

**FINANCIAL
ASSISTANCE
FUNDING OPPORTUNITY
ANNOUNCEMENT**



U. S. Department of Energy

Idaho Operations Office

Fiscal Year 2014

**Scientific Infrastructure Support for Consolidated
Innovative Nuclear Research Funding Opportunity**

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List of Acronyms

ARC - Advanced Reactor Concepts
ATR - Advanced Test Reactor
CFDA - Catalog of Federal Domestic Assistance
CFA - Call for Full Application
CFR - Code of Federal Regulations
CINR – Consolidated Innovative Nuclear Research
COI - Conflict of Interest
CTD – Crosscutting Technology Development
DE – Department of Energy
DOE - Department of Energy
EPAct - Energy Policy Act of 2005
FC R&D - Fuel Cycle Research and Development
FDO - Federal Demonstration Partnership
FFATA - Federal Funding and Transparency Act of 2006
FFRDC- Federally Funded Research and Development Center
FOA - Funding Opportunity Announcement
FSRS - FFATA Subaward Reporting System
GOGO - Government Owned/Government Operated
GSI - General Scientific Infrastructure
ICHMI - Instrumentation, Control, Human, Machine Interface
ID - Identification
IRP - Integrated Research Projects
LWRS - Light Water Reactor Sustainability
M&O - Management and Operating
MOOSE - Multiphysics Object Oriented Simulation Environment
MS - Mission Supporting
MSI - Minority Serving Institution
NE - Office of Nuclear Energy
NEAMS - Nuclear Energy Advanced Modeling and Simulation
NEET - Nuclear Energy Enabling Technologies
NEUP - Nuclear Energy University Programs
NGNP - Next Generation Nuclear Plant Demonstration Project
NSUF - National Scientific User Facility
NNSA - National Nuclear Security Administration
NPPs - Nuclear Power Plants
PD - Program Directed
PDF - Adobe Portable Document Format
PIE - Post-irradiation Examination
PI - Principal Investigator
POC - Point of Contact
QA - Quality Assurance
R&D - Research and Development
RC RD&D - Reactor Concepts Research, Development and Demonstration
RPA - Request for Pre-application
RPS - Radioisotope Power Systems
RPV - Reactor Pressure Vessel
SAM - System for Award Management
SBIR - Small Business Innovation Research
SF - Standard Form
SMR - Small Modular Reactors
STTR - Small Business Technology Transfer
TAC - Total Allowable Costs
TIO - Technical Integration Office
TMI-2 - Three Mile Island Unit 2

PART I – FUNDING OPPORTUNITY ANNOUNCEMENT DESCRIPTION

A. STATEMENT OF OBJECTIVES

This Funding Opportunity Announcement (FOA) is for Scientific Infrastructure Support for Consolidated Innovative Nuclear Research and reactor upgrades for the research community. It is referred to in this document as the “Infrastructure FOA”.

1. Background and Objectives

The Department of Energy’s (DOE) Office of Nuclear Energy (NE) conducts crosscutting nuclear energy research and development (R&D) and associated infrastructure support activities to develop innovative technologies that offer the promise of dramatically improved performance for advanced reactors and fuel cycle concepts while maximizing the impact of DOE resources.

The development of nuclear energy-related infrastructure and basic capabilities in the research community is necessary to promote R&D that supports nuclear science and engineering (NS&E), DOE-NE’s mission, and the Nation’s nuclear energy challenges. Accordingly, DOE intends to enable the education and training of nuclear scientists, engineers, and policy-makers in graduate and undergraduate study and two-year programs, as well as R&D that is relevant to the Department and the nuclear energy industry in general.

The Nuclear Energy University Program (NEUP) utilizes up to 20 percent of funds appropriated to NE’s R&D program for university-based infrastructure support and R&D in key NE program-related areas: Fuel Cycle Research and Development (FCR&D), Reactor Concepts Research, Development and Demonstration (RCRD&D), and Nuclear Energy Advanced Modeling and Simulation (NEAMS). Nuclear Energy Enabling Technologies Crosscutting Technology Development (NEET CTD) supports national laboratory, university and industry led crosscutting research in the areas of reactor materials, advanced sensors and instrumentation, and advanced methods for manufacturing. Additionally, NEET CTD supports DOE National Laboratory infrastructure in the areas of Reactor Materials and Advanced Sensors and Instrumentation.

Historically, an opportunity to receive infrastructure funding in support of NE’s Programs was accomplished through separate Funding Opportunity Announcements (FOAs). For fiscal year (FY) 2014, these opportunities have been consolidated under this FOA. The primary objective for consolidating opportunities is to promote efficiency and the effective use of resources.

The infrastructure requested should be individual, discrete, and definable items or capabilities that will support, maintain, or enhance the institutions’ capacities to attract and teach high quality students interested in nuclear energy-related studies; build the institutions’

research or education capabilities; or enhance the institutions' capabilities to perform R&D that is relevant to DOE-NE's mission.

NE reserves the right to respond to potential shifts in priorities during FY 2014 that may be driven by events, policy developments, or Congressional/budget direction. NE will factor such considerations into decisions related to the timing and scale of award announcements associated with this FOA.

2. Major NE-Funded Research Programs

Fuel Cycle Research and Development (FC R&D) Program. The mission of the FC R&D program is to develop used nuclear fuel management strategies and technologies to support meeting the federal government's responsibility to manage and dispose of the Nation's commercial used nuclear fuel and high-level waste and to develop sustainable fuel cycle technologies and options that improve resource utilization and energy generation, reduce waste generation, enhance safety, and limit proliferation risk.

The program vision is that by mid-century, strategies and technologies for the safe long-term management and eventual disposal of U.S. commercial used nuclear fuel and any associated nuclear wastes have been fully implemented. Additionally, it is desired that advanced nuclear fuel and fuel cycle technologies that enhance the accident tolerance of light-water reactors and enable sustainable fuel cycles are demonstrated and deployed. Together, these technologies and solutions support the enhanced availability, affordability, safety, and security of nuclear-generated electricity in the U.S.

