

**U. S. DEPARTMENT OF ENERGY, OFFICE OF SCIENCE
INTEGRATED SUPPORT CENTER—CHICAGO OFFICE**

**NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)
ENVIRONMENTAL EVALUATION NOTIFICATION FORM**

To be completed by "Applicant," i.e., organization with responsibilities for a "Federal action" involving application to DOE for a permit, license, exemption or allocation, or other similar actions. For assistance with this Form, refer to "Instructions for Preparing ISC-CH F-560, Environmental Evaluation Notification Form."

Solicitation/Award No. (if applicable): DE-SC0023946

Organization Name: Luna Innovations Incorporated

Proposed Action Title: C56-40.W Optical Fiber Based Distributed Radiation Detection

Total DOE Funding/Total Funding: \$199,935.00

I. Project Description: (Use explanation pages if additional space is required)

A. Proposed Project/Action (if applicable, delineate Federally funded/Non-Federally funded portions)

Luna is teaming with Dr. Tom Blue from OSU, who will assist with design, modeling and testing of the gamma thermometer in the Ohio State University Research Reactor (OSURR), a 500 kW Materials Testing Reactor. Luna will fabricate the radiation probes and conduct extensive modeling, temperature testing and calibration of the completed probes. In addition, Luna will provide sensors, electronics, data analysis and on-site personnel support for the testing at OSU. Luna has successfully transitioned fiber optic sensing technology from the laboratory to commercial products, and this innovation would be integrated with our existing product line. It is anticipated that the results could have significant commercial potential in the nuclear reactor sensor market.

B. Would the project proceed without Federal funding?

Yes No

If "yes," use explanation page.

II. Description of Affected Environment: (Use explanation pages if additional space is required)

Luna and The Ohio State University (OSU) propose to combine their expertise to develop an innovative Optical Fiber Based Distributed Radiation Sensor based on a Gamma Thermometer. Installing a permanent system of sensors for LPRM calibration that do not degrade over time would eliminate the risk of releasing radioactive material caused by inserting and removing the TIPs and would also increase the safety and speed of the calibration process while reducing the cost and complexity of the process.

III. Preliminary Questions:

- A. Is the DOE-funded work routinely administrative or *entirely* advisory or a "paper study"? Yes No

If "Yes", ensure that the description in Section I reflects this and go directly to Section V.

- B. Is there *any* potential whatsoever for: (Provide an explanation for each "Yes" response)

- | | | |
|--------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|-------------------------------------|
| 1. Work to be performed outdoors? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Major modification of a building interior? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Threat of violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. Siting, construction or major expansion of waste treatment, storage, or disposal facilities? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Disturbance to hazardous substances, pollutants, or contaminants preexisting in the environment? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. The presence of any environmentally-sensitive resources? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. Any potential whatsoever for high consequence impacts to human health or the environment? | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 8. The work being connected to another existing/proposed activity that could potentially create a significant impact? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9. Nearby past, present, and/or reasonably foreseeable future actions such that collectively significant impacts could result? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. Scientific or public controversy, uncertainty over potential impacts, or conflicts regarding resource usage? | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

If "No" to ALL Section III.B. questions, go directly to Section V.

IV. Potential Environmental Effects: (Provide an explanation for each "Yes" response)

- A. Environmentally Sensitive Resources: Could the proposed action potentially result in changes and/or disturbances to any of the following resources?

- | | Yes | No |
|------------------------------------------------------------------------------------|--------------------------|-------------------------------------|
| 1. Threatened/Endangered Species and/or Critical Habitats | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 2. Other Protected Species (e.g., Burros, Migratory Birds, Pollinators) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 3. Sensitive Environments (e.g., Tundra/Coral Reefs/Rain Forests) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 4. Cultural or Historic Resources | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 5. Important Farmland | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. Non-Attainment Areas for Ambient Air Quality Standards | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 7. Class I Air Quality Control Region | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 8. Special Sources of Groundwater (e.g. Sole Source Aquifer) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 9. Navigable Air Space | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 10. Coastal Zones | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 11. Areas with Special National Designation (e.g. National Forests, Parks, Trails) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 12. Floodplains and/or Wetlands | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

- B. Regulated Substances/Activities: Would the proposed action involve any of the following regulated items or activities?

