction to be less than that measured in the field (85 Fed. Reg. 30940).
[18] Ørsted Wind Power North America, LLC (Ørsted) is affiliated with both South Fork Wind and Dominion, which was the action proponent for pile installation associated with the Coastal Virginia Offshore Wind project as reported in WaterProof (2020).

would increase the harassment zone by only 20 percent; rather, one would expect the Level B harassment zone to more than double[19].

- South Fork Wind would be required to conduct in-situ measurements to ensure that the Level B harassment zone is less than 4,684 m and to add additional sound attenuation measures and devices and conduct additional measurements to ensure the modeled zone is not exceeded (see condition 5(e) in the proposed authorization).
  - It is unclear how South Fork Wind will meet these requirements if the Level B harassment zone has been vastly underestimated and what would occur if the requirements cannot be met (e.g., shut down operations, increase the size of the Level B harassment zones by modifying the authorization, etc.).
  - It also is unclear if lesser hammer energies are needed for the first few piles, whether additional measurements would be conducted for those piles that need higher hammer energies to ensure the modeled Level B harassment zone is not exceeded.

- Underestimation of the Level A and B harassment takes for impact pile driving
  - In addition to the underestimated Level B harassment zones, JASCO's assumptions used to seed its animat modeling were not appropriate.
    - JASCO used seven-day simulations[20] for its exposure modeling to inform its take estimates rather than single-day simulations[21] multiplied by the number of days of each activity (15 days of the standard and 1 day of a difficult pile). It is unclear whether these seven-day simulations appropriately accounted for the 16 days of proposed activities.
  - NMFS did not increase the proposed numbers of takes to at least average group size for Level A harassment takes of blue whales[22] and Level B harassment takes of sperm whales, long-finned pilot whales, and Atlantic spotted dolphins based on Department of the Navy (2017).

[19] The underlying source level should be proportional to the ratio of energy intensity over circumference of the pile. Since the impact hammer for South Fork Wind could exert 7.3 times more energy than the hammer used for Dominion but over a 1.4 times larger circumference, the source level for South Fork Wind should be more than 5 times larger than was determined by Dominion resulting in a source level increase of more than 7 dB. (4,000 kJ/550 kJ)/(34.5 m/24.5 m)=5.2, with 10log(5)=7 dB. Based on DCSM, a 7-dB difference in source levels, the measured Level B harassment zone of more than 3,800 m at Dominion, and α=1.47 dB/km for Dominion, the measured Level B harassment zone would increase by 81 percent resulting in a Level B harassment zone of approximately 6,890 m based on the increased hammer energies and pile size. To relate this adjusted Level B harassment zone to the environmental conditions at South Fork Wind, one must again use DCSM and assume an α=0.9 dB/km. The adjusted Level B harassment zone would increase by 39.8 percent, resulting in a Level B harassment zone of more than 9,600 m for South Fork Wind.

[20] Six days of pile driving for the maximum scenario installed over 20 days and three days of pile driving for the more likely scenario installed over 30 days—neither of which appears to equate to 16 days of actual pile driving, as proposed. The first would equate to at least 18 days of activities and the second would equate to 14 days of actual pile driving. Furthermore, seven-day simulations are more relevant for continuous activities such as seismic surveys. They are not relevant to a few hours of impact pile driving on every other day or even on consecutive days.

[21] The 140 and 250 minutes of activities for standard and difficult-to-drive piles, respectively, with 100 Monte Carlo simulations would take less computational time than what apparently was conducted by JASCO. The density-scaled take estimates for each activity would then have only needed to be multiplied by the number of days of activities.

[22] NMFS increased the Level A harassment takes for sei whales from zero to average group size but did not do the same for blue whales.