Current challenges include the development of high burnup fuel and cladding materials to withstand irradiation for longer periods of time with improved accident tolerance; development of simplified materials recovery technologies, waste management (including storage, transportation, and disposal), and proliferation risk reduction methods; and development of processes and tools to evaluate sustainable fuel cycle system options and to effectively communicate the results of the evaluation to stakeholders.

Reactor Concepts Research, Development and Demonstration (RC RD&D) Program. The mission of the RC RD&D program is to develop new and advanced reactor designs and technologies that broaden the applicability, improve the competitiveness, and ensure the lasting contribution toward meeting our Nation's energy and environmental challenges. Research activities are designed to address the technical, cost, safety, and security issues associated with various reactor concepts. The four technical areas are Light Water Reactor Sustainability (LWRS), Small Modular Reactors (SMR), Advanced (Non-Light Water) Reactor Concepts (ARC), and Advanced Small Modular Reactors (Adv SMRs). In addition, R&D for the manufacturing of radioisotope power systems for national security and space exploration missions is supported through the Space and Defense Infrastructure Program.

Nuclear Energy Advanced Modeling and Simulation (NEAMS) Program. The mission of the NEAMS program is to create modern computer simulation codes and methods that give the user state-of-the-art physics models that can take advantage of powerful multi-

processing computers in order to better understand the behavior of nuclear reactor and fuel systems during normal operations and/or transient events. In particular, NEAMS is aimed at creating an advanced mechanistic toolkit that is applicable to a wide range of reactor designs for use by industry, academia, and the national laboratories. The NEAMS Toolkit will help engineers and scientists form new insights into the safety and economics of current and next generation reactor and fuel systems. It will provide much higher fidelity than current methods and incorporate well-defined and validated prediction capabilities.

This will be achieved by employing advanced software environments and modern high-performance computers to create a set of engineering-level codes in which fuels and materials continuum properties are informed by first-principles modeling of materials at the atomistic and meso scale. A set of simulation tools will be developed that promote interoperability of codes with respect to spatial meshing, materials and fuels models, and achieve a common "look and feel" for setting up problems and displaying results. The tool set to be developed aims to achieve scalability in terms of computing power and the types and couplings of the physics that dominates the system behavior.

Nuclear Energy Enabling Technologies Crosscutting Technology Development (NEET CTD).

The NEET CTD program conducts R&D in crosscutting technologies that directly support and enable the development of new and advanced reactor designs and fuel cycle technologies. These technologies will advance the state of nuclear technology, improving its competitiveness and promoting continued contribution to meeting our Nation's energy and environmental challenges. The activities undertaken in this program complement those within the RC RD&D and FC R&D programs. The knowledge generated through these activities will allow NE to address key challenges affecting nuclear reactor and fuel cycle deployment with a focus on cross-cutting reactor materials, advanced methods for manufacturing, and new instrumentation and sensor technologies.

B. RELATED COLLABORATIVE OPPORTUNITIES

Utilization of equipment acquired as a result of this Infrastructure FOA may enhance or benefit currently funded or proposed NE R&D. Therefore, opportunities exist to leverage R&D applications as outlined below.

1. *Consolidated Innovative Nuclear Research (CINR).* DOE-NE funds Program Supporting, Mission Supporting, and Program Directed R&D projects as part of a separate FOA (DE-FOA-0000998), which seeks applications from U.S. Universities, DOE National Laboratories, and U.S. Industry to support NE mission focused R&D. NE is facilitating the ability of researchers to coordinate and enhance their proposed equipment acquisitions in response to this Infrastructure FOA with R&D applications made in response to the CINR FOA, as appropriate and as described below.

Institutions may submit applications in response to this Infrastructure FOA to support the execution of a proposed R&D project proposed under the CINR FOA (i.e., the requested equipment must be required to execute the R&D project). This linkage is enabled during the submission process of the R&D application.

Applications submitted through this joint mechanism will be reviewed and ranked according to the criteria and processes described in both FOAs. DOE anticipates that applications with a direct tie to DOE-NE funded research will receive higher relevancy scores. As funding permits, applications selected for funding by both review processes will be funded. Both applications must be successful for either to be considered.

2. *ATR National Scientific User Facility (NSUF)*. DOE-NE provides nuclear energy researchers access to world-class capabilities to facilitate the advancement of nuclear science and technology. This mission is supported by providing cost-free access to state-of-the-art experimental irradiation testing and post-irradiation examination facilities as well as technical assistance in design and analysis of reactor experiments. NSUF and its partner facilities represent a prototype laboratory for the future. This unique model is best described as a distributed partnership with each facility bringing exceptional capabilities to the relationship including reactors, beamlines, state-of-the-art instruments, hot cells, and most importantly, expert mentors. Together these capabilities and people create a nation-wide infrastructure that allows the best ideas to be proven using the most advanced capabilities. Through NSUF, University researchers and their collaborators are building on current knowledge to better understand the complex behavior of materials and fuels in the radiation environment of a nuclear reactor. Access to the NSUF and its Partner facilities is granted through a separate competitive proposal process.

To apply to any of the areas in this FOA, the applicant is required to be a current partner or demonstrate the capability and willingness to join the NSUF as a partner facility through the NSUF Partnership Program. (See <http://atrnsof.inl.gov/Partners/tabid/57/Default.aspx> for more information on becoming a NSUF Member.) If NSUF determines the new equipment/capability adds significant value to DOE, the equipment/capability may be added as a DOE user facility so that the equipment is available to other researchers.

C. FUNDING OPPORTUNITIES

DOE is seeking applications under the Infrastructure FOA in the following areas:

1. University Reactor Upgrades Infrastructure Support
2. General Scientific Infrastructure Support for Universities and DOE National Laboratories.

NOTE: An application to either of these FOA areas is restricted to equipment or activities supporting research, teaching, and education, such as the purchase, set-up, and vendor installation costs for equipment and instrumentation, as well as building modifications that immediately support the installation and operation of the equipment. The application cannot include hiring or other human capital costs or the operation and maintenance of equipment or the applicant's reactor. It also cannot include non-standard installation costs for equipment and instrumentation that are beyond the vendor's standard installation cost. Personnel or indirect costs are not allowed. Institution-specific costs, not specific to the equipment or instrumentation, are the responsibility of the applicant. For example, if a vendor needs to meet

safety and health requirements to access the campus or a facility, then these costs are the responsibility of the applicant. Funds are restricted to equipment or activities supporting research, teaching, and education. Upgrades to increase operational profit are not allowed.

