

Nuclear Safety Research and Development Proposal Review and Prioritization Process and Criteria



Nuclear Safety Research and Development Program

**Office of Nuclear Safety
Office of Environment, Health, Safety, and Security
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Nuclear Safety Research and Development Program

1. Introduction

Per the Department of Energy (DOE) *Nuclear Safety Research and Development (NSR&D) Program Operating Plan*, (referred to as the Operating Plan), the DOE NSR&D Program¹ annually implements processes to identify, prioritize, and fund NSR&D projects not already funded through DOE/National Nuclear Security Administration (NNSA) specific programs. These projects demonstrate the potential for DOE-wide benefit in support of safe nuclear facility design, construction, and/or operations.

The process described herein is designed to produce a prioritized and well-vetted list of proposals that will be considered for funding provided by the Office of Environment, Health, Safety and Security's (EHSS's) Office of Nuclear Safety (AU-30), and potentially by the Program Offices. The NSR&D Committee will present the prioritized list of NSR&D proposals, along with proposed project selection, to the DOE's Nuclear Safety Committee (NSC), which is composed of senior Program Office management, for evaluation of benefit across the Department. The NSC's evaluation provides additional insights on the advantages or disadvantages of pursuing the NSR&D activities. The NSC may recommend changes to the projects that will be selected which will be considered by the NSR&D Committee in its decision making process.

2. Annual Proposal Process Description

The NSR&D Program Manager is responsible for the processes conducted to review and prioritize the proposals submitted. The NSR&D Program Manager may, at any time modify the processes as necessary. This annual proposal process was initially piloted in Fiscal Year (FY) 2013 and has been annually revised based on lessons learned gathered from proposers, Program Office personnel, and the NSR&D Committee.

Develop Fiscal Year Specific Schedule

The first step in the process is to develop a schedule that is specific to the activities associated with the upcoming research and development proposal submittal, review and approval cycle. A generic schedule is provided in Section 5. This generic schedule should be used by the NSR&D Program Manager in developing a schedule specific to each FY. The duration of each element may be adjusted depending upon several factors, including: funding for the NSR&D effort,

¹ DOE's NSR&D Program is managed by AU-30 and is separate from the NNSA NSR&D Working Group's efforts.

NSR&D Committee member schedules, and the number of proposals received during the previous year's proposal cycle.

Issue Call for Proposals (CFP)

The Call for Proposals (CFP) will be issued by the NSR&D Program Manager. The *Proposal Submittal Instructions* and *Proposal Review and Prioritization Process Criteria* will accompany the call for proposals. All proposals are to be submitted to the NSR&D Program no later than the date specified in the call for proposals. The call for proposals will be sent to the following, as a minimum, with the expectation that they will further distribute the call for proposals to the appropriate individuals at their respective Site/Field Offices and/or laboratories:

- NSR&D Committee;
- Program Secretarial Officers (PSOs);
- Plant Directed Research and Development Program Managers;
- Energy Facility Contractors Group's (ERFCOG's) Safety Analysis Working Group (SAWG); and
- EFCOG's Engineering Practices Working Group (EPWOG)

Screening of Proposals

Upon receipt of the proposals, the NSR&D Program Manager, assisted by program staff, will perform a simple review to ensure that proposal content is in compliance with the *Proposal Submittal Instructions* and *Proposal Review and Prioritization Process Criteria* and includes an endorsement from the local Site/Field Office or Headquarters Program Office. The endorsement letter should, if appropriate, address why the proposal was not selected for direct program funding, indirect (site) funding, laboratory-directed and program directed research and development. If the proposal is determined to be missing significant information requested in the Proposal Submittal instructions, it will be removed from further consideration. If minor deficiencies are found, supplemental information will be requested by e-mail from the proposer, to be provided as soon as possible.

Review and Prioritize Proposals

Review by NSR&D Committee

The NSR&D Program Manager will ensure that all proposals are distributed to the NSR&D Committee members at least four (4) weeks prior to conducting a proposal ranking meeting. During these four (4) weeks, the NSR&D Committee members will individually review each of the proposals and complete the NSR&D FY16 Summary Ranking Sheet (Appendix B) using the

criteria and guidance provided in Appendix A. This ranking sheet is an informal working paper (or Excel worksheet) and is intended for proposal ranking consolidation by the NSR&D Program and for individual NSR&D Committee member use during the ranking meeting.

