

Nuclear Safety Research and Development Program

Proposal Submittal Instructions for Fiscal Year 2023 and 2024

1.0 INTRODUCTION

The Nuclear Safety Research and Development (NSR&D) Program was created to provide corporate-level leadership supporting NSR&D throughout the Department of Energy (DOE) and the National Nuclear Security Administration (NNSA). The NSR&D Program is managed under the Office of Nuclear Safety (EHSS-30), within the Office of Environment, Health, Safety and Security (EHSS). The NSR&D Program annually solicits NSR&D proposals not only to further nuclear safety at DOE but also as a method to identify areas where research is needed.

NSR&D involves a systematic search for knowledge to advance the fundamental understanding of nuclear safety science and technology through scientific study, analysis, modeling, and experiments. The NSR&D Program functions as a clearinghouse to collect and communicate NSR&D efforts throughout the DOE/NNSA complex to support standards development, validation of analytical models and methods, and improvements in operating practices. It supports DOE in making technically-justified and well-informed nuclear safety decisions and will also help maintain the technical expertise and the analytical tools and techniques to maintain a sufficiently qualified and experienced workforce with a robust infrastructure.

1.1 General Information for Proposers

The NSR&D Program solicits proposals that are not already funded through DOE/NNSA specific programs and evaluates the potential for Department-wide benefit in support of safe nuclear facility design, construction and/or operations. **Conformance to these instructions is required to ensure an objective review and rating of each proposal received.** Proposals that are missing substantive information will not be considered for support. If a proposal is found to have minor deficiencies that can be easily addressed, the submitting team will be contacted via e-mail to provide the additional information.

The NSR&D Program expects to have approximately \$1 million to support FY2023 projects and \$1 million to support FY 2024 projects.

It is strongly recommended that proposing teams search the Office of Scientific and Technical Information's various databases, such as the [Science Research Connection](#) database, for previous research prior to submitting the proposal to help ensure duplicate research efforts are not likely to be funded.

2.0 PROPOSAL INSTRUCTIONS

A complete proposal shall contain the following sections: **cover page, abstract, introduction, technical description, costs and schedule, and the endorsement.** Proposals will be considered officially-submitted upon receipt by the NSR&D Program Manager. **A Microsoft Word**

version of the proposal package must be submitted (the endorsement may be sent as a separate attachment).

Proposals must have the potential to:

- Improve nuclear safety design and/or construction practices, as well as analysis and operations, through applied NSR&D.
- Reduce uncertainties in current nuclear safety analyses (e.g., gain higher confidence in the results, or reduce excessive conservatism included in safety basis documentation).
- Identify or clarify new hazards, accident scenarios and risks.
- Justify changes and immediate benefits to specific nuclear safety regulations, Directives, or Technical Standards that are owned and maintained by EHSS-30 and are based on an improved understanding of risk.
- Provide clear description of immediate proof of concept with commercial applicability leveraged with cost sharing resources.

Completed proposals should be no more than 10 pages in length.

The list of evaluation factors will continue to include the five main criteria with additional information provided in the instructions and criteria documents.

This year's call for proposals covers FY 2023 and FY 2024 with an approximate estimated total of \$2 million available. Projects selected for FY 2023 funding will be awarded mid CY 2023 while projects selected for FY 2024 funding will be awarded early CY 2024.

Proposals with a one-to-two-year project duration with an approximate cost of \$500,000 and covering one or more of the following seven research areas are being solicited:

- **Natural phenomena hazards (NPH) modeling and technology, including for seismic events and events induced by climate change to include extreme straight-line winds, tornadoes, hurricanes, wildland fires, and flood/precipitation with findings that demonstrate direct benefits and improvements to DOE-STD-1020, *Natural Phenomena Hazards Analysis and Design Criteria for DOE Facilities*, and related DOE NPH documents.**
- **Fire protection and fire performance of DOE facilities and equipment with findings that demonstrate direct benefits and improvements to DOE-STD-1066, *Fire Protection*.**
- **Safety basis analyses addressing reductions in uncertainty by demonstrating direct benefits and improvements to DOE-STD-3009, *Preparation of Nonreactor Nuclear Facility Documented Safety Analysis*, and DOE-HDBK-1224, *Hazard and Accident Analysis Handbook*, and related DOE safety basis documents.**
- **ARF/RF testing, modeling and assessment by demonstrating direct benefits and improvements to DOE-HDBK-3010, *Airborne Release Fractions/Rates and Respirable Fractions for Nonreactor Nuclear Facilities*, and related DOE documents.**