1. University Reactor Upgrades Infrastructure Support

Statement of Objectives

This section describes the objectives for University Reactor Upgrades Infrastructure Support. This area of the FOA supports the NE program missions as previously described.

This section seeks applications from Universities with operating research reactors.

Each University is permitted to submit a **single, separate** application to this area of the FOA.

The purpose of the program is to upgrade and improve the U.S. University nuclear research and training reactors and to contribute to strengthen the academic community's nuclear engineering infrastructure.

Applications should be directed to the upgrade of the reactor, or purchase / maintenance of equipment and instrumentation or activities: (1) related to the safety, performance, control or operational capability of the reactor and/or associated facility; (2) for radiation detection and measurement in laboratories directly related to the reactor facility; (3) for security/safety enhancements or licensing renewal support at the reactor facility required by the Nuclear Regulatory Commission (NRC), the state, or other appropriate agency for that particular item; or (4) other safety related equipment. Applications for equipment and instrumentation that significantly improve or expand the research, instruction, and training capabilities of the reactor facility will be highly considered.

Under this FOA area, applications can be submitted for all equipment and instrumentation and associated facility upgrade requests that support nuclear energy-related R&D or education at university research reactors. Infrastructure requests that support the sharing and use of equipment and instrumentation by multiple campuses of a university or multiple universities are encouraged. Equipment and associated upgrades specifically for general scientific laboratories are called for in section C.2 of this FOA.

2. General Scientific Infrastructure Support for Universities and DOE National Laboratories

Statement of Objectives

This section describes the objectives for the General Scientific Infrastructure Support for the NE program missions as previously described.

Universities are permitted to submit multiple applications to this FOA area. However, all applications submitted *except one* must be tied to a currently proposed project submitted in response to the FY 2014 CINR R&D FOA (DE-FOA-0000998). See Part I, Section B – “Related Collaborative Opportunities”. If only one application is to be submitted, it is not required to be tied to a proposed project submitted in response to the FY 2014 CINR R&D FOA (DE-FOA-0000998).

DOE National Laboratories are permitted a total of two applications per laboratory; one each in **Reactor Materials** and **Advanced Sensors and Instrumentation** in support of NEET CTD. Requested DOE National Laboratory equipment should support multiple NE R&D programs (consistent with NEET CTD objectives) and complement and expand upon current capabilities and the associated expertise to provide a needed capability to the nuclear energy research community.

Under this FOA, applications can be submitted for equipment, software, instrumentation and associated facility upgrade requests that support nuclear energy-related R&D or education. Funding requests can include, but are not limited to, equipment and instrumentation for specialized facilities, classrooms and laboratories, and non-reactor NS&E research. Infrastructure requests that support the sharing and use of equipment and instrumentation by multiple campuses of a university, multiple universities or national laboratories are encouraged. Equipment and associated upgrades specifically for research reactors is the subject of the University Reactor Upgrades Infrastructure Support opportunity discussed in subparagraph C.1 above.

PART II - AWARD INFORMATION

NOTE: The following requirements apply to all FOA areas unless specific requirements are identified.

A. TYPE OF AWARD INSTRUMENT

DOE anticipates awarding Grants to Universities, and utilizing the Field Work Proposal (FWP) system for awards to National Laboratories.

B. ESTIMATED FUNDING

The estimated amounts identified for each of the FOA areas is contingent upon Congressional appropriations and is subject to significant change.

1. University Reactor Upgrades Infrastructure Support

DOE currently estimates that it will fund approximately **\$3 million** in awards in response to this FOA area.

2. University and DOE National Laboratory General Scientific Infrastructure Support for CINR and the NEET CTD

DOE currently estimates that it will fund approximately **\$3.5 million** in awards for this FOA area.

C. MAXIMUM AND MINIMUM AWARD SIZE

Maximum and minimum award sizes are identified for the FOA areas below:

1. University Reactor Upgrades Infrastructure Support

Ceiling (i.e., the maximum amount for an individual award made under this area):

Up to \$3,000,000

Floor (i.e., the minimum amount for an individual award made under this area):

None.

2. University and DOE National Laboratory General Scientific Infrastructure Support for CINR and the NEET CTD

Ceiling (i.e., the maximum amount for an individual award made under this area):

Up to \$1,000,000

Floor (i.e., the minimum amount for an individual award made under this area):

None.

D. EXPECTED NUMBER OF AWARDS

The estimated amounts identified for each of the FOA areas is contingent upon Congressional appropriations and is subject to change. However, at this time, DOE anticipates making numerous awards under each FOA area, depending on the quality of the submissions and availability of funds. DOE reserves the right to make fewer or no awards under this announcement.

E. ANTICIPATED AWARD SIZE

The anticipated award size for each of the FOA areas are identified below; the anticipated award size ranges are estimated and actual awards may vary:

1. University Reactor Upgrades Infrastructure Support

DOE anticipates awards up to \$1,500,000 depending on the quality of the submissions and availability of funds. However, DOE anticipates making several smaller awards.

2. University and DOE National Laboratory General Scientific Infrastructure Support for CINR and the NEET CTD

DOE anticipates awards will average \$300,000 for the total project period.

F. PERIOD OF PERFORMANCE

DOE anticipates making awards with an estimated project period of one (1) year. Additional time, if needed, may be requested and justified in the application.

G. TYPE OF APPLICATION

DOE will accept only new applications under this announcement.

PART III - ELIGIBILITY INFORMATION

NOTE: The following requirements apply to all FOA areas unless specific requirements are identified.

A. ELIGIBLE APPLICANTS

Restricted Eligibility

1) Universities and Colleges

In accordance with 10 CFR 600.6(b), eligibility for award is restricted to U.S. universities and colleges. Underrepresented Groups and Minority-Serving Institutions (e.g., Historically Black Colleges and Universities, Hispanic Serving Institutions, Tribal Serving Institutions) are encouraged to apply. The following link provides the list of minority serving institutions: <http://www.ed.gov/about/offices/list/ocr/edlite-minorityinst.html>.

