

STUDY TITLE: Seismic Survey Mitigation Measures and Marine Mammal Observer Reports

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CONTRACT NUMBER: M08PC20051

SPONSORING OCS REGION: Gulf of Mexico

APPLICABLE PLANNING AREA: Gulfwide

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CUMULATIVE PROJECT COST: \$150,000

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KEY WORDS: Protected Species Observer; cetacean; seismic survey; Notice to Lessees

BACKGROUND: As a result of the 2002 National Marine Fisheries Services (NMFS) Biological Opinion for Lease Sale 184 (Western Planning Area), the Bureau of Ocean Energy Management (BOEM) implemented a Seismic Survey Mitigation Measures Notice to Lessees (NTL). This initial NTL was subsequently updated (2003-G08; 2004-G01; 2007-G02) and expanded to include a variety of mitigations and reporting requirements. These measures apply to all on-lease surveys conducted under 30 CFR 250 and all off-lease surveys conducted under 30 CFR 251. Seismic operators in the GOM are required to submit reports on the 1st and 15th of each month. Reporting requirements include an observer effort reports, surveys reports, and sightings reports. Sighting reports are submitted for all species; BOEM had a considerable amount of data requiring evaluation in order to determine the effectiveness of existing mitigation. This would tell BOEM and NMFS about the generalities of the effectiveness of similar mitigation and reporting requirements in other regions.

OBJECTIVES: (1) Summarize and synthesize seismic survey observer reports for the years 2002 to 2008. (2) Make recommendations as to the effectiveness of mitigation measures and suggestions for improved mitigations.

DESCRIPTION: A total of 1,440 bi-weekly reports were received by BOEM for seismic surveys in the GOM conducted between December 2002 and December 2008. Bi-weekly reports were reviewed and data from each of three standard forms (effort, survey, and sightings) within the reports were entered into databases. Data from three airgun firing modes (ramp-up, mitigation, and full power) were analyzed separately and each compared against sightings during which airguns were silent. Sightings of different species groups were analyzed separately for baleen whales, Delphinids, sperm whales, and sea turtles. Also, an analysis was undertaken for all cetaceans combined (excluding sea turtles). Data analyses included two core methodologies. The first was the analysis of sightings collated by block identification for use in determination of sightings frequency per 1,000 hrs effort per block, average sightings duration per block, and the average closest distance of approach of animals to airguns per block. The second methodology comprised the analysis of individual sightings events for analysis of animal behavior in response to airgun firing modes.

SIGNIFICANT CONCLUSIONS: There was a high level of compliance with regard to pre-firing surveys, shut-down requirements, ramp-up delays, and ramp-up times. Sighting duration was found to be longer during times of full power seismic source operation when compared to silence, for both the 'delphinid' species group and 'all cetaceans' group. Each species group was found to be sighted at significantly greater distances from the seismic source during full power when compared to silence, illustrating a level of spatial avoidance of the seismic source. While the data demonstrated a number of short-term behavioral effects, the consequences in the long-term remain unknown, which underscores the need for precaution when implementing or developing mitigation measures. It is also clear that the data have limitations regarding the collection, interpretation and analysis of behavioral observations in relation to their use in impact assessment.

STUDY RESULTS: There were 32,939 ramp-ups recorded within all bimonthly reports. Of these records 65% were fully complete or nearly complete so that ramp-up activity and compliance were clearly discernible. Of the ramp-ups recorded, 90% were between 20 and 40 minutes in duration, as required by BOEM. There were 32 delays in ramp-ups due to the presence of protected species in the exclusion zone during the 30 minutes immediately prior to ramp-up. Of these delays, 24 (75%) were due to dolphins, four (12.5%) due to sea turtles, and four (12.5%) due to sperm whales. There was a total of 18.5 hours of down time attributed to ramp-up delays. There were 144 occurrences of whales visually detected in the exclusion zone that resulted in a shutdown of airguns. Of the required 144 shutdown events, 139 (97%) were due to sperm whales. The average downtime resulting from shutdowns was 58 minutes and there was a total of 125.74 hours of down time attributed to shutdowns for all years combined. The minimum distance of dolphins to airguns increases from silent, to ramp-

up, to mitigation, and full power. At full power, the mean closest approach of dolphins to airgun arrays was 90% further away than during silent status.

STUDY PRODUCT: Barkaszi, M.J., M. Butler, R. Compton, A. Unietis, and B. Bennet. 2012. Seismic survey mitigation measures and marine mammal observer reports. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico OCS Region, New Orleans, LA. OCS Study BOEM 2012-015. 51pp.