PMC-EF2a
(2.04.02)

U.S. DEPARTMENT OF ENERGY
EERE PROJECT MANAGEMENT CENTER
NEPA DETERMINATION

RECIPIENT: University of Maine **STATE:** ME

PROJECT TITLE : Recovery Act: Validation of Coupled Models and Optimization of Materials for Offshore Wind Structures

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000090	DE-EE0002981	GFO-10-121-002	EE2981

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:
Description:

A9 Information gathering (including, but not limited to, literature surveys, inventories, audits), data analysis (including computer modeling), document preparation (such as conceptual design or feasibility studies, analytical energy supply and demand studies), and dissemination (including, but not limited to, document mailings, publication, and distribution; and classroom training and informational programs), but not including site characterization or environmental monitoring.

B3.1 Onsite and offsite site characterization and environmental monitoring, including siting, construction (or modification), operation, and dismantlement or closing (abandonment) of characterization and monitoring devices and siting, construction, and associated operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis. Activities covered include, but are not limited to, site characterization and environmental monitoring under CERCLA and RCRA. Specific activities include, but are not limited to:

B3.3 Field and laboratory research, inventory, and information collection activities that are directly related to the conservation of fish or wildlife resources and that involve only negligible habitat destruction or population reduction

B3.6 Siting, construction (or modification), operation, and decommissioning of facilities for indoor bench-scale research projects and conventional laboratory operations (for example, preparation of chemical standards and sample analysis); small-scale research and development projects; and small-scale pilot projects (generally less than two years) conducted to verify a concept before demonstration actions. Construction (or modification) will be within or contiguous to an already developed area (where active utilities and currently used roads are readily accessible).

Rational for determination:

The review is being conducted due to a scope change being made on activities previously listed in the original SOPO for this award. Changes include the addition of task 8, a change in task 4.6 and the removal of task 5.2. Task 4.6 and 5.2 activities have been shifted to the 2010 Congressionally Directed funding (CDP) awarded to the University of Maine. An additional NEPA review will occur for project work under this funding.

Wind turbine platforms will not be fabricated or deployed at the University of Maine Deepwater Offshore Wind Test Site under this Department of Energy Recovery Act award. Additional CDP funds will cover these tasks and an Environmental Assessment is underway for activities being conducted under that award.

The objective for this project is to focus on furthering the development of floating offshore wind farm technologies for deep water deployments. Project activities will include curriculum development; field studies; environmental monitoring; cost analyses; lab studies to validate aeroelastic-hydrodynamic models and floating platform designs for floating turbines; and cost feasibility assessments.

Tasks for the project are as follows:

**Task 1.0 Micrositing, Geophysical Investigations, and Geotechnical Engineering (seismic reflection, multi-beam bathymetric and side scan sonar survey techniques)
*Subtask 1.1 Seafloor geophysical investigations to assess sediment stratigraphy and the presence of historical resources,
*Subtask 1.2 Geotechnical investigations: sediment sampling for laboratory testing and centrifuge modeling of sediment-anchor interaction.
*Subtask 1.3 Site plans and documentation

**Task 2.0 Study of Environmental/Ecological Impacts
*Subtask 2.1 Benthic invertebrates and sediments (switchback sampling)
*Subtask 2.2 Fish (acoustic monitoring)
*Subtask 2.3 Marine mammals (acoustic monitoring)
*Subtask 2.4 Birds and bats (horizontal and vertical array marine surveillance radar system monitoring techniques)

**Task 3.0 Permitting and Policy

**Task 4.0 Floating Turbines Design and Lab Testing
*Subtask 4.1: Initial platform evaluation and down select for tank testing
*Subtask 4.2: Perform tank testing of selected concepts
*Subtask 4.3: Validate/revise coupled aeroelastic/hydrodynamic models
*Subtask 4.4: Develop preliminary platform designs and concept estimates
*Subtask 4.5: Platform optimization and lab testing of hybrid composite components
*Subtask 4.6: Begin draft design of floating platform(s)

**Task 5.0 Offshore turbine testing, monitoring, and reliability
*Subtask 5.1 Physical Ocean environment monitoring
*Subtask 5.2 Test turbine instrumentation and monitoring

**Task 6.0 Education and Outreach
*Subtask 6.1 Develop Master of Science degree model
*Subtask 6.2 Develop undergraduate minor in deepwater wind energy
*Subtask 6.3 Develop associates degree program in wind power technology

**Task 7.0 Project Management and Reporting

**Task 8.0 Feasibility Study

Task 1 (subtasks 1.0 – 1.3) will involve field studies that will provide characterization of the seafloor environment for turbine anchoring at the University of Maine Deepwater Offshore Wind Test bed located in the Gulf of Maine. Activities will include Seismic reflection profiling which involves using a "boomer" seismic system towed behind Maine Maritime Academy's R/V Friendship vessel. Approximately 3 km2 of seafloor will be explored across three locations over areas that have the most potential for turbine siting. Small quantities of bottom sediment samples will be collected at sites where survey data is inconclusive. Surveys will be used to determine seabed bathymetry, surficial material types and their spatial variability, and important geologic features such as prehistoric, submerged coastlines or basins of potential archeological significance.