- | | | |
|----------------------------------------------------------------------------------------------------|--------------------------|-------------------------------------|
| 13. Natural Resource Damage Assessments | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 14. Invasive Species or Exotic Organisms | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 15. Noxious Weeds | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 16. Clearing or Excavation greater than one acre or Removal of Trees Governed by Local Requirement | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 17. Dredge or Fill (under Clean Water Act, Section 404, greater than one acre) | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

B. Regulated Substances/Activities: Would the proposed action involve any of the following regulated items or activities? (continued)

	Yes	No
18. Noise (in excess of regulations)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
19. Asbestos Removal	<input type="checkbox"/>	<input checked="" type="checkbox"/>
20. Polychlorinated biphenyls (PCBs)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
21. Import, Manufacture, or Processing of Toxic Substances	<input type="checkbox"/>	<input checked="" type="checkbox"/>
22. Chemical Storage/Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
23. Pesticide Use	<input type="checkbox"/>	<input checked="" type="checkbox"/>
24. Hazardous, Toxic, or Criteria Pollutant Air Emissions	<input type="checkbox"/>	<input checked="" type="checkbox"/>
25. Liquid Effluents	<input type="checkbox"/>	<input checked="" type="checkbox"/>
26. Spill Prevention/Surface Water Protection	<input type="checkbox"/>	<input checked="" type="checkbox"/>
27. Underground Injection	<input type="checkbox"/>	<input checked="" type="checkbox"/>
28. Hazardous Waste	<input type="checkbox"/>	<input checked="" type="checkbox"/>
29. Underground Storage Tanks	<input type="checkbox"/>	<input checked="" type="checkbox"/>
30. Radioactive or Radioactive Mixed Waste	<input checked="" type="checkbox"/>	<input type="checkbox"/>
31. Radiation Exposure	<input checked="" type="checkbox"/>	<input type="checkbox"/>
32. Nanoscale Materials	<input type="checkbox"/>	<input checked="" type="checkbox"/>
33. Genetically Engineered Microorganisms/Plants or Synthetic Biology	<input type="checkbox"/>	<input checked="" type="checkbox"/>
34. Ozone Depleting Substances	<input type="checkbox"/>	<input checked="" type="checkbox"/>
35. Greenhouse Gas Generation/Sustainability	<input type="checkbox"/>	<input checked="" type="checkbox"/>
36. Off-Road Vehicles	<input type="checkbox"/>	<input checked="" type="checkbox"/>
37. Biosafety Level 3-4 Laboratory	<input type="checkbox"/>	<input checked="" type="checkbox"/>
38. Research on Human Subjects or other Vertebrate Animals	<input type="checkbox"/>	<input checked="" type="checkbox"/>
39. Facility footprint exceeds 5,000 Square Feet	<input type="checkbox"/>	<input checked="" type="checkbox"/>

C. Other Relevant Information: Would the proposed action involve the following?

	Yes	No
40. Disproportionate Nearby Presence of Minority and/or Low Income Populations	<input type="checkbox"/>	<input checked="" type="checkbox"/>
41. Existing, Modified, or New Federal/State Permits	<input checked="" type="checkbox"/>	<input type="checkbox"/>
42. Involvement of Another Federal Agency (e.g. license/permit, funding, approval)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
43. Action in a State with NEPA-type law	<input type="checkbox"/>	<input checked="" type="checkbox"/>
44. Expansion of Public Utilities/Services	<input type="checkbox"/>	<input checked="" type="checkbox"/>
45. Depletion of a Non-Renewable Resources	<input type="checkbox"/>	<input checked="" type="checkbox"/>
46. Subject to an Existing Institutional Work Planning and Control Process	<input type="checkbox"/>	<input checked="" type="checkbox"/>
47. Other Pertinent Information Which Could Impact Human Health or the Environment	<input type="checkbox"/>	<input checked="" type="checkbox"/>