If the University has an award in progress from DOE under one of the FOA areas specified in the Infrastructure FOA from a previous year's FOA, the University may be ineligible to apply for a new award under this Infrastructure FOA opportunity. Existing projects must be completed and all associated funds in excess of \$250,000 must be costed prior to the application due date to be considered for an award.

2) DOE/NNSA Federally Funded Research and Development Centers (FFRDCs)

DOE/NNSA Federally Funded Research and Development Centers (FFRDCs) and DOE Government-Operated Government-Owned laboratories (GOGOs) are eligible to apply for funding under the General Scientific Infrastructure Support for Consolidated Innovative Nuclear Research and for the NEET CTD as a prime recipient.

B. COST SHARING

Cost sharing is not required but encouraged.

C. OTHER ELIGIBILITY REQUIREMENTS

NSUF Partner Facilities

To apply to any of the areas in this FOA, the applicant is required to demonstrate the capability and willingness to join the NSUF as a partner facility through the NSUF Partnership Program or be a current partner. (See <http://atrnsof.inl.gov/Partners/tabid/57/Default.aspx> for more information on becoming a NSUF Member.)

Table 1. Parts II and III Summary

	Estimated Available Budget	Eligibility	Maximum Award Size	Anticipated Award Range	Cost Match	Multiple Applications
Reactor Upgrades	\$3,000,000	University	\$3,000,000	Up to \$1,500,000	N/A	No
GSI	\$3,500,000	University	\$1,000,000	\$300,000	1:1 >\$250,000	Yes, if tied to a CINR R&D application.
		National Laboratory	\$1,000,000	\$300,000	N/A	Yes, 1 for Materials, 1 for ASI

PART IV - APPLICATION AND SUBMISSION INFORMATION

NOTE: The following requirements apply to all FOA areas unless specific requirements are identified.

A. ADDRESS TO REQUEST APPLICATION PACKAGE

Application forms and instructions are available at Grants.gov. To access these materials, go to <http://www.grants.gov>, select "Apply for Grants," and then select "Download Application Package." Enter the CFDA and/or the funding opportunity number located on the cover of this announcement and then follow the prompts to download the application package. Once the application package has been downloaded, access the mandatory documents by highlighting the document and then clicking the "move from to complete" button. Then complete forms as required.

B. LETTER OF INTENT AND PRE-APPLICATION

1. Letter of Intent

Letters of Intent are not required.

2. Pre-application

Pre-applications are not required.

C. CONTENT AND FORM OF APPLICATION

Applicants must complete the mandatory forms and any applicable optional forms (e.g., SF-LLL- Disclosure of Lobbying Activities) in accordance with the instructions on the forms and the additional instructions below. Files attached to the forms must be in Adobe Portable Document Format (PDF) and merged into a single PDF file unless otherwise specified in this announcement.

1. SF 424 - Application for Federal Assistance

Complete this form first to populate data in other forms. Complete all required fields in accordance with the pop-up instructions on the form. The list of certifications and assurances referenced in Field 21 can be found on the DOE Financial Assistance Forms Page at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms> under Certifications and Assurances.

2. Project/Performance Site Location(s)

Indicate the primary site where the work will be performed. If a portion of the project will be performed at any other site(s), identify the site location(s) in the blocks provided.

Note that the Project/Performance Site Congressional District is entered in the format of the 2 digit state code followed by a dash and a 3 digit Congressional district code, for example VA-001. Hover over this field for additional instructions.

Use the Next Site button to expand the form to add additional Project/Performance Site Locations.

3. Other Attachments Form

Submit the following files with your application and attach them to the Other Attachments Form. Click on “Add Mandatory Other Attachment” to attach the Project Narrative. Click on “Add Optional Other Attachment” to attach the other files.

a. Project Narrative File - Mandatory Other Attachment

The project narrative must not exceed eight (8) pages, including cover page, table of contents, charts, graphs, maps, photographs, and other pictorial presentations, when

printed using standard 8.5" by 11" paper with 1 inch margins (top, bottom, left, and right) [single spaced] with font no smaller than 11 point for general text; fonts no smaller than 8 may be used for figures, charts, graphs, maps, photographs, and other pictorial presentation. EVALUATORS WILL REVIEW ONLY THE NUMBER OF PAGES SPECIFIED IN THE PRECEDING SENTENCE. Do not include any Internet addresses (URLs) that provide information necessary to review the application. See Section VIII.D for instructions on how to mark proprietary application information. Save the information in a single file named "Project.pdf," and click on "Add Mandatory Other Attachment" to attach.

The project narrative must include:

- 1) Narrative Cover Page which must indicate:
 - a) The name and type of organization;
 - b) The announcement number;
 - c) The FOA Opportunity Title (e.g. University Reactor Upgrades Infrastructure Support, General Scientific Infrastructure Support);
 - d) The technical and business points of contract for the applicant, denoting the names, titles, addresses, telephone and facsimile numbers, and electronic mail addresses;
 - e) Principle Investigator's name, telephone number, facsimile number, e-mail address, and organization name/unit; and
 - f) Names of team members or partnerships.
- 2) *Project Objectives*. This section should provide a clear, concise statement of the specific objectives/aims of the proposed project. For universities, briefly describe the NS&E program(s) at your school; if you do not have a current program, describe your plans to establish such a program. Provide a narrative that describes how your application will further NS&E R&D and education. Discuss the proposed objectives and goals for use of the equipment. Discuss how the request enables the university's learning mission or the national laboratory's nuclear energy mission; and how the request fills current infrastructure gaps and complements existing infrastructure and personnel capabilities.
- 3) *Merit Review Criterion Discussion*. The section should be formatted to address each of the merit review criterion and sub-criterion listed in greater detail in Section V.A.2, as well as Other Selection Factors. Applicants shall provide sufficient information so that reviewers will be able to evaluate the application in accordance with the merit review criteria and other selection factors.
- 4) *Project Timetable*: This section should outline as a function of time, year by year, all the important activities or phases of the project, including any activities planned beyond the project period. Successful applicants must use this project timetable to report progress.
- 5) *Relevance and Outcomes/Impacts*: This section should explain the relevance of

the effort to the objectives in the program announcement and the expected outcomes and/or impacts. The justification for the proposed project should include a clear statement of the importance of the project in terms of the utility of the outcomes and the target community of beneficiaries.

- 6) *Roles of Participants*: Describe the capabilities and qualifications of the Principal Investigator and application team to accomplish the proposed work.
- 7) *Facilities And Other Resources*: Identify the facilities (e.g., office, laboratory, computer, etc.) and expertise to be used at each performance site listed and, if appropriate, indicate their capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Describe only those resources that are directly applicable to the proposed work. Provide any information describing the other resources available to the project such as machine and electronics shops.
- 8) *Equipment*: List important items of equipment already available for this project and, if appropriate, note the location and pertinent capabilities of each. If you are proposing to acquire equipment, describe comparable equipment, if any, already at your organization or within the DOE complex and explain why it cannot be used.
- 9) *Utilization*: Provide a narrative that describes how your application will allow for researcher usage, both within the institution and by other entities or institutions. Provide a measure of the amount of use expected for the requested equipment and instrumentation by both the proposing institution and others within the research community. If there is a preexisting capability, provide a description of how readily accessible and/or currently utilized the resource is by other entities or institutions.

b. Project Summary/Abstract File

The project summary/abstract must contain a summary of the proposed activity suitable for dissemination to the public. It should be a self-contained document that identifies the name of the applicant, the project director/principal investigator(s), the project title, the objectives of the project, a description of the project, including methods to be employed, the potential impact of the project (i.e., benefits, outcomes), and major participants (for collaborative projects). This document must not include any proprietary or sensitive business information as the Department may make it available to the public if an award is made. The project summary must not exceed one (1) page when printed using standard 8.5" by 11" paper with 1" margins (top, bottom, left and right) [select single or double spaced] with font no smaller than 11 point. Save this information in a file named "Summary.pdf," and click on "Add Optional Other Attachment" to attach.

c. SF 424 A Excel, Budget Information - Non-Construction Programs File

Applicants must provide a separate budget for each year of support requested and a cumulative budget for the total project period. Use the SF 424 A Excel, "Budget Information - Non Construction Programs" form on the DOE Financial Assistance

Forms Page at <http://energy.gov/management/office-management/operational-management/financial-assistance/financial-assistance-forms>.

Applicants may request funds under any of the Object Class Categories as long as the item and amount are necessary to perform the proposed work, meet all the criteria for allowability under the applicable Federal cost principles, and are not prohibited by the funding restrictions in this announcement (See PART IV, G). Save the information in a single file named "SF424A.xls," and click on "Add Optional Other Attachment" to attach.

d. Budget Justification File

Applicants must justify the costs proposed in each Object Class Category/Cost Classification category (e.g.; provide a list of equipment and cost of each item; and provide any other information you wish to support your budget). **Applicants must submit vendor quotes or referenced costs (catalog pricing) for any single item over \$25,000.**

If cost sharing is proposed, applicants must have a letter from each third party contributing cost sharing (i.e., a party other than the organization submitting the application) stating that the third party is committed to providing a specific minimum dollar amount of cost sharing.

The budget justification file should also identify the following information for each third party contributing cost sharing: (1) the name of the organization; (2) the proposed dollar amount to be provided; (3) the amount as a percentage of the total project cost; and (4) the proposed cost sharing - cash, services, or property.

By submitting your application, you are providing assurance that you have signed letters of commitment. Successful applicants will be required to submit these signed letters of commitments. Save the budget justification information in a single file named "Budget.pdf," and click on "Add Optional Other Attachment" to attach.

e. Budget for DOE/NNSA Federally Funded Research and Development Center (FFRDC) Applicants only

If a DOE/NNSA FFRDC contractor is to perform a portion of the work, you must provide a DOE Field Work Proposal in accordance with the requirements in DOE Order 412.1 Work Authorization System. This Order and the DOE Field Work Proposal form are available at <http://energy.gov/management/office-management/operationalmanagement/financial-assistance/financial-assistance-forms>. Use up to 10 letters of the FFRDC name (plus .pdf) as the file name (e.g., lanl.pdf or anl.pdf), and click on "Add Optional Other Attachment" to attach.

f. Past, Current and Pending Support

Identify funding that is pending or has been awarded, for similar activities related to nuclear infrastructure/ curriculum within the last three years. Please identify by source and amount requested/awarded. Save the information in a file named "Support.pdf" click on "Add Optional Other Attachment" to attach.

g. Authorization for DOE/NNSA FFRDC Applicants only

The cognizant contracting officer for the FFRDC must authorize in writing the use of a DOE/NNSA FFRDC contractor on the proposed project and this authorization must be submitted with the application. The following wording is acceptable for this authorization.

"Authorization is granted for the **Fill-in 1: [Name]** Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complimentary to the missions of the laboratory, will not adversely impact execution of the DOE/NNSA assigned programs at the laboratory."

h. Conflict of Interest Statement (Required for National Laboratories, DOE and non-DOE FFRDC applicants)

Conflicts of interest may exist due to previous efforts performed by the Labs or assistance provided in program direction and other mission related activities. Accordingly, for each subapplicant that is a National Laboratory or DOE and/or non-DOE FFRDC, identify any potential conflicts of interest, fully explain the conflict, whether you feel it is significant or not, along with your rationale, and, if significant, how you will avoid, neutralize, or mitigate the potential conflict. Save this sheet in a single file named "COI.pdf," and click on "Add Optional Other Attachment" to attach.

i. Applicant Lighting Efficiency Additional Budget Justification

If the resulting award is a grant exceeding \$1,000,000, the applicant shall be required to identify the facility (the rooms or areas where a majority of the proposed project work will occur). In the applicants budget justification, they must identify and justify the costs associated with upgrading the light bulbs to meet or exceed the energy efficiency standard for incandescent light bulbs set forth in or pursuant to section 325 of the Energy Policy and Conservation Act (42 U.S.C. 6295) prior to the end of the Federal fiscal year. See Appendix A in Part IX of this FOA for the clause which would be included in the resulting award which includes the technical requirements for this upgrade.

j. Environmental Checklist

Applicants must complete the environmental checklist available at www.NEUP.gov.