  - NMFS did not propose to authorize an appropriate number of Level A harassment takes of fin whales[23] and Level A[24] and B harassment takes of humpback whales[25] given the frequency of occurrence and group sizes observed in the South Fork Wind project area during previous monitoring efforts (A.I.S., Inc. 2017, Smultea Environmental Sciences, LLC 2020).
  - It does not appear that the proposed numbers of Level B harassment takes for other frequently-observed species (e.g., common dolphins, other delphinids[26]) are sufficient to ensure that the numbers would not be met and, in turn, cause unnecessary shut downs of activities or require South Fork Wind to seek an authorization modification.
- Inconsistent and omitted Level A and B harassment zones, clearance zones, and exclusion zones for impact pile driving
  - The Level A harassment zones are inconsistent between Denes et al. (2020b) and the *Federal Register* notice[27], as well as within the *Federal Register* notice[28]. It is unclear what the Level A harassment zones were intended to be.
  - The *Federal Register* notice includes both clearance zones and exclusion zones in Table 24, whereas, the proposed authorization only denotes clearance zones in Table 2[29]. It is unclear at what distance(s) and in what circumstances (pre-activity vs. during the activity) South Fork Wind would be required to delay or shut down its activities[30].
  - The Level A and B[31] harassment zones were omitted from the proposed authorization[32] and must be denoted as they exceed the clearance (and exclusion, if intended to be included) zones for humpback whales for Level A harassment and for all species except right whales for Level B harassment.
- Insufficient and incomplete monitoring measures for impact pile driving

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[23] Ten different sightings of fin whales ranging from 2–5 animals.
[24] Particularly given that the Level A harassment zone is estimated to be more than 3.6 km for humpback whales (see Table 24 of the *Federal Register* notice).
[25] Five different sightings of humpback whales ranging from 8–18 animals (A.I.S., Inc. 2017). Humpback whales were detected 46 times in the various Ørsted lease areas off Rhode Island in 2019–2020. Unfortunately, the raw sightings data were not provided and the group sizes cannot be ascertained (Smultea Environmental Sciences, LLC 2020).
[26] Smultea Environmental Sciences, LLC (2020) noted 380 detections of up to 4,644 common dolphins and 2 detections of 90 common bottlenose dolphins in the various Ørsted lease areas.
[27] For example, the mean Level A harassment zone for a difficult-to-drive pile based on the cumulative SEL (SEL_{cum}) thresholds for low-frequency cetaceans is 7,868 m based on Table G.2.1 of Denes et al. (2020b), while Table 8 in the *Federal Register* notice noted the zone to be 7,846 m.
[28] The Level A harassment zones are inconsistent in Tables 10 and 24 based on the SEL_{cum} thresholds for blue whales and gray seals and based on the peak sound pressure level (SPL_{peak}) thresholds for harbor porpoises and gray and harbor seals based on SPL_{peak} thresholds.
[29] This issue applies to vibratory pile driving as well, see Table 25 in the *Federal Register* notice and Table 2 in the proposed authorization.
[30] For example, the clearance zone was denoted as 5,000 m for North Atlantic right whales and the exclusion zone was denoted as 2,000 m in Table 24 of the *Federal Register* notice. NMFS indicated that South Fork Wind would establish a *clearance zone* for right whales slightly larger than the Level B harassment zone to minimize all takes, but that if a right whale is detected nearing the *exclusion zone*, shut down would be triggered (86 Fed. Reg. 8525). If South Fork Wind is only shutting down when a right whale is at 2,000 m, Level B harassment takes would not be minimized.
[31] The Level B harassment zones for vibratory pile driving and HRG surveys were omitted from the proposed authorization as well.
[32] The proposed authorization also noted monitoring zones but never specified the intent or extent of such zones in Table 2, as delineated in mitigation requirement 4(c)(vii). Again, if the Level B harassment zones extend beyond the monitoring zones, the Level B harassment zones must be specified in the authorization as well.

