

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 nighttime.

Comment 2: The Commission notes that there is no discussion on why nighttime operations are considered necessary.

Response: The daily cost to the Federal government to operate the Ewing is approximately \$33,000-\$35,000/day (Ljunngren, pers. comm. May 28, 2003), or approximately \$1,050,000 for this 30-day research cruise. If the Ewing is prohibited from operating during nighttime, the 30-day trip would require an additional 3–5 days, or up to \$105,000–175,000 more, depending upon average daylight at the time of the work.

Therefore, because NMFS has determined that the safety zone must be visible during ramp-up, and because once the Ewing is underway and ramp-up completed, mammals will have sufficient notice of a vessel approaching (at least one hour) to avoid the approaching array if the sounds are annoying, NMFS determined that it is neither practical nor necessary to limit seismic operations to daylight hours since marine mammals are unlikely to be injured.

Comment 3: The Commission notes that it is unclear whether vessel-based passive acoustic monitoring will be conducted as an adjunct to visual monitoring during daytime and particularly during nighttime operations to detect, locate, and identify marine mammals, and, if not, why not.

Response: The passive acoustical monitoring equipment that was used onboard the Ewing during the 2003 Gulf of Mexico (GOM) Sperm Whale Seismic Study (SWSS), is not the property of LDEO or the Ewing, and therefore is not available for the Norwegian Sea cruise. 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.

Comment 4: The Commission asks whether conducting monitoring for at least 30 minutes prior to the planned start of airgun operations during the day and at night is sufficient, particularly for detecting the presence of species that make long dives.

Response: NMFS believes it is unnecessary to lengthen this period

considering that the ramp-up period will increase SPLs at a rate no greater than 6 dB per 5–minutes for a total ramp-up duration of approximately 14 min for the 6 gun array. Also, while some whale species may dive for up to 45 minutes, it is unlikely that the ship's bridge watch would miss a large whale surfacing from its previous dive if it is within a mile or two of the vessel.

Comment 5: The Commission notes that there are several species of beaked whales in the Norwegian Sea, and states that “although the link between the Gulf of California strandings and the seismic (plus multi-beam sonar) survey is inconclusive, this....suggests a need for caution in conducting seismic surveys in areas occupied by beaked whales.” The Service's **Federal Register** notice, however, makes no reference to or requirement for any additional caution with respect to beaked whales.

Response: While NMFS shares the Commission's concern regarding the possible relationship between low-frequency seismic survey transmissions and the beaked whale strandings in the Gulf of California, NMFS believes that additional factors probably also influence whether beaked whales will be affected in ways other than possibly vacating the immediate vicinity of the noise similar to other marine mammal species. For example, beaked whales in the Gulf of Mexico have been exposed to seismic noise for several decades but mass stranding events similar to the 2000 event in the Bahamas do not appear in the stranding record. However, NMFS welcomes recommendations regarding additional practical mitigation measures to protect beaked whales from anthropogenic sounds. A notice of receipt of an LDEO application and proposed IHA was published in the **Federal Register** on July 28, 2003 (68 FR 44291).

Mitigation

For the seismic operations in the Storegga slide area, LDEO will use 2 GI guns with a total volume of 210 in³ and/or a 6–gun array with a total volume of 1350 in³. The airguns comprising these arrays will be spread out horizontally, so that the energy from the arrays will be directed mostly downward. The directional nature of the airgun arrays to be used in this project is an important mitigating factor, resulting in lower 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. Because the actual seismic source is a distributed sound source (2 or 6 guns) rather than a single point source, the highest sound levels

measurable at any location in the water will be less than the nominal source level.

Safety Radii

Modeled results for the 2- and 6–gun arrays indicate received levels to the 180–dB re 1 μ Pa (rms) isopleth (the level for the potential for Level A harassment applicable to cetaceans) were estimated as 50 and 220 m (164 and 722 ft), respectively. The radii around the 2- and 6–gun arrays where the received level would be 190 dB re 1 μ Pa (rms), (the level for the potential for Level A harassment applicable to pinnipeds), were estimated as 15 and 50 m (49 and 164 ft), respectively. A calibration study was conducted prior this survey to determine the actual radii corresponding to each sound level. These actual radii will be implemented for this study. Until then, or if those measurements appear defective, LDEO will use a precautionary 1.5 times the 180–dB (cetaceans) and 190–dB (pinnipeds) radii predicted by the model as the safety radii. Under those circumstances, the safety radii for cetaceans are 75 and 330 m (246 and 1,083 ft), respectively, for the 2–GI gun and 6–gun arrays, and the proposed safety radii for pinnipeds are 23 and 75 m (75 and 246 ft), respectively.

Shutdown Procedures

Vessel-based observers will monitor marine mammals near the seismic vessel during daylight and for at least 30 minutes prior to start up during darkness throughout the program. Airgun operations will be suspended immediately when marine mammals are observed within, or about to enter, designated safety zones. The shutdown procedure should be accomplished within several seconds or a single seismic ping of the determination that a marine mammal is within or about to enter the safety zone.

Power-down Procedures

Vessel-based observers will monitor marine mammals near the seismic vessel during daylight and for 30 minutes prior to start up during darkness throughout the program. The same procedures for shut-down will be followed in the case that marine mammals are seen within, or about to enter, designated safety zones.

Ramp-up Procedure

A standard “ramp-up” (soft start) procedure will be followed when the airgun arrays begin operating after a period without any airgun operations as specified in this paragraph. From shut-down, ramp-up will begin with the