To ensure a comprehensive technical review is completed for each of the proposals, the NSR&D Program Manager and Committee members should each seek independent subject matter expertise to assist in the review. Subject matter experts should be from sites other than that of the proposed principal investigator. The Committee members are responsible for completing the summary ranking sheets for each proposal. All ranking sheets should be submitted to the NSR&D Program Manager prior to conducting the ranking meeting. Each Committee member's proposal rankings, up to a maximum of 10 proposals, will be used to identify the combined set of top-ranked proposals.

Conduct Initial Ranking Meeting

The NSR&D Committee will conduct an initial ranking meeting in accordance with the meeting criteria contained in the NSR&D Committee Charter. The Program Manager will develop the combined list of top-ranked proposals, which will be discussed during the meeting, based on the summary ranking sheets submitted. At the meeting, the Committee will work to develop a consensus set of the highest-ranked proposals, not to exceed five. When consensus is not attainable, a majority vote may be conducted verbally or via e-mail as long as a quorum² is present. The inputs for the initial ranking meeting shall include:

1. Proposal packets;
2. Summary list of ongoing program-funded NSR&D activities (if available);
3. Available NSR&D funding for the upcoming FY;
4. NSR&D Committee member's NSR&D FY16 Summary Ranking Sheets; and
5. Combined list of top-ranked proposals, based on Committee members rankings.

The deliverable from the initial ranking meeting is a list of the highest-ranked proposals. Meeting minutes shall document both the top-ranked and highest ranked proposals.

Final Ranking Meeting

Upon agreement on the final list of highest-ranked proposals, the Committee will have a final ranking meeting no later than two (2) weeks after the initial ranking meeting. At the meeting, representatives for each proposal in the final list will be given 30 minutes to provide a presentation on their proposals, in person or via video teleconference, and the NSR&D Committee will have the ability to ask questions. Following the presentations, the Committee should attempt to reach consensus on the prioritization of the highest-ranked proposals. When

² Quorum is defined in the NSR&D Committee Charter.

consensus is not attainable, a majority vote may be conducted verbally or via e-mail as long as a quorum is present. The deliverable from the meeting is a list of prioritized proposals, not to exceed five (5), based on the proposals and presentations, with a recommendation for which proposals should be selected for funding. Recommendations for proposal funding will be based on both the NSR&D Committee ranking and available NSR&D Program funding. Meeting minutes shall document the prioritization and recommendations for funding.

Nuclear Safety Committee Evaluation

Following the final ranking meeting, the NSR&D Program Manager will provide the NSC with the NSR&D Committee's prioritization and recommendations prior to their next meeting and arrange to present the recommendations at the meeting. The NSC's evaluation is intended to provide additional insights on the advantages or disadvantages of the proposals and their benefits to DOE. The NSR&D Program Manager will provide the Committee with any NSC recommended changes to the prioritized list. Any changes recommended to the NSR&D Committee's approved prioritization or recommendations for funding will be considered and voted on in accordance with the decision process identified in the Committee's Charter. The NSR&D Program Manager will ensure the final ranking of the highest-ranked proposals and the proposals selected for funding are appropriately archived.

Notification of Decision to Principal Investigators

The NSR&D Program will formally notify the Principal Investigators (PIs) of the Committee's decision on their proposals after completion of the final ranking list. The notification of proposals selected for funding will include the process for funding transfer and the necessary steps for project initiation. Once the PI's have been notified, the selected proposals will then be considered projects and will be tracked by the NSR&D Program.

Identify Lessons Learned

Annually, the NSR&D Program will request feedback on the submittal and review process from the NSR&D Committee, each PI, and any others involved in the process. It is expected that improvements will be identified that can be implemented in the following years. The NSR&D Committee will hold a meeting to compile and discuss lessons learned. In the meeting, the Committee will also discuss any feedback received from the PIs. The outcome of the lessons learned meeting should be documented in meeting minutes for reference when planning begins for the next proposal cycle.

3. Review of Research Deliverables

In order to ensure that the NSR&D Committee selects worthwhile projects, research deliverables (e.g., publications and/or inventions) will be reviewed by the NSR&D Program and/or subject matter experts, as appropriate. Reviews should commence at project milestones identified by the PI or DOE. At a minimum, a review will be conducted after completion of the project's final draft report(s). The makeup of the review team should be commensurate with the technical detail of the project. This review should be completed within 60 days after it commences and should consider, as well as the technical outcome, whether the scope, completeness, increase in safety, and management of the project adhered to the description presented in the application.

