

PMC-ND
(1.08.09.13)

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



RECIPIENT: Applied Research Laboratory / Penn State University

STATE: PA

PROJECT TITLE : Rapidly Deployable Advanced Integrated Low Head Hydropower Turbine Prototype

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001006	DE-EE0006928	GFO-0006928-001	GO6928

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, 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 federal funding to Penn State University (PSU) to design, fabricate, and test a rapidly deployable advanced integrated hydropower turbine generator system. Project work would include design, fabrication, and lab testing of a 1/3 scale prototype turbine and of a full scale prototype turbine.

PSU would perform seven tasks for this project.

Tasks 1 would include information gathering, analysis, and dissemination. Specifically, the task would involve computer modeling and turbine design.

Task 2 would involve design and fabrication of a 1/3 scale prototype turbine and a full scale prototype turbine. The 1/3 scale turbine would be approximately 1 foot in diameter. The full scale prototype turbine would be approximately 3 feet in diameter. All design work would occur at PSU at the Applied Research Lab (ARL) facility in State College, PA. Fabrication work would occur at the PSU ARL facility in University Park, PA.

Task 3 would involve the design and sizing of the rim drive generator. This task would involve computer modeling and generator design work only, and would occur at the commercial offices of General Atomics Inc., in San Diego, CA.

Task 4 would involve the design of supervisory control and data acquisition (SCADA) system health management capabilities for integration into the full scale prototype turbine. This system would be a computer software system for gathering and analyzing real time data from the prototype turbine. Specifically, this task would include the integration of sensor and hardware technology to be built into the turbine generator system, as well as the development of data driven and model based diagnostic techniques for fault isolation, failure predictions, and the detection of failure modes. This task would occur at the PSU ARL facility in State College, PA.

Task 5 would involve information gathering, analysis and dissemination. Specifically this task would involve an assessment study of the potential use and impact of using hybrid materials (composite and metals) on turbine system performance and cost. This task would occur at the PSU ARL facility in State College, PA.

Task 6 would involve testing of the prototype turbines. The 1/3 scale turbine would be subject to materials and finish testing at the PSU ARL facility in University Park, PA. The 1/3 scale turbine would not be subject to hydro testing. The

full scale turbine would be subject to hydro testing. All hydro testing would occur at the PSU ARL 1.22 m diameter Garfield Thomas Water Tunnel (GTWT) facility located in the Garfield Thomas Water Tunnel Building, in State College, PA. The GTWT is a closed circuit, closed jet facility with a 1.22 m diameter by 4.3 m long horizontal test section.

Task 7 would involve project management and reporting.

No new construction, permits, licenses, authorizations, or modifications to existing facilities would be required.

All solid waste generated by the projects would be disposed of appropriately and would comply with all required standards for disposal of solid wastes.

No additional affects to resources or additional concerns were found to exist during this review.

Based on review of the project information and the above analysis, DOE has determined the project would not have a significant individual or cumulative impact to human health and/or environment. DOE has determined the proposed project is consistent with actions contained in DOE categorical exclusion A9 "information gathering, analysis, and dissemination," and, B3.6 "small scale research and development, laboratory operations, and pilot projects," and is categorically excluded from further NEPA review.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If you intend to make changes to the scope or objective of your project you are required to contact the Project Officer identified in Block 11 of the Notice of Financial Assistance Award before proceeding. You must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved.

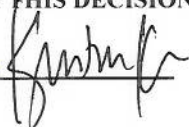
Note to Specialist :

Water Power Program
This NEPA determination does not require a tailored NEPA provision.
NEPA review completed by Roak Parker on 4/7/15

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____

Electronically Signed By: Kristin Kerwin
NEPA Compliance Officer



Date: 4/14/2015

FIELD OFFICE MANAGER DETERMINATION

Field Office Manager review required

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

- Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
- Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

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

Field Office Manager's Signature: _____

Field Office Manager

Date: _____