# **NSUF Statement of Work**

**Tracking ID Number:** Starts with 25-xxxxx, find on Letter of Intent or Pre-Application.

**Title:** Click here to enter text.

**Principal Investigator(s):**

Name; Title; Institute; Address; Telephone; Email

Name; Title; Institute; Address; Telephone; Email

**Collaborator(s):**

Name; Title; Institute; Address; Telephone; Email

Name; Title; Institute; Address; Telephone; Email

**Technical Topic Area Identifier, choose one:**

**Choose topic area here**

**Requesting NSUF capabilities at these partners, check all applicable boxes:**

|  |  |
| --- | --- |
| [ ]  Argonne National Laboratory | [ ]  Brookhaven National Laboratory |
| [ ]  Center for Advanced Energy Studies,  Microscopy and Characterization Suite  | [ ]  Idaho National Laboratory  |
| [ ]  Los Alamos National Laboratory  | [ ]  Lawrence Livermore National Laboratory |
| [ ]  Massachusetts Institute of Technology | [ ]  North Carolina State University |
| [ ]  Oak Ridge National Laboratory | [ ]  The Ohio State University |
| [ ]  Pacific Northwest National Laboratory | [ ]  Pennsylvania State University |
| [ ]  Purdue University  | [ ]  Sandia National Laboratory |
| [ ]  Texas A & M University  | [ ]  University of California, Berkeley |
| [ ]  University of Florida  | [ ]  University of Michigan |
| [ ]  University of Texas @ Austin | [ ]  University of Wisconsin - Madison |
| [ ]  Westinghouse |

1. **Project Objectives**

Provide a concise description of the motivation, scientific and technical objectives and mission relevance. This can be adopted directly from the proposal narrative.

1. **Experiment Description**

Note: If you need to insert a table, you may create it in another document, then copy and paste it into a paragraph field.

1. **Facilities Needed**
2. Identify all testing facilities that may be needed to conduct experiment in its entirety. These facilities can include any of the reactor, PIE and beamline facilities and capabilities available through the NSUF network of partner facilities. Information on available partner facilities and capabilities can be found on the NSUF website: https://nsuf.inl.gov/ then explore capabilities.
3. Clearly identify any testing equipment that may be utilized at other institutions and paid for with other funds. (e.g. R&D funds, collaborating partner, university, etc.).

This information is needed to estimate total project costs incurred for sample shipments.

1. **Test Matrix**

1. Provide a listing of the materials to be tested, including:
	1. material compositions
	2. number of samples
	3. geometry of test samples (with needed tolerances)
2. Provide the source or supplier of materials that will be utilized to fabricate samples into the final desired geometry.
3. For previously irradiated fuels and materials not residing in the NSUF Nuclear Fuels and Materials Library, identify:
	1. location (as specific as possible)
	2. condition
	3. provenance/pedigree
	4. radioactivity levels
	5. isotopic content
	6. material composition
	7. configuration
	8. ownership
	9. other information needed to ship and/or prepare the fuel or material for examination.
4. A test matrix sample table like this is helpful:



*Notes:*

1. *For irradiation tests, experiment feasibility will be strongly influenced by whether a specific material is allowed in the proposed reactor and by the ability to handle the samples for post-irradiation examination.*
2. *Proprietary materials processing methods do not have to be identified, however, any materials tested in-reactor will need material certifications identifying all measurable elemental constituents.*
3. *If material composition certifications are not provided by the material supplier, then material samples will have to be sent to an independent testing lab for elemental composition analysis.*

1. **Testing Conditions & Capsule Design Concept**

1. Indicate the desired testing conditions including:

* 1. flux and +/- % variation
	2. total fluence and +/- % variation
	3. neutron or beam energy spectrum
	4. include details on how this might be achieved (filtering, etc.)
	5. temperature and +/- % variation
	6. irradiation environment (dry, water, PWR conditions, etc.)

2. This information will be reviewed by:

a. Reactor analysts to confirm desired testing conditions can be met and to determine which position(s) in the reactor are suitable for the experiment.

b. Experiment managers to estimate the cost of experiment fabrication. Please keep in mind that tighter tolerances on testing conditions may lead to the necessity for more in-pile instrumentation increasing cost and potentially reducing feasibility.

c. Hot Cell engineers to refine the capsule design and to ensure that disassembly and cataloguing of samples can be efficiently conducted.

1. **PIE Plan**

Provide a description of the post-irradiation examination activities needed to achieve the technical objectives. This plan may cover up to a period of three years.

* 1. Include all anticipated types of analysis and the number of samples that will need to be analyzed in each test
	2. Include facilities to be utilized for each test
	3. Provide a prioritized list of specific samples to be analyzed, as the workscope may be reduced if estimated PIE costs are excessive
	4. A PIE table like this is helpful:



Excess samples from the experiment that have not been analyzed will be placed into the Nuclear Fuels and Materials Library and made available for future researchers.

1. **Data Needs**

Describe all the data needed to meet the technical objectives. This should include:

a. analysts reports on experimental design and fabrication

b. “as-run” irradiation data and analyst reports (dose and temperature)

c. PIE data; be specific for each facility and capability

d. the form of the data needed and how it should be stored and transmitted

e. any necessary quality assurance goals

1. **Project Management**
2. **Schedule**

Provide a Gantt chart that indicates the approximate timeline for only the NSUF access work for the experiment. Reactor analysts will provide the estimated irradiation time to achieve desired fluence based on anticipated availability. Include task numbers, task owner, task description laid out by DOE fiscal year (10/1 – 9/30)

1. **Deliverables**

Identify one or two major deliverables for only the NSUF access work for each year of the project to help evaluate progress and the ultimate likelihood of success.

1. **Roles and Responsibilities**

Provide a description of the contributions from each PI or co-PI institution where possible down to the individual level.

1. **Project Risks and Mitigation Strategy**

Identify major risks to timely accomplishment of project objectives and provide strategies to mitigate these risks.

**Appendices**

Additional information may be added though appendices are not required.