4. SF-LLL Disclosure of Lobbying Activities

If applicable, complete SF- LLL.

Applicability: If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the grant/cooperative agreement, you must complete and submit Standard Form - LLL, "Disclosure Form to Report Lobbying."

Summary of Required Forms/Files

Applications must include the following documents which are all part of the Grants.gov application package.

Name of Document	Format	File Name
Application for Federal Assistance – SF424	Form	N/A
Project/Performance Site Location(s)	Form	N/A
Other Attachments Form: Attach the following files to this form:	Form	N/A
Project Narrative File	PDF	Project.pdf
Project Summary/Abstract File	PDF	Summary.pdf
SF 424A File - Budget Information for Non-Construction Programs	Excel	SF424A.xls
Budget Justification File	PDF	Budget.pdf
Budget for DOE/NNSA Federally Funded Research and Development Center (FFRDC) Applicants	PDF	FFRDC name.pdf
Current and Pending Support	PDF	Support.pdf
Authorization for DOE/NNSA FFRDC Applicants	PDF	FFRDC Authorization.pdf
Conflict of Interest Statement	PDF	COI.pdf
SF-LLL Disclosure of Lobbying Activities, if applicable.	Form	N/A

D. SUBMISSIONS FROM SUCCESSFUL APPLICANTS

If selected for award, DOE reserves the right to request from successful applicant's additional or clarifying information for any reason deemed necessary, including, but not limited to:

- Indirect cost information
- Other budget information
- Name and phone number of the Designated Responsible Employee for complying with national policies prohibiting discrimination (See 10 CFR 1040.5)

- Representation of Limited Rights Data and Restricted Software, if applicable
- Commitment Letter from Third Parties Contributing to Cost Sharing, if applicable

E. SUBMISSION DATES AND TIMES

1. Letter of Intent Due Date

Letters of Intent are not required.

2. Pre-application Due Date

Pre-applications are not required.

3. Application Due Date

Applications must be received by April 3, 2014, no later than 8:00 PM Eastern Time.

Applicants are encouraged to transmit applications well before the deadline.

APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.

F. INTERGOVERNMENTAL REVIEW

This program is not subject to Executive Order 12372 - Intergovernmental Review of Federal Programs.

G. FUNDING RESTRICTIONS

Funding for all awards are contingent upon the availability of funds appropriated by Congress for the purpose of this program.

Cost Principles. Costs must be allowable, allocable and reasonable in accordance with the applicable Federal cost principles referenced in 10 CFR 600. The cost principles for commercial organization are in FAR Part 31.

Pre-award Costs. Recipients may charge to an award resulting from this announcement pre-award costs that were incurred within the ninety (90) calendar day period immediately preceding the effective date of the award, if the costs are allowable in accordance with the applicable Federal cost principles referenced in 10 CFR 600. Recipients must obtain the prior approval of the contracting officer for any pre-award costs that are for periods greater than this 90 day calendar period.

Pre-award costs are incurred at the applicant's risk. DOE is under no obligation to reimburse such costs if for any reason the applicant does not receive an award or if the award is made for a lesser amount than the applicant expected.

H. OTHER SUBMISSION AND REGISTRATION REQUIREMENTS

1. Where to Submit

APPLICATIONS MUST BE SUBMITTED THROUGH GRANTS.GOV TO BE CONSIDERED FOR AWARD.

Submit electronic applications through the "Apply for Grants" function at <http://www.Grants.gov>. If you have problems completing the registration process or submitting your application, call Grants.gov at 1-800-518-4726 or send an email to support@grants.gov.

2. Registration Process

You must COMPLETE the one-time registration process (all steps) before you can submit your first application through Grants.gov (See http://www.grants.gov/applicants/get_registered.jsp). We recommend that you start this process at least three weeks before the application due date. It may take 21 days or more to complete the entire process. Use the Grants.gov Organizational Registration Checklists at <http://www.grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process.

IMPORTANT: During the CCR registration process, you will be asked to designate an E-Business Point of Contact (EBIZ POC). The EBIZ POC must obtain a special password called "Marketing Partner Identification Number" (MPIN). When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e., Grants.gov registration).

3. Application Receipt Notices

After an application is submitted, the Authorized Organization Representative (AOR) will receive a series of four e-mails. It is extremely important that the AOR watch for and save each of the emails. It may take up to two (2) business days from application submission to receipt of email Number 2. The titles of the four e-mails are:

Number 1 - Grants.gov Submission Receipt Number

Number 2 - Grants.gov Submission Validation Receipt for Application Number

Number 3 - Grants.gov Grantor Agency Retrieval Receipt for Application Number

Number 4 - Grants.gov Agency Tracking Number Assignment for Application Number

4. Application Validity Timeframe

By submitting an application in response to this FOA, applicants agree that their applications are valid for at least 1 year from the date set forth for receipt of applications to this FOA.

PART V - APPLICATION REVIEW INFORMATION

NOTE: The following requirements apply to all FOA areas unless specific requirements are identified.

A. CRITERIA

1. Initial Review Criteria

Prior to a comprehensive merit evaluation, DOE will perform an initial review to determine that (1) the proposed work is relevant to the DOE-NE mission; (2) the applicant is eligible for an award; (3) the information required by the funding opportunity announcement has been submitted; (4) the proposed project is responsive to the objectives of the funding opportunity announcement; and (5) no more than one application not tied directly to CINR FOA has been submitted. Applications that fail to pass the initial review will not be forwarded for merit review and will be eliminated from further consideration.

