PMC-ND
(1.08.09.13)

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

RECIPIENT: SurfTec **STATE:** AR

PROJECT TITLE: Polydopamine/PTFE Composite Coating for Large-Scale journal Bearings in Next Generation Electric Machines

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001467	DE-EE0007874	GFO-0007874-001	GO7874

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.
B3.15 Small-scale indoor research and development projects using nanoscale materials	Siting, construction, modification, operation, and decommissioning of facilities for indoor small-scale research and development projects and small-scale pilot projects using nanoscale materials in accordance with applicable requirements (such as engineering, worker safety, procedural, and administrative regulations) necessary to ensure the containment of any hazardous materials. Construction and modification activities would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible).

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to SurfTec, LLC to develop and scale a coating technology to a readiness level for industry adoption.

The proposed polydopamine/polytetrafluoroethylene nanoparticle composite coating would replace traditional journal bearing liners that use lead and bismuth with a high-performance, sustainable alternative. The proposed project activities would include:

1. Lab-scale demonstration and optimization of coating performance in lubrication regimes relevant to hydrodynamic journal bearing operation and validation at a third-party test site.
2. Scale-up of coating deposition techniques to coat large-scale journal bearings for megawatt-class megavolt electric motors and generators and testing at partner motor and generator manufacturer.
3. Inclusion of coated journal bearings in a full-scale prototype system for demonstration and evaluation. Prototype system would be used as a test bed for performance validation.

These proposed activities would take place in the following locations: SurfTec's lab space located in Fayetteville, Arkansas; the University of Arkansas Fayetteville campus; ABB US Corporate Research Center in Raleigh, NC; the Baldor/Dodge manufacturing and evaluation facilities in Greenville, SC; and Oak Ridge National Laboratories in Oak Ridge, Tennessee. The laboratory and research facilities are designed and purpose-built for the type of activities being proposed, so no new facilities or major facility modifications would be required. No change in the use, mission or operation of existing facilities would arise out of this project.

The project would involve the use and handling of various hazardous materials, including metals, solvents and nanoparticle dispersions. All such handling would occur in-lab. All project laboratories would have dedicated proper hazardous material handling and disposal practices. All hazardous materials would be managed in accordance with

federal, state, and local environmental regulations.

Copper and Silica nanoparticles would be used in the low-friction coating. The nanoparticles would be handled and disposed of in accordance with federal, state, and local environmental regulations. At SurfTec and the University of Arkansas laboratories where these materials would be handled, the disposal is managed by the Office of Environmental Health and Safety at the University of Arkansas.

Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

Based on the review of the proposal, DOE has determined the proposal fits within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 outlined in the DOE categorical exclusion(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR 1021.410 (2)) related to the proposal that may affect the significance of the environmental effects of the proposal; (2) the proposal has not been segmented to meet the definition of a categorical exclusion; and (3) the proposal is not connected to other actions with potentially significant impacts, related to other proposals with cumulatively significant actions, or an improper interim action. This proposal 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 the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Insert the following language in the award:

You are required to:
Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements .

Note to Specialist :

Advanced Manufacturing Office
This NEPA determination does require a tailored NEPA provision.
Review completed by Chris Rowe, 2/14/2017

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By Casey Strickland Date: 2/15/2017

NEPA Compliance Officer

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: _____ Date: _____

Field Office Manager