PMC-ND
(1.08.09.13)

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

RECIPIENT: The University of Central Florida Board of Trustees **STATE:** FL

PROJECT TITLE: Autonomous Inverter Controls for Resilient and Secure Grid Operation: Vector Control Design for Grid Forming

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0009028	DE-EE0009028	GFO-0009028-001	

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 federal funding to the University of Central Florida (UCF) to develop a unified control design framework for grid-forming (GFM) and grid-following (GFL) inverters. The proposed research would address the fundamental GFM/GFL inverter control problems for power grids with high inverter-based energy resources (IERs) penetration by designing and testing a unified control design to simplify control implementation, advance standardization of control and communication for IERs, and speed up the integration of IERs.

The project would be comprised of three Budget Periods (BP). Proposed tasks advance in scope from data analysis, computer modeling, and laboratory research and development (R&D) to small-scale field testing at a municipal utility site. Since the proposed project is focused on the design, development, testing, and validation of proposed models and algorithms, new equipment required to carry out project activities would be limited to the acquisition of approximately 20 commercially-available inverters. This hardware would be used to test, implement, and validate the developed control algorithms via a combination of in-lab hardware-in-loop (HIL) simulations and an experimental “nano-grid” in the field. For the latter, project inverters would be brought to an islanded outdoor testing facility at the Orlando Utilities Commission’s Gardenia Operations Center for temporary integration with 30kW of pre-existing floating solar PV, 10kW/30kWh of storage, and dynamic loads. All other project work be carried out indoors by UCF and multiple subrecipients, as follows.

Project management in addition to the design and analysis of inverters, HIL simulations, and laboratory testbed demonstrations would be conducted at UCF (Orlando, FL). Low-level inverter modeling and control design, as well as remote technical support for the utility field test, would be provided by Siemens Corporate Research Center (Princeton, NJ). Dynamic modeling of inverters, HIL simulations, and laboratory testbed validation would occur at Pacific Northwest National Laboratory (Richland, WA). 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.

All project activities would occur at established R&D facilities that were purpose-built for the type of activities being proposed; therefore, no modifications or new permits, additional licenses and/or authorizations would be necessary. No change in the use, mission, or operation of existing facilities would arise out of this effort. The project would not use, consume, or produce any materials beyond the aforementioned inverters, which would be retained for future research after the conclusion of the proposed project.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Solar Energy Technologies Office
This NEPA determination does not require a tailored NEPA Provision.
NEPA review completed by Whitney Doss Donoghue, 01/21/2020

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 Date: 1/22/2020

NEPA Compliance Officer

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: _____ Date: _____

Field Office Manager