Task 2 (subtask 2.1) will involve environmental monitoring for potential turbine siting locations. Activities under this task will include additional seafloor characterization by use of a Remote Operating Vehicle (ROV) which will be equipped with a video camera. This devise will be remotely driven along the seafloor using a switchback sampling design covering the same area from task 1.

Task 2 (subtasks 2.2 and 2.3) will involve underwater acoustic monitoring and recording of fish and cetacean species. Acoustic monitoring systems will be deployed into the test and control sites and used to analyze the distribution of local fish populations. Autonomous passive acoustic recorders will be used to monitor the presence and activity of marine mammal populations. Both systems are relatively small and will be lowered to the sea floor to record activity throughout the duration of the project.

Tasks 2 (subtask 2.4) will involve species and habitat monitoring on regional ocean dependant avian species. The monitoring will be conducted by using a horizontal and vertical array marine surveillance radar system around the proposed region for control data. This system will be located adjacent to the proposed turbine installation sites, and will be used throughout the duration of the project.

The University of Maine's Deepwater Offshore Wind Test Site area has undergone comprehensive review at the state level. Per LD1465, the Maine state statute that allows the establishment of the Test Site, the following state and federal agencies will be consulted, provided with copies of the site, navigation, project removal, remedial action, and environmental/ecological monitoring plans, and provided reports and updates on site activities:

* Department of Marine Resources
* Department of Inland Fisheries and Wildlife
* Department of Conservation
* Coast Guard
* Army Corps of Engineers
* NOAA Fisheries

The University of Maine has stated that as part of their environmental/ecological monitoring plan, which is part of their test site permit application, a review of the potential threats to marine organization will be considered and mitigations measures will be designed. No collection of animal species will occur as part of this project.

Task 1 and 2 (all subtasks) activities involve site characterization and environmental monitoring of ocean dwelling and

avian species which will not significantly impact either populations or habitat; therefore a CX B3.1 and B3.3 apply.

Task 3 involves planning and securing permits for the project from all applicable local, state, and federal permitting authorities; therefore a CX A9 applies.

Task 4 involves laboratory testing and validation activities for various components and composites as part of the design research for the floating wind turbines structure. The University of Maine has filled out and returned an R&D questionnaire for these activities which thoroughly addresses their safety and waste handling procedures; therefore a CX B3.6 will apply.

Task 5 involves ocean environment monitoring activities. The work will be carried out using meteorological sensors mounted on a buoy which will be deployed for the duration of the project (two years) in the Gulf of Maine. Observations which will be collected from the buoy are: wind speed and direction, visibility, irradiance, barometric pressure, GPS, directional waves, and water-column currents.

The buoy is a solar powered platform, 2m in diameter, weighing 1700 lbs. The float portion is made from closed cell foam. The anchor is a stack of 1m sized railroad wheels. The buoy is equipped with a Campbell Data logger, cell phone antenna for dialing into the system, and telemetry system (GOES) to transfer the data via satellite back to the University of Maine. It will be deployed near Monhegan Island in the Gulf of Maine. As described by the recipient, the deployment of the buoy system is performed from a medium-sized vessel. The buoy and its sensors are deployed using a U-frame or crane and allowed to float aft of the vessel, secured by the steel mooring cable. After the subsurface sensors are attached to the cable, the chain and anchor are attached. The ship then steams to the launch site and the anchor is allowed to free-fall to the bottom.

The US Coast Guard (USCG) has an approval of this class of buoy on file from the US Army Corps of Engineers. The final exact location of the buoy will be filed with the USCG and the location and qualities will be disseminated to Mariners. This task involves the deployment of an environmental monitoring device for two years in the Gulf of Maine for the purpose of obtaining data; therefore it qualifies for CX B3.1.

Tasks 6, 7 and 8 for this project funding will involve curriculum development, project management, and desktop feasibility studies; therefore a CX A9 applies.

Based the above information, DOE has concluded that the funding of activities for this project will have no significant impacts to the human and natural environment; therefore the aforementioned CX determinations (A9, B3.1, B3.3, and B3.6) under each task will apply.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Insert the following language in the award:

You are required to:
Prohibited activities under this award include capital equipment purchase, final design, earth moving, site prep, construction and deployment activities associated with the construction and deployment of off-shore wind turbines.

Note to Specialist :

None Given.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 9/9/10

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

☐ Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON: