

MMS ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES

MMS OCS Region: Pacific

Title: Effects of EMF from Transmission Lines on Elasmobranchs and Other Marine Species (PC-08-08)

Total Cost: \$250,000 **Period of Performance:** FY 2009-2010

Conducting Organization: Normandeau Associates, Inc.

MMS Contact: Donna M. Schroeder

Description:

Background:

All foreseeable alternative energy projects on the OCS will use undersea power cables to collect electricity that is generated offshore, transmit it into coastal areas, and connect it into an onshore power grid. A number of factors are important in determining the cable system of an offshore alternative energy project, including installation size (number of units), distance offshore, and the maximum power rating needed. Thus, different types of undersea power cables may be used according to the specific need and design of the project.

All power cables emit electromagnetic fields (EMFs) to some degree. A typical EMF includes both electric and magnetic fields. Secondly, an induced electric field results when organisms move through the magnetic field. Since a number of marine species use natural electromagnetic fields for navigation, orientation, prey location, predator detection, or communication, concerns have been raised by various stakeholders regarding the potential impacts that undersea power cables may have to these sensitive marine species.

In order to conduct detailed environmental analyses of projects proposed for alternative energy development, the potential direct, indirect and cumulative impacts on the marine environment from EMFs must be evaluated in order for the MMS to make environmentally sound decisions about managing alternative energy activities and developing mitigation measures that avoid, minimize, rectify, eliminate, or compensate impacts. A fundamental first step requires an update of existing industry-based and ecological information to assist in identifying data and knowledge gaps, and to frame future investigations. The first part of this study seeks to conduct a comprehensive literature review to identify the existing industry-based and ecological information relevant to EMFs emitted by undersea power cables. Once the information update is complete, the second part of this study seeks to integrate and synthesize the industry-based and ecological information in order to assess potential impacts of alternative energy

projects. The emphasis of this knowledge synthesis shall be on the potential direct, indirect and cumulative environmental impacts of EMFs from alternative energy activities likely to occur on the OCS. Due to the importance of this synthesis as the foundation for future decisions, the products of this study will be subject to a peer review process.

Objectives:

- Collect, review, and compile industry-based and spatial information on existing and proposed electric undersea power cable systems on the OCS that may expose electrosensitive and magnetosensitive species to electromagnetic fields.
- Collect, review and synthesize information on known electrosensitive and magnetosensitive marine species in the Alaska, Atlantic, Gulf of Mexico, and Pacific Regions.
- Review past studies regarding EMF sensory ability of marine species in light of the technical range of EMFs generated by undersea power cables (both alternating and direct current) for the purpose of evaluating alternative energy projects. Propose future studies and suggest experimental designs to address information gaps regarding EMF impacts. For each of the Regions, identify species that are a priority for future investigations.
- Synthesize information concerning EMF impacts and potential mitigations in a summary useful for environmental review of alternative energy projects.

Current Status:

Work has been completed for all tasks. Draft outline for synthesis report completed.

Final Report Due: 9 September 2010

Publications:

Abstract summarizing work submitted to Windpower 2010 Conference (www.windpowerexpo.org), and is under consideration.

Revised date: 27 October 2009