- NMFS indicated that South Fork Wind would be capable of monitoring the exclusion zone and initiating a shut down if a right whale is detected near the zone using a combination of visual monitoring from the construction vessel, a secondary monitoring vessel stationed at 2,200 m[33], and real-time passive acoustic monitoring (PAM; 86 Fed. Reg. 8525).
  - If the intent is to minimize all impacts as specified in the *Federal Register* notice (86 Fed. Reg. 8525), attempting to monitor only a 2,200-m zone is inadequate based on the fact that the Level B harassment zone is 4,684 m.
  - A single vessel stationed at 2,200 m would not be sufficient for monitoring the farther extents of the zones[34]—that is, the distance to the farthest extent would be 4,200 m based on the exclusion zone and more than 6,800 m based on the Level B harassment zone.
  - NMFS proposed to require the PAM operator to review acoustic detections within approximately 15 minutes of the original detection in order to verify whether a right whale has been detected (see mitigation requirement 4(d)(viii)(3) in the proposed authorization). A 15-minute lag in reviewing acoustic detections is not considered real-time, nor would it preclude taking.
  - NMFS provided no information on the minimum number, type (e.g., moored, drifting, or towed), location, bandwidth/sampling rate, estimated acoustic detection range, or sensitivity of the hydrophones or the detection software (e.g., PAMGUARD)[35] proposed to be used by South Fork Wind. This information is necessary to ensure that South Fork Wind can detect, classify, and locate North Atlantic right whales as intended. In addition, NMFS did not appear to consider how the direct strike pulses and reverberation from the activity could inhibit detection of marine mammal vocalizations, particularly those of right whales.

- Insufficient and inappropriate reporting requirements regarding the hydroacoustic monitoring report for impact pile driving
  - South Fork Wind would be required to report only the 'depth' and sediment type at the hydrophone location (see reporting requirement 5(f)(vii)(c) in the proposed authorization). The water depth and sediment type(s) at the pile-driving location(s) and hydrophone locations also should be reported.
  - South Fork Wind would be required to report only the Level B harassment zone, but it would not be required to report the relevant Level A harassment zones as well (see reporting requirement 5(f)(vii)(I) in the proposed authorization). The hydroacoustic data also should be fit using DCSM and 15logR at a minimum, as well as any other appropriate fit, as was conducted by WaterProof (2020).
  - South Fork Wind would be required to report the sampling rate and bandwidth of the hydrophone(s) (see reporting requirements 5(f)(vii)(E) and (F), respectively), but it would

[33] This requirement is not included in the proposed authorization, similar to others specified in the *Federal Register* notice. Some of the mitigation, monitoring, and reporting requirements are included in the *Federal Register* notice but not the proposed authorization and vice versa. In other instances, the information included in the Federal Register notice and proposed authorization is not consistent (e.g., clearance times for certain species and activities for which those apply).
[34] Since NMFS assumes that the zones are radii of circles.
[35] In addition to the PAM reporting requirements specified in 5(f)((vi) of the proposed authorization, the bandwidth/sampling rate and sensitivity of the hydrophones and detection software used should be reported.