V. Applicant certification that to the best of their knowledge all information provided on this form is accurate:

Does this disclosure contain: classified, sensitive business, or other exempt information that DOE would not be obligated to disclose pursuant to the Freedom of Information Act. Yes No

A. Organization Official (Name and Title): Matt Moore/ Manager, Contracts & Compliance

Signature: Matthew E. Moore Date: 8/2/2023

e-mail: moorem@lunainc.com Phone: 540-961-6729

B. Optional Secondary Approval (Name and Title):

Signature: _____ Date: _____

e-mail: _____ Phone: _____

Remainder to be completed by DOE

VI. DOE Concurrence/Recommendation/Determination:

A. DOE Project Director/Program Manager or Contract/Grant Management Specialist:

Has the Applicant completed this Form correctly?
Does an existing generic categorical exclusion apply?

Yes No

If yes, indicate: **CX signed by the NEPA Compliance Officer is filed in ACQ-SD**

Name and Title: **Julian Leal, Contract Specialist**

Signature: **Julian Leal** Digitally signed by Julian Leal Date: 2023.08.03 15:02:56 -05'00' Date: **08/03/2023**

B. DOE NEPA Team Review (if requested):

Is the class of action identified in the DOE NEPA Regulations (Appendices A-D to Subpart D (10 CFR § 1021))?

Yes No

If yes, specify the class(es) of action: **B3.6**

Name and Title: **Environmental Engineer**

Signature: **Jayashree Jayaraj** Digitally signed by Jayashree Jayaraj Date: 2023.08.04 16:41:22 -05'00' Date: _____

C. DOE Counsel (if requested):

Name and Title: _____

Signature: _____ Date: _____

D. DOE NEPA Compliance Officer:

The preceding pages are a record of documentation required under DOE Final NEPA Regulation, 10 CFR § 1021.410.

- Action may be categorically excluded from further NEPA review. I have determined that the proposed action meets the requirements for Categorical Exclusion referenced above.
- Action requires approval by Head of the Field Organization. Recommend preparation of an Environmental Assessment.
- Action requires approval by Head of the Field Organization or a Secretarial Officer. Recommend preparation of an Environmental Impact Statement.

Comments/limitations if any:

Actions are limited to those bounded by the award scope AND covered by the OHIO STATE UNIVERSITY RESEARCH REACTOR ENVIRONMENTAL ASSESSMENT REGARDING RENEWAL OF FACILITY LICENSE NO. R-75 (TAC NO. MA7724) and the License itself.

NEPA Compliance Officer:

Name: _____

Signature: **PETER SIEBACH** Digitally signed by PETER SIEBACH Date: 2023.08.14 16:09:48 -05'00' Date: _____

Optional Additional Narrative: (add additional detail to description to Sections I and II or explanations to responses in Sections III and IV.

For those experiments that monitor radiation in the reactor, Cr-51 will be generated in the nichrome thermocouples. These will be allowed to decay in OSURR's holding pool, and properly disposed of by OSJRR. OSU will handle all radiation work, including reactor operation, sensor installation and removal and waste disposal. The low level waste will be disposed of via OSURR's disposal procedures in accordance with the OSURR's NRC License and the OSURR ALARA program.

Current license /permit associated ith the project: The Ohio State University Research Reactor (OSURR) is owned and operated by OSU, a non-profit educational institution, and is licensed by the US Nuclear Regulatory Commission. Its current license, issued in June 2008, authorizes steady-state 500kW operation for 20 years. All work being performed and material disposal is covered by OSURR's License.

