

In addition, exclusion zones should be based on the best available information, and if that information demonstrates that exclusion zones of less than 500 meters are warranted, then there is no basis for arbitrarily requiring a minimum exclusion zone of 500 m (if the DPEIS intends for 500 m to be a minimum). If a minimum 500 m exclusion zone requirement is not applied, the Associations would support the incorporation of power-down procedures to mitigate any potential effects. Power-down procedures acceptable to the Associations are a modified version of the procedures described at 79 Fed. Reg. 14,780, 14,797 (Mar. 17, 2014) (“Langseth IHA”).<sup>27</sup>

## 5. Dolphin shutdowns

The DPEIS does not clearly explain whether shutdowns for dolphins are required and, if so, under what scenarios. In Chapter 2, the DPEIS appears to state that the “Expanded PSO Program” applicable to Alternatives B-F includes shutdown requirements for whales and manatees and that these requirements are further expanded in Alternative D to apply to all “marine mammals” except for bow-riding dolphins. However, Appendix B suggests that the Expanded PSO Program requires shutdowns for all “marine mammals” except that bow-riding dolphins are excluded from this requirement only for Alternative D. DPEIS Appx. B at B-23, B-24. We assume that Chapter 2 correctly describes BOEM’s intent and that none of the alternatives require shutdowns for dolphins.<sup>28</sup> However, to the extent BOEM does contemplate the application of shutdown requirements to dolphins, or to the extent commenters advocate for dolphin shutdown requirements, such measures have no support for the following reasons.

First, dolphins are mid- to high-frequency specialists and, therefore, insensitive to the low-frequency impulse sounds emitted by seismic operations. A recently published study investigated whether bottlenose dolphin exposure to airgun impulses results in TTS. The paper states that even the highest exposures, cumulative sound exposure levels of 185-195 dB re 1  $\mu$ Pa<sup>2</sup>-s did not result in TTS in any of the subjects.<sup>29</sup> Even at ranges as close as 3.9 m and with

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<sup>27</sup> Specifically, the Associations would support power-down procedures similar to those in the Langseth IHA provided that: (1) power-down would be implemented only if a marine mammal is observed in or entering (not “likely” to enter) the exclusion zone; (2) power-down procedures may involve a reduction in the volume and/or pressure of the array; and (3) if a marine mammal is observed within the 500 m exclusion zone, then the reduced array would be shut down and shutdown procedures would apply.

<sup>28</sup> We agree with, and support, the analysis and conclusion reached by BOEM in Section 2.11.1 of the DPEIS. These conclusions further support our understanding that BOEM does not intend for any of the alternatives to include a dolphin shutdown requirement.

<sup>29</sup> Finneran J.J., Schlundt C.E., Branstetter, B.K., Trickey, J.S., Bowman, V., and Jenkins, K. *Effects of multiple impulses from a seismic air gun on bottlenose dolphin hearing and behavior*. 137 J. Acoust. Soc. Am. 1634-46 (Apr. 2015). The results of this study also support inclusion of frequency weighting in updated acoustic criteria.

the airgun operating at 150 in<sup>3</sup> and 2000 psi, resulting in cumulative SEL of 189-195 dB re 1 $\mu$ Pa<sup>2</sup>s, the impulses did not result in detectable TTS in any dolphin tested. The relatively low-frequency content in airgun impulses may also have lessened the auditory effects on dolphins, which have best hearing sensitivity at much higher frequencies.<sup>30</sup> Industry observations corroborate this scientific evidence. For example, dolphins are frequently observed by personnel on seismic vessels to approach the vessels during operations to bow-ride and chase towed equipment—a direct indication of insensitivity to seismic sound. PSO observation reports indicate that there is no statistically significant difference between the frequency of dolphin sightings and acoustic detections during seismic operations when the source is active or silent. *See Attachment B.*<sup>31</sup>

Second, in areas of high-density dolphin populations, such as the GOM, shutdown requirements for a species that frequently exhibits bow-riding behavior could effectively bring all seismic activity to a halt. Implementation of the proposed measure for dolphin shutdowns will substantially increase the number of shutdowns and delays in ramp-ups, which will result in much longer surveys and significantly increased costs with no environmental benefit. *See Barkaszi, supra*, at 1 (75% of delays in ramp-ups due to presence of protected species in exclusion zone during 30 minutes prior to ramp-up were due to dolphins).

Third, any proposed measure to require shutdowns for dolphins would be without precedent. Under Joint NTL No. 2016-G02 (and previously Joint NTL Nos. 2012-G02 and 2007-G02), BOEM required seismic operators in the GOM to shut down for any whale observed in the exclusion zone. BOEM defined “whales” as all marine mammals except dolphins and manatees. The Settlement Agreement extended the shutdown requirements to manatees.<sup>32</sup> In short, no dolphin shutdown provision has ever been required by any United States agency, and there is no information to support a changed approach.

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<sup>30</sup> In a 2011 Programmatic EIS, the National Science Foundation recognized that “[t]here has been no specific documentation that TTS occurs for marine mammals exposed to sequences of air-gun pulses during operational seismic surveys.” *Programmatic EIS/OEIS for NSF-Funded & USGS Marine Seismic Research*, at 3-133 (June 2011), [http://www.nsf.gov/geo/oce/envcomp/usgs-nsf-marine-seismic-research/nsf-usgs-final-eis-oeis\\_3june2011.pdf](http://www.nsf.gov/geo/oce/envcomp/usgs-nsf-marine-seismic-research/nsf-usgs-final-eis-oeis_3june2011.pdf) (recognizing 180 dB re 1 uPa (rms) criterion for cetaceans “is actually probably quite precautionary, i.e., lower than necessary to avoid TTS at least for delphinids, belugas and similar species”).

<sup>31</sup> *See also* A. MacGillivray et al., *Marine Mammal Audibility of Selected Shallow-Water Survey Sources*, J. Acoustical Soc. Am. 135(1) (Jan. 2014).

<sup>32</sup> Because the Settlement Agreement clearly does not apply shutdown requirements to dolphins, we assume that Appendix B is incorrect in suggesting that Alternatives B-F include shutdown requirements for all “marine mammals.”