not be required to report the sensitivity of the hydrophone(s) or ambient spectra necessary for diagnosing issues with the hydrophone(s).
    - South Fork Wind would be required to report visibility metrics and baseline pre- and post-activity broadband[36] ambient sound levels (see reporting requirement 5(f)(vii)(G) in the proposed authorization).
        - It is unclear why visibility metrics are to be reported for a hydroacoustic monitoring report. Wind speed should be sufficient, if necessary.
        - It also is unclear why pre- and post-activity broadband ambient sound levels would be reported for a source with a Level B harassment threshold at 160 dB re 1 μPa, which is well above ambient. Broadband ambient sound levels are reported when assessing transmission loss and sound levels relative to the 120-dB re 1 μPa threshold. Furthermore, specific requirements are necessary for not only the equipment (more sensitive hydrophones would be needed for measuring ambient sound levels than for impact pile driving) but also for the methods (see NMFS 2012). NMFS (2012) specified that ambient measurements need to be collected for three consecutive 24-hour periods. This type of measurement for South Fork Wind's activities is unnecessary.
- Overestimation of the Level B harassment zones for vibratory pile driving
    - JASCO estimated the Level B harassment zones to be more than 36 km for vibratory installation of sheet piles in a sandy substrate. The modeled spectra provided in Denes et al. (2020b) are inconsistent with spectra obtained from in-situ measurements of similar activities (e.g. see California Department of Transportation (Caltrans) 2016, Illingworth & Rodkin, Inc. (Illingworth and Rodkin) 2017)).
    - Assuming 15logR transmission loss and a Level B harassment zone of 36.8 km, the back-calculated source level would be 173.5 dB re 1 μPa at 10 m—a source level that is much higher than NMFS uses for 48-in pipe piles, let alone sheet piles[37] (see Table 11; 86 Fed. Reg. 1610).
- Inaccurate Level B harassment takes for vibratory pile driving
    - In addition to the overestimated Level B harassment zones, NMFS assumed that pile driving would occur on only two days (86 Fed. Reg. 8521), rather than the maximum of six days[38] specified elsewhere in the *Federal Register* notice (86 Fed. Reg. 8491).
    - Similar to previous comments herein on impact pile driving, NMFS did not increase the estimated Level B harassment takes to an appropriate number based on group size and frequency of occurrence in the project area for fin whales, sei whales, humpback whales, Atlantic white-sided dolphins, and common dolphins.
- Incorrect Level A harassment zones and inconsistent exclusion zones and Level B harassment zones for HRG surveys
    - Consistent with informal comments the Commission made on Ørsted's previous proposed authorization for HRG surveys in the South Fork Wind project area (85 Fed. Reg. 48195) and those for which NMFS did not revise in the final authorization (85 Fed. Reg. 63515), NMFS incorrectly estimated the Level A harassment zones yet again.

[36] Or frequency weighted.
[37] NMFS generally uses a source level between 160–165 dB re 1 μPa at 10 m for vibratory installation of sheet piles.
[38] Up to three days for installation and up to three days for removal.

- NMFS did not specify the input parameters necessary to estimate the corresponding Level A harassment zones in the *Federal Register* notice.
- South Fork Wind specified incorrect frequencies in Table 13 of the application for each functional hearing group's most sensitive frequency within the proposed operating frequencies of all impulsive sources[39].
- Based on South Fork Wind's specified input parameters and NMFS's assertion that its User Spreadsheet was used to estimate the Level A harassment zones (86 Fed. Reg. 8515), the Level A harassment zones are still incorrect in Table 12 of the *Federal Register* notice for numerous non-impulsive and impulsive sources for multiple functional hearing groups[40].
- The exclusion zones for mid-frequency cetaceans, except sperm whales, and phocids are inconsistent between Table 26 in the *Federal Register* notice, where such zones appear to be 0 m, and Table 2 in the proposed authorization.
- The Level B harassment zones for chirps are inconsistent in Tables 12 and 26 of the *Federal Register* notice.

The quality of NMFS's *Federal Register* notices and proposed authorizations has been diminishing for a number of years. Part of the issue appears to stem from a lack of adequate staff education and/or training in underwater acoustics and other technical aspects, as well as lack of attention to oversight and basic quality control. It is imperative that the information underlying such authorizations is accurate and the analyses are sound and that NMFS's statutorily-required determinations are based on best available science. The Commission firmly believes that NMFS should be focusing its efforts on impact pile driving of very large monopiles as they are much more impactful than HRG surveys. In fact, the Commission has questioned whether incidental take authorizations are necessary for HRG surveys[41]. If NMFS insists on evaluating the impacts of HRG surveys and authorizing taking of marine mammals for those activities[42], it must base the analyses on accurate information. NMFS must ensure that its analysts are properly trained to use its various

[39] For example, South Fork Wind specified 1.5 kHz as the most sensitive frequency for all functional hearing groups within the 0.4–5 kHz operating frequency for the GeoMarine Geo-Source 400 tip sparker. The most sensitive frequencies in fact are 1.7 kHz for low-frequency (LF) cetaceans and 5 kHz for the other three functional hearing groups.