- **Improvements to nuclear protective equipment and/or instrumentation, including nuclear air cleaning, HEPA filtration media and technology demonstrating direct benefits and improvements to DOE-STD-3020, *Specification for HEPA Filters Used by DOE Contractors*, DOE-STD-3025, *Quality Assurance Inspection and Performance Testing of HEPA and ULPA Filters*, DOE-STD-1269, *Air Cleaning Systems in DOE Nuclear Facilities*, DOE-HDBK-1169, *Handbook for Use with DOE-STD-1269-2022, “Air Cleaning Systems in DOE Nuclear Facilities,”* and related DOE documents.**
- **Technical bases for developing updated or new nuclear safety Directives, Technical Standards or guidance that improves effectiveness and efficiency of regulatory or technical approach, reduces unnecessary burden, or otherwise demonstrates direct benefits and improvements to quality assurance or safety basis requirements affecting nuclear safety of Hazard Category 1, 2, or 3 DOE nuclear facilities.**
- **Risk assessment and risk-informed performance-based approaches to safety assessment.**

Proposals that address areas not included in the above list will still be considered; however, the review process will note that the proposal is outside the targeted research areas.

Proposals should address the above considerations in the following sections.

2.1 Cover Page

The cover page should include:

- a. NSR&D Program Fiscal Year (FY) 2023 and 2024 Call for Proposals,
- b. Project name,
- c. Submitting site and program office,
- d. Principal Investigator(s) (PI) and contact information (i.e., e-mail, mailing address, telephone), and
- e. Proposal submission date.

If an individual other than the PI(s) should be contacted concerning the proposal, contact information should also be provided for that person.

2.2 Abstract

In one page or less, provide a brief summary of the following information found in the proposal.

Use the headers listed below:

- a. **Objective:** A concise description of the objective of the proposed project, including the issue/problem to be addressed, and its relevance and importance to NSR&D. Summarize what the project is expected to accomplish and how the results will be applied.

- b. Technical Approach: A concise summary of the methodology that will be employed to achieve the objective (e.g., how a process will be evaluated, or the technique that will be used to assess conservatisms in the design basis) and overall project duration (i.e., months, year, etc.).
- c. Benefits: A brief description of the expected benefits to DOE/NNSA, the scientific community, and specifically, Technical Standards and Directives owned and maintained by EHSS-30. Include the sites that expect benefit and impacts by the research along with immediate proof of concept and commercial application.

Note: The abstract will be used as the basis for the project description and may be posted on the NSR&D Web site and/or distributed to DOE senior management. As such, the abstract must be a stand-alone technical summary to be made available for public release¹.

2.3 Introduction Section

Provide a brief description of the following:

- a. Purpose: Describe the issue/problem that the research will address, the research objective(s), and any relevant background.
- b. Scope: Describe what the research will and will not cover, including any limitations.
- c. Business Case: Describe how the proposed research project responds to complex-wide NSR&D needs.
- d. Linkage: Discuss the DOE Directive(s) or Technical Standard(s) that influenced development of the proposal or that the results may potentially affect.

2.4 Technical Description Section

Provide a detailed description of the research to be undertaken. The description shall include the following:

- a. Technical Approach: Outline the research activities. Articulate specific technical methods and goals of the proposed project.
- b. Milestones: The proposer is expected to provide realistic milestones, accounting appropriately for potential problems and unexpected results that may be encountered. Proposals should include planning for: monthly status reports (emails), bi-annual project summary presentations (teleconference), annual project summary reports, and a final project report. Prior to completion of any funded projects, a technical review may be conducted.
- c. Transition Plan: To the extent possible, describe how the project results will be implemented in the field or transitioned for further nuclear safety research. Indicate efforts to identify a receiver of the product(s), and any commitments to transition this technology by the completion of the project.

