

17773). During the 30-day public comment period, comments were received from the Marine Mammal Commission (the Commission), the Florida Department of Environmental Protection (DEP), and a member of the public who opposed the issuance of the IHA but did not provide additional information. The Commission and DEP comments are addressed in this document.

Comment: The Commission believes that NMFS' preliminary determinations, made in the previously cited notice, are reasonable provided the proposed mitigation and monitoring activities are conducted as described. Accordingly, the Commission recommended that NMFS grant the authorization.

Response: NMFS reviewed the mitigation and monitoring measures that were proposed by LDEO and has found that they will provide the best means to ensure that the findings made herein, (that the taking, by harassment, will result in only small numbers of marine mammals and have no more than a negligible impact on affected species and stocks) are valid. A discussion of the mitigation and monitoring measures that are contained in the IHA follows.

Mitigation

The directional nature of the alternative airgun arrays to be used in this project (especially the larger arrays) is an important mitigating factor. This directionality will result in reduced sound levels at any given horizontal distance than would be expected at that distance if the source were omnidirectional with the stated nominal source level.

For the proposed airgun calibration work in the GOM in 2003, LDEO at times will use 2 GI-guns with total volume 210 in³, and at other times will use a 20-gun array with 6–20 active guns and total volume 1350–8600 in³. Individual airguns will range in size from 80 to 850 in³. The airguns comprising these arrays will be spread out horizontally, so that the energy from the array will be directed mostly downward.

The sound pressure fields have been modeled in relation to distance and direction from each of the five array configurations and are shown in Figs. 7–11 in LDEO's application. The radii around the arrays where the received level would be 180 dB re 1 μ Pa (rms), the shutdown criterion applicable to cetaceans, were estimated as 50 m (164 ft), 220 m (722 ft), 830 m (2,723 ft), 880 m (2,887 ft) and 950 m (3,117 ft) for the 2-, 6-, 10-, 12-, and 20-gun arrays, respectively.

Until such time as the sound pressure fields estimated by the model have been confirmed by measurements of actual sound pressure levels, LDEO will use 1.5 times the estimated 180-dB isopleth. One of the main purposes of the measurements that will be made during the GOM project is to verify or refine these safety radii. The current plan is to measure sounds produced by the 6-, 10-, 12- and 20-gun arrays during the same transit past the spar buoy, operating these four combinations of airguns in a repeating sequence. The safety radius for the 20-gun array ($\times 1.5$) will be used whenever the sequence including (at times) 20 active guns is in progress. Sounds from the 2 GI guns will be measured during separate transits past the spar buoy. During the GOM cruise, the safety radii for cetaceans are 75 m (246 ft) and 1,425 m (4,675 ft), respectively, for the 2 GI-guns and 20-gun array. LDEO will shut down the airguns if marine mammals are detected within the safety radii.

Also, LDEO will use a ramp-up (soft-start) procedure when commencing operations. Ramp-up will begin with the smallest gun in the array that is being used (80 in³ for all subsets of the 20-gun array). Guns will be added in a sequence such that the source level of the array will increase at a rate no greater than 6 dB per 5-minutes. Additional mitigation measures will occur through the LDEO monitoring program.

Marine Mammal Mitigation Monitoring

Two observers will monitor marine mammals from the Ewing starting 30 minutes before all Ewing airgun operations. Airguns will be operated only during daylight; they will not be operated or started up during darkness or periods whenever the safety zone is not visible to the observer. Airgun operations will be suspended when marine mammals are observed within, or about to enter, designated safety zones where there is a possibility of significant effects on hearing or other physical effects.

The *Ewing* is a suitable platform for marine mammal observations. The observer's eye level will be approximately 11 m (36 ft) above sea level when stationed on the bridge, allowing for good visibility within a 210° arc for each observer. In addition to visual observations, a towed hydrophone array will be used to detect and locate marine mammals. This will increase the likelihood of detecting and identifying any marine mammals that are present during airgun operations. The proposed monitoring plan is summarized later in this document.

Safety Radii

Received sound levels have been modeled for the 2-, 6-, 10-, 12-, and 20-airgun arrays and are depicted in Figures 7–11 of the LDEO application. Based on the modeling, estimates of the 190-, 180-, 170-, and 160-dB re 1 μ Pa (rms) distances (safety radii) for these arrays are shown in Table 1 in the application and previously (see 68 FR 17773, April 11, 2003). Acoustic measurements in shallow (>100 m/328 ft), mid-depths (100–2000 m/328–6,562 ft), but probably about 1000 m (3,281 ft)), and deep (>2000 m) water will be taken during the proposed cruise, in order to check the modeled received sound levels during operation of these airgun arrays in a wide variety of water depths. Because the safety radii will not be confirmed before the cruise, conservative safety radii will be used during the GOM surveys. Conservative radii will be established at 1.5 times the distances calculated for the 2 GI-guns and the 20 airgun array. Thus, during the GOM cruise the conservative safety radii for cetaceans are 75 m (246 ft) and 1,425 m (4,675 ft) for the 2 GI guns and 20-gun arrays, respectively.

Airgun operations will be suspended immediately when cetaceans are detected within or about to enter the appropriate 180-dB (rms) radius. This 180 dB criterion is consistent with guidelines listed for cetaceans by NMFS (2000) and other guidance by NMFS.

Mitigation During Operations

The following mitigation measures, as well as marine mammal monitoring, will be adopted during the GOM acoustic verification program, provided that doing so will not compromise operational safety requirements:

Course Alteration

If a marine mammal is detected outside the safety radius and, based on its position and the relative motion, is likely to enter the safety radius, alternative ship tracks will be plotted against anticipated mammal locations. If practical, the vessel's course and/or speed will be changed in a manner that avoids approaching within the safety radius while also minimizing the effect to the planned science objectives. The marine mammal's activities and movements relative to the seismic vessel will be closely monitored to ensure that the marine mammal does not approach within the safety radius. If the mammal appears likely to enter the safety radius, further mitigative actions will be taken (i.e., either further course alterations or shutdown of the airguns).