

Environmental Studies Program: Ongoing Study

Title	Assessment of Chemicals Associated with Offshore Wind Facilities and Potential Environmental Impacts on the Atlantic Outer Continental Shelf (OCS)
Administered by	Office of Renewable Energy Programs
BOEM Contact(s)	Ian Slayton (ian.slayton@boem.gov)
Procurement Type(s)	Contract
Conducting Organization(s)	Research Planning, Inc.
Total BOEM Cost	\$228,218.66
Performance Period	FY 2023–2024
Final Report Due	June 30, 2025
Date Revised	July 28, 2023
PICOC Summary	-
<i><u>Problem</u></i>	Offshore wind facilities use and store chemicals that have the potential to impact the environment in the event of a spill.
<i><u>Intervention</u></i>	This study will utilize literature review, discussions with offshore wind developers and equipment manufacturers, and modeling to identify chemicals used and stored on offshore wind facilities and their associated environmental risks.
<i><u>Comparison</u></i>	Assess the impacts that the identified chemicals may have on benthic habitats, marine flora and fauna, and water quality, and the environments likely affected by transport of these hazardous materials in the event of a spill.
<i><u>Outcome</u></i>	The goal of the study is to understand the types and volumes of chemicals used and stored on offshore wind facilities and the impacts those chemicals may have on the environment.
<i><u>Context</u></i>	This study will focus on currently proposed offshore wind facilities on the Atlantic Outer Continental Shelf (OCS) and reasonably foreseeable technological advancements over the next 10 years.

BOEM Information Need(s): Offshore wind facilities will contain various chemicals and hazardous fluids such as electrical insulating oils, diesel fuel, and lubricating oils. As part of its environmental assessments, BOEM must assess the impacts offshore wind facilities may have on the environment, specifically the impact of these chemicals in the event of a spill or other release such as material degradation. BOEM must analyze the impacts these chemicals may have on benthic habitats, marine flora and fauna, and water quality, and the environments likely affected by transport of these hazardous materials. This study will provide an assessment of the likely chemicals found on an offshore wind facility and their environmental risks, fates, and effects. BOEM will incorporate this information into future EISs.

Background: In 2013, BOEM completed a study titled “Environmental Risks, Fate and Effects of Chemicals Associated with Wind Turbines on the Atlantic Outer Continental Shelf” (Bejarano et al. 2013) that provided an evaluation of the chemicals typically found on offshore wind turbines and the potential

consequences of a spill. This study was based on offshore wind facility information available at the time, such as the Cape Wind project which proposed the use of 130 3.6 MW turbines.

Turbine and substation technology has changed since the conclusion of the previous study. Turbine capacity has increased, such as the 14 MW turbines commercially available and proposed for use, and larger turbines are in development. This increase in turbine capacity means an increase in chemical volumes required to be used and stored on an individual turbine. With the increase in turbine size and mitigations to address stakeholder concerns, overall facility design has also changed. For example, the spacing between turbines has increased to an average of 1 nautical mile at many Atlantic OCS project locations. Multiple offshore substations (also known as electrical service platforms, offshore service platforms, etc.) are proposed at some project locations, including both high voltage alternating current (HVAC) and high voltage direct current (HVDC) designs. Changes to facility design may also impact the volume and type of chemicals stored at the facility and may change the risk profile of a spill.

Due to the evolution of offshore wind facility design, BOEM needs to determine whether the analyses and conclusions of the 2013 BOEM study remain applicable, and where needed, update those analyses.

Objectives: To provide an updated assessment of the chemicals used and stored on offshore wind facilities and the impacts those chemicals would have on the environment in the event of a spill.

Methods: This study will assess the applicability of the 2013 BOEM study to proposed offshore wind projects currently under review by BOEM and, where necessary, provide updated assessments of 1) the chemicals and quantities that could be present on different types of offshore wind turbines and offshore substations proposed for use on the Atlantic OCS; 2) chemical transfer, storage, and disposal methods 3) the risk of a spill or other release (i.e. material degradation) of the identified chemicals; and 4) the transport, fate, and impacts of the identified chemicals in the event of a spill.

To identify the chemicals and quantities, methods may include literature review, discussions with offshore wind facility developers and component manufacturers, and discussions with relevant government agencies such as the U.S. Environmental Protection Agency. Modeling may be used to provide a comprehensive assessment of spill risk and the fate of the identified chemicals in the event of a spill. Modeling methods may be similar to those used by the 2013 BOEM study. The study will base its assumptions and analysis on facility designs proposed in the Construction and Operations Plans currently under review by BOEM, which can be found on BOEM's website at <https://www.boem.gov/renewable-energy/state-activities>, and on reasonably foreseeable technological advancements over the next 10 years.

Specific Research Question(s):

1. What chemicals are used and stored on offshore wind facilities?
2. What is the risk of a spill or other release of chemicals contained on offshore wind facilities?
3. How will a spill or release of chemicals from an offshore wind facility impact the environment?

Current Status: A kick-off meeting was held on July 10, 2023.

Publications Completed: N/A

Affiliated WWW Sites: N/A

References:

Bejarano AC, Michel J, Rowe J, Li Z, French McCay D, McStay L, Etkin DS. 2013. Environmental risks, fate and effects of chemicals associated with wind turbines on the Atlantic Outer Continental Shelf. Herndon (VA): U.S. Department of the Interior, Bureau of Ocean Energy Management. 355 p. Report No.: OCS Study BOEM 2013-213.