PMC-ND
(1.08.09.13)

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

RECIPIENT: Starfire Industries LLC **STATE:** IL

PROJECT TITLE : Novel Corrosion And Wear Resistant Coatings Using Innovative Cold Plasma Jet Surface Treatment To Enable Improved Bonding Performance of Dissimilar Material Joints Subject To Harsh Environmental Exposure

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001465	DE-EE0008319	GFO-0008319-001	GO8319

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 Starfire Industries to develop and test plasma generated coatings intended to be corrosion/wear resistant, as well as demonstrating improved bonding strength. The coatings would be tested on multi-material automotive joints, though the process would be developed so as to be applicable to a wide range of transportation industries.

Proposed project activities would include data analysis, computer simulations and modeling, process analysis (e.g. power delivery, equipment, and safety analyses), plasma jet applicator development, coating process testing and optimization, material coupon generation, corrosion/exposure testing, and plasma jet demonstrations. Data analysis, plasma systems development and materials testing would be conducted at Starfire Industries' laboratory in Champaign, IL. Plasma testing, computer modeling, coupon generation and materials testing would be carried out at the University of Illinois' Center for Plasma-Material Interactions Laboratory in Urbana, IL. Corrosion/exposure testing on material coupons would be conducted at the University of Illinois' Applied Research Institute Laboratory in Champaign, IL. Materials testing and plasma system demonstrations would be carried out at General Motors' R&D Laboratory in its Manufacturing Center in Warren, Michigan. All research laboratories are dedicated, purpose built facilities that regularly carry out the type of work proposed as part of this project. No change in the use, mission, or operation of existing facilities would arise as a result of the proposed project.

Project materials would include laboratory-scale quantities of various metals and metal alloys. Material coupons and sheets would be composed of aluminum (Al) and magnesium (Mg). Coating materials would include silane, alumina, and zirconia precursors. Coating materials would be deposited onto the surfaces of the material coupons and sheets via the atmospheric-pressure plasma system developed as part of the project. The thin-film coatings would initially be grown at nanoscale lengths (length scales ~50-2000 nm). These coatings would be bonded to the material coupons

and would be non-hazardous as produced. Any resulting airborne emissions would be minimal since the surface areas to be treated would be measurable in inches. Additionally, a down draft flow table would be used during testing, which would pull any vapors into a HEPA air filter before circulating the air back into the room environment.

The proposed project would include the use and handling of high-voltage electrical sources for plasma generation, as well as compressed gas cylinders to channel gas into the plasma generator. All such handling would occur in laboratory settings at the sites detailed above. All of the facilities in which laboratory work would be conducted have appropriate health and safety policies and procedures in place, including employee training, proper protective equipment, engineering controls, monitoring, and internal assessments. All laboratory work would comply with established Federal, State and local environmental regulations.

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.

Note to Specialist :

Advanced Manufacturing Office
This NEPA determination does not require a tailored NEPA Provision.
NEPA review completed by Jonathan Hartman 5/30/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Casey Strickland Date: 5/30/2018

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