¹ See DOE Order 241.1B, Chg 1, *Scientific and Technical Information Management*.

2.5 Cost and Schedule Section

This section of the proposal is a cost breakdown for the project. Separate cost breakdowns are required for each collaborator or subcontractor whose costs cumulatively exceed \$10,000 in any FY (this may be achieved by simply adding columns for each). Furthermore, the cost breakdown should include individual disciplines, task breakdowns, and projected labor hours for each. Cost information should be rounded to the nearest thousand dollars. Accompanying narrative is permitted, if desired, but is not required.

NSR&D projects may be jointly funded by multiple DOE Program Offices, DOE contractors, government organizations, or commercial entities. Funds or “in-kind” contributions should be identified in this section and reflected in the identification of the research team (see 2.7, below).

NSR&D projects may be funded incrementally, with funds provided in the year in which they are expected to be expended. The cost should be structured to indicate total and annual funding required, and if possible, quarterly funding profiles. For planning purposes, proposing teams should assume award of work during the spring, work on the project beginning on October 1, and that the project year runs through September 30, until anticipated project completion.

2.6 Endorsement

Each proposal should be reviewed and endorsed by the local Site/Field Office or the appropriate DOE Headquarters Program Office, with the endorsement letter submitted as an appendix to the proposal. The Field Office Manager is suggested as the endorsement official, but other field office or headquarters staff may be designated by management to provide the endorsement. For proposals previously submitted to other funding organizations (i.e., direct program funding, indirect (site) funding, laboratory-directed research and development, or plant-directed research and development), the endorsement letter should address and explain why each proposal was not selected. Sites/Program Offices with multiple proposals may submit a single endorsement letter for all proposals submitted as a single package; however, the Site/Field/Program Office should address each proposal and evaluate the proposals for project overlap and rank the proposals based on the relative value with respect to the DOE complex and the individual site.

2.7 Research Team

At the end of the proposal, identify the PI and the key collaborators and their respective organizations. Also, identify government or contractor organizations that will be contributing direct funding or in-kind resources to the research effort.

3.0 EVALUATION FACTORS FOR PROPOSALS

An assessment will be made on whether the submission (1) responds to DOE-wide NSR&D needs and (2) falls within the NSR&D Program objectives to support nuclear safety research. If the proposal does not meet those primary criteria, no further evaluation will be made. The following will be the basis for reviewing proposals pursuant to the ranking criteria and their respective weights in the *NSR&D Proposal Review and Prioritization Process and Criteria*:

Nuclear Safety Benefit/Risk Reduction: This criterion evaluates the benefit to improving nuclear safety through reducing risk by better understanding existing, or developing new, approaches and technologies. (Weight: 30%)

Technical Approach: This criterion evaluates the soundness and technical rigor of the research methodology. (Weight: 25%)

Project Management and Execution: This criterion evaluates the degree to which the proposal includes a comprehensive, logical, orderly, and concise plan that indicates major tasks, milestones, critical paths, go/no-go decision points and key events, leading to the completion of the project in the proposed period. (Weight: 15%)

Multi-Site/Multi-Program Office Benefit: This criterion evaluates the degree to which the results of the proposal affect nuclear safety activities across multiple site or program offices with DOE. (Weight: 15%)

Proof of Concept/Commercial Applicability/Cost Sharing: This criterion evaluates the degree to which immediate outcomes of the efforts provide strong evidence of a feasible design concept and business proposal. (Weight: 15%)

4.0 SUBMITTAL

Once the proposal has been finalized, a single Microsoft Word version² should be created that contains all required sections; as noted above, the local site/field office endorsement may be sent separately, if necessary. The proposal will be considered officially submitted upon receipt by the NSR&D Program Manager. All submissions should be sent to: nsrdprogram@hq.doe.gov.

² The editable MS Word version to be used during the EFCOG independent review process where proposal costs and financial information are redacted from the original submittal.