

observers will not be on duty during nighttime hours, or how effective the observation efforts are expected to be. The efficacy of visual monitoring is not clear and may be inadequate during some of the times that airguns would be in use. The Commission notes that NMFS has previously estimated in a **Federal Register** notice dated March 19, 2001, that visual observation efforts were expected to detect about 5 percent of animals inside safety limits (66 FR 15380). Although the efficacy of visual observations will be determined by many factors (e.g., species in the area, daylight, sea surface conditions, observer position), it is feasible that many, if not most, marine mammals go undetected based on visual observations alone. If information is available regarding the efficacy of visual monitoring from the vessel to be used, then that information should be provided to justify NMFS' confidence that the proposed monitoring program will be adequate. If no information is available to assess efficacy, then NMFS should seek alternative means of ensuring that adequate monitoring methods are used, or conduct research to evaluate their adequacy. In addition, the Commission notes that it is unclear whether vessel-based passive acoustic monitoring will be conducted as an adjunct to visual monitoring during the daytime and particularly at night to detect, locate, and identify marine mammals and, if not, why not.

*Response:* Nighttime operations are necessary due to cost considerations. The daily cost to the federal government to operate vessels such as the *Ewing* and the *Knorr* is approximately \$33,000 to \$35,000/day (Ljunngren, pers. comm. May 28, 2003), or approximately \$910,000 for a total of 26 days of research during both Mid-Atlantic cruises. If the vessels were prohibited from operating during nighttime, it is possible that each trip would require an additional three to five days, or up to \$105,000 to \$175,000 more, depending on average daylight at the time of work.

Taking into consideration the additional costs of prohibiting nighttime operations and the likely impact of the activity (including mitigation and monitoring), NMFS has determined that the mitigation required by the IHA ensures that the activity will have the least practicable impact on the affected species or stocks. In summary, marine mammals will have sufficient notice of a vessel approaching with operating seismic airguns (at least one hour in advance), thereby giving them an opportunity to avoid the approaching array; if ramp-up is required after an extended power-down, two marine

mammal observers will be required to monitor the safety radii using night vision devices for 30 minutes before ramp-up begins and verify that no marine mammals are in or approaching the safety radii; ramp-up may not begin unless the entire safety radii are visible; and ramp-up may occur at night only if one airgun with a sound pressure level of at least 180 dB has been maintained during interruption of seismic activity. Therefore, it is likely that the 20-gun array will not be ramped-up from a shut-down at night. See Mitigation and Monitoring for more details.

It is also noted that at times, pinnipeds and even some small cetaceans will approach a vessel during transmissions (the vessel itself moving forward at about 3–5 knots) from the side of the vessel or the stern, meaning that the animal is voluntarily approaching a noise source that is increasing in strength as the animal gets closer. Experience indicates that pinnipeds will come from great distances to scrutinize seismic-reflection operations. Seals have been observed swimming within airgun bubbles only 10 m (33 ft) away from active arrays. Also, Canadian scientists, who were using a high-frequency seismic system that produced sound frequencies closer to pinniped hearing than those used by the *Ewing*, describe how seals frequently approached close to the seismic source, presumably out of curiosity. Therefore, NMFS has concluded that this mitigation requirement is reasonable because the bridge-watch will be concentrating on marine mammals approaching the vessel from the bow. Also, the night-vision ability of the trained bridge-watch staff will be better than observers elsewhere on the vessel where normal ship-board lighting is more likely. Finally, an observer is still required to be on standby, meaning he or she will be in the vicinity of the bridge and is not precluded from conducting observations during night-time.

The methodology for visual observations was changed since the 5 percent estimate (noted by the Commission above), resulting in a revised estimate of 9 percent efficacy (67 FR 46712, July 16, 2002). That figure includes both daytime and nighttime periods of observation. The rate increases to 18 percent based only on daytime monitoring. However, NMFS shipboard marine mammal assessment surveys estimate a higher rate of efficacy. It should be understood that these efficacy ratings were based on most difficult marine mammals to sight, such as harbor porpoise and Cuvier's

beaked whales, and not those more easily sighted.

Passive means of monitoring was found to be 25 percent effective. However, shipboard passive acoustics do not allow scientists to determine a marine mammal's distance from the vessel through triangulation; the vessel operator could determine only that a marine mammal is some unknown distance from the vessel. In order to triangulate on the animal, a system similar to that used in the Gulf of Mexico (GOM) Sperm Whale Seismic Study (SWSS) in May, 2003 would be needed. The passive acoustical monitoring equipment that was used onboard the *Ewing* during the GOM SWSS is not the property of LDEO or the *Ewing*, and therefore is not available for the Mid-Atlantic cruises. LDEO is presently evaluating the scientific results of the passive sonar from the SWSS trip to determine whether it is practical to incorporate it into future seismic research cruises. NMFS expects a report on this analysis shortly.

Finally, NMFS notes that the monitoring methods employed on the *Ewing* are standard methods used onboard vessels for conducting marine mammal abundance surveys and under IHA's. NMFS would welcome the Commission's participation in its annual workshop in Seattle, WA to discuss similar monitoring methodology used in oil exploration and production, including vessel seismic operations, in Arctic waters or in another venue. NMFS is especially interested in exploring with the Commission the potential for alternative, practical, monitoring methodology for use in waters too far from shore-side facilities to make aircraft surveillance practical. Recently, LDEO submitted its required monitoring report for the IHAs issued for the *Ewing's* seismic work in the Gulf of Mexico (68 FR 32460, May 30, 2003) and Hess Deep (68 FR 41314, July 11, 2003). Copies of those documents are available upon request (see ADDRESSES).

*Comment 2:* Several species of cetaceans for which LDEO is seeking incidental take authority stay submerged on most dives for more than 30 minutes. The Commission questions whether conducting monitoring "for at least 30 minutes prior to the planned start of airgun operations" during the day and at night is sufficient to detect those species.

*Response:* NMFS believes that a 30-minute pre-ramp-up monitoring period is sufficient considering that the ramp-up period will increase SPLs at a rate no greater than 6 dB per 5-minutes for a ramp-up duration of approximately 25 min for the 20-gun array and a total