PMC-ND
(1.08.09.13)

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

RECIPIENT: Gas Technology Institute **STATE:** IL

PROJECT TITLE: Free-Piston Expander for Hydrogen Cooling

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001874	DE-EE0008431	GFO-0008431-001	GO8431

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 funding to Gas Technology Institute (GTI) to simulate, design, fabricate, and test a free piston expander that meets the precooling standard set by the SAE J2601 Protocol for hydrogen vehicle fueling. The expander would serve to replace the existing hydrogen pre-cooling system and variable area control device which controls a hydrogen vehicle's pressure ramp rate. The project would be carried out over three Budget Periods (BP), with a Go/No-Go Decision Point between each one.

Proposed project activities for BP1 would include computer modeling (e.g. operations simulations, thermo-economic modeling), component configuration selection, and design/fabrication of a component testing apparatus. BP2 activities would include component validation testing (e.g. valve and control system testing), engineering design, and expander unit fabrication. BP3 activities would consist of commissioning of the expander unit (e.g. safety review, startup of control systems, hydraulic pressure testing), unit testing, preliminary design of a fueling station interface, and economic analysis.

All project activities would be performed at existing, purpose-built facilities at GTI's research campus in Des Plaines, IL, and at the University of Texas' (UT-Austin) J.J. Pickle Research Campus in Austin, TX. No changes in the use, mission or operation of existing facilities would be required as part of this project. No additional permits would be required in order to perform the project work activities.

Testing and fabrication would involve the use of inert gases, including nitrogen and hydrogen. Hydrogen is a high pressure and flammable gas. Accordingly, it would be handled in a dedicated laboratory space designed specifically for high pressure hydrogen used in vehicle and fueling station applications. Potential hazards associated with this award, including the use of inert gases, as described above, would be mitigated by following applicable codes and standards, complying with corporate health and safety policies, regular training of personnel, hazard assessments, engineering controls, monitoring and the use of proper personal protective equipment.

Materials to be used during fabrication and testing would include approximately 1100 kg of stainless steel, 100 kg of nitrogen and hydrogen gases, as well as small quantities of hydraulic fluid, cutting fluids and ionic fluids (less than 50 gallons). All waste materials would be disposed of in accordance with GTI and UT-Austin's standard waste management policies. GTI and UT-Austin would adhere to all local, state, and Federal health, safety and 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 :

Fuel Cell Technologies Office
This NEPA determination does not require a tailored NEPA provision.
Review completed by Jonathan Hartman on 9/4/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Casey Strickland Date: 9/4/2018

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