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(1.08.09.13)

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

RECIPIENT: Electrical Distribution Design (EDD) **STATE:** VA

PROJECT TITLE: Faster-than-real-time Simulation with Demonstration for Resilient DER Integration

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001987	DE-EE0008768	GFO-0008768-001	GO8768

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.
B5.15 Small-scale renewable energy research and development and pilot projects	Small-scale renewable energy research and development projects and small-scale pilot projects, provided that the projects are located within a previously disturbed or developed area. Covered actions would be in accordance with applicable requirements (such as local land use and zoning requirements) in the proposed project area and would incorporate appropriate control technologies and best management practices.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to Electrical Distribution Design (EDD) to design, develop, and test a software solution for resilient distributed energy resource (DER) integration, which would provide the real-time intelligence needed for rapidly detecting abnormalities, including cyber security breaches, and managing voltage stability.

The proposed project would focus primarily on the creation of a software system termed “Measurement and Model Integrator for Ensuring Grid Security (MIEGS).” MIEGS would be designed to incorporate abnormality detection, real-time voltage stability monitoring, large and small PV generation, batteries, flexible loads, coordination between transmission system needs and primary distribution system controls, and coordination between primary distribution system control and secondary distribution system control. The project would consist of three Budget Periods (BP). The types of activities associated with BP1 and BP2 would be limited to stakeholder outreach, data analysis, computer modeling, preliminary engineering/design, and laboratory research. Activities associated with BP3 would include a field demonstration of the MIEGS system in collaboration with a utility partner on a power grid with suitably high DER penetration.

Desktop-based outreach, analysis, software design and algorithm development, and database management would

occur at EDD (Blacksburg, VA) as well as the offices of subrecipients Dominion Voltage, Inc. (DVI; Richmond, VA) and Clean Power Research (CPR; Kirkland, WA and Napa, CA). Utility partner Pepco Holdings, Inc. (PHI; Washington, DC) would provide IT support along with circuit measurements to incorporate into real-time model simulations. Laboratory-based activities, including electrical testing and cyber control hardware-in-loop (HIL) experiments, would be conducted at the University of Delaware's Institute of Energy Conversion (UD IEC; Newark, DE). Research conducted in-lab at UD to test the developed software would ultimately be scaled-up to field demonstration at two PHI distribution feeders located in suburban MD, although the exact sites have yet to be finalized. Selection of the two demonstration feeders would take place over the course of the proposed project, and this effort would be based on analysis of DER types, penetration level, critical infrastructure, and other criteria such as existing batteries, flexible loads, AMI voltage meter availability and sampling frequency, and planned components.

Implementation of the MIEGS system on utility feeders would be performed in order to demonstrate initial results and obtain lessons learned for potential future DER management strategies; the proposed project would not involve long-term or permanent deployment. Demonstration activities would include the installation and integration of software and associated hardware components at utility feeders, then the validation of system performance via a series of remote field experiments. These would include creating simulated cyberattack indicators within the network to test the software's detection ability, and inducing a momentary voltage disturbance (by taking selected inverters offline) to test real-time control and monitoring abilities. All such management of the feeders by the project would be subject to prior PHI approval and oversight. PHI would work with EDD throughout the installation, integration, and testing of all solution components and would perform site acceptance testing and risk management as needed to establish the processes required to support smooth operation of the developed system in the field.

The selected feeders may be modified with the addition of new control devices and/or additional communication and test equipment if necessary. Any such equipment would be minor in scale and would only serve to facilitate demonstration of the proposed software system; the project would not involve the acquisition, installation, or operation of new power generating equipment or facilities. All utility infrastructure that would be used by the project is owned by PHI. Potential installations of new components would not entail any ground-disturbance or physical modifications to PHI facilities. No change in the use, mission, or operation of existing facilities would arise out of the proposed short-term and temporary project efforts. At this time, no new permits have been specified by EDD as prerequisite to carrying out the proposed field-based project activities. However, if during the course of project work it is determined that any additional permits and/or authorizations are in fact required (e.g. to install certain pieces of communications equipment), EDD would first obtain all relevant permits and/or authorizations before commencing the covered activities. The PHI utility sites under consideration for project work are purpose-built for the type of activities being proposed; therefore, no adverse impacts to sensitive resources are expected as a result of the proposed field demonstration activities regardless of the exact locations selected.

The proposed project would not involve the use or handling of hazardous materials. Desktop-based analytical and software development activities would not use or consume any materials beyond standard office supplies. Minimal quantities of waste anticipated to be produced by the proposed project would include leftover cardboard or wooden crates from shipments of laboratory materials/equipment, which would be recycled as per established UD procedures. Laboratory and field equipment purchased for the purposes of the proposed project would either be retained for future research or appropriately decommissioned following DOE policy.

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, 7/5/2019

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: 7/9/2019

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

- [x] 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