

PMC-ND

(1.08.09.13)

U.S. DEPARTMENT OF ENERGY
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY
NEPA DETERMINATION

**RECIPIENT:** [Portland State University](#)**STATE:** OR**PROJECT TITLE:** [Performance Testing of an Integrated Magnetic Power Take-Off,](#)

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001837	DE-EE0008631	GFO-0008631-001	GO8631

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

CX, EA, EIS APPENDIX AND NUMBER:

Description:

A9 Information gathering, analysis, and dissemination Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.)

B3.6 Small-scale research and development, laboratory operations, and pilot projects Siting, construction, modification, operation, and decommissioning of facilities for smallscale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Portland State University (PSU) to design, develop, fabricate and test a novel magnetic power take-off (mPTO) for resonance power generation in wave energy converters (WEC). Components for either a linear mPTO or a rotary mPTO would be developed, as well as conjugate controllers for each prototype device. As the project progresses a decision would then be made whether to develop a linear or a rotary mPTO scale prototype device. Water tank testing would then be performed to verify the performance of the mPTO prototype. The project would be completed over two Budget Periods (BPs), with a Go/No-Go Decision Point in between each BP.

In BP1, scale components would be developed and tested in order to determine which design path to pursue for fabrication of the mPTO device (e.g. linear or rotary mPTO). Component development would follow the same approach for each individual component. This approach would include a magnetic design/analysis phase, followed by a mechanical/thermal analysis phase (e.g. 3-D Finite Element Analysis (FEA) and development of mechanical design drawings), a component fabrication phase, and a testing phase. Component fabrication and assembly would be performed by qualified-third party vendors, or by PSU at its research facilities at its campus in Portland, OR. Component testing would be performed using existing dynamometer test-stands at PSU's research facilities. Components to be developed would include a linear adjustable magnetic spring ('AMS' – 1:50 scale), a rotary AMS (1:50), and a magnetic lead screw ('MLS' – 1:20). A Marine Hydrokinetic (MHK) Advisory Board, composed of MHK companies interested in using the mPTO technology, would also be formed during BP1, and would be consulted throughout the project to assist in reaching a decision regarding which design path to pursue.

Activities for BP2 would include the selection of the design path (e.g. linear or rotary mPTO) based on the results of component testing during BP1, fabrication of the mPTO device (1:20), laboratory testing using a dynamometer at PSU, conjugate controller development, wave tank testing of the mPTO, and completion of a scaling/cost analysis.

Work would be completed by PSU as well as project partners AquaHarmonics, the University of North Carolina at

Charlotte (UNC Charlotte), and Sandia National Lab (SNL). Both Aqua Harmonics and UNC would assist in design and fabrication. Conjugate controller development and testing would be performed at SNL's research facilities in Albuquerque, NM. SNL would also assist with wave tank testing. Wave tank testing would be performed at the Hinsdale Wave Tank Laboratory at Oregon State University.

No change in the use, mission or operation of existing facilities would be required as part of this project. Likewise, no additional permits or authorizations would be required.

PSU and its project partners would adhere to established health and safety policies and procedures when performing laboratory testing. All applicable Federal, state, and local health, safety, and environmental regulations would be observed.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

Any work proposed to be conducted at a federal facility may be subject to additional NEPA review by the cognizant federal official and must meet the applicable health and safety requirements of the facility.

Notes:

Water Power Technologies Office

This NEPA determination does not require a tailored NEPA provision. Include the standard DOE lab language in the NEPA provision.

Review completed by Jonathan Hartman, 05/06/2019

FOR CATEGORICAL EXCLUSION DETERMINATIONS

The proposed action (or the part of the proposal defined in the Rationale above) fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D. To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposed action that may affect the significance of the environmental effects of the proposal.

The proposed action has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

The proposed action is categorically excluded from further NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____

 Electronically Signed By: Kristin Kerwin

NEPA Compliance Officer

Date: 5/8/2019

FIELD OFFICE MANAGER DETERMINATION

- Field Office Manager review not required
- Field Office Manager review required

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____
Field Office Manager

Date: _____