[40] For example, the Level A harassment zone for the non-impulsive GeoPulse 5430 would be 97.7 m for high-frequency (HF) cetaceans using NMFS's user spreadsheet (which NMFS indicated was used to estimate the zones; 86 Fed. Reg. 8515), 45.1 m using NMFS's HRG Level A harassment spreadsheet that accounts for beamwidth and an infinite water depth, and 39.2 m using NMFS's MATLAB® code that accounts for beamwidth, water depth, and absorption. NMFS indicated that the zone was 36.5 m in Table 12 of the notice. As another example, NMFS indicated that all Level A harassment zones for all impulsive sources would be 0 m based on the SEL_{cum} thresholds for HF cetaceans, which is incorrect. In addition, NMFS again specified that the Level A harassment zone for the AA Triple plate S-boom would be 4.7 m based on the SPL_{peak} threshold for HF cetaceans—the SPL_{peak} source level of 211 dB re 1 μPa_{peak} at 1 m specified by South Fork Wind is the same for the boomer and sparkers. As such, the Level A harassment zone would be 2.8 m for the boomer consistent with the zones for all of the sparkers.

[41] See its 2 September 2020 (Ørsted Wind Power North America, LLC), 13 July 2020 (Equinor Wind, LLC), 6 July 2020 (Dominion Energy Virginia), 26 June 2020 (Mayflower Energy, LLC), 12 March 2020 (Vineyard Wind, LLC), 18 October 2019 (Skipjack Offshore Energy, LLC), 23 August 2019 (Ørsted Wind Power LLC), 6 July 2018 (Dominion Energy Virginia), and 13 June 2018 (Ørsted/Bay State Wind) letters.

[42] See the Commission's 2 September 2020 letter on Ørsted's current authorization.

spreadsheet tools and that its acoustic expert is consulted to review the Level A and B harassment zones estimated from the spreadsheet tools[43] or more sophisticated modeling.

Revise and republish

Based on the deficiencies noted by the Commission herein, it is unclear how NMFS can make the relevant findings under the MMPA, including ensuring that mitigation measures would effect the least practicable impact on the species and stocks—particularly North Atlantic right whales—during impact pile driving. It should not be left to the Commission or the public to attempt to decipher or presume what NMFS intended. Given that South Fork Wind's activities are not to begin until spring 2022, the Commission recommends that NMFS address the aforementioned issues, revise the *Federal Register* notice and proposed authorization accordingly, republish the revised notice in the *Federal Register*, and provide an additional 30-day public comment period.

Wind energy authorizations in general

The Commission underscores its support of wind energy development and industry operators, such as Ørsted, that are striving to conduct the activities in an environmentally-conscientious manner and attempting to minimize impacts on marine mammals. It is clear that the operators have not been provided the relevant information and direction necessary to submit an informed application and to tailor mitigation and monitoring measures appropriately. Those deficiencies fall squarely on the regulatory agency. NMFS must provide consistent and informed guidance to the numerous industry operators that have submitted or soon will submit incidental take authorization applications for wind energy surveying, siting, and construction projects.

Please contact me if you have questions regarding the Commission's recommendations.

Sincerely,

Peter O. Thomas, Ph.D.,
Executive Director

cc: Amy Scholik-Schlomer, NMFS
Stan Labak, BOEM

[43] NMFS's acoustic expert (and other properly-trained analysts) also should use the relevant code and modeling software (i.e., MATLAB® or R) to estimate more accurate Level A harassment zones for HRG surveys—this has been an ongoing issue for research permits involving HRG devices as well. Both issues can be resolved by NMFS purchasing the relevant software license(s) or rewriting the current MATLAB® code in R. In either case, the issues must be resolved in the near term.

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