2. Merit Review Criteria

The following evaluation criteria and weights will be used to evaluate applications submitted for Reactor Upgrades. Rating criteria include demonstrations of increasing or enhancing research or teaching capabilities.

a) University Reactor Upgrades Infrastructure

- i. (40%) Potential of the requested equipment, instrumentation or modification to:
 - Enhance the safety, performance, control or operational capability of reactor systems, or
 - Increase the quality, safety/security, or efficiency of the operation of the reactor facility, or
 - Improve or expand the research, teaching and training capabilities of the reactor facility.
- ii. (30%) As a result of the proposed equipment, the amount of student and faculty usage of the reactor facility, and the amount and variety of research and/or services actually provided by the facility.
- iii. (30%) Project Implementation – Capability to implement the full scope of the project including personnel.

b) University and DOE National Laboratory General Scientific Infrastructure Support for CINR and the NEET CTD

- i. (40%) Potential of the requested equipment, instrumentation or modification to facilitate, improve or expand ongoing Office of Nuclear Energy research (or research proposed in FY 2014 in response to the CINR FOA DE-FOA-0000998) and training capabilities;

- ii. (30%) As a result of the proposed equipment, the amount of student, faculty, or researcher usage of the capabilities, and the amount and variety of research and/or services actually provided by the facility;
- iii. (30%) Project Implementation - Capability to implement the full scope of the project including personnel.

3. Other Selection Factors

Program Policy Factors. The selection official may also consider the following program policy factors in the selection process under all FOA areas as appropriate (not listed in order of importance):

- Degree to which proposed project optimizes/maximizes use of available DOE-NE funding to achieve DOE program goals and objectives. This includes how those infrastructure projects support DOE-NE research; it may also include how the infrastructure project support other complementary efforts or projects, which when taken together, will best achieve program research goals and objectives.
- Application selection may optimize appropriate mix of projects to achieve DOE-NE research goals and objectives.
- Other Cost/Budget considerations, including cost reasonableness of the equipment or instrumentation to achieve the proposed objectives, and availability of funding.
- Existing NS&E Program, or realistic plan to establish NS&E program.
- Underrepresented Groups and Minority-Serving Institutions that submit a competitive application.
- Cost share, if any, proposed.
- Extent or degree to which projects provide a balanced programmatic effort and a variety of research capabilities among various sizes and kinds of organizations and their geographic distribution.

The above program policy factors may be used by the Selection Official to assist in determining which application shall receive DOE funding support. These factors, while not indicators of the application's technical excellence, applicant's ability, etc., are essential to the process of selecting the application that, individually or collectively, will best achieve the program objectives and maximize public benefits. These factors may also be influenced by issues beyond the control of the Applicant. Each Applicant should recognize that some very good applications might not receive an award because they do not fit within a mix of projects that maximizes the probability of achieving the DOE's overall objectives.

B. REVIEW AND SELECTION PROCESS

1. Merit Review

Applications that pass the initial review will be subjected to a merit review in accordance with the guidance provided in the "Department of Energy Merit Review Guide for Financial Assistance." This guide is available under Financial Assistance, Regulations and Guidance at <http://energy.gov/management/office-management/operational-management/financial-assistance>.

2. Selection

The Selection Official will consider the merit review recommendation, program policy factors, and the amount of funds available.

3. Discussions and Award

The Government may enter into discussions with a selected applicant for any reason deemed necessary, including but not limited to: (1) the budget is not appropriate or reasonable for the requirement; (2) only a portion of the application is selected for award; (3) the Government needs additional information to determine that the recipient is capable of complying with the requirements in 10 CFR 600; and/or (4) special terms and conditions are required. Failure to resolve satisfactorily the issues identified by the Government will preclude award to the applicant.

C. ANTICIPATED NOTICE OF SELECTION AND AWARD DATES

DOE anticipates notifying applicants selected for award and making awards by September 30, 2014. DOE reserves the right to make additional award selections using applications submitted in response to this FOA. Award(s) for this project are subject to the availability of Federal funding.

PART VI - AWARD ADMINISTRATION INFORMATION

A. AWARD NOTICES

1. Notice of Selection

DOE will notify applicants selected for award. This notice of selection is not an authorization to begin performance. (See Section IV.G with respect to the allowability of pre-award costs.)

Organizations whose applications have not been selected will be advised as promptly as possible. This notice will explain why the application was not selected.

2. Notice of Award

An Assistance Agreement issued by the contracting officer is the authorizing award document. It normally includes either as an attachment or by reference: (1) Special Terms and Conditions; (2) Applicable program regulations, if any; (3) Application as approved by

DOE.; (4) DOE assistance regulations at 10 CFR Part 600; (5) National Policy Assurances To Be Incorporated As Award Terms; (6) Budget Summary; and (7) Federal Assistance Reporting Checklist, which identifies the reporting requirements.

For grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 of the CFR (Grants and Agreement), the Award also includes the Research Terms and Conditions located at <http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp>.

B. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

1. Administrative Requirements

The administrative requirements for DOE grants and cooperative agreements are contained in 10 CFR 600 (See: <http://ecfr.gpoaccess.gov>). Grants and cooperative agreements made to universities, non-profits and other entities subject to Title 2 CFR are subject to the Research Terms and Conditions located on the National Science Foundation web site at <http://www.nsf.gov/bfa/dias/policy/rtc/index.jsp>.

DUNS AND CCR REQUIREMENTS

Additional administrative requirements for DOE grants and cooperative agreements are contained in 2 CFR, Part 25 (See: <http://www.eCFR.gov>). Prime awardees must keep their data at the System for Award Management (SAM) current at <http://www.sam.gov>. SAM is the government-wide system that replaced the CCR. If you had an active registration in the CCR, you have an active registration in SAM. Subawardees at all tiers must obtain DUNS numbers and provide the DUNS to the prime awardee before the subaward can be issued.

SUBAWARD AND EXECUTIVE REPORTING

Additional administrative requirements necessary for DOE grants and cooperative agreements to comply with the Federal Funding and Transparency Act of 2006 (FFATA) are contained in 2 CFR, Part 170. (See: <http://www.eCFR.gov>). Prime awardees must register with the new FSRs database and report the required data on their first tier subawardees. Prime awardees must report the executive compensation for their own executives as part of their registration profile in the System for Award Management (SAM).

2. Special Terms and Conditions and National Policy Requirements

Special Terms and Conditions and National Policy Requirements. The DOE Special Terms and Conditions for Use in Most Grants and Cooperative Agreements are located at http://management.energy.gov/business_doe/business_forms.htm.