4. Criteria and Guidance for Ranking Proposals

This section is intended to assist the NSR&D Committee members in evaluating the NSR&D proposals. Appendix A contains four (4) criteria that will be used to rank proposals. The four (4) criteria are (1) Nuclear Safety Benefit/Risk Reduction, (2) Technical Approach, (3) Project Management and Execution, and (4) Multi-Site/Multi-Program Office Benefit. The suggested weighting of each criterion is included. Each criterion includes considerations to help guide the reviewer in ranking the proposal, as well as brief descriptions for each ranking. Research topics should be limited to those in support of safe nuclear facility design, construction, and/or operations for DOE/NNSA nuclear facilities, nuclear explosives, and environmental restoration activities.

5. Basic Schedule Template

The schedule below is intended as a resource for the NSR&D Program Manager in developing a schedule specific for upcoming proposal process. Each of the Activities in the schedule corresponds to a section in this procedure.

NSR&D Proposal Review and Prioritization Process and Criteria

Time Frame (Est. Schedule)	Activity	Responsibility
(October)	Develop FY Specific Schedule Conduct Workshop	NSR&D Program Manager
6 weeks (mid-January)	Issue Call for Proposals	NSR&D Program Manager
6 weeks (mid-February)	Proposals due to nsrdprogram@hq.doe.gov (AU-30).	Applicants
1 week (late February)	Screening of proposals for conformance with Proposal Submittal Instructions. Additional information will be requested for proposals with minor deficiencies.	NSR&D Program Manager
1 week (late February)	Additional information provided for proposals, if needed.	Applicants
1 week (mid-March)	Hold call and distribute proposal packages to the NSR&D Committee Members.	NSR&D Program Manager
4 weeks (March)	Review proposal packages, perform individual rankings, and submit FY16 Summary Ranking Sheet to NSR&D Program Manager.	NSR&D Committee Members
1 week (late-March to late April)	Initial ranking meeting to determine highest-ranking proposals.	NSR&D Committee Members
2 weeks (early-May)	Final ranking meeting with presentations on the highest-ranking proposals to determine prioritization.	NSR&D Committee Members
2 weeks (late May)	Present prioritized list of highest-ranking proposals to the NSC.	NSR&D Program Manager
1 week (late May)	Review NSC evaluation and recommendations, if any, and finalize proposal prioritized list.	NSR&D Committee Members
(June)	Notify proposal Principal Investigators of funding decision and path forward for selected projects.	NSR&D Program Manager

Appendix A. NSR&D Ranking Criteria

Criterion #1: Nuclear Safety Benefit / Risk Reduction (Weight: 35%)	Ranking and Description
<p>This criterion evaluates the benefit to improving nuclear safety through reducing risks by better understanding existing or developing new approaches and technologies.</p> <p>Considerations when evaluating:</p> <ul style="list-style-type: none"> ● The proposed project supports safe nuclear facility design, construction, and/or operations for DOE/NNSA nuclear facilities, nuclear explosives, and/or environmental restoration activities. ● The results of the proposed project are expected to reduce uncertainties in current nuclear safety analyses (providing higher confidence in the results or cost savings on engineering or administrative controls by reducing excessive conservatism). ● The results of the proposed project are time-critical (e.g., needed to support new construction activities, new mission requirements, Department commitments, etc.). ● The results of the proposed project are expected to improve the nuclear safety knowledge base and/or the technical bases for DOE Directives and Technical Standards. ● The results of the proposed project are expected to demonstrate proof of concept or reduction of risk for high-consequence, low-probability events. ● The results of the proposed project will benefit high-profile nuclear safety issues demanding immediate attention. ● The proposed project cost is in line with the perceived or estimated benefit. ● The proposed project provides a potential for a high benefit/cost ratio. 	<p>Nuclear Safety Benefit:</p> <p>0 - Provides minimal risk/safety benefit</p> <p>1 - Research will establish foundation for safety/risk benefit, but further research is needed for implementation</p> <p>2 - Safety benefit/risk reduction can be realized in the near term, but impact is limited</p> <p>3 - Results will have an immediate and broad-based impact on risk magnitude and/or uncertainty, or produce an immediate safety or cost benefit</p>

