U.S. DEPARTMENT OF

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Offshore Wind Turbine Radar Interference Mitigation Webinar Series

Monday, July 27, 2020 11:00 a.m. Welcome, M

11:00 a.m.	Welcome, Meeting Objectives Speaker: Patrick Gilman U.S. Department of Energy's Wind Energy Technologies Office (WETO)
11:05 a.m.	 The United States National High-frequency (HF) Radar Network Brian Zelenke National Oceanic & Atmospheric Administration (NOAA) Overview of HF Radar Network: ~160 HF oceanographic HF radars along the U.S. coastline, where offshore wind farms are planned. U.S. HF Radar Network Missions: provides near real-time information on the speed and direction of surface currents to support search and rescue operations, response to oil spills, marine shipping navigation, tracking harmful algal blooms, coastal water quality monitoring, etc. HF Radar Capabilities: ~150 km beyond the horizon when propagating over conductive sea water. Potential Mitigations: Wind farm operators may be able to address voids wind turbines will cause in the HF radar network's measurement field by taking measures such as instrumenting turbines with oceanographic sensors (e.g., current and wave meters) that send a real-time data stream to the NOAA U.S. Integrated Ocean Observing System (IOOS). HF radar manufacturer-specific mitigations to wind turbine interference (WTI) may be possible, but depend on early forewarning of wind farm layouts and may require real-time feeds of each turbine's rotor speed and nacelle position.
11:15 a.m.	 Background Information and Previous Mitigation Efforts Hugh Roarty Rutgers University HF Radar Network Background: Measuring Mid-Atlantic ocean surface currents since 1998 and delivering ocean surface currents to the U.S. Coast Guard (USCG) since May 2009. Secondary measurements of the HF Radar network are ocean wave height, period, and wind direction. Interference from Block Island, how the effects have been mitigated (removing range cells that contain turbines), and future issues with planned development (continuing to remove range cells not feasible).
11:30 a.m.	 Wind Turbine Interference (WTI) Mitigation Efforts Chad Whelan and Dale Trockel CODAR Ocean Sensors, Ltd. Differences in WTI with oceanographic HF radars vs. other radars. Characterization of WTI in oceanographic HF radars and methods of mitigation. Bureau of Ocean Energy Management (BOEM) funded CODAR work on WTI simulation software and development of a real-time mitigation solution.
11:45 a.m.	 Assessing the Effectiveness of WTI Mitigation and Impacts to Observations Anthony Kirincich Woods Hole Oceanographic Institution (WHOI) Brian Emery University of California, Santa Barbara (UCSB) Planned field work to develop of validation data sets (independent <i>in situ</i> observations of currents) for assessing mitigation methods. Testing effectiveness of mitigation using validation data sets and assessing the impact to current velocity observations, including increased errors. This will assist with moving the technology readiness level of any WTI mitigation. Studies ensure the continued quality and reliability of the ocean current product provided by NOAA-IOOS.
12:00 p.m.	 Importance of Reliable and Accurate Environmental Data in the U.S. Coast Guard's Search and Rescue Optimal Planning System (SAROPS) Cristina Forbes U.S. Coast Guard (USCG) The USCG uses SAROPS for drift modeling and search planning of persons lost at sea. SAROPS is a fast comprehensive framework which 1) minimizes data entry, reducing the potential for

	 user input error, 2) accesses global and local environmental data, 3) uses a Markov's Monte Carlo method to simulate the drift of thousands of particles for each scenario, 4) computes probabilistic search areas, and 5) creates search action plans that maximize the probability of success (POS). Availability and access to high-quality and reliable global/regional wind and surface current data (speed and direction) derived from observational networks and from the latest state-of-the-art forecast modeling systems available is essential for accurate prediction of the drift of persons or objects in the marine environment and for targeted search and rescue (SAR) operations and planning.
12:15 p.m.	Turbine Siting and Opportunities for Impact Mitigation
	 Timeline of wind facility development to include when Construction and Operations Plans are available and when the facility design is final (Facility Design Report).
	 Opportunities to contribute to mitigation measures and/or Terms and Conditions of project approval. How to be proactive as a community of HF Radar stakeholders.
12:30 p.m.	Audience Questions & Answers Moderator: Patrick Gilman WETO
1:00 p.m.	Conclude