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Topic: Assessing Risk to Ship Traffic near Offshore Wind Farms

Tens of offshore wind projects have been built and many more are in the works. Even though there has never been a ship-turbine collision, risk assessment of these accidents and their consequences has to be performed before an offshore wind facility can be built. Risk assessment is a process for identifying and analyzing undesirable events or results of a process, and determining whether the risks are acceptable. Despite a variety of models, most of which inherited form the offshore oil and gas risk evaluations, there is no standardized risk assessment procedure. Thus, different models utilize different assumptions and criteria and expectedly produce varying results. The models generally consider three categories of risks: risks of ship-turbine collision, risk of ship-ship collision due to a change of course near the wind farm, and grounding. Damages to the wind turbine structure, the ship, as well as impacts such as loss of energy production, loss of investment, fatalities and injuries and environmental damage (chemical and oil spills) are modeled. Inputs consist of a variety of data, ranging from turbine dimensions, vessel's mass and velocity to soil conditions and wind speed. Collision frequencies and probabilities are generated for powered and drifting ship collisions. Presently, projects that have return periods (time between potential accidents) of more than 150 years are approved, less than 50 years – rejected, while projects in the 50-150 year range have to show reduction in risk probabilities to be cleared for construction. Risk reduction measures include proper siting of projects, special painting and lights placed on the turbines, and expansion of usage of the Automatic Identification System (AIS) for ships.