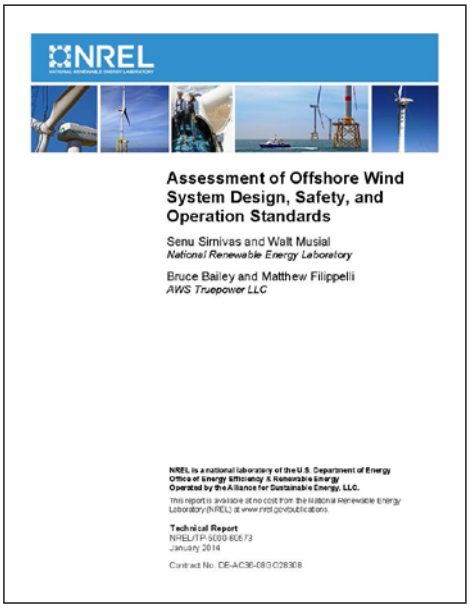
NREL
NATIONAL RENEWABLE ENERGY LABORATORY

NREL Assesses National Design Standards for Offshore Wind

Highlights in Research & Development

Report summarizes regulations, standards, and guidelines for the design and operation of offshore wind projects in the United States.

In 2012, the American Wind Energy Association (AWEA) published its Offshore Compliance Recommended Practices that are based on existing standards (International Electrotechnical Commission, International Organization for Standardization, and American Petroleum Institute) and guidelines (American Bureau of Shipping and DNV GL). Although the AWEA document provides an interim pathway for U.S. offshore wind development, it does not address some of the challenges unique to offshore wind development in the United States, including deeper water that will require floating structures and hurricanes and freshwater ice that will require structures designed to withstand extreme operating conditions.



Developing or adapting appropriate offshore wind standards requires detailed analysis of current and pending wind and offshore design standards and guidelines. The results of these analyses must then be synthesized with national offshore meteorological, ocean, and lake conditions to identify and bridge any gaps. Sponsored by the U.S. Department of Energy (DOE), the National Renewable Energy Laboratory's (NREL) Assessment of Offshore Wind System Design, Safety, and Operation Standards report introduces the pertinent international and domestic offshore design standards and guidelines, discusses their relative applicability and shortcomings for the nation's offshore wind development, and provides a snapshot of industry and government efforts underway (or planned) to develop guidelines for U.S. offshore wind.

The effort summarizes the regulations, standards, and guidelines currently available. These documents, however, do not yet provide a comprehensive assessment of how to address tropical (and extratropical) events, freshwater ice, or deeper water deployments requiring floating structures, which are important for offshore wind plant development in U.S. waters. The gaps critical for U.S offshore wind plant developments are identified, and recommendations to bridge these gaps are outlined.

Technical Contact: Senu Sirnivas, *senu.sirnivas@nrel.gov*

Reference: Sirnivas, S.; Musial, W.; Bailey, B.; Filippelli, M. (2014). *Assessment of Offshore Wind System Design, Safety, and Operation Standards*. NREL/TP-5000-60573. *www.nrel.gov/docs/fy14osti/60573.pdf.*

Key Research Results

Achievement

A new report introduces pertinent international and domestic offshore wind design standards and guidelines, discusses their relative applicability and shortcomings for the nation's offshore wind development, and provides a snapshot of industry and government efforts to develop guidelines for U.S. offshore wind.

Key Result

The results of this initiative are intended to produce a comprehensive definition of relevant meteorological-ocean resource assets and needs and design standards, as well as to provide a basis for recommendations for meeting offshore wind energy industry data and design certification requirements.

Potential Impact

This project supplements, facilitates, and enhances ongoing multiagency efforts to develop an integrated national offshore wind energy data network.

NREL is a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.

15013 Denver West Parkway
Golden, CO 80401
303-275-3000 | www.nrel.gov

NREL/FS-5000-61808 | June 2014

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