

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** NREL**STATE:** CA**PROJECT****TITLE:**

Effect of Cell Cracks on Module Power Loss and Degradation; NREL Tracking No. 19-016a

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
	DE-AC36-08GO28308	NREL-19-016a	GO28308

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:

**B3.11 Outdoor tests and experiments for the development, quality assurance, or reliability of materials and equipment (including, but not limited to, weapon system components) under controlled conditions. Covered actions include, but are not limited to, burn tests (such as tests of electric cable fire resistance or the combustion characteristics of fuels), impact tests (such as pneumatic ejector tests using earthen embankments or concrete slabs designated and routinely used for that purpose), or drop, puncture, water-immersion, or thermal tests. Covered actions would not involve source, special nuclear, or byproduct materials, except encapsulated sources manufactured to applicable standards that contain source, special nuclear, or byproduct materials may be used for nondestructive actions such as detector/sensor development and testing and first responder field training.**

**DOE/EA-1968 (NREL STM)** SITEWIDE ENVIRONMENTAL ASSESSMENT, U.S. DOE NATIONAL RENEWABLE ENERGY LABORATORY, SOUTH TABLE MOUNTAIN CAMPUS, GOLDEN, COLORADO

## Rationale for determination:

The U.S. Department of Energy's (DOE) Solar Energy Technologies Office (SETO) proposes to provide federal funding to the National Renewable Energy Laboratory (NREL) and Electric Power Research Institute (EPRI) to evaluate how cell cracks in photovoltaic (PV) panels influence degradation and power loss of the modules.

Existing PV modules would be instrumented to collect performance and meteorological data. The data would be used to develop a model of a PV module that could be used to predict degradation behavior in PV modules, and assist in understanding the environmental conditions that create cell cracks, resulting in degradation. The project would also develop a method to test for crack susceptibility in new PV modules. Outdoor testing would be performed at three sites; two are known at this time. This NEPA review is limited to the first two test locations, as part of the scope of work is to select a third site. The NEPA review of the third site will be conducted when site-specific information is available.

NREL would conduct imaging and modeling activities, in addition to on-sun testing and accelerated lifetime testing of the PV modules. EPRI would provide new and accelerated-aged silicon-based PV modules to NREL for testing. On-sun and accelerated lifetime testing of the modules would occur at the Outdoor Test Facility (OTF), located at NREL's South Table Mountain campus. On-sun testing would occur at the OTF's outdoor PV site, wherein the PV modules would be installed on an existing single-axis tracker. Accelerated lifetime testing would occur in existing laboratory space at the OTF that is equipped to perform such work. Testing would take approximately 3 years.

Both NREL and EPRI would install instruments on existing PV panels or nearby on existing structures that would collect module health data, electrical performance data, and meteorological data. Imagery data would also be collected at EPRI, and the equipment needed would be installed on existing structures.

Proposed project activities would not affect cultural resources, threatened or endangered species, wetlands, floodplains, or prime farmlands and no permits would be required. The project would not involve ground disturbance, as all equipment would be installed on existing infrastructure. No change in the use, mission, or operation of existing facilities would result from the proposed project. As such, no direct or indirect impacts resulting from the proposed project would be anticipated.

At the conclusion of testing at NREL, the undamaged PV modules would be returned to their respective owners. The PV modules that are stress tested and purposefully cracked would be disposed of in the sanitary landfill per existing NREL procedures.

Individuals could be exposed physical hazards during the course of this project. Existing corporate health and safety policies and procedures at NREL and EPRI would be followed, including employee training, proper protective equipment, engineering controls, and monitoring. Additional policies and procedures would be implemented as necessary if new health and safety risks are identified.

## NEPA PROVISION

DOE has made a conditional NEPA determination.

The NEPA Determination applies to the following Topic Areas, Budget Periods, and/or tasks:

This NEPA review is limited to the first two test locations, as part of the scope of work is to select a third site.

The NEPA Determination does not apply to the following Topic Area, Budget Periods, and/or tasks:

The NEPA review of the third site will be conducted when site-specific information is known.

Notes:

NREL  
Nicole Serio 3/4/2019

## 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.

A portion of the proposed action is categorically excluded from further NEPA review. The NEPA Provision identifies Topic Areas, Budget Periods, tasks, and/or subtasks that are subject to additional NEPA review.

## SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: \_\_\_\_\_

 **Electronically Signed By: Kristin Kerwin**  
NEPA Compliance Officer

Date: 3/6/2019

## 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: \_\_\_\_\_  
Field Office Manager

Date: \_\_\_\_\_