Criterion #2: Technical Approach (Weight: 30%)	Ranking and Description
<p>This criterion evaluates the soundness and technical rigor of the research methodology.</p> <p>Considerations when evaluating:</p> <ul style="list-style-type: none"> ● The overall scientific and technical merit of the proposed project is clearly identifiable. ● The proposed project clearly identifies the depth of the research that will be conducted, and the proposed approach can be substantiated by calculations, test data, and references. ● The proposed project clearly articulates how the research will advance DOE’s nuclear safety program and objectives. ● The proposed project is expected to produce defensible results that can withstand peer review and challenges by organizations with opposing interests. ● The proposed project can be feasibly/technically accomplished within the proposed time frame. ● The transition plan for the proposed research product(s) provides a clear understanding of how the project’s results will transition to implementation, either directly, through future demonstrations, or future development. 	<p>Technical Approach:</p> <p>0 - Proposed approach is unsubstantiated</p> <p>1 - Proposed approach is unclear in some respects</p> <p>2 - Technical approach is clear but not feasible in proposed time frame</p> <p>3 - Technical approach is clear, substantiated, and can be accomplished in proposed time frame</p>

Criterion #3: Project Management and Execution (Weight: 15%)	Ranking and Description
<p>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.</p> <p>Considerations when evaluating:</p> <ul style="list-style-type: none"> ● The proposed project 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. ● The transition plan identifies the linkage between the work proposed, the needs of the end user of the results, the immediacy of the nuclear safety issue, and the implementation feasibility (including a timeline). ● The proposed cost is reasonable and appropriate for the technical complexity of the work described. ● The potential cost/benefit, cost sharing, and/or leveraging of resources is described. ● Successful completion of the proposed project is likely (based on success of previous similar work, expertise/experience of researchers, etc.). ● The proposed project does not repeat previous or ongoing research completed by DOE/NNSA line organizations or other agencies, unless there is a demonstrated need to validate, verify, or extend such research. ● Short-duration projects are preferred, but flexibility is permitted in ranking of longer-term projects if the benefit to DOE is significant and commensurate with the duration/cost. 	<p>Project Management and Execution:</p> <p>0 - Costs/schedules are not adequately specified and/or there are no deliverables or milestones until project is completed.</p> <p>1 - Costs/schedules are incomplete and/or listed deliverables/milestones are not adequate for scope of proposed work.</p> <p>2 - Costs/schedules and/or deliverables/milestones are reasonable, but additional details would be useful.</p> <p>3 - Costs/schedules and deliverables/milestones are completely specified and reasonable for scope of proposed work.</p>

Criterion #4: Multi-Site / Multi-Program Office Benefit (Weight: 20%)	Ranking and Description
<p>This criterion evaluates the degree to which the results of the proposal affect nuclear safety activities across multiple site or Program Offices with DOE.</p> <p>Considerations when evaluating:</p> <ul style="list-style-type: none"> ● The results of the proposed project are expected to justify changes to nuclear safety regulations, Directives, or Technical Standards based on an improved understanding of risk. ● The results of the proposed project are expected to have a DOE-wide benefit. ● The proposed project addresses issues that could impact a significant number of DOE nuclear facilities and/or nuclear operations. ● The proposed project makes use of cost sharing and/or leveraged resources with other DOE or Federal organizations. 	<p>Multi-site / Multi-Program Office Benefit:</p> <p>0 - Benefit to DOE nuclear sites is unclear or not evident</p> <p>1 - Benefit to one site or program</p> <p>2 - Benefit to multiple sites within one program</p> <p>3 - Benefit to multiple sites and multiple programs</p>

Appendix B. Sample NSR&D FY16 Summary Ranking Sheet

Proposal ID	Proposal Title	Nuclear Safety Benefit/Risk Reduction	Technical Approach	Project Management and Execution	Multi-Site/ Multi-Program Office Benefit	Total (sum of scores multiplied by rating factors)
NSRD-1						
NSRD-2						
NSRD-3						
NSRD-4						
NSRD-5						
NSRD-6						
NSRD-7						
NSRD-8						
NSRD-9						
NSRD-10						
NSRD-12						
NSRD-13						
NSRD-14						
NSRD-15						
NSRD-16						
NSRD-17						
NSRD-18						
NSRD-19						
NSRD-20						
NSRD-21						