The National Policy Assurances To Be Incorporated As Award Terms are located at <http://www.nsf.gov/bfa/dias/policy/rtc/appc.pdf>.

Intellectual Property Provisions. The standard DOE financial assistance intellectual property provisions applicable to the various types of recipients are located at http://www.gc.doe.gov/financial_assistance_awards.htm.

3. Applicant Lighting Efficiency Certification (April 2012)

If the resulting award is a grant in excess of \$1,000,000, the applicant shall be required to identify the facility (the rooms or areas where a majority of the proposed project work will occur) and certify that if chosen for a grant award it will, by the end of the Federal Government's fiscal year, upgrade the efficiency of its facilities by replacing any incandescent lighting of the type for which section 325 of the Energy Policy and Conservation Act (42 USC 6295) establishes a standard that does not meet or exceed the energy efficiency standard for incandescent light bulbs set forth in that section with a lamp that meets or exceeds the standards for lamps established in or pursuant to that section. See Section IX, Appendix A of this FOA for the clause which would be included in the resulting award which includes the technical requirements for this upgrade.

C. REPORTING

Reporting requirements are identified on the Federal Assistance Reporting Checklist, DOE F 4600.2, attached to the award agreement. For a sample Checklist, see <http://www.management.energy.gov/documents/DOEF4600pt292009.pdf>.

PART VII - QUESTIONS/AGENCY CONTACTS

A. QUESTIONS

Questions regarding the content of the announcement must be submitted to NEUP@inl.gov.

Questions and comments concerning this FOA shall be submitted not later than five (5) calendar days prior to the application due date. Questions submitted after that date may not allow the Government sufficient time to respond.

Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. DOE cannot answer these questions.

B. AGENCY CONTACT

Name: Aaron Gravelle
E-mail: gravelap@id.doe.gov

PART VIII - OTHER INFORMATION

A. MODIFICATIONS

Notices of any modifications to this announcement will be posted on Grants.gov and the FedConnect portal. You can receive an email when a modification or an announcement message is posted by registering with FedConnect as an interested party for this FOA. It is recommended that you register as soon after release of the FOA as possible to ensure you receive timely notice of any modifications or other announcements.

B. GOVERNMENT RIGHT TO REJECT OR NEGOTIATE

DOE reserves the right, without qualification, to reject any or all applications received in response to this announcement and to select any application, in whole or in part, as a basis for negotiation and/or award.

C. COMMITMENT OF PUBLIC FUNDS

The Contracting Officer is the only individual who can make awards or commit the Government to the expenditure of public funds. A commitment by other than the Contracting Officer, either explicit or implied, is invalid.

D. PROPRIETARY APPLICATION INFORMATION

Patentable ideas, trade secrets, proprietary or confidential commercial or financial information, disclosure of which may harm the applicant, should be included in an application only when such information is necessary to convey an understanding of the proposed project. The use and disclosure of such data may be restricted, provided the applicant includes the following legend on the first page of the project narrative and specifies the pages of the application which are to be restricted:

"The data contained in pages FOA Insert pages] of this application have been submitted in confidence and contain trade secrets or proprietary information, and such data shall be used or disclosed only for evaluation purposes, provided that if this applicant receives an award as a result of or in connection with the submission of this application, DOE shall have the right to use or disclose the data herein to the extent provided in the award. This restriction does not limit the government's right to use or disclose data obtained without restriction from any source, including the applicant."

To protect such data, each line or paragraph on the pages containing such data must be specifically identified and marked with a legend similar to the following:

"The following contains proprietary information that (name of applicant) requests not be released to persons outside the Government, except for purposes of review and evaluation."

E. EVALUATION AND ADMINISTRATION BY NON-FEDERAL PERSONNEL

In conducting the merit review evaluation, the Government may seek the advice of qualified non-Federal personnel as reviewers. The Government may also use non-Federal personnel to conduct independent reviews, as well as routine, nondiscretionary administrative activities. The applicant, by submitting its application, consents to the use of non-Federal reviewers/administrators. Non-Federal reviewers must sign conflict of interest and non-disclosure agreements prior to reviewing an application. Non-Federal personnel conducting administrative activities must sign a non-disclosure agreement.

F. INTELLECTUAL PROPERTY DEVELOPED UNDER THIS PROGRAM

Patent Rights. The government will have certain statutory rights in an invention that is conceived or first actually reduced to practice under a DOE award. 42 U.S.C. 5908 provides that title to such inventions vests in the United States, except where 35 U.S.C. 202 provides otherwise for nonprofit organizations or small business firms. However, the Secretary of Energy may waive all or any part of the rights of the United States subject to certain conditions. (See "Notice of Right to Request Patent Waiver" in paragraph G below.)

Rights in Technical Data. Normally, the government has unlimited rights in technical data created under a DOE agreement. Delivery or third party licensing of proprietary software or data developed solely at private expense will not normally be required except as specifically negotiated in a particular agreement to satisfy DOE's own needs or to insure the commercialization of technology developed under a DOE agreement.

G. NOTICE OF RIGHT TO REQUEST PATENT WAIVER

Applicants may request a waiver of all or any part of the rights of the United States in inventions conceived or first actually reduced to practice in performance of an agreement as a result of this announcement, in advance of or within 30 days after the effective date of the award. Even if such advance waiver is not requested or the request is denied, the recipient will have a continuing right under the award to request a waiver of the rights of the United States in identified inventions, i.e., individual inventions conceived or first actually reduced to practice in performance of the award. Any patent waiver that may be granted is subject to certain terms and conditions in 10 CFR 784 <http://www.gc.doe.gov/documents/patwaivclau.pdf>.

Domestic small businesses and domestic nonprofit organizations will receive the patent rights clause at 37 CFR 401.14, i.e., the implementation of the Bayh-Dole Act. This clause permits domestic small business and domestic nonprofit organizations to retain title to subject inventions. Therefore, small businesses and nonprofit organizations do not need to request a waiver.

H. NOTICE REGARDING ELIGIBLE/INELIGIBLE ACTIVITIES

Eligible activities under this program include those which describe and promote the understanding of scientific and technical aspects of specific energy technologies, but not those which encourage or support political activities such as the collection and dissemination of information related to potential, planned or pending legislation.